IMPACT OF THE US-COLOMBIA FTA ON THE SMALL FARM ECONOMY IN COLOMBIA

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ABREVIATIONS

ANDI	National Business Association of Colombia
ATPDEA	Andean Trade Promotion and Drug Eradication Act
CAFTA	US - Central America Free Trade Agreement
CAN	Community of Andean Nations
CCI	*Corporación Colombia Internacional*
CET	Common External Tariff
CIF	Cost, Insurance, and Freight
COP	Colombian Pesos
CPI	Consumer Price Index
DANE	*Departamento Administrativo Nacional de Estadística* (Colombian national statistics department)
ECH	*Encuesta Continua de Hogares* (a survey of households)
EFTA	European Free Trade Association
ENA	*Encuesta Nacional Agropecuaria* (Colombian agricultural survey)
FEDEGAN	*Federación Nacional de Ganaderos* (Colombian federation of cattle farmers)
FFA	*Fondo Financiero Agropecuario* (Colombian agricultural funding body)
FINAGRO	*Fondo para el Financiamiento del Sector Agropecuario* (Colombian agricultural funding body)
FOB	Free On Board
FTA	Free Trade Agreement
G3	Group of 3
GDP	Gross Domestic Product
ha	hectare
IDEMA	*Instituto Colombiano de Mercadeo Agropecuario* (Colombian agricultural marketing institute)
m	million
MAC	*Mecanismo Público de Administración de Contingentes* (Colombian quota administration mechanism)
MADR	*Ministerio de Agricultura y Desarrollo Rural de Colombia* (Colombian Ministry of Agriculture and Rural Development)
MERCOSUR	Southern Common Market
MFN	Most Favored Nation
NAFTA	North American Free Trade Agreement
OIE	World Organization for Animal Health
PPI	Producer Price Index
PSE	Producer Subsidy Equivalent
RMER	Representative Market Exchange Rate
SFP	Sampled Farm Part (*Pedazo de Segmento de Muestreo*) observation unit of the *ENA* - "*continuous land surface contained within a sample segment, in the charge of a producer or administrator"*

TRM	*Tasa de Cambio Representativa del Mercado* (Colombia's representative market exchange rate)
SAFP	*Sistema Andino de Franja de Precios* - Andean Price Band System
t/ton	Metric Ton
US	United States of America
USD	US Dollars
USDA	United States Department of Agriculture
VP	Value of Production
WTO	World Trade Organization

GLOSSARY

Ad Valorem Tariff: import tariff, charged at a fixed percentage of the value of the good

Andean Price Band System: tariff system applied by Colombia, Ecuador and Venezuela to a subset of agricultural products under World Trade Organization rules: It combines two tariffs, one fixed and one variable, applied inversely to the international price. When this tariff system was negotiated, Venezuela and Peru were exempted from applying it. Venezuela later left the Andean Group, and it is likely that Peru will continue with its own band system.

Antidumping Tariff: tariff applied in order to counteract the injury that is caused or may be caused to domestic production by dumping practices (when a country exports goods at a price lower than that charged in its domestic market)

Base Tariff: level from which a program of tariff reduction is applied

Common External Tariff: customs tariff applied in a uniform manner by members of the Community of Andean Nations

Countervailing Duty: customs duty levied on imports of a certain good in order to counteract the injury caused, or that may be caused, to domestic production by the granting of export subsidies on the part of the exporting country

Domestic Crop Purchase Requirement: legal requirement imposed on importers of agricultural products by which a tariff exoneration or preference is determined on the purchase of domestic crops

Import Licensing: administrative procedures that require the presentation of an application or other documentation (other than those required for purposes of customs) to the appropriate administrative organ as a prior condition for the import of goods (It refers here to the Colombian *Licencias Previas.*)

In-quota tariff: the tariff applied on imports within a quota

Level of Tariff Restitution: maximum percentage or amount to which a tariff can be increased as a consequence of the imposition of a quantity or price safeguard measure, after having being reduced by virtue of a tariff reduction or elimination program

Preferential Clause: regulation in an agreement by which a country or group of countries concede special treatment to another country or group of countries

Price or Quantity Safeguard: a measure that may be imposed to temporarily protect domestic production of a certain good from imports: These measures may be triggered by a change in price or quantity. They may have the nature of a tariff or be of a quantitative type.

Price Safeguard Trigger Level: price of a good at which any further decrease permits the application of a safeguard measure

Quantity Safeguard Trigger Level: volume of imports of a good at which any further increase permits the application of a safeguard measure

Quota: quota or quantity of imports, in units or in value, that is subject to some kind of special treatment, normally with regard to tariffs

Self-Contained Negotiation: negotiation characterized by an equivalence of concessions

Short-Cycle Crops: crops with a production cycle of less than a year

Specific Tariff: a fixed charge per unit of product imported

Transition Period: duration of the period of tariff elimination for a product within the framework of a free trade agreement: If the term refers to the FTA as a whole, this will be the duration of the longest tariff elimination period of the Agreement.

1 billion USD = 1,000 million USD

1 billion COP = 1,000,000 million COP

INTRODUCTION

The principal aim of this study is to analyze and estimate the impact that the Free Trade Agreement negotiated by Colombia and the United States is likely to have on the Colombian small farm[1] economy, using the results and conditions agreed for the agricultural sector.

To begin with, the impact that the tariff elimination agreed in the FTA may bring to the Colombian agricultural production sector is estimated in terms of the expected changes in domestic prices, and resulting variations in the areas cultivated and production levels of important small farm products.

Generally, this estimate uses a *comparative statics* methodology based on the average behavior of domestic and international prices and exchange rates in the recent past, under the assumption that, with the FTA in force, market conditions typical of the last few years will be maintained for the products under study. However, in order to measure results in cases of possible changes in these conditions, the impact is calculated for scenarios of both high and low international prices, as well as devaluing and revaluing exchange rates. A *partial equilibrium analysis* is used to enable the evaluation of effects on tradable Colombian agricultural products in greater detail, albeit at the cost of ignoring part of the indirect effects resulting from relations of substitution and complementarity among them.

Secondly, a characterization of the Colombian small farm economy is undertaken. Using the results of a survey of households (*Encuesta Continua de Hogares - ECH*) from the first quarter of 2005, the situation of small farm households is described. Also, the contribution of these households to Colombian agricultural production, and the quantification of their crop growing and livestock activities are presented, taking the results of the National Agricultural Survey (*ENA*) of 2005 as a reference.

Third, the probable effect that trade liberalization would bring to the producers of the small farm economy, and consequently their household income, is estimated using the general results on the impact of the FTA for each particular agricultural activity. This measurement involves the calculation of the average income and expenditure structure of these producers, using the information on prices and production costs available in Colombia. Estimated changes in domestic prices, production and area cultivated due to effects of the FTA are then applied to the calculated productive structure. Hence, taking 2005 as a reference year, the impact on total income, added value or producer surplus, and net profit for small-scale producers can be estimated. With these estimates, the impact that the FTA could have on the total income of small farm households is evaluated.

The principal concern of this study is to determine the impact of the FTA on the Colombian small farm economy and its dependent households from the point of view of production patterns. Thus, the effects on households of changes in the relative prices of different consumer goods, changes in national income, and changes in the fiscal income of the nation are not taken into account.

[1] In this document, the terms *small farmer, small-scale producer, small farm economy* etc. are used when translating the Spanish word *campesino*. Detailed information is provided in chapter III.

An executive summary containing the principal results of the study is included. In the first chapter of the report, some of the characteristic elements of the agricultural negotiations and their main results are given. The following chapters deal with: a calculation of the foreseeable effects of the FTA on the agricultural sector, a characterization of the small farm economy, and an estimate of the impact of this new scenario on small-scale producers and their households.

A CD with all the methodological and statistical annexes used in the study is available.

EXECUTIVE SUMMARY

This study aims to estimate the effect that the Free Trade Agreement signed by the United States and Colombia may have on Colombian small-scale farmers, in terms of a decrease in production and income. The estimate is carried out under the hypothesis that it is very unlikely that these producers will be able to take advantage of the few opportunities to increase their production or income that are offered in agricultural[2] matters by the FTA.

In effect, almost all traditional Colombian export goods already count on duty-free entry to the United States, and the only Colombian product with high export potential now subject to US customs restrictions, sugar, was excluded from the tariff phase-out program. An increase in exports as a result of the FTA is uncertain for the majority of agricultural products identified as promising by the Colombian government, and is tied to the fulfillment of several prerequisites. On one hand, an increase in exports depends on the willingness of the United States authorities to remove unjustified barriers to trade, such as dates and ports of entry, while on the other hand, it depends on advances made in the Colombian domestic agenda towards improving the competitiveness of these products, adjusting them to sanitary and phytosanitary norms, such as traceability, and adapting domestic production to international standards in quality and packaging, etc.

If any of the possibilities created by the FTA materialize, it is not clear they can benefit the small farm economy, considering the magnitude and cost of the changes and investments necessary to produce on a scale large enough to fulfill likely minimum order sizes.

The average changes in prices and production that may occur due to tariff elimination were estimated for a significant set of small farm economy products in scenarios of average, low, and high prices and exchange rates. This estimate used supply functions calculated in a Ministry of Agriculture and Rural Development study on agricultural products in 2005, and in two university theses in the cases of pork and chicken. The changes were applied to the figures for the small farm production structure of the year 2005 to determine the loss in net income that would occur as a consequence of the FTA.

1. Implications of negotiating a free trade agreement in agriculture with the United States

The negotiation of the US - Colombia FTA has been the principal and most important manifestation of the Colombian government's recently adopted policy of "internationalization" of the economy, whose main instruments are the adoption of free trade agreements and promotion of bilateral investments with various commercial partners. The significance of this agreement lies in the size of the trade flows between the two countries, the considerable capacity of the US market compared with that of Colombia in the majority of goods and services, and the political relationship between the two countries in the fight against drug trafficking.

[2] In this document, the word *agriculture* is taken to include both crop cultivation and livestock rearing. In the case that one or the other is referred to solely, this will be stated: *crop farming, livestock rearing* etc.

The usual sensitivity that characterizes the agricultural sector in trade negotiations, not only in Colombia, but in the world as whole, is even greater in the case of this FTA, due to several factors.

First, even though significant tariff reductions were implemented in Colombia from the beginning of the 1990s, the sector remained protected by various instruments. These included: variable tariffs for an important group of products (cereals, oil seeds, dairy products, chicken, pork and sugar); high ad valorem tariffs for another group of sensitive goods (rice, beef and beans); domestic purchasing requirements; import quotas; and direct support for production in certain activities, among others.

Second, at the beginning of the twenty-first century, Colombia found itself on the point of establishing a free trade scenario with one of the world's great economic powers, in the face of an obviously acute degree of asymmetry between: the economies of the two nations (in 2001, the US GDP was 122 times that of Colombia); the size of markets (in 2001, the population of the United States was seven times that of Colombia, and its geographic area nine times larger); agricultural production (US agricultural GDP is 15 times greater than Colombia's, and the area cultivated is 26 times larger); the export capacity of the agricultural sector (US agricultural exports are 20 times greater than those of Colombia); and the degree of technological development (the number of tractors per thousand workers is 257 times higher in the United States).

Third, it was intended that the Colombian domestic market be opened to the exports of a nation that grants a substantial amount of domestic support for production and export subsidies, with clear distorting effects on trade and world prices. Although it was known that, with the exception of non-financial subsidies to exports, negotiation on these measures would be very difficult if not impossible, it was at least expected that compensatory measures could be implemented to avoid transferring their effects onto Colombian agricultural producers.

Fourth, one of the principal objectives of the negotiation was to permanently consolidate the unilateral preferences granted by the United States in the ATPA/ATPDEA (Andean Trade Preference/Andean Trade Promotion and Drug Eradication Acts). However, it was clear that the FTA would only succeed in increasing Colombian agricultural exports if the following two conditions were met: i) the United States were to go beyond the ATPA/ATPDEA unilateral tariff preference scheme, by eliminating or phasing out tariffs on sensitive products (sugar, beef, dairy products, and tobacco), which was only partially achieved, due to some extent to the maintenance of the US megatariff [3] on sugar, and ii) if agreement could be reached in overcoming the non-tariff barriers faced by a group of

[3] From WTO glossary:
Megatariffs: Extremely high tariffs that effectively cut off all imports other than the minimum access amounts granted under the WTO Agreement on Agriculture. Some well-known examples of megatariffs resulting from tariffication include the base tariffs calculated for European Union tariffs on grains, sugar, and dairy products; U.S. sugar, peanuts, and dairy products; Canadian tariffs on dairy products and poultry; and Japanese tariffs on wheat, peanuts, and dairy products.

promising Colombian export products (beef, dairy products, fruits and vegetables), the outcome of which is still uncertain.

Lastly, the sensitivity of the agricultural sector in terms of Colombian political, economic and social stability is well known. This vulnerability is fundamentally due to the relation of the agricultural sector to the internal conflict that has existed in Colombia for several decades, and the need to create profitable alternatives to illicit crops.

As will be seen below, in spite of all the former considerations, the results of the negotiation show that the following points were not taken into account: the aforementioned asymmetries; the supposed political importance of Colombia; the shared responsibility of the United States in the fight against drug trafficking and terrorism; and the foreseeable harmful effects of opening the Colombian domestic market in the face of distorting measures, and without real possibilities of increasing agricultural exports significantly. The United States negotiated the FTA taking only commercial considerations into account. Generally, the treatment accorded Colombia was less favorable than that granted to other countries in previous trade agreements.

2. The terms of the negotiation: inequity and asymmetry operate against Colombia

The negotiation of the FTA with the United States proved weighted against Colombia.

While the United States managed to maintain a good part of its existing protection by preserving domestic support for production, Colombia agreed to phase out all its tariffs (over different periods according to the product), and dismantle its principal measures of protection, such as the Andean Price Band System and the *MAC* quota administration mechanism, which guarantees the purchase of Colombian crops. The country was left with no possibility of adopting mechanisms to counteract the effects of US domestic support and export subsidies.

Additionally, one of the United States' most sensitive products, and at the same time one of Colombia's offensive interest export products, sugar, was excluded from tariff relief, the United States maintaining its megatariff on this product. Other high sugar content products not ready for consumption were also excluded. In contrast, Colombia was not permitted to exclude any product at all from tariff phase out, as had been intended in the cases of highly sensitive goods, such as chicken and rice. Furthermore, a non-reciprocal preferential clause was included for the agricultural sector, in which Colombia must grant the United States the same tariff negotiated with other trade partners if this tariff is lower than that granted in the US-Colombia Agreement. This takes away an enormous amount of flexibility from Colombia in future trade negotiations as it impedes the country from granting preferential access to other countries for products in which Colombia has a comparative advantage, in exchange for favorable treatment in products of interest to Colombia. (Garay et al. 2006)

The negotiation also turned out to be asymmetrical in favor of the United States inasmuch as it clearly ignored the differences in the size and degree of development of the economies and the agricultural sectors of the two nations. The concessions granted by Colombia (value of the trade placed in immediate tariff elimination and value of the duty free quotas) exceeded in value those offered by the United States. This implies that on entry into force

of the FTA, in the short term, the increase in exports from United States to Colombia would be greater than that of Colombia to the United States. (Garay et al. 2006)

It is unlikely that this situation can be reversed, at least in the short and medium term, as no guarantee was reached on real access for the Colombian products which could potentially penetrate the US market, since the sanitary and phytosanitary commitments assumed by the United States outside the text of the FTA are expressed in conditional language, and amount to a declaration of goodwill. While US obligations do not go beyond those stipulated in the WTO Agreement on the Application of Sanitary and Phytosanitary Measures, the requirements made of Colombia in sanitary matters were very precise, as exemplified by the entry conditions for meat products. This is yet another factor in the inequality and asymmetry contained in the FTA.

In short, Colombia guaranteed unconditional access to its domestic market for principal US export products such as rice, corn (maize), wheat, barley, soybeans, beans, oil seeds, chicken, pork, high quality beef, dried milk, and whey, among others. However, in contrast, the United States conditioned the entry of an important Colombian product, sugar, to a duty free quota, and did not guarantee the elimination of non-tariff barriers.

3. The foreseeable impact of the FTA: loss of production and income for Colombian producers competing with imports

The products most affected by the FTA would be the principal short-cycle crops, such as cereals (rice, yellow and white corn, sorghum and wheat), legumes (beans and peas), oil seeds, some vegetables (tomato, onions and carrots), and livestock rearing activities, such as the production of chicken and pork. The United States has a significant export capacity in these products, derived in part from the subsidies granted to producers. Tariff phase-out on the above products would result in a reduction of the domestic prices received by Colombian farmers, and an increase in imports.

Under these circumstances, it is to be expected that the decrease in domestic prices would cause a reduction in the cultivated area and production of the above goods, depending on the elasticity of supply in each case. This would increase food dependence for Colombia.

Estimates made in this study found that the agreed tariff elimination would result in a considerable decrease in domestic prices. This would vary between 15%, in the case of peas and vegetables, to a 55% drop in the price of beans, in a scenario of average prices and exchange rates. Reductions in prices received by Colombian producers would cause significant falls in production, varying between 19% for rice, to a 54% decrease in the production of beans (no estimate of supply functions was available for peas and vegetables, so supply was assumed to be perfectly price inelastic: 0% change).

Together, the estimated changes would have an important effect on the value of production of these goods, with reductions of over 50% in the majority. The value of production of white corn (maize) would be reduced by 52%, that of yellow corn by 54%, wheat by 62%, pork by 65%, sorghum by 66%, chicken by 68%, and beans by 79%.

Summary of the Impact of the US – Colombia FTA on Sectors Producing Goods that Compete with Imports - Scenario of Average Prices and Exchange Rates

ACTIVITY	Change in Price	Change in Area Cultivated	Change in Production	Change in Value of Production
Rice	-20%	-19%	-19%	-35%
Yellow Corn	-41%	-24%	-21%	-54%
White Corn	-42%	-21%	-18%	-52%
Sorghum	-41%	-40%	-42%	-66%
Wheat	-25%	-77%	-49%	-62%
Beans	-55%	-34%	-54%	-79%
Peas	-15%	0%	0%	-15%
Onions	-15%	0%	0%	-15%
Tomato	-15%	0%	0%	-15%
Carrots	-15%	0%	0%	-15%
Chicken	-51%	N.A.	-35%	-68%
Pork	-28%	N.A.	-51%	-65%

Source: Author's calculations

4. The importance of the small farm economy in Colombia

Several academic studies carried out in Colombia have recognized the role of the small-scale producer in providing a substantial part of the domestic food supply. The present study verifies this, and also shows that the small farm economy provides occupation for a significant proportion of the population employed in the agricultural sector.[4]

Of those employed in the Colombian agricultural sector in the year 2005, 48% or some 1,776,253 persons, were independent or self-employed workers who can be classified as small farmers.[5] They represent 10% of the total number of persons employed in Colombia, an appreciable percentage demonstrating the importance of this segment in Colombian economic activity.

The number of small farm households, understood as those which contain at least one independent worker in the agricultural sector, was 1,369,438, or 12% of the total number of households in Colombia.

During the year 2005, the average monthly income of small farm households was around 340,200 COP (146.60 USD[6]) per month. There was a significant difference between small farm households in urban areas, whose average income was 536,619 COP (231.22 USD) per month, and those in rural areas, whose income was 278,280 COP (119.90 USD) per

[4] Characterization made using the continuous survey of households (*Encuesta Continua de Hogares*) carried out in the first semester of 2005.

[5] Persons who exploit a business (farm) on their own or with the help of family members, but without contracting any paid full-time workers.

[6] Dollars calculated at the average annual representative market exchange rate published by the Banco de la República (Colombian central bank) for the year 2005 (2320.77 COP per USD)

month. The major part of this income came from the farming activities carried out by the household (69%), followed in importance by profits and salaries from other economic activities (25%).

The income figures for small farm households bear witness to precarious living conditions. Some 68% (76% in rural and 44% in urban areas) of the households have an income lower than one statutory minimum wage. Only 3% (2% in rural and 9% in urban areas) obtained an income higher than three statutory minimum wages per month, the amount legally considered to be the minimum income necessary for a *Family Agricultural Unit*[7] to remunerate its work and obtain capital.

Principal Characteristics of Small Farm Households in Colombia in 2005

Concept	*Urban*	*Rural*	***Total***
Total small farm households	**328,234**	**1,041,204**	**1,369,438**
Percentage of small farm households in the total number of agricultural producers' households	*82.0%*	*90.1%*	*88.0%*
Percentage of small farm households in the total number of households with activities in the agricultural sector	*47.9%*	*57.1%*	*54.6%*
Percentage of small farm households in the total number of households in Colombia	*3.9%*	*37.6%*	*12.3%*
Absorption of family labor in agriculture	*60.7%*	*76.8%*	*72.9%*
Average monthly income per household (COP 2005)	**536,619**	**278,280**	**340,200**
Percentage of net agricultural profits in the total small farm household income	*57.9%*	*68.9%*	*64.7%*

Source: Author's calculations based on information from the continuous survey of households (*Encuesta Continua de Hogares*) 2005, carried out by the Colombian National Statistics Department (*DANE*).

In the year 2005, 87% of agricultural productive units were part of the small farm economy,[8] with an important presence in some Colombian departments: 98% of agricultural units in Boyacá were small farms; 96% in Cauca; 94% in Nariño; 92% in Huila; and 90% in Cundinamarca. Each one of the small-scale productive units utilized on average 4.8 hectares of land, of which 1.2 were in crops, 3.2 were used for livestock and 0.4 in forest. This contrasts with the figures observed for business agriculture, which used 65.1 hectares

[7] The measure *Unidad Agrícola Familiar (UAF)*, *Family Agricultural Unit*, is defined as the amount of land required for crops grown locally to provide three minimum wages per month to a family. Because land conditions vary in different departments (Colombian geopolitical divisions), the *UAF* is not a fixed size. (more detailed information is given in Chapter III)

[8] Small-scale farm units were considered as those *Sampled Farm Parts** in which the agricultural area was less than or equal to one departmental (local) Family Agricultural Unit (*UAF*), and in which the number of animals was less than the limit for the small producer defined by the *CCI Corporación Colombia Internacional*, and the fish farm area was less than 5 hectares. (more detailed information is given in Chapter III)

*A *Sampled Farm Part* is: a continuous land surface, contained within a sample segment, under the charge of a producer or administrator. (a more detailed definition is given in Chapter III)

per farm, with 53.1 of these in pasture and weeds. These larger units are probably mostly engaged in extensive cattle farming.

Small farms make an important contribution to Colombian crop production, with 47% of the total area and 50% of the production of short-cycle crops, and 56% of the total area and 48% of production of permanent crops in 2005. Their participation stands out in terms of the area and production[9] of short-cycle crops such as scallions (97%), broad beans (96%), tobacco (91%), onions (89%), wheat (83%), potatoes (82%), beans (81%), peas and barley (79% each), traditional yellow maize (corn) (71%), carrots (79%), as well as in permanent crops such as cocoa (81%), banana (75%), coffee (74%), sugar cane for brown sugarloaf and plantain (70% each).

Similarly, the contribution of small farms in livestock production is important. In 2005, small farm units owned 17% of all cattle in Colombia, with a greater share in the national total of milk and dual purpose cattle (25%), than in those for meat only (12%). Furthermore, small farms accounted for 17% of the national total of poultry, 35% of pigs, and 38% of smaller species (sheep, goats, rabbits and guinea pigs).

Participation of Small-Scale Producers in Colombian Agricultural Activity 2005

Concept	Total for Agricultural Sector	Total for Small Farm Economy	
	Units	Units	Participation %
Agricultural Units Surveyed (Sampled Farm Part*)	41,700	36,212	87%
Agricultural Area Covered in the Survey (hectares)	530,737	173,505	33%
Hectares per Productive Unit (hectares)	12.7	4.8	38%
National Area Cultivated in 2005 (hectares)			
Short-cycle Crops	*1,407,026*	*654,541*	*47%*
Permanent Crops	*1,688,491*	*938,843*	*56%*
Total	***3,095,517***	***1,593,384***	***51%***
National Livestock Inventory in 2005 (Animals)			
Cattle for meat	*15,404,471*	*1,854,582*	*12%*
Cattle for milk	*10,294,926*	*2,550,381*	*25%*
Poultry	*37,963,442*	*6,392,427*	*17%*
Pigs	*1,724,062*	*604,769*	*35%*
Smaller species	*8,752,681*	*3,286,737*	*38%*

Source: Author's calculations based on statistics from the national agricultural survey (*Encuesta Nacional Agropecuaria ENA*) 2005 carried out by the Colombian national statistics department (*DANE*). *The observation unit of the ENA, a Sampled Farm Part, is a "continuous land surface contained within a sample segment, in the charge of a producer or administrator" – see chapter III section A.3 for further explanation.

[9] This study assumes that productivity in small-scale farm units is equal to that observed at a national level.

Observations on the productive structure of small farm units revealed that short-cycle crops occupy 41%, and permanent crops 59%, of their total cultivated area. In Colombian agriculture as a whole, short cycle crops occupy 45% of the total area cultivated, and permanent crops take up 55%. Short-cycle crops account for 32% of the production in small farms, while permanent crops account for 68%. The difference in percentages between area used and production are due to the greater yield per hectare that permanent crops provide. Among the leading small farm crops are: coffee (31%), plantain (15%), corn (maize) (13%), rice (8%) and sugar cane for brown sugarloaf (7%).

A classification of the tradability of small farm crops in terms of the area cultivated shows that: 29% of this area is in crops that compete with imports from the United States, 4% in crops with potential for export to the United States (fruit and tobacco), 49% in traditional export crops which would not suffer an impact from the FTA (as they are covered by the most favored nation tariff, 0%), and the remaining 18% in crops that are non-tradable with the United States.

A breakdown of total small farm income, which stood at 8.1 billion COP (3.5 billion USD) in the year 2005, shows that: 22% came from agricultural activities that would potentially compete with US imports; 4% was from crops with export potential for the US market; 52% came from agricultural activities that would not suffer an impact from the FTA (traditional export goods with most favored nation tariff (0%), and non-tradable goods);

Distribution of Activities Carried Out by Small Farm Households by Degree of Tradability with the United States - 2005

Concept	Area Cultivated (Hectares)	% Share	Gross Income (m COP)	% Share
Crops				
Sectors that compete with imports from United States	*467,129*	*29%*	*1,268,326*	*16%*
Sectors with export potential to United States	*65,557*	*4%*	*296,698*	*4%*
Sectors without foreseeable impact from FTA				
Traditional export sectors	*781,720*	*49%*	*2,804,391*	*35%*
Non- tradable sectors [1]	*278,978*	*18%*	*1,228,234*	*15%*
Subtotal	***1,593,384***	***100%***	***5,597,649***	***69%***
Livestock				
Sectors that compete with imports from United States	*N.A.*	*N.A.*	*502,771*	*6%*
Sectors with double trade flow [2]	*N.A.*	*N.A.*	*1,817,474*	*22%*
Non- tradable sectors	*N.A.*	*N.A.*	*178,636*	*2%*
Subtotal	***N.A.***	***N.A.***	***2,498,881***	***31%***
Total	**1,593,384**	**100%**	**8,096,531**	**100%**

Source: Author's calculations (1) Includes cotton, which, although registering a significant level of imports, would not be affected by the FTA, given that it is subject to a policy of guaranteed minimum price. (2) Cattle farming for meat and milk.

and 22% was income contributed by cattle farming (beef and milk), a sector that has potential for exporting to the United States, as well as being at risk from US exports.

5. The effects of the FTA on small-scale producers: reduction of income and profits

An approximation of effects of the FTA on small-scale producers' gross income (value of production) and net income (profits from the activity) was made. This was based on a calculation of their average income and expenditure structure during the year 2005, using data from *Corporación Colombia Internacional - CCI*[10] on small-scale production costs. It involved a calculation of the general impact of the FTA on domestic prices, areas cultivated and production obtained.

The productive units were previously classified into one of five categories of impact from the FTA, according to their participation in areas which compete with imports from the United States. The categories are as follows:

1. *Full Impact*: Units in which 100% of the area cultivated in 2005, or the livestock inventory, was in activities that compete with imports

2. *High Impact*: Units in which more than 66.7%, but less than 100% of the area cultivated in 2005, or the livestock inventory, was in activities that compete with imports

3. *Moderate Impact*: Units in which more than 33.3%, but less than 66.7% of the area cultivated in 2005, or the livestock inventory, was in activities that compete with imports

4. *Low Impact*: Units in which more than 0%, but less than 33.3% of the area cultivated in 2005, or the livestock inventory, was in activities that compete with imports

5. *No Impact*: Units in which neither crops nor the recorded livestock inventory in 2005 were in activities that compete with imports

The results showed that, with the FTA, in a scenario of average prices and exchange rates, the total agricultural income generated by small-scale productive units would fall by 0.82 billion COP (0.35 billion USD). This means a change of 10% in comparison to the value without the FTA. Their net income would drop by 0.36 billion COP (0.16 billion USD) in absolute terms, or 16% in relative terms.

Effects would differ according to the category of impact from the FTA. There would be considerable reductions in production, or in net profits, for those classified in full or high

[10] *Corporación Colombia Internacional* (CCI) is a non-profit, autonomous entity with mixed private and public funding that promotes the agricultural and food sectors in Colombia, including exports.

impact categories, and much smaller, or no reductions, for those in the groups with low or no impact.

For the 14% of producers subject to full impact, entry into force of the FTA would bring a reduction in total agricultural income of 0.25 billion COP (0.11 billion USD), or 37% in relative terms. Their net income would fall by 0.13 billion COP (0.05 billion USD) in absolute terms, and by 70% in relative terms.

The 14% of producers subject to a high impact would experience a reduction in total agricultural income of 0.23 billion COP (0.10 billion USD), or 28% in relative terms. Their net income would fall by 0.10 billion COP (0.04 billion USD) in absolute terms, and by 49% in relative terms.

At the other end of the scale, the 31% of producers subject to a low impact from the FTA would see a reduction in total agricultural income of 0.19 billion COP (0.08 billion USD), or 5% in relative terms. Their net income would fall by 0.06 billion COP (0.02 billion USD) in absolute terms and by 5% in relative terms.

Lastly, it was found that 29% of the total number of small-scale producers would not be affected by the FTA, due to the make-up of their production.

Summary of the Effects of the FTA on Small-Scale Producers - Scenario of Average Prices and Exchange Rates (Pesos 2005)

Category of Impact*	% of Producers	Change in Gross Income		Change in Net Income	
		(COP m)	%	(COP m)	%
Full Impact	14%	-250,876	-37.4%	-127,387	-70.2%
High Impact	14%	-228,755	-27.5%	-102,528	-48.5%
Moderate Impact	13%	-152,892	-14.3%	-72,398	-25.2%
Low Impact	31%	-191,337	-5.1%	-56,578	-5.3%
No Impact	29%	0	0.0%	0	0.0%
Total (COP m)	**100.0%**	**-823,859**	**-10.2%**	**-358,890**	**-16.1%**
Total (USD m)		-355		-155	

Source: Author's calculations (m = millions). *See definition of categories of impact earlier in this section.

6. The FTA would reduce the income of small farm households

In addition to a loss of cultivated area, production, gross and net income in the agricultural sector, the impact of the FTA would also be felt in small farm household income, which at the time of writing is already at quite low levels.

According to the estimates, in a case of average prices and exchange rates, the reduction in net profits from agricultural activities would cause a drop of 10.5% in the total income of

the 1.4 million small farm households. This would bring their average monthly income down to 304,642 COP (131.26 USD)[11] per household.

The situation would be critical for the subset of small-scale producers subject to a full or high impact from the FTA. These account for 28% of the total number of producers, or some 386,000 households. Total income would suffer a reduction of 45% in households subject to full impact, falling to an average monthly value of just 185,618 COP (79.98 USD), and a reduction of 31% in the case of high impact, falling to 233,354 COP (100.55 USD) monthly. Around 172,000 households subject to moderate impact from the FTA would also experience a considerable loss of income. This subset represents 13% of small-scale producers, whose total income would fall by 16%, to an average 284,621 COP (122.68 USD) monthly per household.

Summary of the Effects of the FTA on Small Farm Households - Scenario of Average Prices and Exchange Rates

Category of Impact*	Average Monthly Income per Household - Without FTA (COP 2005)			Average Monthly Income per Household - With FTA (COP 2005)			Percentage Changes with FTA		
	Net Agric. Profit	Other Income	Total Income of Household	Net Agric. Profit	Other Income	Total Income of Household	Net Agric. Profit	Other Income	Total Income of Household
Full	220,175	120,025	340,200	65,593	120,025	185,618	-70.2%	0.0%	-45.4%
High	220,175	120,025	340,200	113,330	120,025	233,354	-48.5%	0.0%	-31.4%
Moderate	220,175	120,025	340,200	164,597	120,025	284,621	-25.2%	0.0%	-16.3%
Low	220,175	120,025	340,200	208,567	120,025	328,591	-5.3%	0.0%	-3.4%
No Impact	220,175	120,025	340,200	220,175	120,025	340,200	0.0%	0.0%	0.0%
Total COP	**220,175**	**120,025**	**340,200**	**184,617**	**120,025**	**304,642**	**-16.1%**	**0.0%**	**-10.5%**
Total USD	**94.87**	**51.71**	**146.58**	**79.54**	**51.71**	**131.26**			

Source: Author's calculations. *See definition of categories of impact in section 5.

[11] Calculated in dollars at the average annual representative market exchange rate published by the *Banco de la República* (Colombian central bank) for the year 2005 (2320.77 COP per USD).

I. COLOMBIAN AGRICULTURE IN A CONTEXT OF FREE TRADE WITH THE UNITED STATES

A. THE PROTECTION OF COLOMBIAN AGRICULTURE AND THE FTA

Until the 1980s, the Colombian economy was relatively closed to the effects of world markets, and the emphasis in agricultural policy was toward promoting production of food for domestic consumption, raw materials for industry, and some surplus of goods for export with little processing or preparation.

The unilateral opening of trade in the early 1990s during the Gaviria administration transformed public policy in the following ways: direct intervention in the form of crop purchase and support prices was abandoned; the monopoly of the agricultural marketing institute (*IDEMA*) in imports of several products (wheat, barley, beans, maize, sorghum, rice, milk, soybean, vegetable oils) was brought to an end; import licenses requiring a previous application process were eliminated; and tariffs were reduced.

Parallel to the economic opening, a policy of support for competitiveness and the modernization of production was established and consolidated in a law (*Ley 101 1993*). This law sought to: i) promote research and the transfer of technology; ii) provide universal and obligatory technical assistance; and iii) transform the agricultural credit system: from being managed by an agricultural finance fund administered by the central bank (*Fondo Financiero Agropecuario - FFA*), this was handed over to a new entity (*el Fondo para el Financiamiento del Sector Agropecuario - FINAGRO*), a second tier bank, which is a more flexible banking institution that does not deal directly with the public and grants credit at an interest rate close to the market rate. Also at that stage, incentives for rural capitalization (*ICR*) and reforestation (*CIF*) were established. Product promotion funds, based primarily on parafiscal contributions[12] from the private sector and aiming to promote research and the transfer of technology, were strengthened, and price stabilizing funds (*Fondos de Estabilización de Precios*) were developed.

Briefly, before the 1990s, agricultural policy was centered on instruments of direct state intervention, whose regulatory mechanisms worked mainly through support prices, import licenses, high tariffs, preferential credit, and domestic crop purchase requirements. Agriculture was kept isolated by both tariff and non-tariff barriers and the monopoly on imports held by the Colombian agricultural marketing institute (*IDEMA*). Then, in the 1990s, more emphasis was given to the promotional mechanisms of investment, capitalization and modernization of production, in a scheme more open to the world economy.

This economic opening in the early 1990s, unmatched by an equally rapid modernization, in a background of low international prices and a revaluating exchange rate, gave rise to a substantial reduction in the area cultivated in Colombia, particularly in the sector of short-cycle crops. Cultivation of these crops fell from 2.5 million hectares in 1990 to 1.4 million in 1998, its lowest level in recent decades. As a result, a reorganization of agricultural

[12] Obligatory state levies made within a sector, and which may only be used in benefit of that sector.

production took place. The area of some permanent crops grew, increasing by 300,000 hectares towards the end of the 1990s (not including coffee). Considerable expanses of land were given over to extensive cattle farming: land used in this activity amounted to 37 million hectares at the end of the 1990s. As a consequence, an appreciable number of large, medium and small-scale farmers were obliged to abandon their activities.

In this context of reduced cultivated area, especially in cereals and other short-cycle crops, certain mechanisms to aid transition between the previous closed economy and the new more open one were established. The Colombian price band mechanism was created in 1991, and then, in 1994, the Andean System of Price Bands (*SAFP*) was adopted for a large group of agricultural and agro-industrial products. The price bands covered practically all trade tariffs. These systems are principally intended to counteract volatility in prices in the international market. They provide for the application of a fixed tariff (equivalent to the common external tariff), and a variable tariff, set according to the variation in international prices, and in some cases they include additional protection criteria to compensate for the distortions caused by changes in these prices.

In general terms, some level of protection for agriculture was maintained in the agreements reached, with Chile in 1993 and with Mexico in 1994. Sensitive agricultural products were excluded from the negotiations of the 'Group of Three' (Mexico, Venezuela and Colombia). In the agreements signed with Chile, and later with the Southern Common Market (*MERCOSUR*), tariff elimination was agreed only for the fixed tariff component of the Andean Price Band System (*SAFP*), with the exception of wheat and barley in the MERCOSUR agreement, for which elimination of both fixed and variable tariffs was agreed.

In 1995, Colombia consolidated its instruments of protection through the World Trade Organization: high tariff levels, as a result of eventual *tariffication;*[13] direct support for production; and policies such as those of domestic purchase and import licensing for chicken pieces, requiring an application to the appropriate administrative organ as a prior condition.

However, several of these regulatory instruments expired due to WTO commitments in 2005, among them the policy of domestic crop purchase. On their expiry, the Colombian State created the *Mecanismo Público de Administración de Contingentes - MAC*, a quota administration mechanism which works through a stock market auction and grants import rights according to participation in the purchase of domestic crops.

In 2005, some key products were separated from the Andean Price Band System, and fixed ad valorem tariffs were established for them, normally at higher rates than were levied under the price band system, for example rice (80%), white corn (50% and later 30%), and dried milk (50%). Likewise, high tariffs were established for some products that were not in the price band system, such as beans (60%), and beef (80%).

[13] From WTO Glossary: Tariffication: The process of converting non-tariff trade barriers to bound tariffs. This was done under the WTO Agreement on Agriculture in order to improve the transparency of existing agricultural trade barriers and facilitate their proposed reduction. In the future, countries will not be able to use non-tariff measures to restrict trade.

Such measures as those adopted during the 1990s and the first years of the new century, show that traditional agricultural sector products still needed certain continued levels of protection, and that, with a few exceptions, it has not been possible to develop, on an adequate scale, other agricultural activities considered as having a *comparative advantage*.

Therefore, if the United States Congress were to approve the FTA, this would be the first time that Colombia has opened the agricultural sector in a comprehensive manner, and, at the same time, to one of the most developed economies on the planet. The United States has a strong agricultural sector that makes extensive use of measures which strongly distort the principles of free trade. These measures include support for domestic production, and subsidies to agricultural exports in the form of credit, credit guarantees, and insurance.

In later Colombian negotiations to establish trade agreements with EFTA, Canada and Central America, the price band system was maintained for sensitive products, and several products were excluded from the negotiating schedule.

As will be set out below, a scenario of free trade with the United States could bring grave consequences for Colombian agricultural producers, considering the existing disparity between the agricultural sectors of the two countries, the distorting effects of the substantial support granted to producers in the United States, and the terms finally agreed.

B. ASYMMETRIES BETWEEN COLOMBIA AND THE UNITED STATES

From the beginning of negotiations, the great differences, particularly in the agricultural sector, between the Colombian and US economies were understood. It was thought that these asymmetries would be taken into account in favor of Colombia in the terms of the negotiation.

In effect, a free trade agreement was being prepared with an economy 122 times bigger (in terms of total GDP) than that of Colombia, a population seven times greater, a per capita income 18 times superior and a geographical area nine times larger. Likewise, with specific regard to the agricultural sector, the gross domestic agricultural product of the United States was 15 times greater than its Colombian counterpart, the cultivated area was 26 times larger, the value added per worker 14 times higher, agricultural exports were 20 times those of Colombia, and the degree of technological development (measured by the number of tractors for every thousand workers) 257 times superior.[14]

Moreover, the export potential of the United States in the agricultural sector was well-known. At the time of the negotiation, that country was: the world's biggest producer of poultry, beef, corn (maize), sorghum, soybeans, soybean meal, and soybean oil; the second largest producer in the world of pork, milk, eggs, honey and cotton; and the fourth in wheat, potatoes and tobacco. At that time, agricultural exports from the United States amounted to 13% of the world total for the sector, with a share in world trade of 50% in

[14] See Garay, et. al. (2005).

corn (maize), 40% in oil seeds, 24% in wheat, around 20% in beef, poultry and tobacco, over 11% in fruit and vegetables, and over 10% in beans, rice and pork. [15]

In contrast, Colombia was neither the largest producer, nor exporter, of any important agricultural product in world trade. It is the world's second largest exporter of flowers, the second largest in value and third in volume of coffee, and the fourth largest in bananas.

C. SUBSIDIES TO AGRICULTURAL PRODUCTION

In addition to the asymmetries in the size and level of development of the two economies, the fundamental problem in the agricultural negotiation of the FTA stems from the US position of protecting its domestic support and export subsidies. This was established before beginning negotiations and maintained entirely until the end. The US negotiators impeded the inclusion of any stipulations affecting either the transfers made to their agricultural producers through support for production, or US export subsidy policies in the form of credit, guarantees of credit, or credit insurance. Any possibility of establishing provisions on the reduction or elimination of US support for exports destined for Colombia was denied, with the argument that this could only be agreed in multilateral negotiations within the framework of the WTO. Nor was it possible to include terms or instruments to compensate the effects that this support in the United States would have on Colombian producers.

US domestic support constitutes a protection mechanism that distorts competition by enabling production at levels in which marginal cost exceeds marginal income. This support has a double effect. On one hand, it allows the subsidized export of products, which then compete unfairly with the domestic production of the importing countries, and on the other hand, it inhibits exports to the United States, as the exports of other countries are forced to compete with the subsidized domestic prices.

Transfers to agricultural producers in the United States and Colombia at the time of the negotiation were compared. It was found that, on average, for the period 2000-2002, these amounted to 71,269,000,000 USD in the United States against a total of only 1,143,000,000 USD in Colombia. These figures represent 51% and 11% of the agricultural GDPs of the two countries respectively. For the negotiation of the FTA, it was important not only to analyze the disparity in the amount of transfers, but also the differences in their composition. While, in Colombia, 77% of the total amount of transfers came from support at the border (tariffs, quotas, licenses and other customs mechanisms), in the United States these sources accounted for only 23% of transfers. This difference between the United States and Colombia in the composition of support translates into a substantial threat to Colombian production, given that 92% of domestic support for production in the United States was concentrated on export products, which thus compete unfairly with Colombian domestic production. [16]

[15] Garay, et. al. (2005).

[16] Garay, et. al. (2005).

Support for products in both countries was also compared by taking the Producer Subsidy Equivalent (PSE) as a percentage of the producers' income. The indicator was similar for the two countries only in the cases of three products, corn (U.S. 26%, Col. 29%), soybeans (U.S. 22%, Col. 26%), and chicken (U.S. 17%, Col. 19%). The proportion of subsidies in the income of producers was substantially greater in the United States in the case of rice (U.S. 50%, Col. 26%), beet and cane sugar (U.S. 55%, Col. 19%), fresh milk (U.S. 48%, Col. 14%), wheat (U.S. 40%, Col. 21%) and barley (U.S. 36%, Col. 9%). Additionally, as indicated above, the greater part of transfers for products in the United States was granted through domestic support, except in the case of sugar, milk and chicken, while in Colombia the situation was the opposite, in that the greater proportion of subsidies was granted through tariff protection at the border. [17]

The distortion created by subsidies granted to agriculture in the United States is clear, in that it enables US producers and exporters to sell their crops at prices lower than production costs. For the period 2000-2002, the average economic production costs for US agriculture were found to be substantially higher than the average market prices received by producers: 29% for corn, 87% for wheat, 118% for sorghum, 82% for rice, 95% for barley, 37% for soybeans, 82% for cotton, 25% for milk and 5% for sugar beet.

The disparity in the size of transfers and the differences in their composition would significantly affect trade flows between the two countries in a scenario of free trade. As will be detailed below, while in the course of the negotiations Colombia comprehensively eliminated protection at the border, the United States maintained its domestic support measures, as well as export subsidies in the form of credit, guarantees of credit, and insurance for exports.

The position adopted by the United States with regard to transfers made to its farmers, as well as to the central elements of Colombian agricultural policy (price bands and domestic crop purchase requirements), is an indication of the way in which the negotiations comprehensively ignored the situation of rural Colombia and went against the objectives set for the FTA by the first Minister of Agriculture of the Uribe administration, and originally by the President of Colombia himself.

D. RESULTS OF THE NEGOTIATION [18]

The negotiation of the FTA was essentially of a commercial nature and did not involve, as had been expected in Colombia, elements of a geopolitical nature. The United States clearly disregarded the role that Colombia has played internationally in the fight against drugs and terrorism, at the same time ignoring its own role of shared responsibility in these fields. This was plainly demonstrated by the US position of conditioning the consolidation of preferences granted in the Andean Trade Promotion and Drug Eradication Act (ATPDEA) on the elimination of all the protection mechanisms that the Colombian economy in general, and its agriculture in particular, had counted on. The United States did not permit

[17] *Idem.*

[18] Based on Garay et al. (2006).

exclusions of any nature, nor mechanisms to counteract either US domestic support for agricultural production or its subsidies for exports.

The then Colombian Minister of Agriculture, Carlos Gustavo Cano, affirmed that the roots of the rural problem in Colombia, expressed in the social exclusion of the rural population, stem from the drug trade and the armed conflict, and that the only viable option for defeating the drug traders and insurgent groups lay in assuring a prosperous rural Colombia with ample opportunities for employment, and adequate levels of remuneration and social security. With the assent of the Colombian government, the United States took none of this into account in the negotiations.

In the preamble to the FTA negotiations, President Uribe had maintained that each time licit agriculture is weakened, illicit alternative crops and the violent groups that finance themselves through expanding their cultivation and trade are strengthened. However, the negotiations ignored not only this, but also his speech to the negotiating team at the ceremony inaugurating talks: "In our country, the strength of the agricultural sector is the guarantee of the definitive destruction of illicit drugs. Consequently, fair treatment for the agricultural sector is an essential tool in defeating terrorism financed by drugs."

1. Results of the Negotiation in Defensive Terms

None of the mechanisms that Colombia had expected would counteract US domestic support were agreed on. Some of them were not even put forward by the Colombian negotiators. These included: anti-dumping tariffs; automatic countervailing duties without evidence of injury; and a tariff phase-out program to be applied according to the difference in the domestic support between the two parties, similar to the one agreed between the United States and Canada. Other mechanisms, such as maintaining the price bands, and a price safeguard during the period of the FTA, or at least for as long as US domestic support for production is in force, were rejected by the United States. Nor could agreement be reached on a measure to freeze the amount of existing US domestic support. The lack of such a regulation could affect possibilities for Colombian exports, should the United States decide to substitute protection at the border with domestic support for products such as milk, tobacco, and beef, among others.

Moreover, unlike other US trade partners, such as Central America, Costa Rica and Morocco, Colombia did not obtain exclusions from the tariff elimination program for its sensitive products. However, the United States excluded sugar and high sugar content products not ready for consumption.

The unfavorable treatment bestowed on Colombia can also be seen in the fact that, unlike Chile, a country which also relied on a price band system, Colombia was obliged to do away with the Andean Price Band System (SAFP) right from the start of the tariff elimination program. Yet further still, the United States rejected a quite reasonable Colombian proposal to fix base tariffs for the *SAFP* price band products on the average of a period that took in both low and high tariffs, and forced the use of a period of low variable tariffs resulting from high international prices (2001-2004) to determine these. This resulted

in only minimal differences from the common external tariff for some products. For example, there was a difference of only 2% for oil seeds.

In short, in the negotiations, Colombia sacrificed the protection and stabilization mechanism for its most sensitive products, whereas the United States managed to maintain a large part of its own protection and stability by preserving domestic support, refusing to convert its specific tariffs to ad valorem tariffs, and proceeding to consolidate them as base tariffs.[19] Colombia was not able to include a substitute mechanism for the *SAFP*, such as price safeguards during the period of the FTA. Neither was any such mechanism agreed even for the transition period.

On this point, the severity of the United States position in relation to Colombia and the abuse of its dominant position are clear when other cases are taken into account. Morocco was permitted to exclude all the wheat product chain from the negotiations, and use a price safeguard for the duration of the agreement - not only during the transition period - in the case of chicken leg quarters. Furthermore, the United States negotiated, for its own benefit, safeguards of this nature for beef in a free trade agreement with Australia.

Quantity safeguards for only 21 Colombian tariff subheadings were included in the final text of the FTA. Among these, rice, chicken pieces (fresh, chilled, frozen and seasoned), old hens (spent fowl), beef (other than high quality cuts), and dried beans stand out. Colombia thus only obtained 27% of the safeguards originally sought (21 of 77 subheadings). Safeguards were not finally insisted on for those products whose tariff elimination period was agreed for five years or less, such as the following product chains: oil seeds, pork, barley, wheat, and cotton. To avoid US application of safeguards on dairy products, Colombia did not insist on them for this product chain either.

Lastly on the subject of safeguards, it should be pointed out that, unlike other countries which have signed free trade agreements with the United States, Colombia and Peru were obliged to renounce not only the present agricultural safeguards of the WTO, but also the application of future regulations agreed at the WTO.

Another relevant area of negotiation is that related to the quota administration system: the volumes of US imports permitted from the beginning of the tariff elimination period with an in-quota tariff of zero. The United States position was also imposed in this matter with the establishment of "first come, first served" as a fundamental principle in the

[19] For some products, the United States has specific, rather than ad valorem, tariffs. These specific tariffs are not determined as a constant percentage of the price like an ad valorem tariff, but, for example, can be established as a fixed tariff per quantity, such as 3 USD per ton. The equivalent ad valorem tariff in this example, if the price of the product were 30 USD per ton at the moment of negotiation, would be 10.0%. If a schedule of five years had been fixed for this product with an ad valorem tariff in place, during the first year the tariff would be equivalent to 8% of the price, and 6% in the second year. However, on not converting the specific tariff into an ad valorem tariff, the tariff becomes an inverse function of the price. The lower the price, the higher the tariff and vice-versa. With a specific tariff in place for a product whose tariff elimination schedule is set for five years, the tariff for the first and second years depends on the price of the product. Thus, if the price during the first year is 24 USD per ton, a tariff of 2.4 USD will be paid: that is the equivalent of an ad valorem tariff of 10%, but if the price in the second year is 12 USD per ton, 1.8 USD would be paid: that is the equivalent of an ad valorem tariff of 15%.

administration of quotas, Colombia thus having to abandon the *MAC* quota administration mechanism with no possibility whatsoever of applying any mechanism to guarantee the purchase of domestic crops. Once again, this underlines the toughness of the United States position with regard to Colombia, since, in agreements with the Central American countries and Morocco, the application of performance requirements or quota administration arrangements through public auctions were admitted.

Exceptions to the "first come, first served" principle were made in the cases of chicken leg quarters and rice. It was agreed that the quotas for these two products could be managed by marketing companies made up of producers from the two countries.

Colombia had to accept a non-reciprocal preferential clause by which it promised to grant the United States all preferences, in addition to those of the FTA, that may at any stage in the future be granted to any country with which Colombia signs or broadens trade agreements. Except in the Peru FTA, signed some months before that of Colombia, the United States had not insisted on the incorporation of a comprehensive preferential clause for the agricultural sector in any trade agreement. This kind of clause was not incorporated

Table 1. *Quotas granted by Colombia in the US - Colombia FTA.*

Product	Quota (tons)	Imported from U.S. 2001-04 (tons)	Total Colombian imports 2001-04 (tons)	Quota as % of imports from U.S.	Quota as % of world imports
Beef	2,000	13	1,056	15,110%	189%
Bovine offal	4,400	1,298	3,279	339%	134%
Chicken leg quarters	26,000	1,226	1,683	2,120%	1545%
Milk powder	5,000	77	8,013	6,459%	62%
Yogurt	100	0	0	N.A.	N.A.
Butter	500	5	131	9,418%	383%
Cheese	2,100	43	117	4,877%	1800%
Preparations for infant foods	1,000	92	4,332	1,083%	23%
Ice cream	300	10	157	3,092%	191%
Beans	15,000	490	22,335	3,059%	67%
Yellow corn (maize)	2,000,000	1,636,957	1,905,540	122%	105%
White corn (maize)	130,000	107,737	124,595	121%	104%
Sorghum	20,000	0	24,230	N.A.	83%
Glucose (not as sugar substitute)	10,000	1,406	2,538	711%	394%
Pet food	8,000	3,103	5,224	258%	153%
Balanced animal feeds	185,000	87,874	166,702	211%	111%
Rice (Paddy Equiv.)	111,268	5,226	124,784	2,129%	89%
Soybean oil crude	30,000	7,070	139,874	424%	21%
TOTAL	**2,550,668**	**1,852,628**	**2,534,589**	**138%**	**101%**

Source: Garay et al. (2006). Table 9. (N.A. not applicable) With the exception of rice, the initial quota levels for the first year of entry into force of the FTA would be equivalent to the determined volumes incremented by the established growth rate.

in the CAFTA agreement. In the agreement signed with Chile, a clause of this nature was introduced retroactively, but limited to wheat, wheat flour and vegetable oils. In the agreement with Morocco, the preferential clause was not of a retroactive nature, although its coverage was greater in comparison with its Chilean counterpart, being applied to products such as beef and chicken, wheat, corn (maize), various milled cereal products belonging to chapter 11 of the tariff schedule, some oils, and some food preparations from chapter 19.

In the negotiation of quotas, Colombia was very generous in granting the United States 2,550,000 tons of tariff free imports. As the table shows, the amount of the quota was greater than the average volume of imports originating from the United States in the period 2001-2004 for all products subject to this mechanism. Thus, it may be said that the market for these products would be opened comprehensively from the time the FTA comes into force.

The quota amounts granted give US producers the capacity to replace those of other countries that export to Colombia. This is a sizeable opportunity, as the quotas are equivalent to 138% of previous imports from the United States, and US producers would be able to gain an additional market of around 700,000 tons. A comparison of the figures in the table for the quotas granted, previous imports from the United States, and from the rest of the world bears this out.

The results of the negotiation shown up to this point with regard to defensive interests indicate that Colombia was not able to secure favorable treatment for its sensitive products. No kind of exclusions from the tariff elimination program or residual tariffs were obtained for these products. Furthermore, Colombia was obliged to relinquish the price band system and the *MAC* public quota administration mechanism. The base tariffs for price band products were fixed at reduced levels, and the volume of quotas granted for all these products exceeded average US imports in the period 2001-2004. Countervailing mechanisms against US domestic support and subsidies to exports were not obtained.

Colombia failed in its attempt to exclude chicken leg quarters from the negotiation, which was sought because of consumer preferences in the United States. Nor did Colombia manage to obtain the adoption of a residual tariff for rice. Nevertheless, the least unfavorable results were attained for these two products, in that high base tariffs were agreed on (164.4% on chicken leg quarters and 80% on rice), as well as extended tariff phase-out periods (18 and 19 years respectively), and grace periods of six and five years at which tariffs remain at base rate levels.

Other products which were considered sensitive in the negotiations, particularly because of their importance to the small-scale farm economy, were treated less favorably. The base tariff for yellow corn (maize) exceeded the common external tariff by only 10 points, being fixed at 25%, and is subject to a tariff phase out period of just 12 years. A duty free quota of 2,000,000 tons was awarded to the United States for this product. This quantity is greater than either the imports originating from the United States or total Colombian imports of yellow corn, and amounts to a significant part of apparent consumption.

The treatment of beans in the negotiation was also unsuited to their nature as a sensitive product, since on entry into force of the FTA, the base tariff of 60% would be reduced by 33% and the tariff phase-out period would be only 10 years. In addition, an import quota of 15,000 tons was granted, which is equivalent to 67% of Colombia's average annual imports of beans in the period 2001-2004. Nevertheless, a quantity safeguard was obtained for this product during the period of tariff elimination, with a trigger level of 130% of the quota.

Apart from some of the poultry product chain, it cannot be said that the remaining agricultural products have been treated as sensitive products. Table 2 shows the results of the negotiation for Colombia's principal defensive interest products.

Table 2. *Results of the Negotiation for the Principal Colombian Defensive Products*

Group / Product	Base tariff	Tariff elimination period	Modality	Quota (tons) /1	Growth rate	Safe-guard
Chicken						
Chicken leg quarters frozen	164.4%	18 years	Duty remains 5 years at base rate	26,000	4%	Volume
Chicken leg quarters seasoned	70%	18 years	Duty remains 10 years at base rate			
Other cuts and whole chicken	20%	10 years	Linear	0	N.A.	N.A.
Rice (equivalent paddy)	80%	19 years	Duty remains 6 years at base rate	111,268	4%	Volume
Maize and derivates						
Yellow corn (Maize)	25%	12 years	Linear	2,000,000	5%	N.A.
White corn (Maize)	20%	12 years	Linear	130,000	5%	N.A.
Sorghum	25%	12 years	Linear	20,000	5%	N.A.
Balanced animal feed	25%	12 years	Linear	185,000	5%	N.A.
Glucose (not sugar substitute)	28%	10 years	Linear	10,000	5%	N.A.
Pet food	28%	8 years	Linear	8,000	8%	N.A.
Dairy products						
Liquid milk and whey	33%	Immediate	N.A.	N.A.	N.A.	N.A.
Milk powder	33%	15 years	Linear	5,000	10%	N.A.
Yogurt	20%	15 years	Linear	100	10%	N.A.
Cheeses	20% and 33%	15 years	Linear	2,100	10%	N.A.
Milk for infants	20%	15 years	Linear	1,000	10%	N.A.
Butter	33%	11 years	Linear	500	10%	N.A.
Ice cream	20%	11 years	Linear	300	10%	N.A.
Beef						
Prime and choice cuts	80%	Immediate	N.A.	N.A.	N.A.	N.A.
Other beef	80%	10 years	37.5% 1st year	2.000	5%	Volume
Bovine offal	80%	10 years	37.5% 1st year	4.400	5%	Volume
Pork						
Bacon and pork skin	20%	Immediate	N.A.	N.A.	N.A.	N.A.
Pork	30%	5 years	Linear	0	N.A.	N.A.

Group / Product	Base tariff	Tariff elimination period	Modality	Quota (tons) /1	Growth rate	Safe-guard
Oil seeds						
Soybeans, soybean flour and cake	20%	Immediate	N.A.	N.A.	N.A.	N.A.
Soybean oil crude	24%	10 years	Linear	30,000	3%	N.A.
Other fats and oils	23% and 24%	5 years	Linear	0	N.A.	N.A.
Other cereals						
Wheat	13%	Immediate	N.A.	N.A.	N.A.	N.A.
Barley for malting	15%	Immediate	N.A.	N.A.	N.A.	N.A.
Barley other than for malting	13%	3 years	Linear	0	N.A.	N.A.
Fruit and Vegetables						
Dry beans shelled	60%	10 years	33% 1st year	15,000	5%	Volume
Potatoes frozen	15%	5 years	Linear	0	N.A.	N.A.
Potatoes prepared	20%	Immediate	N.A.	N.A.	N.A.	N.A.
Peas frozen	15%	5 years	Linear	0	N.A.	N.A.
Other vegetables and fruits	15% and 20%	Immediate	N.A.	N.A.	N.A.	N.A.
Sugar and derivates						
Sugar raw	47%	15 years	Linear	0	N.A.	N.A.
Sugar refined	38%	15 years	Linear	0	N.A.	N.A.
Glucose and fructose syrup	28% and 36%	9 years	Linear	0	N.A.	N.A.
Confectionery and chocolates	20%	Immediate	N.A.	N.A.	N.A.	N.A.
Others						
Cotton	10%	Immediate	N.A.	N.A.	N.A.	N.A.
Liquors	20%	10 years	Linear	0	N.A.	N.A.
Total Quotas				**2,550,668**		

Source: Taken from Garay et al. (2006), Table 8. 1. N.A. Not Applicable. With the exception of rice, the initial levels of quotas for the first year of entry into force of the FTA would be equivalent to the volumes determined, incremented at the established growth rate.

An analysis of the tariff elimination granted by Colombia to the United States in terms of Colombian tariff subheadings shows that 717 of these, representing 77.5% of the agricultural sphere, were included in the category for immediate tariff elimination. Furthermore, 162 tariff subheadings (17.8%) were in the short and medium term categories (3 to 10 years), and 43 subheadings (4.7%) were in the long-term tariff elimination category (over 10 years). In terms of trade, 53.7% of average annual Colombian imports originating in the United States during the reference period 2001-2004 are subject to immediate tariff elimination. However, products entering duty-free as part of the quotas granted by Colombia must be added to this figure, although they may be incorporated in other tariff elimination categories. Taking this into account, 94.8% of the average imports of the 2001-2004 period would immediately enter duty-free from the first year of the FTA entering into force.[20]

[20] Garay et. al. (2006).

It should also be pointed out that because of the tariff elimination and quota amounts granted by Colombia, opportunities are created for the United States to replace Colombian imports from nations outside the Andean Community. Thus, around 206 million USD in third party exports to Colombia could be substituted by the United States in those Colombian tariff subheadings subject to immediate tariff elimination, plus around 151 million USD in products that are included in the quotas granted. Consequently, if this potential rerouting of trade is included, the United States would be able to export agricultural products to a value of around 866 million USD on entry into force of the FTA, or 70% more than the figure for 2001-2004.[21]

2. Results of the Negotiation for Colombia's Offensive Interests

The main result of the negotiations as regards Colombia's offensive interests was the consolidation of the tariff preferences awarded through the ATPDEA by the United States. Thus, the risk of Colombia facing relative disadvantages in tariffs in comparison to competitors was eliminated. This is especially important with regard to the aggressive policy of negotiating free trade agreements initiated by President Clinton and continued by the administration of President George W. Bush.

The consolidation of these preferences is particularly important in the short-term in maintaining exports of flowers, and increasing other exports, such as cigarettes. It will also eventually be important for fruit and vegetables in the medium and long term, providing that Colombia manages to overcome restrictions that affect the marketing of these products, such as those regarding minimum order sizes, standardization in production quality, presentation and packaging of products, among others. Furthermore, some sanitary problems must be overcome, and there is a need to produce competitively alongside countries which have already successfully entered the US market with fruit and vegetables, such as Mexico, Brazil, Peru and Costa Rica.

Additionally, the guarantee of continued duty-free entry to the United States market is important for Colombia, as it is undoubtedly a factor in attracting foreign investment.

Another of Colombia's fundamental interests lay in reaching commitments on sanitary and phytosanitary measures that go further than those obtained in the WTO Agreement on the Application of Sanitary and Phytosanitary Measures. This objective was not achieved in the manner originally intended. However, outside the legal text of the FTA, a text with a binding nature was negotiated, according to which the United States will collaborate with Colombia in the removal of the sanitary and phytosanitary obstacles that restrict the access of products to the US market.

Nevertheless, this text implies no concrete obligations for either party in guaranteeing solution of the sanitary and phytosanitary problems that affect the entry of several promising Colombian products, such as meat, fruit, and vegetables. Rather, it may be interpreted as an expression of the willingness of the US government to collaborate with its

[21] Garay et. al. (2006).

Colombian counterpart in removing these obstacles, yet without any specific obligation stemming from the FTA.

Some export products that are not subject to tariff preferences are of particular interest to Colombia. Sugar stands out among them, along with dairy products, beef and tobacco. All of these products are considered sensitive by the United States.

Regrettably, sugar and high sugar content products not prepared for marketing to final consumers were excluded from the US tariff elimination program. However, Colombia was granted a quota of 50,000 tons per year for these products. Although it was much lower than that sought, and considerably less than Colombia's export potential, it is the highest quota for sugar products individually conceded in free trade agreements signed by the United States. The negotiation for the group of sugar products was asymmetric in favor of the United States, since, as previously mentioned, the US megatariff was maintained, and sugar was excluded from US tariff elimination. Yet, Colombia agreed to phase out tariffs on its nearest substitutes (glucose and fructose syrups with over 20% fructose content) over nine years, and on more distant substitutes (glucose with more than 20% but less than 50% fructose and aromatized sugars) over fifteen years. The asymmetry stands out even more on considering the fact that Colombia removed tariffs immediately on confectionery and chocolates, while, as mentioned, the United States excluded high sugar content products not ready for final consumption.

The first point of note as regards the negotiations on dairy products is that they were *self-contained* or reciprocal, as the parties agreed to grant each other quotas of 9,000 tons. Yet, this agreement turned out asymmetrical in favor of the United States, at least until the stipulated tariff elimination periods are fulfilled in 11 to 15 years, depending on the product. There are two main reasons for this asymmetry. First, the quantity of milk required to produce the milk derivates for which Colombia granted quotas is superior to that necessary to produce those derivates of interest to Colombia. Second, Colombia agreed on immediate tariff elimination for the liquid milk subheading, which includes pasteurized milk and whey, while the United States did not immediately eliminate tariffs on any of the dairy products of interest to Colombia as exports. However, in the long term, the terms agreed for this product chain may turn out to be asymmetrical in favor of Colombia, given the difference in size of the markets, and the possibility that the Colombian dairy industry may compete successfully in the United States.

The tariff phase-out periods for beef were fixed at 10 years for both Colombia and the United States. The quota granted by Colombia of 6,400 tons was greater than that granted by the United States, of only 5,000 tons. Moreover, this quota can only be utilized once the quota granted by the United States through the WTO is filled. The negotiation on beef would surely turn out to be asymmetrical in the short and medium term, since it is unlikely that Colombia will be able to comply with all the requirements on sanitary and traceability matters and the certification of slaughterhouses to be able to make use of the quota. However, Colombia has made progress in these areas, as indicated by its recent qualification by the World Organization for Animal Health (OIE) as being free of foot and mouth disease by vaccination. If Colombia manages to overcome the sanitary problem,

increase the number of cattle, and improve slaughter and meat marketing methods, the country could probably export substantial volumes of beef to the United States.

As a condition for remitting the FTA to the consideration of the US Congress for legal review, Colombia was required to accept the entry of beef products from animals over 30 months old. This establishes a risk for the Colombian cattle farming sector of a possible increase in imports of low quality or industrial type meat from the United States, as well as the risk that exists from the import of bovine offal.

In the case of tobacco, a highly sensitive US product, Colombia was granted a quota of 4,000 tons, and a tariff phase-out period of fifteen years was agreed on. Although the quota granted was not the amount sought by Colombia, the opening of this market over 15 years presents interesting opportunities for increasing commercial flows of tobacco.

An estimate of the value of concessions granted to Colombia shows that 86.3% of the US agricultural tariff subheadings are in the immediate tariff elimination category. This includes all the subheadings that benefit from preferential treatment in the APTDEA. Only 1.1% of subheadings would be subject to medium-term tariff relief, with a tariff phase-out period of between 5 and 10 years. Long-term tariff elimination, over a period of between 10 and 15 years would be applied to 9.2% of the subheadings. These consist primarily of dairy products, tobacco and peanuts. Finally, 3.3% of the US agricultural tariff subheadings, those of sugar and high sugar content products not ready for consumption were excluded from the negotiation. An analysis of the results in terms of trade, without taking into account those subheadings that benefit from a most favored nation (MFN) tariff of 0%, shows that basically all Colombian exports to the United States of the period 2001-2004 (99.9%) were included in the immediate tariff elimination category. Likewise, the remaining products traded (0.1%) would enter the United States market without duty by virtue of the quotas granted. [22]

The value of the quotas granted to Colombia exceed the average value of US imports from Colombia during the period 2001-2004 by almost 70 million USD. Thus, it may be expected that Colombia would increase its exports by 10.3 % upon entry into force of the FTA. If the immediate possibility of exporting ethanol for an annual value of around 29 million USD is taken into account, the total value of expected Colombian exports would reach an annual average of 776 million USD. This would represent an increase in sales to the United States of 14.5% in the first year of the FTA coming into force. [23]

[22] Garay et. al. (2006).

[23] Garay et. al. (2006).

Table 3. *Results of the Negotiation for the Principal Offensive Colombian Products*

Product	Base tariff [1]	Period of tariff elimination	Modality of tariff elimination	Quota (Ton) [3]	Growth Rate	Safe - guard
ATPDEA						
- Flowers	6%	Immediate	N.A.	N.A.	N.A.	N.A.
- Fruit and Vegetables	7%	Immediate	N.A.	N.A.	N.A.	N.A.
- Confectionery and Chocolate	5%	Immediate	N.A.	N.A.	N.A.	N.A.
- Cigarettes	11%	Immediate	N.A.	N.A.	N.A.	N.A.
- Ethanol	47%	Immediate	N.A.	N.A.	N.A.	N.A.
- Other products	5%	Immediate	N.A.	N.A.	N.A.	N.A.
Beef [2]	26%	10 years	Linear	5,000	5%	Volume
Dairy Products						
- Liquid Milk	72%	11 years	Linear	100	10%	N.A.
- Butter	88%	11 years	Linear	2,000	10%	N.A.
- Cheese	40%	15 years	Linear	4,600	10%	N.A.
- Ice Cream	34%	11 years	Linear	300	10%	N.A.
- Preparations chap. 19	65%	15 years	Linear	2,000	10%	N.A.
Sugar and Products with Sugar [4]	82%	Excluded	N.A.	50,000	1.5%	N.A.
Tobacco	350%	15 years	Linear	4,000	5.0%	N.A.
Cotton	32%	Immediate	N.A.	N.A.	N.A.	N.A.
Total Quotas				**68,000**		

Source: Taken from Garay et al. (2006), Table 8. 1. (N.A. = not applicable) For the specific tariffs, the *ad valorem* equivalent was calculated from the implicit prices of the period 2001-2004. 2. The quota will only be available once the WTO quota is filled. 3. With the exception of sugar, the initial levels of the quotas for the first year of entry into force of the FTA would be equivalent to the volumes determined, augmented at the established growth rate. 4. The quota is subject to countervailing and net exporter clauses. The annual growth rate is simple. Products containing sugar are those not ready for consumption.

6. Conclusions

- The negotiation of the US - Colombia FTA was governed exclusively by commercial interests. The United States ignored the struggle that Colombia is engaged in against terrorism and drug trafficking, and did not take into account the importance of the welfare of the rural population to the economic, social and political stability of Colombia.

- The negotiation of the FTA was inequitable, against Colombian interests. This is clear from the fact that, while keeping a good part of its own protection by maintaining domestic support for production, the United States would not permit Colombia to use exclusions or residual tariffs, or adopt any mechanisms such as price safeguards to counteract the effect of US domestic support and export subsidies. Safeguards were accepted neither for the duration of the FTA, nor until removal of the US domestic support measures. Nor could a clause to freeze US domestic support at pre-FTA levels be obtained. Yet, in contrast, the United States excluded sugar and other high sugar content products from the negotiation.

- The United States insisted on the introduction of a non-reciprocal preferential clause by which Colombia promises to grant any preference, further to those foreseen in the FTA, that may be conceded to any other country with which Colombia makes or deepens trade agreements from 27th of February 2006.

- The negotiation of the FTA proved asymmetrical in favor of the United States. This is at variance with the size of the economies and their degree of development. By means of the quotas granted, Colombia offered to immediately eliminate tariffs on imports with a value of 839 million USD, while the United States only eliminated tariffs on imports worth 776 million USD (based on averages from the period 2001-2004).

- While the sanitary and phytosanitary commitments assumed by the United States outside the text of the FTA are expressed in conditional language, the demands made of Colombia in these matters are very precise.

- The United States assumed a more radical position with Colombia than with the Central American countries. This can be concluded from several facts:
  - i) In the CAFTA Agreement, some few exceptions were permitted, as well as an option for member countries to administrate a number of quotas by means of performance requirements.
  - ii) No non-reciprocal preference clause was required in CAFTA.
  - iii) While, in the US-Colombia FTA, 94.8% of the average value of the imports of the 2001-2003 period are to be duty free on entry into force of the Agreement, these percentages amounted to 75% in the case of Guatemala, 74.3% for Costa Rica, 66.1% for El Salvador, 58.1% for Honduras, and 45.8% for Nicaragua. On aggregate, 69.4% of United States exports to the CAFTA countries and Costa Rica are duty free from the entry into force of the agreement, while the figure for Colombia is 25% higher at 94.8%.
  - iv) By means of the quotas granted, the United States may increase its exports to the CAFTA countries and Costa Rica by 7.7% on aggregate, while the figure for Colombia is 22% higher.
  - v) A greater quantity of the Central American countries' tariff subheadings were subject to the longest tariff elimination periods (over 10 years). The figures are as follows: 4.7% for Colombia, 32.2% for Costa Rica, 27.1% for Nicaragua, 25.8% for Honduras, 20.6% for El Salvador, and 18.7% for Guatemala.
  - vi) The conditions for the application of quantity safeguards were stricter for Colombia than for the CAFTA countries.

II. THE IMPACT OF THE FTA FROM A PERSPECTIVE OF COMPARATIVE STATICS

A. AREA OF STUDY

1. Products that Compete with Imports

The tariff elimination granted by Colombia for the agricultural sector would affect the producers of goods in which the United States has export capacity and that compete directly or indirectly (substitutes) with imports provided that the duty-free cost of importing from the United States, with goods placed in the production zone, is lower than the domestic price received by Colombian producers. If this condition is fulfilled, it is expected that the area cultivated and national production would decrease, depending on degrees of elasticities of supply.

As can be seen in table 4, a significant proportion of Colombian short-cycle crops makes up the group of goods that would compete with imports on entry into force of the FTA. This group is composed mainly of cereals (for animal or human consumption), legumes, oil seeds, cotton, potatoes, and some vegetables. In effect, either imports already provide an important proportion of the domestic supply of these goods, or the volume of US exports constitutes a threat to Colombian domestic production.

Also among the goods that would compete with US exports are chicken and pork, in which the United States has a significant export capacity. There is a slight shortfall in the Colombian domestic supply of these products and they currently benefit from significant tariff protection.

Of the above products, cotton would not be affected by the FTA, as it is subject to a minimum price guarantee policy, under which the Colombian government compensates any difference between the price paid to the producer and the guaranteed price established for each crop.[24]

Although the producers of oil crops such as soybean or oil palm could be affected by competition from imports of oil seeds and derivates (oils and oilcakes) from the United States, these crops have traditionally been associated with large-scale commercial agriculture, and thus were not included in the present study.

For the remaining activities, the effect of the FTA depends on the difference between Colombian domestic prices and the prices at which goods could be imported duty-free from the United States. If the latter is lower, a negative impact on the area cultivated, production, and income of each sector can be expected.

[24] In principle, the FTA would have an impact, due to the elimination of the tariff on cotton imports from the United States, as the Colombian government will have to make a greater fiscal expenditure. However, as the imported cotton is normally used entirely in the making of cloth and garments for export, it enters Colombia free of duty and sales tax under a customs scheme called *Plan Vallejo*.

Table 4. *Activities that Compete with Imports: National Production, Colombian Imports and United States Exports - Year 2007*

ACTIVITY	DOMESTIC SUPPLY 2007 [1]			US EXPORTS (tons) [2]
	Area Cultivated (ha)	Production (tons)	Imports (tons)	
Cereals				
Corn (Maize)	626,616	1,370,457	3,309,195	56,837,895
Rice (equiv. paddy)	460,767	2,493,118	30,790	2,631,043
Sorghum	44,528	137,362	67,041	5,610,457
Wheat	18,539	44,374	1,285,968	32,990,625
Barley	2,305	3,939	248,605	730,379
Legumes				
Beans	130,656	156,236	29,111	308,440
Peas	26,828	45,725	43,920	466,423
Oil seeds				
Soybean	28,876	55,271	332,064	29,776,868
Vegetables				
Onions	22,760	496,677	44,713	280,156
Tomatoes	15,605	476,985	3,752	161,339
Carrots	12,364	270,201	63	116,782
Others				
Potatoes	163,505	2,986,215	0	337,379
Cotton [3]	54,914	48,091	53,307	3,258,111
Livestock				
Chicken [4]	N.A.	924,662	26,823	3,175,549
Pork [4]	N.A.	173,558	8,203	1,225,397

Source: (1) Ministry of Agriculture, Statistical Yearbook 2007; Agronet; *Asociación Colombiana de Porcicultores* for pork (2) FAS (Foreign Agricultural Service), USDA. (3) Production of cotton fiber (4) Includes preparations

2. Products with Export Potential

The tariff elimination granted by the United States in the agricultural sector would have a direct impact on producers of export goods, or those with export potential, provided that the price received in the external market (export price), after discounting transport costs, is greater than the price in the domestic market. In accordance with the principles noted above in the case of imported goods, in this scenario it is likely that the area cultivated and national production would increase.

The range of exportable agricultural goods includes those identified by the Colombian Ministry of Agriculture and Rural Development in an agricultural export initiative (*Apuesta Exportadora Agropecuaria*). Among these are:

- some tropical fruits: pitahaya, mango, banana, Tahiti lime, pineapple guava (*feijoa*), avocado, cape gooseberry (*uchuva*), pineapple, passion fruit, naranjilla (*lulo*), blackberry, granadilla (a passion fruit variety), and tree tomato;

- some vegetables: chili pepper, asparagus, onions, broccoli, cauliflower, gourmet lettuce, and artichoke;
- slow growing crops such as rubber, macadamia and cashew nuts;
- some short-cycle crops such as tobacco, cotton, and yellow potatoes;
- cattle farming for beef and dairy produce;
- fish farm products such as shrimp and tilapia; and
- production of bio-fuels.

Added to these, of course, are the traditional Colombian export products, among which are banana, plantain, palm oil, flowers and coffee.

The expected effects of the FTA on these products would not be immediate or uniform, as each one faces different conditions of entry to the United States market.

Firstly, almost all the traditional Colombian agricultural sector export goods, such as palm oil, flowers, coffee, banana and plantains, already benefit from duty-free entry to the United States, either by virtue of preferences granted by the ATPDEA or because the most favored nation tariff is zero. Therefore, it cannot be expected that production or employment generated in these activities increase as a consequence of the FTA.

Sugar was the only traditional Colombian export product subject to quantity restrictions and tariffs in the United States, and at the same time the product with the greatest potential for increased sales in the US market due to the surplus generated in the Colombian domestic market. However, it was the only product excluded from tariff relief, and the quota granted, although it would improve the average income of the Colombian producers, would not have any effect on areas cultivated, production, or present employment levels. Furthermore, the cultivation of sugar in Colombia, like that of the oil palm, has been associated with large-scale, rather than small-scale, agriculture.

Some of the products considered as possible winners with the FTA are certain fruits and vegetables, beef, dairy products, and tobacco. However, these products either face problems in domestic supply, which must be solved before considering their export, or are subject to unjustified non-tariff restrictions that could not be eliminated in the FTA negotiations: for example, port restrictions or dates of entry. The investments needed to comply with US import requirements for these products, such as the traceability or sanitary procedures to eliminate risk of epidemic or illness, imply very high costs. Thus, a significant impact cannot be expected for them in the short or medium term, especially for small-scale producers.

B. ESTIMATED IMPACT FOR GOODS COMPETING WITH IMPORTS

1. Methodological Considerations

In general terms, the estimate of the impact of tariff elimination on domestic prices, area cultivated and production of the agricultural goods competing with imports is based on the methodology and data of the preparatory study for the Colombian Ministry of Agriculture

negotiations on the FTA, (Garay et al. 2005). There was some modification and broadening of the analyses and scenarios as considered appropriate.

Certain methodological steps were followed to measure the impact of the different scenarios of US tariff relief:

1) *Identification of domestic prices without the FTA*:

   According to the availability of information, either the average prices paid to the producer or those paid at wholesale level are used.

   Because of considerable volatility in prices, which makes forecasting exceedingly difficult, it was considered convenient to determine price scenarios based on their registered behavior in the period between January 1997 and January 2009. The scenario of average prices is based on the arithmetical average of domestic values at constant prices, deflated using agriculture producer price index (PPI), taking January 2009 as a base. The scenarios of high and low prices are obtained by adding or subtracting a standard deviation to or from the arithmetical average.

   It should be clarified that, in exercises using comparisons at the level of prices to producers, the margin of intermediation between wholesaler and producer is assumed to be of a constant percentage. This does not necessarily occur. In effect, with tariff elimination in place, it may happen that the intermediary, on seeing the cost of importing reduced by a certain degree, would transfer a greater percentage of this reduction onto the price paid to the domestic producer, if wishing to maintain profit or the intermediation margin constant in absolute terms.

2) *Calculation of domestic prices with the FTA:*

   It is assumed that, once the barriers to imports originating in the United States are eliminated, the price paid to the producer (or that paid at the wholesale level, according to the case), would be equivalent to the duty free cost of importing from the United States, with goods brought into the production zone (or wholesale).

   When the reference market for the product is that of the United States, calculation of the price is based on estimating the US export price using the official CIF reference prices published by the Community of Andean Nations (CAN). In cases where the reference market for the product under analysis is not that of the United States, or the product is simply not part of the Andean Price Band System, the implicit FOB US world export price was taken. International freight and maritime insurance costs were added to convert this into a CIF price. Finally, and according to available information, the costs of local freight to the production or consumption zone were added to this CIF price.

   Using the same methodology as that used for domestic prices, scenarios of medium, high and low prices were constructed. In all cases, the prices were deflated according to the US consumer price index, taking January 2009 as a base.

Finally, the international prices of products placed in the consumer or production zone are changed to prices in Colombian pesos, using the representative market exchange rate (*Tasa Representativa del Mercado*) for the period November 2008 to April 2009. This period represents average exchange rates during recent years, equivalent to 2,384 pesos per dollar (COP per USD).

Nevertheless, like international prices, the market exchange rate of the dollar has suffered high levels of volatility in recent years. Therefore, two additional exchange rate scenarios were constructed: a revaluating scenario, defined by the average exchange rate from the period between October 2007 and June 2008, of 1,899 pesos per dollar; and a devaluing scenario defined by the average rate from the period between August 2002 and March 2003, of 2,824 pesos per dollar.

The sources of information, the transformation of the variables to be compared, the freight costs and other adjustments to data are shown in Methodological Annex 1. All the information used in calculations can be found in the Statistical Annexes (available on CD by request).

3) *Estimating the impact on the area cultivated and the volume of production:*

To determine the impact of tariff elimination on the area cultivated, production and producer surplus, estimates of the supply function for each product must be used. The functions used for this were mainly those estimated by Ramírez and Martínez for the preparatory study on the FTA carried out by the Ministry of Agriculture (2005). These cover the following products: rice, beans, yellow and white corn, potatoes, sorghum, soybeans and wheat.

In all cases, the long-term supply function is used, in which lags in quantity supplied and price cancel out in such a way that the long-term supply function depends solely on the long-term equilibrium price.

The impact on the livestock sector was estimated by Vargas (2007) for pork farming, and by Cardona and Van Brackel (2004) for chicken, in their respective Master's in economics theses. (please see Methodological Annex 1)

Using the supply functions estimated for the area cultivated as well as production, the change in these variables due to the FTA may be found by substituting the prices with and without the FTA in the respective equations.

It should be pointed out that the supply functions were estimated for the economy as a whole, and are not segmented according to the size of producer. Functions of this kind cannot be calculated using the available sources of information, as the indispensable elements – small-scale production and the prices at which this production is placed on the market – cannot be estimated with total certainty.

However, it can be affirmed that in the cases of yellow and white corn (maize), wheat and beans, the estimated supply functions are near those for small-scale producers, given the substantial contribution of these farmers to the total amount of production of these crops, as will be seen in chapter III.[25]

The analysis described here is one of *comparative statics*, which is based on the performance of data observed in the recent past. It supposes that once the FTA is in force, with the exception of Colombian domestic prices, other market conditions for the products studied remain the same as in recent years (marketing, intermediation etc.).

The *partial equilibrium analysis* approach also used has the advantage of enabling the evaluation of the direct effects of the FTA on the principal Colombian agricultural products in greater detail, yet at the cost of ignoring part of the indirect effects arising from the relations of substitution and complementarity that exist among them, which could be estimated using a general equilibrium model.

Given the absence of information on elasticity of supply for other products such as barley, peas, tomatoes, onions and carrots, the impact that the agreed tariff elimination would have on these products cannot be estimated with the same rigor.

However, as small-scale farmers account for a good a part of the areas cultivated in the former crops (as will be seen in the following chapter), it was considered appropriate to include some estimate of the impact they may suffer. To this end, and with the purpose of avoiding overestimates, it was only assumed that the domestic price of these goods would fall by 15%, which is equivalent to the tariff reduction that would affect them. This assumes perfectly inelastic supply: that is, it is assumed that the fall in domestic price would not cause additional impact in the areas cultivated or the amounts produced.

2. Impact on the Paddy Rice Producing Sector

In 2007, 461,000 hectares of rice were sown in Colombia, and 2.5 million tons were produced. Imports amounted to 123,000 tons of white rice (173,000 tons in paddy equivalent), the greater part of which came from Ecuador. This implies that there is a slight shortfall in Colombian production.

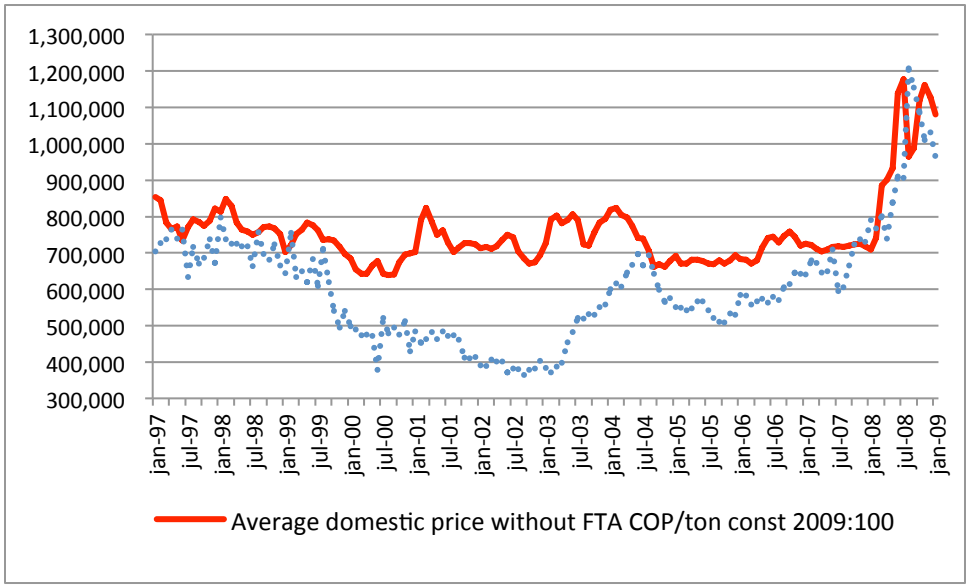
The international prices of rice are determined in good part by the United States, which is the fourth largest exporter of processed rice in the world, and the first in paddy rice, with a share of 12% in world exports of the former and 69% in those of the latter. Thus, export prices are strongly influenced by US policies of subsidies to producers and exports, which distort production and trade flows.

[25] The supply functions used in the calculations for each productive activity are included in Methodological Annex 1, and the calculations corresponding to the various scenarios of prices and exchange rates are given in the Statistical Annexes 1-9.

US export prices are quite volatile and register periods of low and high prices in both current dollars as well as constant dollars. Between January 1997 and January 2009, the United States exported dry paddy rice at an average FOB price of 255 USD per ton in constant terms, with a standard deviation of 79 USD and a variation coefficient of 31%.

Although Colombia is a small and marginal country in terms of production, and therefore should be a taker of international prices, the high degree of tariff protection imposed on imports of rice (ad valorem tariff of 80%) isolates the country from the effects of the world market and allows domestic prices to remain constantly above international prices. Consequently, once the tariff elimination of the FTA is applied, a significant impact on domestic prices is to be expected. In comparison with the domestic prices paid to producers without the FTA, prices with the Agreement in force would be lower during practically the whole period of analysis. (Figure 1)

Figure 1. *Domestic Prices of Green Paddy Rice without the FTA Compared to Domestic Prices with the FTA (Constant 2009:100) – COP per Ton - Average Exchange Rate*



Source: Author's calculations: please see Annex 1

A comparison of the whole period analyzed shows that, in a scenario of average prices and exchange rates, the price of paddy rice with the FTA would be 20% lower on average than the price without the Agreement. According to the supply function estimated by Ramírez and Martínez (2005), the price elasticity of supply for rice is 0.94 in area and 0.93 in production. This implies that, in the above scenario, the area cultivated and national production would each decrease by 19% in comparison to the situation before the FTA, while the value of production would fall by 35%. (Table 5)

However, in a scenario of low prices and a revaluing exchange rate, the impact on prices could reach 45%, with a loss of 43% in the area cultivated and the level of production, and of 69% in the value of production. On the other hand, in a scenario of high prices and a devaluing exchange rate, the average import price of US paddy rice, brought to the

production zone in Colombia, would be higher than the average price observed in the past, and thus, in this case, no impact would be registered. (Table 5)

Table 5. *Impact of the US - Colombia FTA on the Paddy Rice Producing Sector in Colombia - Summary of Price and Exchange Rate Scenarios*

VARIABLES	UNITS	PRICE AND EXCHANGE RATE SCENARIOS		
		AVERAGE	LOW	HIGH
Domestic Price without FTA (Green Paddy Rice)	COP/ton	755,715	655,942	855,487
Domestic Price with FTA (Green Paddy Rice)	COP/ton	603,852	359,343	898,991
Change in price	**%**	**-20%**	**-45%**	**5%**
Change in Area Cultivated	hectares	-124,122	-247,028	0
	%	**-19%**	**-43%**	**0%**
Change in Production Level	tons	-554,995	-1,107,828	0
	%	**-19%**	**-43%**	**0%**
Change in Value of Production	COP millions	-783,307	-1,165,557	0
	%	**-35%**	**-69%**	**0%**

Source: Author's calculations: please see Annex 1.

3. Impact on the Yellow Corn (Maize) Producing Sector

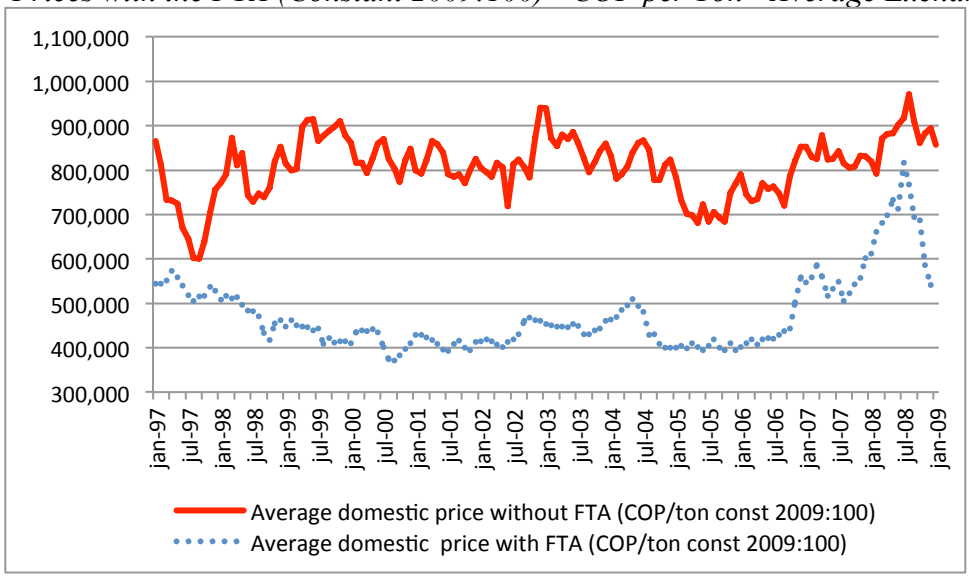
In 2007 in Colombia, around 306,00 hectares of yellow corn were sown and a little less than one million tons were produced. Imports of this product reached 3.2 million tons, of which the United States supplied 80%.

The United States is the principal producer (332 million tons in 2007) and exporter of corn (maize) in the world (60% of world corn exports), and thus the main agent in forming the international price, which is consequently affected by US policies of subsidies to production and exports.

World corn prices are characterized by a high volatility and a downward tendency, with the exception of the years 1996 and 2007. Between January 1997 and January 2009, the CIF reference price used by the Community of Andean Nations (CAN) for US yellow corn was on average 160 USD per ton in constant terms, with a standard deviation of 35 USD and a variation coefficient of 22%.

Given the high level of competition with imports, the Colombian domestic price of yellow corn is formed according to the price of imported corn, and determined by agreement between growers and the industry (import parity price). Imports are permitted according to the purchase of national production through the *MAC* quota administration system. Thus, a direct impact on domestic prices is foreseen with the tariff elimination of the FTA in force. In comparison with domestic wholesale prices without the FTA, the price with the Agreement in force would be lower during the whole period under analysis. (Figure 2)

Figure 2. *Domestic Prices of Yellow Corn (Maize) without the FTA Compared to Domestic Prices with the FTA (Constant 2009:100) - COP per Ton - Average Exchange Rate*



Source: Author's calculations: please see Annex 1

A comparison of the whole period analyzed shows that, in a scenario of average prices and exchange rates, the average price of yellow corn with the FTA would be lower by 41% than the prices without the Agreement. According to the supply function estimated by Ramírez and Martínez (2005), the price elasticity of supply for corn is 0.51 in area, and 0.45 in production. This implies that, in the above scenario, the area cultivated and national production would decrease by 24% and 21% respectively, in comparison with conditions prior to entry into force of the FTA, while the value of production would fall by 54%. (Table 6)

Table 6. *Impact of the FTA on the Yellow Corn (Maize) Producing Sector in Colombia (COP January 2009) - Price and Exchange Rate Scenarios Summary*

VARIABLES	UNITS	PRICE AND EXCHANGE RATE SCENARIOS		
		AVERAGE	LOW	HIGH
Domestic Price without FTA	COP/ton	808,237	740,661	875,814
Domestic Price with FTA	COP/ton	473,330	325,205	646,559
Change in price	**%**	**-41%**	**-56%**	**-26%**
Change in the Area Cultivated	hectares	-211,775	-290,965	-132,388
	%	**-24%**	**-34%**	**-14%**
Change in the Level of Production	tons	-308,856	-429,871	-190,910
	%	**-21%**	**-31%**	**-13%**
Change in the Value of Production	COP millions	-632,818	-720,375	-468,709
	%	**-54%**	**-70%**	**-36%**

Source: Author's calculations: please see Annex 1.

However, in a scenario of low prices and a revaluing exchange rate, the impact on the price could reach 56%, with losses of 34% in the area cultivated, 31% in the level of production, and 70% in its value. In the case of high prices and a devaluing exchange rate, the domestic price could fall by 26%, causing reductions of 14% in the area cultivated, 13% in production and 36% in its value. (Table 6)

4. Impact on the White Corn (Maize) Producing Sector

In the year 2007, some 255,000 hectares of white corn were sown and a little under 700,000 tons were produced in Colombia. The imports of this product rose to 109,000 tons, of which 85% came from the United States.

Although previously the United States was not a large producer of white corn and most of its production was oriented toward yellow corn, its production of white corn has grown recently, specifically to take advantage of opportunities in the Mexican market after NAFTA.

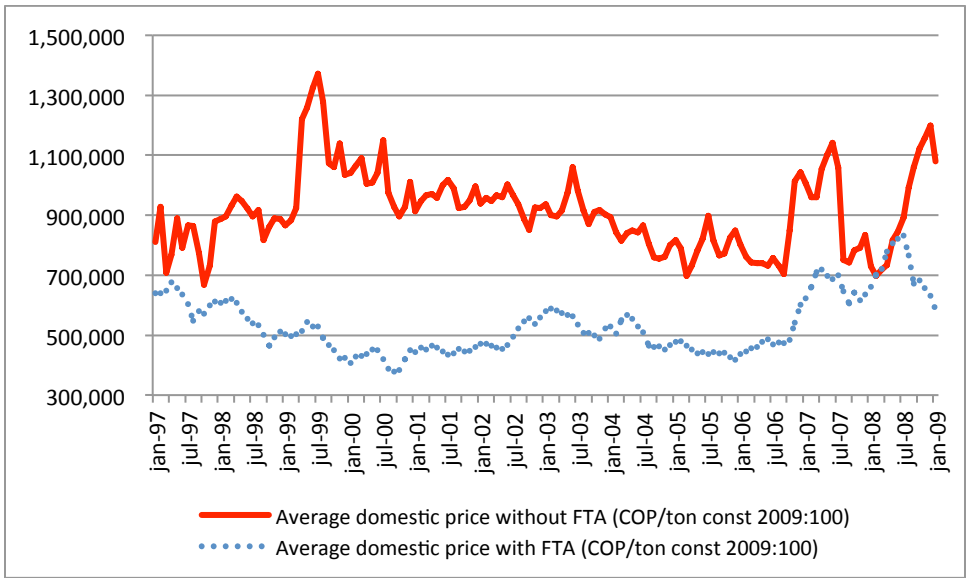
Like that of yellow corn, the price of white corn is quite volatile. Between January 1997 and January 2009, the CIF reference price used by the CAN for US white corn was on average 179 USD per ton in constant terms, with a standard deviation of 41 USD and a variation coefficient of 23%.

Due to the high level of competition with imports, the domestic price of white corn is also formed according to the import price. Thus, a direct impact on domestic prices is foreseeable once tariff elimination for US exports is in place. In comparison with domestic wholesale prices without the FTA, the price with the Agreement in force would be lower during practically the whole period under analysis. (Figure 3)

A comparison of the whole period analyzed shows that, in a scenario of average prices and exchange rates, the average price of white corn with the FTA would be lower by 42% than the price without the Agreement. According to the supply function estimated by Ramírez and Martínez (2005), the price elasticity of supply for corn (maize) is 0.51 in area and 0.45 in production. This implies that, in the above scenario, the area cultivated would decrease by 21% and national production by 18% in comparison to the situation prior to the entry in force of the FTA, while the value of production would fall by 52%. (Table 7)

However, in a scenario of low prices and revaluing exchange rates, the impact on prices could reach 53%, with losses of 28% in the area cultivated, 25% in the level of production and 65% in its value. Alternatively, in a situation of high prices and a devaluing exchange rate, the domestic price could decrease by 30%, causing a reduction of 15% in the area cultivated, 13% in production and 39% its value. (Table 7)

Figure 3. *Domestic Prices of White Corn (Maize) without the FTA Compared to Prices with the FTA (Constant 2009:100) - COP per Ton - Average Exchange Rate*



Source: Author's calculations: please see Annex 1.

Table 7. *Impact of the FTA on the Colombian White Corn Producing Sector (COP January 2009) - Summary of Price and Exchange Rate Scenarios*

VARIABLES	UNITS	PRICE AND EXCHANGE RATE SCENARIOS		
		AVERAGE	LOW	HIGH
Domestic Price without FTA	COP/ton	912,348	778,127	1,046,569
Domestic Price with FTA	COP/ton	533,461	365,277	731,175
Change in price	**%**	**-42%**	**-53%**	**-30%**
Change in the Area Cultivated	hectares	-191,767	-240,443	-141,481
	%	**-21%**	**-28%**	**-15%**
Change in the Level of Production	tons	-267,479	-341,142	-194,492
	%	**-18%**	**-25%**	**-13%**
Change in the Value of Production	COP millions	-695,675	-692,057	-626,988
	%	**-52%**	**-65%**	**-39%**

Source: Author's calculations: please see Annex 1.

5. Impact on the Sorghum Producing Sector

After the crisis in the sorghum sector during the past decades, the area cultivated fell from 800,000 hectares in 1990 to just 32,000 in 2007, during which year a little over 118,000 tons was produced in Colombia. Imports of this product rose to 67,000 tons, all of which came from Argentina.

The United States is the principal exporter of sorghum in the world with a share of 90% in international trade. According to US Department of Agriculture reports, the exports of sorghum grain in 2008 were 5.2 million tons, valued at 1,240 million USD FOB.

However, the most important effect on sorghum prices for Colombian producers would very probably be felt in the increase of low-priced corn imports, as corn is a direct substitute for sorghum in the production of animal feeds. In fact, due to characteristics of sorghum in the composition of animal feed concentrates, its price in Colombia is traditionally quoted as a percentage (93%) of the price of yellow corn. Thus, it is expected that, once the FTA is in force, the domestic price of sorghum transacted on the exchange market would fall in the same proportion as that of yellow corn.

According to the supply function estimated by Ramírez and Martínez (2004), the price elasticity of supply for sorghum is 0.95 in area and 1.02 in production. This implies that with the FTA, in a scenario of moderate prices and exchange rates under which the domestic price falls by 41%, the area cultivated and national production would decrease by 40% and 42% respectively, and the value of production would fall by 66%. (Table 8)

However, given a scenario of low prices and revaluing exchange rates, in which the price could fall by 56%, there may be losses of as much as 54% in the cultivated area, 57% in production, and 81% in its value. On the other hand, in a situation of high prices and devaluing exchange rates, in which the domestic price decreases by 26%, there would be a fall of 25% in the area cultivated, 27% in production, and 46% in its value. (Table 8)

Table 8. *Impact of the US - Colombia FTA on the Sorghum Producing Sector in Colombia (COP January 2009) - Summary of Price and Exchange Rate Scenarios*

VARIABLES	UNITS	PRICE AND EXCHANGE RATE SCENARIOS		
		AVERAGE	LOW	HIGH
Domestic Price without FTA	COP/ton	583,733	527,724	639,741
Domestic Price with FTA	COP/ton	341,853	231,710	472,281
Change in price	**%**	**-41%**	**-56%**	**-26%**
Change in Area Cultivated	hectares	-112,687	-139,517	-77,208
	%	**-40%**	**-54%**	**-25%**
Change in Level of Production	tons	-323,796	-394,517	-225,066
	%	**-42%**	**-57%**	**-27%**
Change in Value of Production	COP millions	-296,790	-296,880	-247,768
	%	**-66%**	**-81%**	**-46%**

Source: Author's calculations: please see Annex 1.

6. Impact on the Wheat Producing Sector

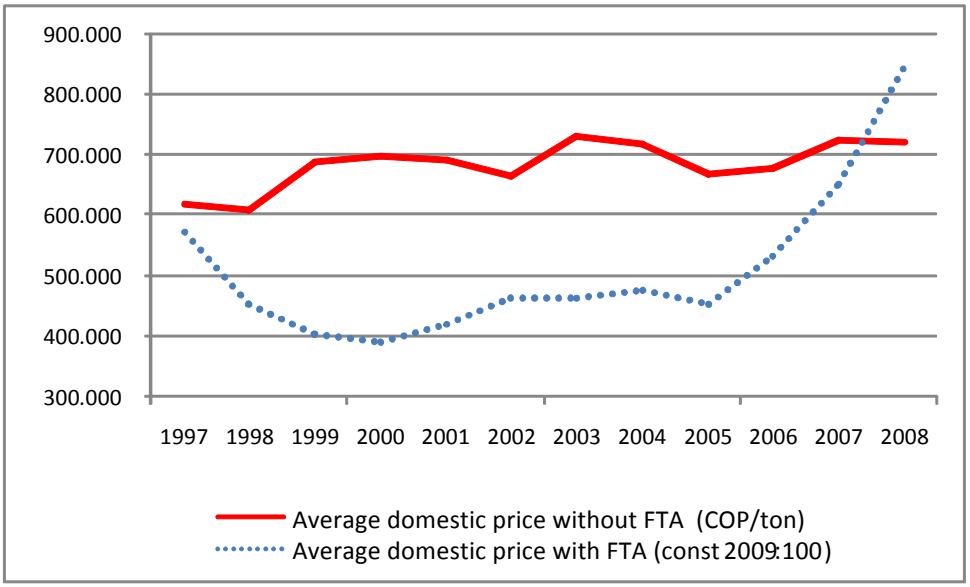
Like that of sorghum, wheat has been one of the sectors most affected in the past two decades, as evidenced by a reduction in the area cultivated, which fell from 56,000 hectares in 1990, to only 19,000 in 2007. During that year, a little over 44,000 tons were produced in Colombia. Wheat imports rose to 1.3 million tons, 60% of which came from the United States.

The United States is the third largest producer of wheat in the world, with 54 million tons, or 9% of world production, and exports more wheat than any other country (30 million tons in 2008), thus having a notable influence on world prices.

International wheat prices are also extremely volatile. Between January 1997 and January 2009, the CIF reference price used by the Community of Andean Nations for US wheat was on average 220 USD per ton in constant terms, with a standard deviation of 62 USD and a variation coefficient of 28%.

Given the high level of competition with imports, it is likely that, with the tariff phase-out of the FTA in place, the domestic price of wheat would be even lower than at present and the area cultivated and production would continue to decrease. In comparison with the domestic purchase price without the FTA, the price with the Agreement in force would be lower during practically the whole period under analysis. (Figure 4)

Figure 4. *Domestic Wheat Prices without the FTA Compared to Prices with the FTA (Constant 2009:100) - COP per ton - Average Exchange Rate*



Source: Author's calculations: please see Annex 1.

A comparison of the whole period analyzed revealed that in a scenario of average prices and exchange rates, the average price of wheat with the FTA would be lower by 25% than that without the Agreement. According to the supply function estimated by Ramírez and Martínez (2005), the price elasticity of supply for wheat is 5.0 in area and 2.3 in production. This implies that, in the above scenario, the area cultivated would fall by 77%, domestic production by 49%, and the value of production by 62% in comparison to the situation prior to the application of the FTA. (Table 9)

However, in a scenario of low prices and a revaluing exchange rate, the impact on prices could reach 55%, with losses of 98% in the area cultivated, 84% in the level of production and 93% in its value. On the other hand, in a situation of high prices and a devaluing exchange rate, the average import price of US wheat placed in the Colombian production

zone would be higher than the prices observed in the past, and in this case there would be no impact.

Table 9. *Impact of the FTA on the Colombian Wheat Producing Sector (COP January 2009) - Summary of Price and Exchange Rate Scenarios*

VARIABLES	UNITS	PRICE AND EXCHANGE RATE SCENARIOS		
		AVERAGE	LOW	HIGH
Domestic Prices without FTA	COP/ton	684,829	645,008	724,650
Domestic Prices with FTA	COP/ton	511,797	292,857	775,841
Change in price	**%**	**-25%**	**-55%**	**7%**
Change in Area Cultivated	hectares	-79,442	-75,173	0
	%	**-77%**	**-98%**	**0%**
Change in Level of Production	tons	-50,947	-76,250	0
	%	**-49%**	**-84%**	**0%**
Change in Value of Production	COP millions	-44,172	-54,435	0
	%	**-62%**	**-93%**	**0%**

Source: Author's calculations: please see Annex 1.

7. Impact on the Bean Producing Sector

In the year 2007, around 131,000 hectares of beans were sown and a little over 156,000 tons were produced in Colombia. At present, Colombia is a net exporter of this product, with an export volume of 58,000 tons, Venezuela being the principal customer. Colombia imported some 20,000 tons of beans in 2007, mainly from Ecuador, followed by Bolivia and Peru. The two-way trade exists because of the different varieties of beans grown in Colombia and other countries.

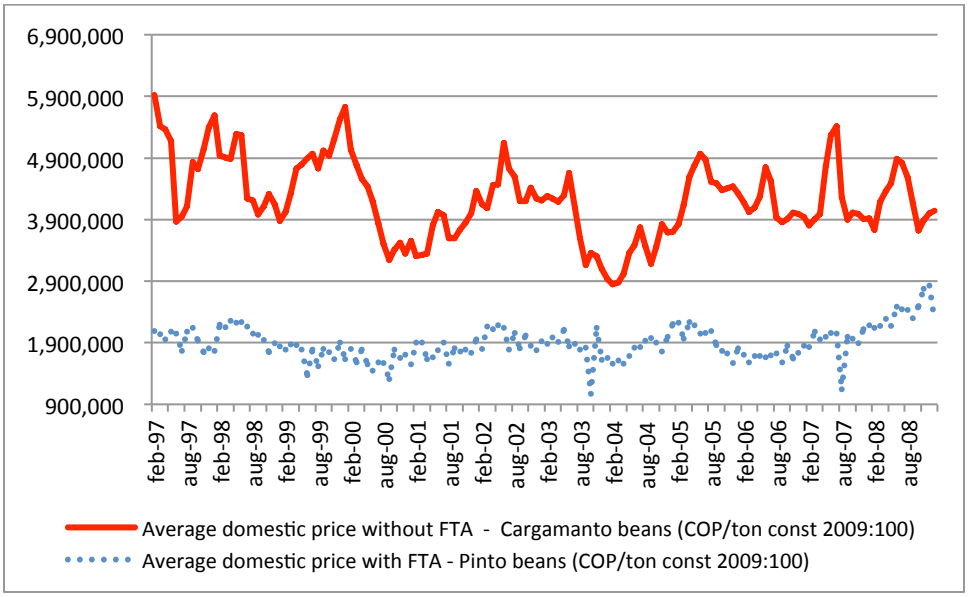
The United States is an important producer of beans, most of the production being destined for export. Some of the varieties produced there are similar to those produced in Colombia. The *Small Red* is similar to the *Radical* variety sown in Colombia, and the *Kidney* bean is similar to the *Nima-Calima* variety, for example. Colombian production and exports are not directly subsidized.

An analysis of implicit US export prices reveals significant differences between the varieties. Between January 1997 and January 2009, the FOB price of the *Pinto* bean was on average 680 USD per ton in constant terms, with a standard deviation of 113 USD, and a variation coefficient of 17%, while the price of *Small Red* maintained an average of 770 USD per ton in constant terms, with a standard deviation of 178 USD, and a variation coefficient of 22%.

Although Colombia is a small and marginal country with regard to production, and as a result should be an international price taker, the high tariff protection imposed on bean imports (60% ad valorem tariff) isolates the country from world market tendencies and maintains domestic prices higher than those of the international market. Thus, a significant impact on domestic prices is foreseen upon implementation of the FTA tariff elimination,

as it would create substantial competition between some Colombian and US varieties. The domestic wholesale price of the *Cargamanto* variety without the FTA may be compared to that of the US *Pinto* variety with the Agreement in force. The latter would be lower throughout the whole period of analysis. (Figure 5)

Figure 5. *Domestic Prices of Cargamanto Beans without the FTA Compared to Domestic Prices of Pinto Beans with the FTA - (Constant 2009:100) - COP per ton - Average Exchange Rate*



Source: Author's calculations: please see Annex 1.

A comparison of the whole period analyzed reveals that, in a scenario of average prices and exchange rates, the average price of beans with the FTA in force would be lower by 55% than the average price without the Agreement. According to the supply function estimated by Ramírez and Martínez (2005), the price elasticity of supply for beans is 0.51 in area cultivated and 0.96 in production. This means that, in the above scenario, the area cultivated would fall by 34%, domestic production by 54%, and the value of production by 79% in comparison to the situation before the application of the FTA. (Table 10)

Alternatively, in a scenario of low prices and a revaluing exchange rate, the impact on price may reach 63%, resulting in losses of 40% in the area cultivated, 62% in the level of production and 86% in its value. On the other hand, in a situation of high prices and a devaluing exchange rate, the domestic price may decrease by 48%, causing reductions of 28% in the area cultivated, 46% in production, and 72% in its value. (Table 10)

Table 10. *Impact of the FTA on the Colombian Bean Producing Sector (COP January 2009)- Summary of Price and Exchange Rate Scenarios*

VARIABLES	UNITS	PRICE AND EXCHANGE RATE SCENARIOS		
		AVERAGE	LOW	HIGH
Domestic Prices without FTA	COP/ton	4,228,593	3,594,494	4,862,692
Domestic Prices with FTA	COP/ton	1,895,936	1,314,551	2,547,780
Change in price	**%**	**-55%**	**-63%**	**-48%**
Change in Area Cultivated	hectares	-60,988	-67,033	-54,824
	%	**-34%**	**-40%**	**-28%**
Change in Level of Production	tons	-111,821	-110,318	-110,095
	%	**-54%**	**-62%**	**-46%**
Change in Value of Production	COP millions	-697,612	-551,087	-831,613
	%	**-79%**	**-86%**	**-72%**

Source: Author's calculations: please see Annex 1.

8. Impact on the Potato Producing Sector

In 2005, around 140,000 hectares of potatoes were sown and 2.8 million tons were produced in Colombia. At present, Colombia is a net exporter of this product, with a total export volume of 22,000 tons of fresh or refrigerated potatoes in 2007, most of which were exported to Venezuela. Although there were no imports of unprocessed potatoes, those of frozen potatoes rose to around 4,000 tons, of which 46% came from the United States.

The United States is the fourth largest producer of potatoes in the world, with 5% of world production (18 million tons in 2007). The main export product is French fried potatoes, which make up 62% of total US potato exports over the last 10 years. This is also the main potato product imported by Colombia from the United States, purchases of which rose to 2,000 tons in 2008.

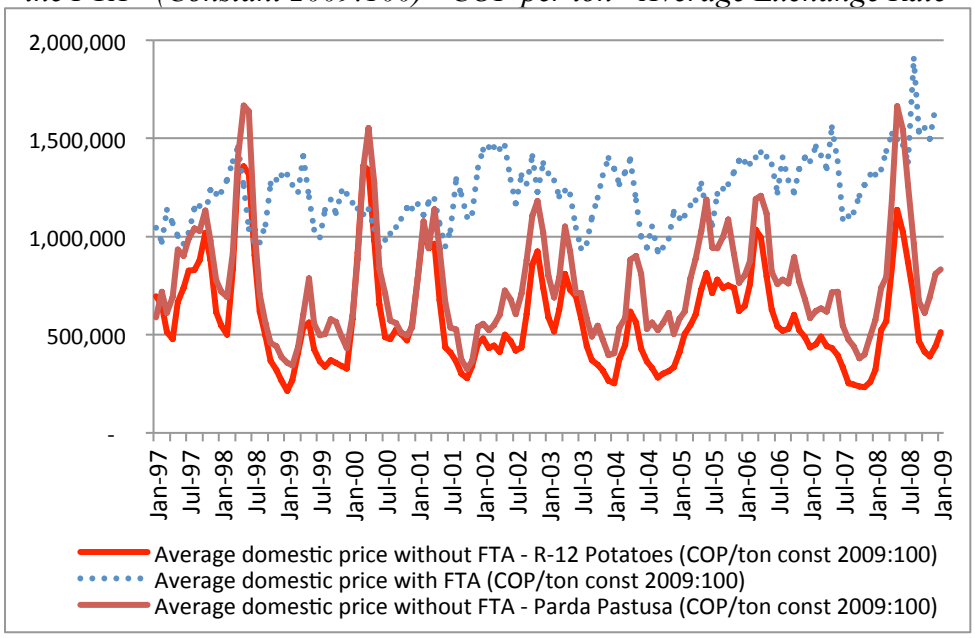
An analysis of the implicit US export prices shows that between January 1997 and January 2009, the average FOB price of fresh or refrigerated potatoes was 432 USD per ton in constant terms with a standard deviation of 81 USD and a variation coefficient of 19%.

As most of Colombian consumption is of fresh potatoes, which do not participate greatly in world trade, the domestic price does not take the world price as a reference, but is formed in the large local wholesale markets in each region. The price differs according to varieties such as *Parda Pastusa* (for direct human consumption) or *R-12* or *Diacol-Capiro* (for industrial use – indirect human consumption), among others.

A comparison was made between the Colombian domestic wholesale prices of the *Pastusa* and *R-12* varieties without the FTA and the price on implementation of the Agreement, taking the price of fresh or refrigerated US potatoes as a reference. The price with the FTA would be higher than that observed in the past in Colombia during practically the whole period of analysis. (Figure 6)

This result indicates that, by virtue of the agreed tariff elimination, in principle, the FTA would not have a great impact on the potato producing sector in Colombia.

Figure 6. *Domestic Prices of Potatoes without the FTA Compared to Domestic Prices with the FTA - (Constant 2009:100) - COP per ton - Average Exchange Rate*



Source: Author's calculations: please see Annex 1. (ene = jan: lost hyperlink)

Although there is no concern over fresh or refrigerated potato imports, there may be some impact on the potato growing sector in Colombia to the degree that the industry imports its raw materials from the United States. Furthermore, though Colombian consumption has traditionally been of fresh potatoes, this tendency has altered in recent years, and changes in preferences have opened the way for processed products. According to the *CCI* (2008), between 170,000 and 250,000 tons of potatoes are processed annually in Colombia, a figure that represents around 12% of national production (of this percentage, 80% are potato chips and 12% are frozen French fries).

9. Impact on the Poultry Producing Sector

In 2007, more than 900,000 tons of chicken were produced in Colombia, this being the largest supply of any kind of meat in the country, more than beef. According to national statistics, no chicken pieces were imported that year, although almost 26,000 tons of chicken preparations were imported.

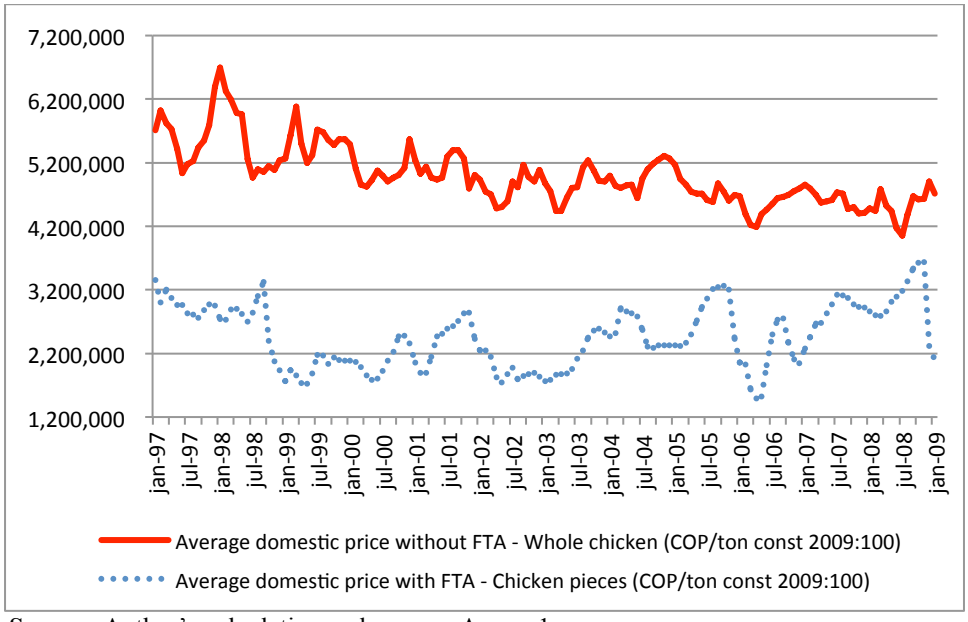
The United States is the biggest producer of chicken in the world, with 22% of world production (74 million tons in 2007). In 2007, US chicken exports amounted to 2.6 million tons and 32% of world trade in this product. Most of these exports are chicken pieces, especially legs and leg quarters, whose price in the US market has historically been lower than (less than half) the price of whole chicken or of other cuts, due fundamentally to US consumer preferences.

An analysis of implicit export prices of US chicken pieces shows that between 1997 and 2009, the FOB price was, on average, 959 USD per ton in constant terms, with a standard deviation of 81 USD and a variation coefficient of 22%.

Colombia has applied rather high tariffs to chicken pieces in recent years, such that domestic production has not been exposed to the low US export prices resulting from consumer preferences in that country. Thus, the Colombian domestic price is formed by the supply and demand relationships in the national market and competition with other meat products. However, protection for this sector would cease on the implementation of the FTA. This would pose a clear threat to Colombian poultry producers, inasmuch as it is expected that the domestic price would be formed by the international price of leg quarters, since these cuts may substitute whole chicken meat or other cuts traditionally consumed in Colombia.

In comparison with the wholesale domestic price of whole chicken without the FTA, the price that would register with the Agreement in force would be lower during the whole period under analysis. (Figure 7)

Figure 7. *Domestic Prices of Chicken without the FTA Compared to Domestic Prices with the FTA - (Constant 2009:100) - COP per ton, Average Exchange Rate*



Source: Author's calculations: please see Annex 1.

A comparison of the whole period analyzed shows that in a scenario of average prices and exchange rates the average price of chicken with the FTA would be lower by 51% than the prices without the Agreement. According to the supply function estimated by Cardona and Van Brackel (2005), the price elasticity of supply of chicken is 1.5, while the response to movements in the prices of balanced feeds (which would also be affected by the entry into force of the FTA) is -0.9. This implies that, in the above scenario, combining the reduction in price of chicken with the fall in price of balanced feed, domestic production would

decrease by 35%, in comparison with its level before the FTA, while the value of production would fall by 68%. (Table 11)

Alternatively in a scenario of low prices and a revaluing exchange rate, the reduction in price may reach 65%, with a loss of 48% in the level of production and 81% in its value. In a scenario of high prices and a devaluing exchange rate, the domestic price may decrease by 36% causing a fall of 24% in production and of 52% in its value. (Table 11)

Table 11. *Impact of the FTA on the Colombian Chicken Producing Sector (COP January 2009)- Summary of Price and Exchange Rate Scenarios*

VARIABLES	UNITS	PRICE AND EXCHANGE RATE SCENARIOS		
		AVERAGE	LOW	HIGH
Domestic Prices without FTA (Whole Chicken)	COP/ton	4,997,296	4,528,593	5,465,998
Domestic Prices with FTA (Chicken pieces)	COP/ton	2,464,382	1,597,625	3,479,442
Change in price	**%**	**-51%**	**-65%**	**-36%**
Change in Level of Production	tons	-314,731	-398,339	-227,387
	%	**-35%**	**-48%**	**-24%**
Change in Value of Production	COP millions	-3,033,155	-3,092,764	-2,663,801
	%	**-68%**	**-81%**	**-52%**

Source: Author's calculations: please see Annex 1

10. Impact on the Pork Producing Sector

In 2007, more than 177,000 tons of pork were produced in Colombia. According to national statistics, in that year imports of pork, cuts of pork and other pork products amounted to around 8,000 tons.

The United States produces 10 million tons of pork per year, 9% of the world's total, and is the second largest producer and exporter with 24% of the world total. The principal pork export is unprocessed frozen pork.

An analysis of the CIF reference price used by the CAN for US pork shows that between January 1997 and January 2009, the price was on average 1,768 USD per ton in constant terms, with a standard deviation of 388 USD and a variation coefficient of 22%.

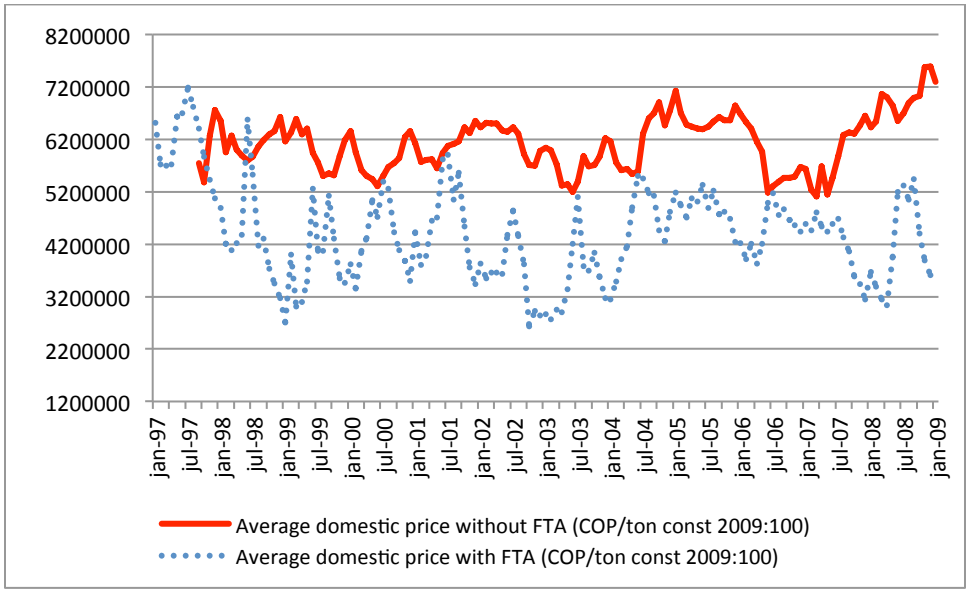
Given that Colombian pork has benefited from significant tariff protection by virtue of the *SAFP* price band system, a direct impact on prices is expected once tariff elimination is implemented. In comparison with the wholesale domestic price of pork without the FTA, the price with the Agreement in effect would be lower throughout practically the whole period of analysis. (Figure 8)

A comparison of the whole period shows that, in a scenario of average prices and exchange rates, the average price of pork with the FTA would be lower by 28% than the average price without the Agreement. According to the supply function estimated by Vargas (2007),

the price elasticity of supply for pork is 5.1, while the response to movements in prices of balanced feeds (which would also be affected by entry into force of the FTA) is -2.9. This implies that with the FTA, in the above scenario, the fall in the price of pork combined with the reduction in price of balanced feeds would result in a reduction in domestic production of 51%, while the value of production would fall by 65%. (Table 12)

Alternatively, in a scenario of low prices and a revaluing exchange rate, the impact on the price of pork may reach 50%, with a loss of 78% in the level of production and of 89% in its value. On the other hand, in a situation of high prices and a devaluing exchange rate, the domestic price would fall by just 5%, causing a reduction of 11% in production, and of 16% in its value. (Table 12)

Figure 8. *Domestic Prices of Pork without the FTA Compared to Domestic Prices with the FTA - (Constant 2009:100) - COP per ton, Average Exchange Rate*



Source: Author's calculations: please see Annex 1

Table 12. *Impact of the FTA on the Colombian Pork Producing Sector (COP January 2009)- Summary of Price and Exchange Rate Scenarios*

VARIABLES	UNITS	PRICE AND EXCHANGE RATE SCENARIOS		
		AVERAGE	LOW	HIGH
Domestic Prices without FTA	COP/ton	6,123,395	5,601,801	6,644,990
Domestic Prices with FTA	COP/ton	4,405,549	2,800,706	6,289,746
Change in price	**%**	**-28%**	**-50%**	**-5%**
Change in Level of Production	tons	-65,425	-81,729	-17,287
	%	**-51%**	**-78%**	**-11%**
Change in Value of Production	COP millions	-506,600	-521,740	-162,766
	%	**-65%**	**-89%**	**-16%**

Source: Author's calculations: please see Annex 1.

11. A Summary of the Results for Goods that Compete with Imports

According to the estimates made in this study, the tariff elimination agreed in the FTA would have a significant impact on the sectors producing goods that compete with imports.

In a scenario of average prices and exchange rates, domestic prices may decrease in considerable proportions, ranging between 15%, in the case of peas and vegetables and 55% in the case of beans. Reductions in prices received by producers would cause significant falls in production levels, ranging between 19% for rice, and 54% for beans (in the absence of supply function estimates for peas and vegetables, supply was supposed perfectly price inelastic, 0%). The estimated changes would also have a significant effect on the value of production of these goods, with a reduction of over 50% in the majority of cases, such as white corn (52%), yellow corn (54%), wheat (62%), pork (65%), sorghum (66%), chicken (68%) and beans (79%). (Table 13)

Table 13. *Summary of Impact on Sectors Producing Goods that Compete with Imports - Scenario of Average Prices and Exchange Rates.*

ACTIVITY	Change in Price	Change in Area Cultivated	Change in Production	Change in Value of Production
Rice	-20%	-19%	-19%	-35%
Yellow Corn	-41%	-24%	-21%	-54%
White Corn	-42%	-21%	-18%	-52%
Sorghum	-41%	-40%	-42%	-66%
Wheat	-25%	-77%	-49%	-62%
Beans	-55%	-34%	-54%	-79%
Peas	-15%	0%	0%	-15%
Onion	-15%	0%	0%	-15%
Tomato	-15%	0%	0%	-15%
Carrots	-15%	0%	0%	-15%
Chicken	-51%	N.A.	-35%	-68%
Pork	-28%	N.A.	-51%	-65%

Source: Author's calculations: please see Annex 1

C. CONSIDERATIONS ON GOODS WITH EXPORT POTENTIAL

1. Beef

During the year 2007, Colombia produced around 800,000 tons of beef. Exports of 80,000 tons were recorded, mainly destined for the Venezuelan market, while beef imports were less than 1,000 tons. In that year, a total of 27 million head were recorded in the cattle inventory in Colombia, 18 million of which were kept for meat production.

Beef was included as one of Colombia's offensive interests in the negotiations, given the supply capacity of this subsector and the fact that several analyses were in agreement on its export potential, which originates in the price differential between Colombia and the United States, where prices are higher.

However, several conditions must be fulfilled in order to realize the potential of beef products: i) the elimination of tariff and quantity restrictions in the US market; ii) the elimination of the sanitary and phytosanitary restrictions affecting the entry of beef products to the US market; and iii) the solution of domestic problems in production and marketing, adjusting these to international standards. If these conditions are met, according to *FEDEGAN*, the Colombian cattle farming federation, Colombia could in due course export 40,000 tons of beef a year.

The first of the above conditions would be fulfilled in the long term, as both countries agreed to eliminate import tariffs and quotas over a 10 year period. In the short term, however, the negotiation resulted asymmetrical in favor of the United States, as Colombia granted immediate tariff elimination on high quality (prime and choice) cuts, which, according to *FEDEGAN*, amounts to 60% of the US supply.[26] Additionally, the duty free beef quotas of 6,400 tons granted by Colombia in industrial meat, heads, feet, and offal were superior to those granted by the United States, which were of 5,000 tons, conditioned on Colombia first filling the quota notified at the WTO.

Furthermore, the negotiation of the FTA introduced risks that US beef products at low prices, owing to consumer preferences in that country, may enter Colombia: for example, heads, feet and offal, or the meat of animals over 30 months old.[27] These products are treated as waste in the United States, but may be used for human consumption in Colombia. On application of the NAFTA in Mexico, there was a significant increase in imports of industrial quality meat from the United States.

With regard to the second condition, the elimination of sanitary and phytosanitary restrictions, as mentioned in chapter 2, the FTA contains no explicit commitments on the part of the United States. Thus, the impact on livestock products, especially meat, depends largely on the good intentions of the US government in recognizing Colombian progress in sanitary matters.

Concerning the third condition, which includes adjusting production and marketing to international standards, there are several questions with regard to the real potential for increasing Colombian beef exports. In effect, the highest prices paid in the US market are for the fine cuts, which account for a good part of consumption in that country, and thus exports would ultimately be limited to high quality Colombian beef. As can be appreciated in table 14, beef can be bought in the US retail market for 4 USD (ground beef) to 21 USD per kilo (sirloin, fillet steak). Price depends on the cut (rib, loin, etc.), and on the quality of the livestock (prime, choice, select, etc.).

[26] FEDEGÁN, Informe Especial *TLC y Ganadería.* March 2006.

[27] It is worth pointing out that, as a condition for submitting the Agreement for legal revision by the United States Congress, the United States demanded that Colombia accept the entry of beef from animals over 30 months old.

Table 14. *US Domestic Retail Beef Prices - April 2008*

Cut	USD / Kg
Ground chuck	4.25
Ground beef, 100-percent beef	4.56
Chuck roast, graded and ungraded but not choice or prime	5.16
All uncooked ground beef	5.42
Chuck roast, USDA Choice, boneless	5.45
All uncooked beef roasts	5.95
Round roast, USDA Choice, boneless	6.13
Steak, round, graded and ungraded but not choice or prime	6.55
Round roast, graded and ungraded but not choice or prime	6.88
Lean and extra lean ground beef	7.01
All uncooked other beef not veal	7.05
Steak, round, USDA choice	7.45
Beef for stew, boneless	7.69
Steak, sirloin, graded and ungraded but not choice or prime	10.87
All uncooked beef steaks	11.18
Steak, sirloin, USDA Choice, boneless	11.44
Steak, T-bone, USDA Choice, bone-in	15.17
Steak, rib eye, USDA Choice, boneless	20.92

Source: ERS, USDA. Retail Scanner Prices for Meat and Author's calculations.

Compliance with the quality requirements of the US market is related to several factors, among which, according to FEDEGAN,[28] the following can be cited:

- Bringing the sanitary efforts of recent years to a successful conclusion, to attain international certification as being free of foot and mouth disease in the whole country (an accomplishment recently achieved)

- Passing a law of traceability and working on its implementation, as well as enforcing regulations on production residues, processing, marketing and transport of meat and milk products

- Attaining a progressive and faster process of business improvement in cattle farming, to bring about greater competitiveness in production and management

- Consolidating the progress made in the adaptation of milk and meat processing infrastructure to international standards, as a basis for the access of tradable bovine products to international markets

- Increasing the number of cattle in Colombia to attend export challenges, without impairing the national market, which requires progress in restocking cattle nationally

- Providing large scale financing, through the incentives for rural capitalization (*ICR*), for haymaking and storage machinery, a key step in standardizing an exportable supply independent of seasonal changes in climate

[28] FEDEGÁN, Carta Ganadera, 2004.

- Increasing state investment in social as well as physical infrastructure

In addition to these tasks, the following may be included, among others: i) management and genetic selection of breeds – for example, while in the United States cattle are raised specifically for meat or milk, in Colombia a high proportion are dual purpose; ii) feeding – while cattle feeding in the United States is based primarily on the use of balanced feeds, in Colombia it is based on grazing; iii) age of slaughter – in the United States, this is around two years, due to feeding methods, while in Colombia cattle can be slaughtered up to four years old.

All the former will take time and, more important still, substantial and costly changes, investments and modifications will have to be made. This leaves a high degree of uncertainty about the real export potential of the sector. Furthermore, potential access to export markets would not be generalized, but as FEDEGAN acknowledges, limited to some *export farms* selected because of their high degree of technology. One of the present weaknesses put forward by the cattle farming organizations as limiting the industrialization process is small-scale farming. [29]

Consequently, and considering the number of conditions and questions to be resolved, it cannot be stated with any certainty that the FTA would have a positive impact on the income of Colombian cattle farmers. Furthermore, in the event that the objectives established by the internal agenda of the sector are attained, it is unlikely that the benefits accruing from an increase in exports to the United States would cover small-scale Colombian cattle farmers. The latter usually keep genetically unsophisticated breeds, use feeds of a deficient quality, and also value dual purpose cattle highly as a source of milk for home consumption.

2. Dairy Products

During 2007, 6,800 million liters of milk were produced in Colombia, a little over 23 million liters of which were for export. In that year, of a national total of 27 million, 8.6 million head of milk producing cattle were recorded in the bovine inventory, including those of farms with dual purpose cattle.

As with the beef sector, the supply capacity of the dairy subsector has made it one of Colombia's offensive interests in negotiations. However, the negotiation was of the *self contained* type, meaning that any concession granted by the United States should be matched by similar considerations on the part of Colombia within the same dairy subsector.

In terms of the elimination of tariff and quantity barriers, the dairy sector negotiations were asymmetrical in favor of the United States in the short-term. Colombia granted immediate tariff elimination on liquid milk and whey and, when estimated in terms of their liquid milk content, the bilaterally exchanged quotas were greater for the United States.

[29] FEDEGÁN, Carta Ganadera, 2004.

However, as the livestock sector federation, FEDEGAN, acknowledged, the impact of the FTA would be different according to which stage in the production chain is analyzed. Thus, while some significant possibilities are opened for the Colombian dairy processing industry to increase exports of finished products such as cheese, butter, and other dairy products, risks are created for the primary producers by potential imports of milk powder and whey, which could substitute part of the domestic supply and affect the income received by the Colombian cattle farmers. [30]

Ultimately, the impact would depend on two factors: first, the capacity of the industrial stage to significantly increase exports and attain a surplus bilateral balance in this subsector, and second, the degree to which this higher income from exports is transferred to the primary production stage through higher prices for liquid milk, thus overcoming the decrease in income that the entry of US products may bring.

Thus, as in the case of beef, it cannot be stated with any degree of certainty that the FTA would have a positive impact on the income of Colombian cattle farmers.

3. Promising Fruits and Vegetables

It is often affirmed that one way of counteracting losses caused due to the signing of the FTA is through increasing the production of fruit in Colombia. In this regard, the most emblematic case has been that of the cape gooseberry (*uchuva*).

Colombian fruits are tropical, and are thus considered exotic in temperate zone countries like the United States. While it is true that such fruits, for example, banana, papaya, passion fruit and pineapple, among others, have penetrated temperate zone markets, this success is the result of a long development process in crops and logistics (packaging, transport, handling), as well as of expensive campaigns to attain their acceptance and create consumption habits.

Colombia has enjoyed success in world markets with certain kinds of fruits. This has been the case with the passion fruit (*granadilla de Urrao*), cape gooseberry and tree tomato. However, this success has been relative. Only after much effort has production been adapted to the international market and to the task of opening markets. Even then, these markets are relatively small and their growth has been slow.

Though the potential for fruit production in Colombia is great, the size of markets, both domestic and international, makes prices volatile. Thus, cycles are generated that alternate scarcity with gluts and ruin producers. To date, no practical way of consolidating these activities enough to assure the sale of the whole harvest at a remunerative price has been found. This has brought a high social and economic cost.

When production is geared primarily to the international market, domestic prices tend to be fixed by the export companies. A known case is that of banana production, in which the profit margins of a product with a strong position in the world market are appropriated by

[30] FEDEGÁN, Informe Especial *TLC y Ganadería.* March 2006.

the international marketing companies. Banana growers have not been so adversely affected by this due to a wide network of production cooperatives, government support, the existence of marketing and transport infrastructure, as well as the management of standards and appropriate volumes of production. This is not the case with other fruits such as the cape gooseberry, or the pitahaya, and a hundred other products.

In the case of the cape gooseberry, there are three or four relatively large firms that stockpile, prepare and export production. They began their activity using *agriculture by contract*, a scheme by which the farmer commits to produce and sell, and the exporters to buy at a pre-established price. However, as production grew and exceeded the capacity for placing the goods in the international market, the exporters breached the contracts and began to lower the prices paid to growers.

Another problem in expanding production of the cape gooseberry lies in the fact that the crop is still in the process of being domesticated. The same is true of the naranjilla, bananito, purple passion fruit, and several others. There is little or no genetic selection, or uniformity in the behavior of the plants, and an absence of a proven standardized technology suitable for the crop. In these matters, the cultivation of the cape gooseberry still suffers many weaknesses. Also, in spite of the efforts of *Proexport* [31] in promoting the consumption of fruit in the United States, Europe and Asia, the growth of demand continues at a slow pace.

Exotic products in general enjoy a good initial acceptance in the markets of developed countries. Nevertheless, taste for one exotic product is quickly shifted to another, thus causing a high volatility in demand. Studies carried out on the marketing of exotic products show that success in the international market depends to a great degree on the ability to coordinate production with multinational producers and buyers of fruit, and with distribution chains in the consumer countries. This is evident in the cases of bananas and pineapples, among others. However, multinationals and marketing chains require the existence of mass consumption and a significant sales volume before handling a product. The considerable effort needed to develop a product being launched in the market usually falls on the small-scale producers, who face difficulties in putting together the necessary framework for production, preparation, transport and marketing.

Growth in the area cultivated and production of fruit in Colombia is tied to the growth in market size for these products. Consequently, it should not be thought that these promising crops can in the short and medium term replace the large areas under cultivation with crops that would be affected by the FTA. A slight increase in production floods the national and international market, affecting prices and margins, frequently leading to the ruin of producers and their abandoning the enterprise. This has happened several times in the case of cape gooseberries.

Expectations of production potential for fruit exports are many, but there is a lack of serious agronomic, economic and market studies that specify their real development possibilities. In order to prove that expectations are not unfounded, the steps to convert them into feasible businesses must be clearly established

[31] Proexport is an entity which promotes Colombian exports, foreign investment and tourism in Colombia

The situation of vegetables is very similar to that of fruit, yet with even more problems in need of solving. Colombia does not have a great diversity of vegetables, and the development of new varieties is almost non-existent. Little is known about these products, and there is a lack of systematic studies on the whole subject, from agronomy to marketing. There is no world market at present for Colombia's promising vegetable products, such as beet, lettuce, cabbage, etc., and even less so for the fresh product. Thus, changes must be made in Colombia with regard to agronomic, economic, commercial and financial research, and coordination with input, service and product markets; that is, the whole product chain must be developed.

In these circumstances, the impact that the FTA may have on the income of Colombian fruit and vegetable producers cannot be quantified with an adequate degree of certainty.

4. Tobacco

Tobacco was another of Colombia's offensive interests during the FTA negotiations, owing to its present capacity and the potential for increasing exports to the United States due to the high prices paid in that market.

However, there are no estimates of supply elasticities for tobacco that would indicate the response in area cultivated and national production to the application of the FTA. Nor are there agronomic studies to determine Colombia's capacity for increasing the area cultivated for export.

In Garay et al. (2006) a preliminary approximation was made to estimate the effect that the tobacco quota of 4,000 tons granted by the United States would have during the transition period, assuming that this amount originated from an increase in present levels of production. According to this calculation, Colombian tobacco producers could increase their annual income by 41,000,000,000 COP (using 2005 as the base). This represents an increase of 19% with regard to present income. As a result, the area cultivated, employment and earned income would increase by 15%.

5. Summary of the Results for Goods with Export Potential

In conclusion, although the FTA presents some possibilities for increasing Colombian agricultural exports to the United States, this is dependent on several factors and the fulfillment of various conditions. In some cases, an increase in exports is subject to the implementation and progress of the domestic agenda that would be needed to improve competitiveness and adapt products to international standards. In other cases, whether possibilities become reality or not depends on the goodwill of the US authorities in recognizing Colombian progress in sanitary and phytosanitary matters, as well as in removing unjustified barriers to trade.

Additionally, in the case that any of the opportunities opened by the FTA do become reality, it is not clear that, under present conditions, they can benefit small-scale producers, taking into account the size and cost of the necessary changes and investments.

Thus, for the majority of products identified by the government as part of the agricultural export agenda, either no impact in production or income is foreseeable, as goods already count on unrestricted access to the United States, or there is no sufficient basis or criteria to state with any certainty that the FTA would have a positive impact on the income of small-scale producers in Colombia. Therefore, a reliable estimate of the impact that could occur cannot be made. Nevertheless, it is worth reiterating that any profit which Colombia could obtain through these products would require time and substantial investment resources, and entail considerable risks. Consequently it would seem unlikely that small-scale producers could participate in such benefits as may accrue.

III. CHARACTERIZATION OF THE SMALL FARM ECONOMY IN COLOMBIA

A. DEFINITION OF THE SMALL FARM ECONOMY

To precisely define the scope and meaning of the small farm (*campesino*) [32] economy is not an easy task. Depending on the objective of the research, as well as the sources of information available for quantification, the term may cover different household typologies, producers, or productive activities.

It is not within the scope of this study to establish a complete and unequivocal definition of the small farm economy. This would not only be conceptually inadequate, but also impossible to quantify empirically. Thus, the study seeks to establish some objective and verifiable criteria based on an appraisal of: i) the theoretical framework of the concept of the small farmer; ii) the analytical studies and measurements of the small farm economy that have been made in Colombia, especially in recent years; and iii) the available agricultural data. This is carried out with the objective of providing an approximation of the quantification, characteristics, and productive structure of the small farm economy, so as to analyze the impact that the FTA could have on this segment of the rural economy.

1. Theoretical Framework

As affirmed by Valderrama and Mondragón (1998), *"The role and existence of the small farmer in capitalist societies do not seem to fit any logic of the functioning of capitalism and modern society, as seen by politicians and intellectuals. From different points of view, and from the 19th century on, the peculiarities that are characteristic of the small farm or peasant economy have been analyzed all over the world."*

From an economic point of view, thinking on the peasant or small-scale economy can be summarized in three main currents. These are the principal theoretical sources for studies in agricultural economics carried out all over the world, and in particular in Latin America. They are as follows: i) the Chayanov theory; ii) the Marxist school; and iii) the Neo-Classical theory.

The **Chayanov Theory (or organization and production school)**: Alexander Chayanov (1888-1939) carried out the most comprehensive analysis of the microeconomic aspects of the peasant economy. This was based on its analysis as a distinct economic system, given that its own kind of functioning and rationality makes the peasant economy different from other modes of production in modern economies. Political economic concepts such as wages, price, profit, or land rent are not applicable to the peasant economy, since these correspond to a relation based on salaried work and maximization of profits, while the basic concept of the peasant or small-scale farm unit is that of *self-exploitation of labor* (with lower than statutory remuneration). Thus, the product of annual family labor is the only category of income.

[32] In this chapter, the words *small-scale producer, small farm, small farmer,* etc. is used for the Spanish word *campesino* where the reference is to present day Latin America, and the word *peasant* will be used in some cases where studies on the subject use this concept – a typical example being with regard to Russia.

Chayanov pointed out that the peasant economy is part of a much broader category, the *family economy*, whose basic characteristic is the production-consumption unit, and in which family labor is the essential input of production. The heart of this theory is the equilibrium between the satisfaction of needs (not that of obtaining profits) and the fatigue or effort that labor implies, taking into account its decreasing yields. The family covers its needs by means of a combination of activities, whether they be in crafts, retailing, or agriculture itself, according to profitability.

This family behavior differs from that in a capitalist economy in which labor and land are variables that combine efficiently to obtain the maximum remuneration, and where capital is the fixed factor. On the contrary, in the peasant economy, family labor is the fixed factor, and that which determines changes in the amount of capital and land used. In short, Chayanov defines the peasant economy as a non-capitalist form of production in which, after deducting production costs, the respective rewards of the factors of capital, labor, and land cannot be determined (Bartra, 1976).

The **Marxist school** (political economy) has produced important works, ranging from the classics (Marx, Kautsky, Lenin) to those, particularly in Latin America, by the so-called *peasantists* (*campesinistas*) and their opponents, those who believe the peasant or small-scale farmer will tend to disappear (*descampesinistas*).

Marx dealt with the peasant or small farm economy in parts of his economic, historical and political works. He considered that, within the setting of capitalist development, the peasant economy would tend inevitably to disappear because of the development of productive forces, with only a type of *parcel economy* (peasants on small parcels) surviving as a pre-capitalist form of production. Marx believed that even these would also inevitably succumb in the face of the dynamic process brought about by the accumulation of capital, competition from more developed productive units, growth of industry, usurpation of land by large landowners, usury, and taxes, which would lead them to poverty.

The basic characteristics of the *parcel economy* as a form of production are the following: farmers own their means of production; they are a large mass without any, or with very little, relation among them, yet live in similar conditions; there is no division of labor, nor application of scientific developments; each family is self-sufficient, especially in the productive process; little labor outside the family group is contracted; the unit is supplied by resources from its own land; its livelihood is obtained in relation to nature, rather than to the rest of society; and its production is little related to market prices. Marx also assumes that the *parcel economy* produces at higher unit costs than commercial agriculture, particularly because the latter produces with economies of scale.

The objective of *parcel economy* production is not average profit but *self paid wages* (part of the profit from the business), obtained after deducting the costs incurred in production. If the market price covers the production costs, the cultivation is continued, taking the "wages" to the limit.[33]

[33] "*The absolute limit for him (peasant owner of a parcel) as a small capitalist is no more than the wages he pays to himself, after deducting his actual costs. So long as the price of the product covers these wages, he*

For Lenin and Kautsy, the peasant economy is a legacy of the feudal past, as the feudal productive system was fed by peasant labor through the subdivision of its properties into small parcels from which rents are paid in labor, in kind or in money.

Kautsky reproduces and develops the features of Marx's argument, pointing out that the growth of large industry, modern agriculture and trade inevitably destroy the old forms of production, and that the economies of scale in the large agricultural enterprise make small-scale production unviable. However, he points out some advantages of small-scale farming, such as work activities on the parcel, cooperative organization to reduce the transaction costs of supplies and sales of produce, the absence of labor shortages, in contrast with large enterprises, and the state support that assists production and exchange.

Although Lenin initially maintained the tendency of the previously mentioned authors, he later reconsidered the inevitability of the dissolution of the peasant economy, recognizing its role in the formation of modernity and the society that was coming into being. He set out the idea that modern society develops in two different ways, depending on the treatment given to peasants. In the first place is the US model, in which the peasant makes the change towards the modern farm, sustained initially by family labor, and later in combination with salaried labor. The second form is the "Prussian" way in which the landlord economy moves slowly towards agri-business, condemning peasants to entire decades of expropriation of land and painful exploitation. The first is a democratic route offering more rapid development, while the second is consolidated more slowly and painfully, with more exclusion.

Then follows the neo-classical (or dualist) theory, by authors such as Schulz, Johnston and Kilby, who work in terms of a traditional/modern dichotomy in the agriculture of underdeveloped countries. Here, *traditional* is taken to be peasant, or small-scale. Thus, two sectors are distinguished: a modern one of business and export agriculture, governed by economic rationality and open to adopting profitable technological changes; and another backward sector composed of peasants (small and medium-scale producers and smallholders), whose production is oriented towards subsistence, with an excess of labor force and low marginal output.

Johnston and Kilby (1980) consider that distribution by size of farm is the principal determinant in forming the pattern of agricultural modernization and income distribution. The more unequal the distribution by size, the more that commercial agricultural sales will be concentrated in a subsector of agricultural units atypically large in capital. Therefore, the degree of participation in commercial sales is a critical factor in determining the extent to which farmers can transform their traditional technology through the purchase of modern inputs.

In synthesis, three different theoretical perspectives are found in the outlines of these three currents in agricultural economic thinking: the first, marked by the anti-capitalist thinking of Chayanov, which emphasizes the social and productive methods of the peasant as the

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will cultivate his land, and often at wages down to a physical minimum." (Marx - Capital: volume 3, chapter 47) .

moral savior of society; the second, the Marxists, with their teleological perspective on the inevitability of capitalism; and the third, Schultz, with a liberal vision of society superseding the *traditional* organization of the rural economy. In spite of their differences, all coincide in the necessity of transforming the peasant economy into a superior form of development.

Additionally, anthropological and sociological approaches must be taken into account, as well as those which give precedence to sociopolitical analysis. These consider small-scale farmers as distinct groups with a particular social and economic reality and their own cultural identity.

2. The Study of the Small Farm Economy in Colombia

i) Academic tendencies

The study of the small farmers in Colombia and in Latin America has a history of several decades, although with differences in scope, objectives, sources of information or the methodologies used.

According to Salgado (2004), academic work on rural matters from 1985 to 2002 has concentrated little on the analysis of Colombian small-scale farmers and their economies, showing an undervaluing of the subject, particularly by an important portion of the academy. The review carried out by this author led to the conclusion that: "… *in this country, policies for small farmers are being designed and executed without sufficient study of their evolution, and without a precise understanding of their roles. The reason behind this lies as much in concepts of development that generate prejudices and negative discrimination against the figure of the small farmer, as in the predominantly productivist nature of the analyses of agricultural matters, which are based on certain kinds of paradigms and end up ignoring the social and political world while preconceiving the economic one*."

Nevertheless, this review draws attention to the work of the Institute of Rural Studies group from the Faculty of Rural and Environmental Studies, of the *Universidad Javeriana*, Bogotá.[34] This group has a long tradition of work on the subject, carrying out case and policy studies influenced by a *new rurality* approach, and has carried out a continuous study of the evolution of small farm economies led by experts on the subject of the small farmer, such as Jaime Forero.

On one hand, there is a tendency to undervalue the role of the small farmer, in academic as well as political circles, due to models of agricultural development that have favored differentiated production, the promotion of export goods and a vision focused on productivity and efficiency. On the other hand, there is an academic tendency that, through interpretative innovations, presents a renewed and optimistic conceptual framework for the economic and political role of the small farmer, for whom it sees a promising future. The *new rurality* approach stems from this.

[34] Instituto de Estudios Rurales, Facultad de Estudios Rurales y Ambientales, Universidad Javeriana, Bogotá.

This last tendency recognizes the role of small farmers as providers of a substantial part of the food supply, as well as their capacity for developing employment strategies, sustaining themselves, modernizing, and growing in spite of the model and current policies.

ii) Definitions of the Small-Scale Economy

Several studies that define, characterize and carry out field research on the small farm economy have been carried out in recent decades.

In 1990, an agricultural study team (*la Misión de Estudios del Sector Agropecuario*) identified some characteristics typical of small farmers. According to the study, they are characterized by: i) a scarcity of land; ii) the predominant use of the family labor force; iii) little integration with markets in produce and production factors; iv) a limited capacity for absorbing technological changes and accumulating capital. All of this implies, in the end, extended and persistent situations of poverty.

Later, in Machado et al., (1993) the concept of the small farmer (*campesino*) was defined as: "*a socio-economic and cultural system of production-consumption founded in family labor, connected in multiple ways to the socio-economic system and markets, operating within a rural way of life.*"

Mondragón and Valderrama (1998) defined the small farmer as: " *that producer who has one of the factors of production - land - as the principal limiting factor.*" Thus, the concept is closely tied to the size of parcels, although it cannot be limited to small farms, given that small and even medium-sized producers can be categorized as small farmers (*campesinos*).

Other characteristics of the small farmer distinguished by these authors were: i) while land and capital are limiting factors, the family labor force is an abundant factor; ii) production is oriented towards subsistence, and thus to home consumption; iii) decisions are not based on the maximization of profits, but on guaranteeing levels of home consumption for the family and the income necessary to acquire non-agricultural goods; iv) the family income is low and is highly diversified (a range of products, non-agricultural activities, and wages from outside their parcel); v) there are links to the market through the sale of products, the workforce, and the purchase of supplies; vi) once levels of home consumption are satisfied, the workforce migrates temporarily or permanently to other places.

Recently, Forero broke down the Colombian agricultural productive structure into three basic business forms: capitalist industrial agriculture; speculative cattle ranching; and family or community production. This author maintains that the great majority of small farmers are *family agricultural producers* (agriculture including forests and fish farms), for whom "*productive units are at the same time consumption units, whose purpose is the reproduction of the family or the community*".

In a study carried out by the Andes University Center for Economic Development Studies (*CEDE*) for the FAO and the IDB (Maldonado et al. 2007), *family agriculture* is defined as: "*that portion of agriculture whose productive units are at the same time units of production and consumption, and which base the reproduction of the productive unit, and of the family*

itself, on the use of family labor and on various income generation strategies." The study considers that the concepts of *small farm economy*, *small-scale agricultural producers*, *smallholders*, and others are all part of the sphere of *family agriculture*.

According to this definition, *family agriculture* is characterized by: i) predominant use of family labor, not precluding the contracting of casual labor; ii) limited access (in quantity and quality) to resources of land and capital; and iii) the diversification of income generating activities within the household.

Arango and Forero (1987, 1991) and Forero (1999) have also studied the evolution of the small farm economy in recent decades, particularly as regards: its modernization, characterized by small farmers taking the step from being producers of surpluses to being producers of tradable goods; the involvement of paid labor; the introduction of technical changes; the use of new land (colonization or agrarian reform); the substitution of crops according to market demand and profitability; the increase in yield; and the taking of more rational decisions.

In the attempts to define the concept of the small farm economy, as can be seen here, the recurring characteristics are the small size of the farms, the intensive use of family labor and the high level of home consumption.

iii) Measurement Criteria

When determining the importance and participation of the small farm economy nationally, several sources of information and measurement criteria are used. However, among these, three types of measurement that are more frequently utilized stand out.

Firstly, there is the *quantification* of small farm households, based on information obtained from national surveys and censuses. For this type of measurement, it is assumed that small farmers are *independent agricultural sector workers* – that is, persons who exploit a business (farm) on their own, with or without the help of family members, but without contracting any paid worker (employee or laborer). Traditionally, this quantification has been limited to workers in rural zones.

Secondly, one of the most common classification variables of the small farm economy has been the *size* of parcels or farms, given the strong association between small farmers (*campesinos*) and small producers, or smallholders (*minfundistas*). Thus, using information on land gathered in Colombia or derived from agricultural surveys, small farms are classified according to maximum size. This has usually been established as *between three and five hectares for smallholdings (minifundios), 20 hectares for small producers, and up to 50 hectares for medium-sized producers*. Units over this size are considered to be large farms.

Another type of quantification related to size is the determination of family or small-scale agriculture using the concept of the *Family Agricultural Unit* (*Unidad Agrícola Familiar – UAF*. By this definition all those parcels that provide a family with a monthly income not

exceeding three statutory minimum salaries are considered as being of small-scale agriculture.

Third and lastly, in Colombia the contribution of the small farm economy has often been quantified by means of the *classification of activities* as being of either small farm or business (capitalist) type, or alternatively as being traditional or modernized, whether this kind of measurement uses the criteria of size of farms, areas given over to each crop or activity, or more subjective criteria.

iv) Quantification of the Small Farm Economy in Colombia

- *La Misión de Estudios Agropecuarios (agricultural study team)*

The most complete application of the criteria mentioned has perhaps been that carried out by an agricultural study team (*la Misión de Estudios del Sector Agropecuario*) in 1990 to characterize the small farm economy in Colombia.

That study analyzed the following aspects: i) the evolution of land ownership for parcels under 20 hectares; ii) the contribution of small farms to agricultural production, taking as a reference farm units of less than 20 hectares whose patrimony did not exceed 300 minimum statutory monthly wages (in accordance with the definition in Decree 1946 from 1989) and which use predominantly family labor; iii) the occupations and income of small farmers, for identified as self-employed workers and households possessing an agricultural business with land of up to 20 hectares; and iv) the performance of small farm crops, classified as those produced predominantly by small farmers.

With regard to land ownership, the study team found that in 1988, small proprietors (0-20 hectares) possessed 16% of the land surface owned, in around two million parcels with an average size of 3.3 hectares per parcel, according to the land registry of that year. Of these, 33% of the area was in parcels of less than five hectares.

Concerning the second aspect, the contribution of small-scale producers to the agricultural sector excepting coffee, it was shown that these producers cultivated 57% of national cropland and produced 57% of crops by volume in 1988. However, the value of this production only amounted to 43% of the national total, due to the composition of products (57% of the area was sown with short-cycle crops), and to the lower average yields obtained in some activities. With reference to the small farm productive structure, it was found that 48% of the area was sown with tradable crops (38% in importable crops, and 10% in exportable crops), yet this only contributed 14% of production, while the remaining 53% was in non-tradable crops that comprised 86% of production. Thus, 88% of cropland and 97% of production by small farmers outside of coffee was in food for domestic consumption.

Measurement of the occupational structure determined that 1.4 million of those occupied in the rural sector were small farmers. This represents 50% of rural dwellers occupied in the agricultural sector during 1988, and 36% of the total number of persons occupied in rural

areas, according to data taken from a survey of rural households (*Encuesta Rural de Hogares*).

The products in which small farms have the greatest share in the total area cultivated were yams and sisal, 100% of which was cultivated by small farmers, followed by 96% of tobacco, 89% of beans and sugar cane for sugarloaf, 86% of cassava, 76% of sesame and vegetables, 74% of wheat, and 72% of cocoa, among the most important. In contrast, the share of small farms in crops such as cotton, sorghum, export bananas and oil palm was less than 10%.

An analysis of small farm participation in livestock rearing activities found that parcels of less than 20 hectares accounted for 23% of the area in natural and artificial pasture, and that small farmers possessed 23% of the livestock inventory equivalent, with 21% of cattle (40% of those for milk), 71% of pigs, and 5% of poultry.

Finally, with regard to employment, small-scale producers contributed 67% of casual day labor in the sector, while households with between 0.5 and 20 hectares contributed 78% of the employment generated by agricultural units.

- The Census of Small Farms (*El Censo de Minifundios*)

With regard to the application of the *Family Agricultural Unit* (*UAF*) criterion in the classification of small farm or family agriculture, a census of small holdings (*minifundios* - under five hectares) carried out in 1994 reported a total of 2.3 million, making up 82% of the total number of agricultural parcels in the country, but only 16% of the total area, with an average of 4.1 hectares per parcel.

The proportion of small farms stands out in Boyacá and Cauca, where 95% of parcels are small farms, as well as Nariño with 89%, among others. In terms of area, the proportions in Boyacá (40%) and Nariño (30%) stand out.

- Family Agriculture in 2003

One of the most recent studies on the quantification of family agriculture in Colombia (which also estimates the effects of the US - Colombia FTA on this segment), is that carried out by the Andes University Center for Economic Development Studies (*CEDE*) for the FAO and the IDB (Maldonado et al. 2007).

The study characterized households classified in the family agriculture category in terms of occupation, income and expenditure. These households were defined as those whose head was a self employed worker in the national (urban and rural) agricultural sector, according to the standard of living survey of 2003 (*Encuesta de Calidad de Vida*).

To quantify the productive structure, the contribution of family agriculture to the principal Colombian crops (its share in livestock rearing activities was not quantified) was determined using information on area, production and income taken from the *UAF* 2003 database, complemented by total national information from the Ministry of Agriculture.

Farms of less than 20 hectares where family labor was more than 50% of total labor costs were selected.

The results showed 740,000 households were engaged in family agriculture in 2003, accounting for 46% of heads of households working in the agricultural sector. Over 70% of family labor was occupied in the work of these households. Their average monthly income was 371,506 COP (160.07 USD), 50% of which came from net agricultural profits.

In terms of crop growers, around 1.8 million of these were found to belong to the family agriculture segment, accounting for 87% of the total number of crop growers in the country. This implies that, on average, each family agriculture household had 2.4 crops on its parcel, according to the total number of households in this segment.

As regards the structure of production, it was found that family agriculture cultivated 46% of the average area (2002-2004) of short-cycle crops planted, and 66% of the area of permanent crops, for a total of 57% of the national cropland. On average, 2.9 hectares were cultivated per family unit. The most important family agriculture crops, covering 56% of the area cultivated, were coffee, traditional corn (maize), and plantain. The contribution of family agriculture to production was only 39%, and to the value of production 41%, as the study assumed less yield for these producers in comparison with other types of farms.

3. Measurement Criteria Used

Taking into account the conceptual framework explained above, the methodologies and criteria used in other studies, and particularly the availability of information on agriculture in Colombia, the quantification and characterization of the small farm economy in this study uses the following criteria:

a) Small Farm Households: households in which at least one (1) member is occupied as an independent or self-employed worker in the agricultural sector.[35]

   This is thus an intermediate definition, lying between the measurement used by the agricultural study team (*Misión de Estudios Agropecuarios*), which quantified the number of persons, and not the number of households, and the methodology used by the Andes University Center for Economic Development Studies (*CEDE*) study in 2006, which considered only the households where the head was a self-employed agricultural worker, and excluded those with family members other than the head working in the agricultural sector.

b) Small-Scale Productive Units: productive units whose total agricultural area is less than one Family Agricultural Unit (*UAF*), and also, in which the livestock inventory does not exceed the following criteria:

   - 50 head of cattle
   - 100 pigs

[35] Includes crop growing, cattle rearing, hunting, forestry and fishing.

- 100 birds
- 150 head of other smaller species (sheep, goats, rabbits and guinea pigs)

While in the departments of Casanare, Meta, and La Guajira the average size of the *Family Agricultural Unit* (UAF) was very large (348, 696, and 123 hectares respectively), in the other departments covered by the survey the maximum UAF was defined as 48 hectares. Consequently, the criterion for a small farm economy was limited to 50 hectares for these three departments. It should be noted that studies on the agricultural sector carried out in Colombia usually define small and medium-scale agriculture as parcels of 50 hectares or less.

The present study classifies the small farm economy according to the legal criteria defining *Family Agricultural Units*. This takes into account the regional differences by types of farms and crops, instead of relying on some pre-established criterion of maximum size to determine who is a small farmer and then applying that to all regions, such as the 20 hectares used in the studies mentioned.

However, in the case of livestock rearing activities, given that the physical size of the farm is not the most suitable variable to differentiate production between small, medium and large, this study makes use of the livestock rearing segmentation criteria established by the *Corporación Colombia Internacional (CCI),*[36] for calculating cost structures by typology.

After defining the former criteria, an analysis of information sources available in Colombia was carried out. There is no single updated source from which both a characterization of small farm households and a quantification of their productive structure could be obtained.[37] Thus, independent sources were used as follows:

a) For the characterization of small farm households: a household survey (*Encuesta Continua de Hogares - ECH*) from the first quarter of 2005 was used, taking the data expanded to a national level, as well as information taken from the database of the Colombian statistics department (*DANE*).

b) For the characterization of small farm productive units: a national agricultural survey (*Encuesta Nacional Agropecuaria ENA*) from 2005 was used, as well as information taken from the database of the Colombian statistics department (*DANE*).

With regard to the information from the *ENA* survey, two important points should be clarified: first, the observation unit of the *ENA* national agricultural survey, called a *sampled farm part,* is a "*continuous land surface contained within a sample segment, in the charge of a producer or administrator.*" Thus defined, a *sampled farm part* (abbreviated as *SFP* in tables below) does not necessarily correspond to

[36] Corporación Colombia Internacional (CCI) is a non-profit, autonomous entity with mixed private and public funding, which promotes the agricultural and food sectors in Colombia, including exports.
[37] The only source which would enable a study of this nature is the standard of living survey: *Encuesta de Calidad de Vida* of 1997.

the total area of the farm or parcel of the producer surveyed. Firstly, it only includes the portion of this area contained within one single sample segment, and not that which is outside it (except in the measurement of livestock variables or special studies). Secondly, it does not identify the units that are property of the same producer, yet separated one from another. This sample design may underestimate the participation and contribution of the large-scale crop farms. However, it is considered a useful estimate in the case of small-scale agriculture, since although it is common to divide a small farm into parcels, small farmers who own several farms are not commonly found.

Secondly, the *ENA* survey is expanded based on the areas cultivated within each segment rather than using the *Sampled Farm Parts.* Therefore, the characterization of small-scale production was based on the unexpanded results of the survey. However, to obtain final expanded results, the subsequent procedure was followed: i) the productive structure of small farm units was determined by calculating the proportion of area cultivated for each crop or the number of animals with respect to the total of *sampled farm parts* surveyed; ii) these proportions were applied to the national totals estimated by the *ENA* agricultural survey for each crop or animal, found in the published results of the survey; and iii) assuming that the productivity of small farm units is equal to that of farms observed at a national level, the total production of each crop is calculated.

B. CHARACTERIZATION OF COLOMBIAN SMALL FARM HOUSEHOLDS

According to figures on employment for the first quarter of 2005, in Colombia there were 3,668,930 persons working in the agricultural sector, of which 48%, or 1,776,253 persons, were independent or self-employed workers. These were followed in importance by: day laborers or farm workers, who accounted for 21% of those employed in agriculture (775,976 persons); salaried workers (employees and laborers) with 15%, (567,541 persons); family workers with 9%, (330,448 persons); and lastly, the employers with 6% (215,632 persons). (Table 15)

This implies that the total number of agricultural producers amounted to 1,991,885 persons, calculated as the sum of independent farmers plus the employers. Of this total, 89% can be classified as part of the small farm economy segment (the independents), and 11% in that of business agriculture.

There are 22% of small-scale producers in urban zones (municipal areas) and 78% in rural areas. These proportions are the same as those observed for all persons employed in the agricultural sector.

It should also be pointed out that small-scale producers account for 10% of all occupied persons in Colombia, an appreciable percentage that denotes the importance of this segment in the economic activity of the country.

Table 15. *Number of Occupied Persons of Working Age by Occupation-2005*

Occupation	Total				
	Urban	*Rural*	*Total*	*% of Agric*	*% of Total*
Agricultural Sector (1)					
Salaried (2)	330,441	237,100	567,541	15%	3%
Day laborers or farm workers	0	775,976	775,976	21%	4%
Self employed	393,577	1,382,676	1,776,253	48%	10%
Employer	76,128	139,504	215,632	6%	1%
Unpaid Family Worker	22,662	307,786	330,448	9%	2%
Others	280	2,800	3,080	0%	0%
Subtotal agricultural sector	**823,088**	**2,845,842**	**3,668,930**	**100%**	**21%**
Other activities	**12,020,324**	**1,797,866**	**13,818,190**		**79%**
TOTAL PERSONS OCCUPIED	**12,843,411**	**4,643,708**	**17,487,119**		**100%**

Source: Author's calculations based on *ECH* survey of households 1st quarter, 2005. (1) codes CIIU 01, 02, and 05
(2) Includes laborers or employees of private firms or government and domestic employees.

In the agricultural sector, 11% of independent workers are women and 89% are men, proportions slightly inferior to those observed for the total number employed in the agricultural sector (13% and 87% respectively), and much less than those observed for the total number of employed in Colombia (40% women and 60% men). (Table 16)

Table 16. *Number of Occupied Persons of Working Age by Occupation and Sex -2005*

Occupation	Total				
	Women	*Men*	*Total*	*% Agric*	*% Total*
Agricultural Sector (1)					
Salaried (2)	99,038	468,503	567,541	15%	3%
Day laborers or farm workers	41,714	734,262	775,976	21%	4%
Self employed	195,183	1,581,070	1,776,253	48%	10%
Employer	22,397	193,235	215,632	6%	1%
Unpaid Family Worker	120,459	209,988	330,448	9%	2%
Others	0	3,080	3,080	0%	0%
Subtotal Agricultural Sector	**478,792**	**3,190,138**	**3,668,930**	**100%**	**21%**
Other activities	**6,513,011**	**7,305,179**	**13,818,190**		**79%**
TOTAL PERSONS OCCUPIED	**6,991,803**	**10,495,317**	**17,487,119**		**100%**

Source: Author's calculations based on *ECH* survey of households 1st quarter 2005. (1) codes CIIU 01, 02, and 05
(2) Includes government and private sector workers or employees, and domestic employees.

In the agricultural sector independent persons make up 1,369,438 small farm households in the whole country. These account for 55% of the households that include members occupied in the agricultural sector, and 88% of the total number of households in which at least one person is an agricultural producer (independent or employer). Of the total number of households in Colombia, small farm households account for 12%, with a much greater share in rural areas (38%) than urban (4%), as would be expected. (Table 17)

Table 17. *Number of Households by the Occupations of their Members*

Categories	*Urban*	*Rural*	***Total***	***% Agric***	***% Total***
Self Employed in Agricultural Sector (1)	328,234	1,041,204	1,369,438	55%	12%
Employers in the Agricultural Sector (2)	71,842	114,853	186,694	7%	2%
Other Households in the Agricultural Sector (3)	284,843	665,879	950,721	38%	9%
Subtotal Agricultural Sector Households (4)	**684,918**	**1,821,936**	**2,506,854**	**100%**	**22%**
Other Households (5)	**7,723,312**	**943,779**	**8,667,091**		**78%**
TOTAL HOUSEHOLDS	**8,408,230**	**2,765,715**	**11,173,945**		**100%**

Source: Author's calculations based on *ECH* survey of households - 1st quarter 2005. (1) At least one member is self employed in the agricultural sector, but none are employers in the sector (they may be occupied in other positions or in other sectors). (2) At least one of the members is an employer in the agricultural sector but none are self-employed in the sector (they may be occupied in other positions or in other sectors). (3) At least one household member is salaried, or a day laborer, or a family worker in the agricultural sector, but none are occupied as self-employed or as employers in the agricultural sector (they may be occupied in other sectors). (4) The sum of categories 1 to 3. (5) None of their members are occupied in the agricultural sector (this includes households in which all members are unoccupied or inactive).

By regions, the greater presence of small farm households was observed in the Atlantic Coast area (37%), followed by the Eastern and Pacific regions (23% each), and the Central region (16%). (Table 18) [38]

Table 18. *Number of Self Employed Households (1) in the Agricultural Sector by Department*

Department	*Urban*	*Rural*	***Total***	***% Total***
Atlantic Region	192,250	318,694	510,944	37.3%
Eastern Region	46,305	274,090	320,395	23.4%
Central Region	38,927	185,469	224,396	16.4%
Pacific Region	45,190	262,952	308,142	22.5%
Bogotá	5,561	0	5,561	0.4%
TOTAL	**328,234**	**1,041,204**	**1,369,438**	**100.0%**

Source: Author's calculations based on *ECH* survey of households 1st quarter 2005.
(1) At least one household member is self employed in the agricultural sector, but none are employers in that sector.

The principal activity of 60% of independent workers is crop growing, 13% are principally engaged in livestock rearing, and 27% are occupied in mixed activities, or others such as forestry, hunting, fishing, related activities or agricultural services. (Table 19)

[38] The regions are groups of departments within an area with similar physical and biotic conditions.

Table 19. *Number of Self Employed Persons in the Agricultural Sector by Principal Activity* [(1)]

Agricultural Activity	*Urban*	*Rural*	*Total*	*% Total*
Agricultural Production	218,315	746,734	965,048	59.7%
Livestock Production	39,439	168,723	208,162	12.9%
Mixed and Other Activities	93,874	348,908	442,782	27.4%
TOTAL	**351,628**	**1,264,365**	**1,615,992**	**100.0%**

Source: Author's calculations based on *ECH* survey of households 1st quarter 2005. (1) At least one household member is self employed in the agricultural sector but none are employers in that sector.

On average, each small farm household is made up of 4.8 members, whose average age is 28.8, and average years of education are 4.7. An average of 2.1 persons per household, or 43% of household members, are occupied. (Table 20)

Table 20. *Number of Self Employed Households in the Agricultural Sector by Socio-Demographic Characteristics.* [(1)]

Characteristic	*Urban*	*Rural*	***Total***
Number of members per household	5.0	4.7	4.8
Average age	29.45	28.54	28.76
Years of education of those over 15	5.72	4.30	4.66
Family labor engaged in agriculture	*60.7%*	*76.8%*	*72.9%*

Source: Author's calculations based on *ECH* survey of households 1st quarter 2005. (1) At least one household member is self employed in the agricultural sector but none are employers in that sector.

There are in total a little over 5 million persons of working age in small farm households, of which 56% are occupied and 40% are inactive, with an unemployment rate of 6.4%. Of those occupied, 77% had some type of work in the agricultural sector, and 23% worked in other economic sectors. By adding the number of self-employed workers and unpaid family workers it is found that small farm households demanded 73% of the family workforce for their agricultural activities. (Table 21)

The average monthly income of small farm households during the year 2005 amounted to 340,200 COP (146.60 USD). There is an important difference between households in urban zones, which obtained an average income of 536,619 COP (231.22 USD) per month, and those in rural zones, with an average monthly income of 278,280 COP (119.90 USD). [39] (Table 22)

[39] However it should be noted that income from farming activities corresponds to net profit (total income less total costs). As set out in the theoretical framework, this concept cannot be applied directly to the small farm economy, as the value of family labor and the home consumption generated increase the value that members place on the activities carried out.

Table 21. *Number of Persons of Working Age in Self Employed Households in the Agricultural Sector by Occupation* [(1)]

Occupation	*Urban*	*Rural*	***Total***	***% Occup.***	***% Total***
Agricultural Sector					
Salaried (2)	5,034	20,467	25,501	1%	1%
Day laborers or farm workers	0	93,325	93,325	3%	2%
Self Employed	395,645	1,384,398	1,780,043	63%	35%
Employer	0	0	0	0%	0%
Unpaid Family Worker	17,710	273,218	290,928	10%	6%
Others	0	0	0	0%	0%
Subtotal Agricultural Sector	**418,389**	**1,771,408**	**2,189,797**	**77%**	**43%**
Other Activities				*0%*	*0%*
Salaried (2)	102,381	124,555	226,936	8%	4%
Day laborers or farm workers	0	6,619	6,619	0%	0%
Self Employed	143,457	226,066	369,523	13%	7%
Employer	7,394	4,968	12,362	0%	0%
Unpaid Family Worker	9,368	25,044	34,412	1%	1%
Others	47	289	336	0%	0%
Subtotal Other Activities	**262,647**	**387,540**	**650,187**	**23%**	**13%**
Subtotal Occupied	**681,037**	**2,158,948**	**2,839,984**	**100%**	**56%**
Subtotal Unoccupied	**55,420**	**139,936**	**195,356**		**4%**
Subtotal Inactive	**481,258**	**1,576,868**	**2,058,126**		**40%**
Total Persons of Working Age	**1,217,714**	**3,875,752**	**5,093,466**		**100%**

Source: Author's calculations based on *ECH* survey of households 1st quarter 2005. (1) At least one household member is self employed in the agricultural sector but none are employers in that sector. (2) Includes government or private sector workers or employees, and domestic employees.

Of the total income of small farm households, 69% came from work in the agricultural sector, basically from productive activities (65%), and to a lesser degree from work outside the farm or parcel (4%). Work in areas outside agriculture contributed 25% of income, while income originating from sources other than work, such as rents, interest, and pensions, contributed 6%. (Table 22)

The dependence on income from farming activities is greater in small farm households located in rural areas than those in urban zones (76% versus 59%). Urban zoned households receive a greater income through work in other sectors of the economy than those in rural areas (34% versus 19%).

A comparison of income obtained by small farm households with the statutory minimum wage for 2005 (381,500 COP - 164.38 USD) shows that the situation is critical: 44% received income lower than one half of a statutory minimum wage – 53% of those in rural areas and 17% of those in urban zones; 68% of households received income lower than the statutory minimum wage – 76% of those in rural areas and 44% of those in urban zones. (Table 23)

Table 22. *Average Monthly Income of Self Employed Households in the Agricultural Sector by Source.* [(1)]

Source	*Urban*	*Dist.*	*Rural*	*Dist.*	*Total*	*Dist.*
Income from Agricultural Sector						
Salaries (2)	3,712	1%	18,776	7%	15,165	4%
Net Profits (3)	310,510	58%	191,698	69%	220,175	65%
Subtotal Agricultural Sector	**314,222**	**59%**	**210,474**	**76%**	**235,341**	**69%**
Income from Other Sectors						
Salaries (2)	91,991	17%	26,956	10%	42,544	13%
Net Profits (3)	90,232	17%	26,178	9%	41,531	12%
Subtotal Other Sectors	**182,223**	**34%**	**53,134**	**19%**	**84,074**	**25%**
Other Income (4)	**40,174**	**7%**	**14,673**	**5%**	**20,785**	**6%**
TOTAL INCOME	**536,619**	**100%**	**278,280**	**100%**	**340,200**	**100%**

Source: Author's calculations based on *ECH* survey of households 1st quarter 2005. (1) At least one household member is self employed in the agricultural sector, but none are employers in that sector. (2) This does not include payment in kind. (3) Net profit of the business or crop in the previous 12 months divided by 12. (4) Includes pensions, rents, financial support, interests and dividends, other sources, secondary employment, severance pay, pension bonuses, and sale of properties.

Consequently, the proportion of households that receive income equal or superior to three statutory minimum wages per month, the level which according to law (*Ley 505 de 1999*) enables a *Family Agricultural Unit* (*UAF*) to remunerate its work and obtain capital, amounted to just 3%, or 2% of those in rural areas and 9% of those in urban zones. (Table 23)

Table 23. *Distribution of Self Employed Households in the Agricultural Sector by Range of Monthly Income* [(1)]

Range of Income	*Urban*	*Rural*	*Total*
Less than half a statutory monthly wage (less than 190,750 COP/ 82.19 USD)	16.6%	52.7%	44.1%
Between half and one statutory monthly wage (190,750 to 381,500 COP/ 82.19 to 164.38 USD)	27.6%	22.8%	24.0%
Between one and two statutory monthly wages (381,500 to 763,000 COP/164.38 to 328.77 USD)	36.4%	18.6%	22.9%
Between two and three stat. monthly wages (763,000-1,144,500 COP/328.77 to 493.15USD)	10.8%	4.2%	5.7%
More than three statutory monthly wages (over 1,144,500 COP/493.15 USD)	8.6%	1.7%	3.4%
Total	**100.0%**	**100.0%**	**100.0%**

Source: Author's calculations based on *ECH* survey of households 1st quarter 2005. (1) At least one household member is self employed in the agricultural sector but none are employers in that sector.

C. THE AGRICULTURAL ACTIVITY OF SMALL-SCALE PRODUCERS IN COLOMBIA

1. Characterization of Small-Scale Productive Units

The productive units identified with the small farm economy were selected from the *sampled farm parts* in the *ENA* national agricultural survey of 2005 u sing the criteria set out in part A of this chapter on maximum size of the *Family Agricultural Units* (*UAFs)* and the maximum number of animals, as mentioned previously in the description of methodology. The principal characteristics of these units are presented in this section, with reference only to unexpanded information from the ENA database.

Table 24. *Total Number of Sampled Farm Parts (SFPs) Surveyed and Agricultural Area Covered, by Department - Total ENA and Small Farm Economy - 2005*

DEPARTMENT	TOTAL ENA [1]		SMALL FARM ECONOMY [3]				OTHERS			
	No of SFPs	Agric Area (ha) [2]	No. de SFPs	Agric Area (ha) [2]	% SFPs	% Agric Area	No de SFPs	Agric Area (ha) [2]	% SFPs	% Agric Area
Antioquia	2,392	37,469	2,019	15,377	84%	41%	373	22,092	16%	59%
Atlántico	142	3,055	91	647	64%	21%	51	2,408	36%	79%
Bolívar	425	16,226	267	3,779	63%	23%	158	12,447	37%	77%
Boyacá	8,590	28,619	8,431	23,032	98%	80%	159	5,588	2%	20%
Caldas	911	9,441	792	4,475	87%	47%	119	4,967	13%	53%
Casanare	324	66,910	116	2,385	36%	4%	208	64,526	64%	96%
Cauca	2,638	15,264	2,545	10,231	96%	67%	93	5,032	4%	33%
Cesar	325	23,833	93	1,786	29%	7%	232	22,047	71%	93%
Córdoba	1,492	26,424	1,090	6,627	73%	25%	402	19,797	27%	75%
Cundinamarca	6,549	47,877	5,903	23,561	90%	49%	646	24,317	10%	51%
Huila	2,763	34,230	2,543	18,274	92%	53%	220	15,956	8%	47%
La Guajira	153	12,522	66	1,084	43%	9%	87	11,438	57%	91%
Magdalena	393	20,509	204	2,499	52%	12%	189	18,011	48%	88%
Meta	568	39,321	308	4,137	54%	11%	260	35,184	46%	89%
Nariño	4,983	15,079	4,688	10,245	94%	68%	295	4,834	6%	32%
Norte De Santander	961	14,197	743	4,737	77%	33%	218	9,460	23%	67%
Quindío	431	4,317	355	1,668	82%	39%	76	2,649	18%	61%
Risaralda	973	6,501	818	2,711	84%	42%	155	3,790	16%	58%
Santander	2,480	38,220	2,045	15,874	82%	42%	435	22,345	18%	58%
Sucre	827	16,086	628	5,574	76%	35%	199	10,512	24%	65%
Tolima	2,269	33,793	1,942	13,519	86%	40%	327	20,274	14%	60%
Valle Del Cauca	1,111	20,843	525	1,285	47%	6%	586	19,558	53%	94%
TOTAL	**41,700**	**530,737**	**36,212**	**173,505**	**87%**	**33%**	**5,488**	**357,232**	**13%**	**67%**

Source: Author's calculations based on the *ENA* agricultural survey 2005. (1) *Sampled Farm Parts* (SFPs) in which at least some crop was harvested, or some animal kept, in 2005. (2) Includes short-cycle + permanent + fallow + pasture and weeds + poultry + pigs + fish farming + floriculture (3) *Sampled Farm Parts* in which the agricultural area is less or equal to one local *Family Agricultural Unit* (*UAF*), the number of animals is equal to or less than the limit for the small-scale producer as defined by the CCI, and the area in fish farming is less than five hectares.

Firstly, although the small farm economy accounted for 87% of the productive units surveyed in 2005, these covered only 33% of the agricultural area surveyed. The remaining 13% of units are engaged in commercial farming, and used 67% of the total area given over

to agriculture. This is an indication of the difference in average size among types of farms. There is a considerable presence of small farm units in some departments, such as Boyacá (98%), Cauca (96%), Nariño (94%), Huila (92%) y Cundinamarca (90%). (Table 24)

Secondly, of the surveyed agricultural surface, the small-scale productive units identified accounted for: 45% of the surface planted with short-cycle crops, or left fallow; 65% of that cultivated with permanent crops; 29% in pasture or weeds; 32% in forests; and 16% of that surface used for other livestock rearing activities. Each small-scale productive unit used 4.8 hectares of land, of which 1.2 were in crops, 3.2 used for livestock, and 0.4 in forest. This contrasts with the average size of business agriculture units which used 65.1 hectares per farm, with 53.1 hectares in pasture and weeds. A good part of these units are probably engaged in extensive cattle raising. (Table 25)

Table 25. *Use of Land in Sampled Farm Parts (SFPs) Surveyed, by Activity - Total ENA, Small Farm Economy, and Others*

USE OF LAND	TOTAL ENA [1]		SMALL FARM ECONOMY [2]			OTHERS		
	Area (ha)	ha per SFP	Area (ha)	ha per SFP	% Area	Area (ha)	ha per SFP	% Area
Short-cycle crops + fallow	38,511	0.9	17,295	0.5	45%	21,216	3.9	55%
Permanent crops + floriculture	38,485	0.9	25,005	0.7	65%	13,480	2.5	35%
Pasture and weeds	408,340	9.8	116,955	3.2	29%	291,384	53.1	71%
Natural forest + forest plantations	44,786	1.1	14,149	0.4	32%	30,638	5.6	68%
Pig farming + poultry farming + fish farming	615	0.0	101	0.0	16%	514	0.1	84%
TOTAL AGRICULTURAL AREA	**530,737**	**12.7**	**173,505**	**4.8**	**33%**	**357,232**	**65.1**	**67%**

Source: Author's calculations based on the *ENA* agricultural survey 2005. (1) *Sampled Farm Parts* (SFPs) in which at least some crop was harvested, or some animal kept, in 2005. (2) *Sampled Farm Parts* in which the agricultural area is less or equal to one local *Family Agricultural Unit* (*UAF*), the number of animals is equal to or less than the limit for the small-scale producer as defined by the CCI, and the area in fish farming is less than five hectares.

Third, it was also found that, at the time of the survey, the small farm units kept 19% of the total bovine inventory (on average 4 head per farm), 17% of poultry (on average 10 birds per farm), 35% of pigs (on average 1 pig per farm), and more than 40% of other species. (Table 26)

Table 26. *Livestock Inventory in the Sampled Farm Parts (SFPs) by Species - Total ENA, Small Farm Economy, and Others - 2005*

ACTIVITY	TOTAL ENA [1]		SMALL FARM ECONOMY [2]			OTHERS		
	No of Animals	Animals per SFP	No of Animals	Animals per SFP	% Animals	No of Animals	Animals per SFP	% Animals
Cattle	786,626	19	148,513	4	19%	638,113	116	81%
Poultry	2,123,554	51	357,572	10	17%	1,765,982	322	83%
Pigs	77,544	2	27,201	1	35%	50,343	9	65%
Other species	117,033	3	54,175	1	46%	62,858	11	54%
Fish	2,985,437	72	1,220,087	34	41%	1,765,350	322	59%

Source: Author's calculations based on the *ENA* agricultural survey 2005. (1) *Sampled Farm Parts* (SFPs) in which at least some crop was harvested, or some animal kept, in 2005. (2) *Sampled Farm Parts* in which the agricultural area is less or equal to one local *Family Agricultural Unit* (*UAF*), the number of animals is equal to or less than the limit for the small-scale producer as defined by the CCI, and the area in fish farming is less than five hectares

As regards distribution by size, the small-scale productive units accounted for 99% of parcels smaller than one hectare, 99% of those between 1 and 3 hectares, and very large proportions of the parcels with 3 to 5, and 5 to 10 hectares (98% and 95% respectively). Conversely, small farm units did not account for a great proportion of medium sized parcels (20 to 50 ha), with no share at all in those over 50 hectares. (Table 27)

Table 24. *Total Number of Surveyed Sampled Farm Parts (SFPs) by Size - Total ENA, Small Farm Economy and Others - 2005*

RANGES OF AGRICULTURAL AREAS	TOTAL ENA [1]		SMALL FARM ECONOMY [3]				OTHERS			
	No of SFPs	Agric Area (ha) 2	No of SFPs	Agric Area (ha) 2	% SFPs	% Agric Area	No of SFPs	Agric Area (ha) 2	% SFPs	% Agric Area
Less than 1 ha	9,210	4,859	9,072	4,804	99%	99%	138	55	1%	1%
Between 1.01 y 3 ha	10,716	20,696	10,565	20,375	99%	98%	151	321	1%	2%
Between 3.01 y 5 ha	5,665	22,603	5,542	22,109	98%	98%	123	494	2%	2%
Between 5.01 y 10 ha	6,547	46,978	6,221	44,452	95%	95%	326	2,526	5%	5%
Between 10.01 y 20 ha	4,407	62,826	3,728	52,349	85%	83%	679	10,477	15%	17%
Between 20.01 y 50 ha	3,164	98,790	1,084	29,417	34%	30%	2,080	69,373	66%	70%
Between 50.01 y 100 ha	1,140	79,854	0	0	0%	0%	1,140	79,854	100%	100%
Between 100.01 y 200 ha	498	68,975	0	0	0%	0%	498	68,975	100%	100%
Between 200.01 y 500 ha	308	85,572	0	0	0%	0%	308	85,572	100%	100%
Over 500 ha	45	39,585	0	0	0%	0%	45	39,585	100%	100%
TOTAL	**41,700**	**530,737**	**36,212**	**173,505**	**87%**	**33%**	**5,488**	**357,232**	**13%**	**67%**

Source: Author's calculations based on the *ENA* agricultural survey 2005. (1) *Sampled Farm Parts* (SFPs) in which at least some crop was harvested, or some animal kept, in 2005. (2) Includes short-cycle + permanent + fallow + pasture and weeds + poultry + pigs + fish farming + floriculture (3) *Sampled Farm Parts* in which the agricultural area is less or equal to one local *Family Agricultural Unit* (*UAF*), the number of animals is equal to or less than the limit for the small-scale producer as defined by the CCI, and the area in fish farming is less than five hectares

2. Participation of Small Farm Units in Agricultural Area and Production

Of the units surveyed (*Sampled Farm Parts*), those belonging to the small farm economy were identified and their share in the crop areas and the livestock inventory covered by the survey was obtained. This participation was applied to the expanded data from the ENA survey of 2005 on the national area cultivated and production obtained in the various agricultural activities. Thus, the total area and production of the Colombian small farm economy and its importance in the Colombian agricultural sector were found.

Small farm units accounted for 47% of the total area and 50% of the production of short-cycle crops grown in Colombia in 2005. In permanent crops, they cultivated 56% of the area and were responsible for 48% of the production. Their contribution stands out particularly in crops such as scallions (97%), broad beans (96%), tobacco (91%), onions (89%), wheat (83%), potatoes (82%), beans and cocoa (81% each), peas and barley (79% each), bananas (75%), coffee (74%), traditional yellow maize (71%), carrots (79%), sugar cane for brown sugarloaf and plantain (70% each), among the most important. (Table 28)

Moreover, in 2005, small farm units kept 17% of the cattle in Colombia, with more milk and dual purpose cows (25% of total) than beef cattle (12%). At the time of the survey, these units kept 17% of the poultry, 35% of the pigs, and 38% of the smaller species (sheep, goats, rabbits and guinea pigs). (Table 29)

Table 28. *Area Cultivated and National Agricultural Production - Total ENA and Small Farm Economy - 2005*

ACTIVITY	NATIONAL TOTAL 2005 [1]			SMALL FARM ECONOMY [2]				
	Crop Area (ha)	Yield (ton/ha)	Production (ton)	Crop Area (ha)	Yield (ton/ha)	Production (ton)	% Area	% Prod.
Short-Cycle Crops	**1,407,026**	**5.3**	**7,436,961**	**654,541**	**5.7**	**3,731,511**	**47%**	**50%**
Cotton [3]	73,306	2.0	148,617	33,386	2.0	67,685	46%	46%
Rice total [4]	442,986	5.8	2,574,059	126,329	5.8	734,399	29%	29%
Rice mechanized	*435,335*	*5.8*	*2,534,251*	*124,696*	*5.8*	*725,902*	*29%*	*29%*
Rice manual	*7,651*	*5.2*	*39,808*	*1,633*	*5.2*	*8,498*	*21%*	*21%*
Peas [5]	25,438	2.4	61,817	20,062	2.4	48,754	79%	79%
Barley [6]	5,606	1.6	9,058	4,455	1.6	7,199	79%	79%
Onions [7]	9,543	19.2	183,687	8,498	19.2	163,566	89%	89%
Scallions [8]	12,316	33.2	408,938	11,926	33.2	395,995	97%	97%
Beans [9]	64,463	1.1	72,743	52,372	1.1	59,098	81%	81%
Broad beans [9]	4,279	3.9	16,609	4,103	3.9	15,925	96%	96%
Other vegetables	25,089	N.D.	N.D.	14,637	N.D.	N.D.	58%	N.D.
Maize total [6]	449,428	3.2	1,458,277	207,222	2.5	524,232	46%	36%
Yellow maize mechanized	*160,529*	*4.8*	*771,005*	*38,113*	*4.8*	*183,055*	*24%*	*24%*
Traditional yellow maize	*140,619*	*1.4*	*192,711*	*99,637*	*1.4*	*136,547*	*71%*	*71%*
White maize mechanized	*87,933*	*4.6*	*403,177*	*32,379*	*4.6*	*148,459*	*37%*	*37%*
Traditional white maize	*60,347*	*1.5*	*91,384*	*37,093*	*1.5*	*56,170*	*61%*	*61%*

ACTIVITY	NATIONAL TOTAL 2005 [1]			SMALL FARM ECONOMY [2]				
	Crop Area (ha)	Yield (ton/ha)	Production (ton)	Crop Area (ha)	Yield (ton/ha)	Production (ton)	% Area	% Prod.
Potatoes total [10]	83,394	15.2	1,267,203	68,173	15.2	1,035,911	82%	82%
Sorghum [6]	31,743	3.3	104,080	8,571	3.3	28,103	27%	27%
Soybeans [6]	35,683	2.2	77,565	3,486	2.2	7,578	10%	10%
Tobacco total [11]	14,034	1.8	25,394	12,789	1.8	23,289	91%	92%
Dark tobacco	*4,138*	*1.6*	*6,677*	*3,242*	*1.6*	*5,232*	*78%*	*78%*
Virginia tobacco	*9,896*	*1.9*	*18,717*	*9,547*	*1.9*	*18,057*	*96%*	*96%*
Tomato [12]	6,498	21.3	138,468	4,242	21.3	90,403	65%	65%
Wheat [6]	18,811	1.8	34,716	15,669	1.8	28,918	83%	83%
Cassava [13]	98,999	7.4	729,780	54,324	7.4	400,457	55%	55%
Carrots [13]	5,410	23.3	125,950	4,295	23.3	100,000	79%	79%
Permanent Crops	**1,688,491**	**9.6**	**16,161,492**	**938,843**	**8.3**	**7,782,745**	**56%**	**48%**
Avocadoes [12]	8,410	7.0	58,845	4,701	7.0	32,895	56%	56%
Bananas [12]	39,777	5.2	204,940	29,829	5.2	153,686	75%	75%
Export banana [12]	43,582	34.5	1,502,795	0	N.A.	0	0%	0%
Cocoa [6]	69,069	0.4	31,041	56,078	0.4	25,203	81%	81%
Coffee [14]	668,589	0.9	599,125	493,177	0.9	441,938	74%	74%
Sugar cane [15]	176,366	15	2,683,203	0	N.A.	0	0%	0%
Sugarloaf cane [16]	148,726	48.6	7,226,068	104,355	48.6	5,070,252	70%	70%
Guava [12]	2,588	7.4	19,051	882	7.4	6,494	34%	34%
Oil Palm [17]	161,277	4.2	672,597	0	N.A.	0	0%	0%
Mango [12]	14,053	9.2	128,926	9,080	9.2	83,306	65%	65%
Oranges [12]	23,317	16.7	390,438	7,858	16.7	131,578	34%	34%
Papaya [12]	2,138	20.3	43,478	417	20.3	8,482	20%	20%
Plantain [12]	330,599	7.9	2,600,985	232,465	7.9	1,828,913	70%	70%
TOTAL	**3,095,517**	**7.6**	**23,598,453**	**1,593,384**	**7.2**	**11,514,256**	**51%**	**49%**

Source: Author's calculation based on the *ENA* agricultural survey 2005. (1) ENA results expanded to national level except in export bananas (AUGURA), sugar cane (ASOCAÑA and CENICAÑA) and African palm (FEDEPALMA) (2) *Sampled Farm Parts* (SFPs) in which the agricultural area is equal to or less than one local *Family Agricultural Unit* (*UAF*), the number of animals is equal to or less than the limit for small-scale producers defined by the *CCI,* and the area in fish farming is less than five hectares. (3) Production expressed in cotton seed (4) Production expressed in green paddy (5) Production expressed in green pods (6) Production expressed in dry grain (7) Production expressed in bulbs (8) Production expressed in stalks (9) Production expressed in pods (10) Production expressed in tubers (11) Production expressed in dry leaves (12) Production expressed in fresh fruit (13) Production expressed in tubers or roots (14) Production expressed in dry beans with shell (15) Production expressed in sugar (16) Production expressed in cane (17) Production expressed in crude oil.

Table 29. *Total Number of Livestock Species- Total ENA and Small Farm Economy, 2005*

ACTIVITY	NATIONAL TOTAL 2005 [1]	SMALL FARM ECONOMY [2]	
	No of Animals	No of Animals	% Animals
Cattle	25,699,397	4,404,963	17%
Beef	*15,404,471*	*1,854,582*	*12%*
Milk or dual purpose.	*10,294,926*	*2,550,381*	*25%*
Poultry [3]	37,963,442	6,392,427	17%
Pigs [4]	1,724,062	604,769	35%
Other species	8,752,681	3,286,737	38%

Source: Author's calculation based on the *ENA* agricultural survey 2005. (1) ENA results expanded to national level. (2) *Sampled Farm Parts* (SFPs) in which the agricultural area is equal to or less than one local *Family Agricultural Unit*, the number of animals is equal to or less than the limit for small-scale producers defined by the CCI, and the fish farm area is less than five hectares. (3) Number of birds found on the day of the survey. Includes productive units with less than 20 birds. (4) Includes productive units with less than 100 animals.

In terms of the productive structure within each typology, it was observed that, of the total area cultivated by small farm units, 41% is in short-cycle crops. At a national level, these crops account for 45% of the total area cultivated. The area taken up by permanent crops in small farms is 59% of the total, while the national figure for permanent crops is 55% of the total area. This indicates the predominance of crops such as coffee (31%), sugar cane for sugarloaf (7%), and plantain (15%) in the crop areas of small farms. (Table 30)

Table 30. *National Distribution of Area Cultivated by Crop - Total ENA and Small Farm Economy - 2005*

ACTIVITY	NATIONAL TOTAL 2005 [1]	SMALL FARM ECONOMY [2]
Short-Cycle Crops	**45%**	**41%**
Cotton	2%	2%
Rice total	14%	8%
Rice mechanized	*14%*	*8%*
Rice manual	*0%*	*0%*
Peas	1%	1%
Barley	0%	0%
Onions	0%	1%
Scallions	0%	1%
Beans	2%	3%
Broad beans	0%	0%
Other vegetables	1%	1%
Maize total	15%	13%
Yellow maize mechanized	*5%*	*2%*
Traditional yellow maize	*5%*	*6%*
White maize mechanized	*3%*	*2%*
Traditional white maize	*2%*	*2%*
Potatoes total	3%	4%
Sorghum	1%	1%
Soybeans	1%	0%
Tobacco total	0%	1%
Dark tobacco negro	*0%*	*0%*
Virginia tobacco	*0%*	*1%*
Tomato	0%	0%
Wheat	1%	1%
Cassava	3%	3%
Carrots	0%	0%
Permanent Crops	**55%**	**59%**
Other fruits	2%	1%
Banana	1%	2%
Export banana	1%	0%
Cocoa	2%	4%
Coffee	22%	31%
Sugar cane	6%	0%
Sugar cane (for sugarloaf)	5%	7%
Oil Palm	5%	0%
Plantain	11%	15%
TOTAL	**100%**	**100%**

Source: Author's calculation based on the *ENA* agricultural survey 2005. (1) ENA results expanded to national level except in export bananas (AUGURA), sugar cane (ASOCAÑA and CENICAÑA) and African palm (FEDEPALMA) (2) *Sampled Farm Parts* (SFPs) in which the agricultural area is equal to or less than one local *Family Agricultural Unit* (*UAF*), the number of animals is equal to or less than the limit for small-scale producers defined by the *CCI* and the area in fish farming is less than five hectares.

IV. IMPACT OF THE FTA ON THE SMALL FARM ECONOMY IN COLOMBIA

A. METHODOLOGICAL CONSIDERATIONS

1. Measurement of the Effects on Producer Surplus and Net Income

As mentioned in chapter two, the supply functions used in this study to calculate the general impact of the FTA on agricultural producers were estimated for the economy as a whole, and as such are not broken down according to type of producer. The main reason that estimates at these levels of disaggregation cannot be made has to do with the fact that available sources of information do not provide a uniform series for production by crop over a time period long enough to estimate the supply functions for small-scale production, nor is it possible to determine the prices at which this production has been placed on the market. These are indispensable elements for estimating the supply functions.

Therefore, in this study it is assumed that the impact of the FTA on prices received by producers and the consequent effects on the area planted and production in small farm units are equal in percentage terms to the general estimates for each crop.

However, a decrease in the level and value of domestic production causes losses of well-being for the producing sector that can be measured through various indicators. First, the change in gross income can be measured. This corresponds to the decrease in value of production with the FTA.

Secondly, the loss of gross income causes, in turn, a fall in the net income or profit generated by agricultural activity for the producers and their households. This corresponds to the difference between gross income and the total cost of production. Additionally, taking into account the fact that the small farm economy is characterized by a large component of family labor, the net profit also includes the income from the work of the household members engaged in their own agricultural activity. To calculate this, the methodology adopted by Garay et al. (2009) for estimating additional income in the households of displaced persons that were engaged in agriculture is followed. This assumes that a third of the workdays demanded by agricultural activities are carried out by family members. [40]

Thirdly, the loss of income also generates a fall in the *producer surplus* or value added of the agricultural activity. In economic theory, the producer surplus is defined as the amount by which producers benefit by selling at a higher price than that at which they would be willing to sell. By this definition, the producer surplus would be equivalent to the economic profit plus the rent from fixed or scarce production factors (inelastic supply). In a

[40] The study mentioned points out that: *"….the relevance of this assumption is related to the idea of avoiding the overestimation of income, because, as may be seen in Methodological Appendix 1, the contribution of family labor in the cases collected is generally higher than this fraction."*

competitive market, the long term economic profit should be equal to zero, and the producer surplus will thus correspond to the economic rent of the fixed or scarce factors.[41]

Generally, economic theory distinguishes fixed factors as being the natural resources and physical installations of businesses. However, in the case of agriculture, given its particular characteristics, and the imperfections of some markets, capital – such as machines and investments in productive infrastructure, such as irrigation - and the farmer's own or family labor can be considered as fixed factors in addition to land.

According to Castro (2005) "In a competitive market in which supply is determined by the marginal cost curve, the *producer surplus* can be measured by four equivalent methods: i) the area between the marginal cost curve and the price; ii) the band located at the left of the supply curve (limited above by the price and below by the minimum variable cost); iii) income less variable cost; iv) the sum of fixed costs and profits (where profit equals gross income less average cost).

For the purposes of this study it was decided to measure the producer surplus by taking the difference between the gross income (total value of production) and the variable cost of production, which in turn implies measuring the economic profit of the activity plus the rent from fixed and scarce production factors. However, taking into account that the calculation is of agricultural activities, and considering that the labor market in Colombia is not in full employment, the following are considered as fixed or semi-fixed factors: land (cost of rent); capital (financing costs); and labor (cost of contracted labor plus the opportunity cost of personal or family labor). In this sense, the variable cost is equivalent to average consumption expenses: inputs, fuel and machinery.

Defined in this way, the *producer surplus* for the small farm economy is equal to the value added generated by the activity. This same methodology was applied in the study carried out by the Andes University Center for Economic Development Studies *CEDE* (Maldonado et al. 2007) to estimate the impact of the FTA on family agriculture, although that study made use of assumptions and information sources different from those used here.

Algebraically, the calculations carried out can be understood through the following formulas:

(1) $INGNET_0 = P_0 \times Q_0 - CT \times Q_0 + A_0 \times JF \times VJ \times \frac{1}{3}$

(2) $INGNET_1 = P_1 \times Q_1 - CT \times Q_1 + A_1 \times JF \times VJ \times \frac{1}{3}$

(3) $\text{EXPRO}_0 = P_0 \times Q_0 - CV \times Q_0 = \left[P_0 \times (1+\Delta P)\right] \times \left[Q_0 \times (1+\Delta Q)\right] - CT \times \left[Q_0 \times (1+\Delta Q)\right] + JF \times VJ \times \left[A_0 \times (1+\Delta A)\right] \times \frac{1}{3}$

(4) $\text{EXPRO}_1 = P_1 \times Q_1 - CV \times Q_1 = \left[P_0 \times (1+\Delta P)\right] \times \left[Q_0 \times (1+\Delta Q)\right] - CV \times \left[Q_0 \times (1+\Delta Q)\right]$

[41] See among others: Varian (2005) or Samuelson (1977).

Where:

$INGNET_0$ = Net income without FTA

$INGNET_1$ = Net income with FTA

$EXPRO_0$ = Producer surplus without FTA

$EXPRO_1$ = Producer surplus with FTA

P_0 = Price received by producer without FTA

P_1 = Price received by producer with FTA

Q_0 = Quantity produced without FTA

Q_1 = Quantity produced with FTA

A_0 = Area cultivated without FTA

A_1 = Area cultivated with FTA

CT = Total cost per unit produced

CV = Variable cost per unit produced

JF = Quantity of workdays per hectare

VJ = Value of one workday

ΔP = Percentage change in price through effects of FTA

ΔQ = Percentage change in quantity produced through effects of FTA

ΔA = Percentage change in area cultivated through effects of FTA

In the case of livestock activities, the utilization of labor is calculated in terms of workdays per quantity produced, thus, in formulas (1) and (2) the area variable (A) is replaced by that of production (Q). For these activities, both the impact on variable costs as well as the impact on total cost are calculated due to the reduction in prices of yellow maize, a principal input in animal feed.

Information produced by *Corporación Colombia Internacional (CCI)* since 2007 on agricultural production costs stratified by size of farms is used in the application of the methodology described. Specifically, the information on small producer structures can be considered as providing the costs of small farmers. Prices at which production is valued correspond to the average prices paid to the producer registered in the year 2005, or to wholesale prices, if the former are not available.

Thus, assuming that domestic prices are the same for all producers of a crop, and taking the variable cost and the total cost per unit produced, it is possible to estimate gross income, net income and producer surplus for small-scale producers in 2005. Subsequently, using the estimated percentage changes in price, area cultivated and quantity for the activities that compete with exports, as shown in chapter II, it is possible to find gross income, net income and producer surplus of the small-scale producer on entry into force of the FTA, as well as the changes caused by the tariff phase out.

The methodology described is applied to each small farm crop or activity. The sum of all net incomes or all producer surpluses, with and without the FTA, provide the net income

and the total surplus of the small farm economy in these two scenarios. Changes due to the tariff phase out can be found from this.

It should be pointed out that, for the crops or activities for which no impact from the FTA is foreseen, the net income and the producer surplus with the FTA would be equal to the values without the Agreement. These products include: non-tradable products, such as cassava; products that already benefit from duty-free entry into the United States, such as coffee; and products with export potential, but for which the impact of the FTA cannot be estimated with certainty under present conditions, such as fruit.

The sources of information on prices and costs, the transformation of the variables, and the other assumptions used in the calculations described are shown in Methodological Annex 2. All the information used in the calculations can be found in Statistical Annexes 11 and 12.

2. Measurement of the Effects on the Total Income of Small Farm Households

According to the results shown in chapter III, the total income of small farm households is comprised as follows: 65% from the net profits of agricultural activities; 4% from wages earned in the agricultural sector; 25% from income earned in other sectors; and 6% from unearned income such as pensions and rents.

By applying the methodology described in the previous sections, the effect that the reduction in net agricultural profit (or net agricultural income) would have on the total income of small farm households may be found. Specifically, the calculation is made using the following formula:

$$(1)\quad \mathrm{I}NGTOT_0 = I\mathrm{NGNET}_0 + INGLAB + INGOTR + OTR$$

$$(2)\quad \begin{aligned} \mathrm{I}NGTOT_1 &= I\mathrm{NGNET}_1 + INGLAB + INGOTR_1 + OTR_1 \\ &= \left[I\mathrm{NGNET}_0 \times \left(1 + \Delta I\mathrm{NGNET}\right)\right] + \left[INGLAB_0 \times \left(1 + \Delta INGLAB\right)\right] + INGOTR + OTR \end{aligned}$$

Where:

INGTOT_0 = Total income of small farm households without FTA

INGTOT_1 = Total income of small farm households with FTA

INGNET_0 = Net agricultural income without FTA

INGNET_1 = Net agricultural income with FTA

INGLAB = Earned agricultural wages outside farm (assumes no change with FTA)

INGOTR = Total income from other activities (assumes no change with FTA)

OTR = Other income of households (assumes no change with FTA)

$\Delta INGNET$ = Percentage change in net agricultural income due to effects of FTA

$\Delta INGLAB$ = Percentage change in earned agricultural wages due to effects of FTA

B. CATEGORIES OF IMPACT

As may be appreciated in the characterization described earlier, small-scale producers are responsible for an important proportion of the area cultivated in crops that compete with imports and which would be affected by the FTA, including: barley (79%); peas (79%); carrots (79%); onions (93%); beans (81%); wheat (83%); tomatoes (65%); maize (46%); rice (29%); poultry (17%); and pigs (35%). (Tables 29 and 30)

However, it is clear that the tariff phase out agreed in the FTA would not affect all small-scale producers in the same way. There may be producers who are engaged exclusively in cultivating one or more products that compete with imports, or are only engaged in poultry or pork farming, in which cases the impact of the FTA would cover all income and surplus. On the other hand, producers engaged exclusively in crops or activities that would not be affected by the FTA, such as non-tradable goods, would not suffer any effect in these variables. In between these two extremes are the producers who combine activities competing with imports with others which would not be affected by the FTA; a moderate impact on income and surplus is foreseen for these producers.

Thus, it is appropriate to break down the small-scale production units established in the previous chapter into five categories of impact from the FTA, using the following criteria:

- ***Crops***

1. *Full Impact*: Productive units in which 100% of the area cultivated in 2005 was in crops that compete with imports.

2. *High Impact*: Productive units in which more than 66.7% but less than 100% of the area cultivated in 2005 was in crops that compete with exports

3. *Moderate Impact*: Productive units in which more than 33.3% but less than 66.7% of the area cultivated in 2005 was in crops that compete with exports

4. *Low Impact*: Productive units in which more than 0% but less than 33.3% of the area cultivated in 2005 was in crops that compete with exports

5. *No Impact*: Productive units in which crops that compete with exports were not cultivated in 2005.

- ***Livestock***

1. *Full Impact*: Productive units in which 100% of the animals recorded in 2005 were poultry or pigs.

2. *High Impact*: Productive units in which more than 66.7% but less than 100% of the animals recorded in 2005 were poultry or pigs

3. *Moderate Impact*: Productive units in which more than 33.3% but less than 66.7% of the animals recorded in 2005 were poultry or pigs

4. *Low Impact*: Productive units in which more than 0% but less than 33.3% of the animals recorded in 2005 were poultry or pigs

5. *No Impact*: Productive units in which no poultry or pigs were recorded in 2005

In cases in which both crop growing and livestock rearing activities were carried out in the same productive unit, the units were classified into one of the four categories according to the criteria shown in the following table:

CROP (LIVESTOCK) CATEGORY	LIVESTOCK (CROP) CATEGORY	CATEGORY IN WHICH THE UNIT IS CLASSIFIED
FULL IMPACT	FULL IMPACT	FULL IMPACT
FULL IMPACT	HIGH IMPACT	HIGH IMPACT
FULL IMPACT	MODERATE IMPACT	HIGH IMPACT
FULL IMPACT	LOW IMPACT	MODERATE IMPACT
FULL IMPACT	NO IMPACT	LOW IMPACT
HIGH IMPACT	HIGH IMPACT	HIGH IMPACT
HIGH IMPACT	MODERATE IMPACT	MODERATE IMPACT
HIGH IMPACT	LOW IMPACT	MODERATE IMPACT
HIGH IMPACT	NO IMPACT	LOW IMPACT
MODERATE IMPACT	MODERATE IMPACT	MODERATE IMPACT
MODERATE IMPACT	LOW IMPACT	LOW IMPACT
MODERATE IMPACT	NO IMPACT	LOW IMPACT
LOW IMPACT	LOW IMPACT	LOW IMPACT
LOW IMPACT	NO IMPACT	LOW IMPACT
NO IMPACT	NO IMPACT	NO IMPACT

On applying the methodology described, it is found that 14% of the small-scale productive units were classified in the full impact category, and these account for 9% of the area cultivated. Another 14% were classified in the high impact category and account for 9% of the area cultivated; 13% were classified as being in the moderate impact category and account for 15% of the agricultural area; 31% are found in the low impact category and account for 36% of the area; and 29% of the units covering 27% of the area would not experience any impact. (Table 31)

Table 31. *Total Number of Small Farm Productive Units and Agricultural Area Used, by Categories of Impact from FTA*

CATEGORY OF IMPACT	SAMPLED FARM PARTS - SMALL FARM ECONOMY [1]				
	Number of SFPs	Agricultural Area (ha) [2]	% SFPs	% Agric Area	Ha per SFP
Full Impact	5,084	15,665	14%	9%	3.1
High Impact	5,121	23,521	14%	14%	4.6
Moderate Impact	4,550	25,386	13%	15%	5.6
Low Impact	11,079	62,719	31%	36%	5.7
No Impact	10,378	46.213	29%	27%	4.5
TOTAL	**36,212**	**173,505**	**100%**	**100%**	**4.8**

Source: Author's calculations based on the ENA agricultural survey of 2005. (1) *Sampled Farm Parts* (SFPs) in which the agricultural area is less than or equal to one local *Family Agricultural Unit UAF*, the number of animals is equal to or lower than the limit for small-scale producers defined by the CCI, and the fish farm area is less than five hectares.

It may be seen in table 32 that 100% of the cultivated area of the small-scale productive units classified in the category of *full impact* is in crops that would be affected by the FTA, with 50% of this area in rice, 28% in maize, 8% in beans, 4% in onions, 3% in wheat, and 3% in peas, among others. In the units subject to full impact, 92% of the livestock are poultry, and 8% are pigs.

In the small-scale productive units classified in the category of *high impact*, short-cycle crops account for 95% of the area cultivated, 45% is in maize, 14% in beans, 13% in rice, 3% in wheat, 3% in peas, and 2% in onions, among the principal crops. In terms of livestock, 54% are poultry, 21% are smaller species, 19% are cattle, and 6% are pigs. (Table 32)

As regards the small-scale production units classified in the *moderate impact* category, short-cycle crops account for 84% of the area cultivated, 34% is in maize, 11% in cotton, 10% in cassava, 6% in potatoes, and 5% is in beans, among the principal crops. In terms of livestock, 35% are poultry, 31% cattle, 30% smaller species and 4% pigs. (Table 32)

In the small-scale productive units classified in the *low impact* category, short-cycle crops lose importance and account for only 16% of the total area cultivated, being fundamentally potatoes and cassava. In these units, among the most important main crops are coffee (45%), plantains (21%), and sugar cane for brown sugarloaf (10%). As for livestock, 49% are poultry, 25% cattle, 21% smaller species, and 4% pigs. (Table 32)

Finally, in the units that would not suffer an impact from the FTA, only 15% of the area is in short-cycle crops, basically potatoes and cassava. Coffee is the main permanent crop (45%), followed by plantain (21%), sugar cane for brown sugarloaf (8%) and cocoa (4%). As for livestock, 74% are cattle and 26% are smaller species. (Table 32)

Table 32. *Distribution of the Area Cultivated and Livestock Species, by Categories of Impact from the FTA - Small Farm Economy Units - 2005*[1]

ACTIVITY	FULL IMPACT	HIGH IMPACT	MODERATE IMPACT	LOW IMPACT	NO IMPACT
Short-Cycle Crops	**100%**	**95%**	**84%**	**16%**	**15%**
Cotton	0%	6%	11%	1%	0%
Rice total	50%	13%	3%	1%	0%
Peas	3%	3%	3%	1%	0%
Barley	1%	1%	0%	0%	0%
Onions	1%	1%	1%	0%	0%
Scallions	3%	2%	2%	0%	0%
Beans	8%	14%	5%	1%	0%
Broad Beans	0%	0%	1%	0%	0%
Other Vegetables	0%	1%	1%	1%	1%
Maize total	28%	45%	34%	3%	0%
Potatoes total	0%	1%	6%	4%	9%
Sorghum	2%	1%	2%	0%	0%
Soybeans	2%	0%	0%	0%	0%
Tobacco total	0%	1%	3%	1%	1%
Tomatoes	1%	1%	1%	0%	0%
Wheat	3%	3%	1%	0%	0%
Cassava	0%	3%	10%	3%	3%
Carrots	0%	0%	1%	0%	0%
Permanent Crops	**0%**	**5%**	**16%**	**84%**	**85%**
Avocado	0%	0%	0%	0%	0%
Banana	0%	0%	1%	3%	2%
Export banana	0%	0%	0%	0%	0%
Cocoa	0%	1%	1%	5%	4%
Coffee	0%	1%	7%	45%	45%
Sugar cane	0%	0%	0%	0%	0%
Sugar cane	0%	0%	3%	10%	8%
Guava	0%	0%	0%	0%	0%
Oil Palm	0%	0%	0%	0%	0%
Mango	0%	0%	0%	1%	2%
Oranges	0%	0%	0%	1%	1%
Papaya	0%	0%	0%	0%	0%
Plantain	0%	2%	3%	21%	21%
TOTAL AREA CULTIVATED	**100%**	**100%**	**100%**	**100%**	**100%**
Cattle	0%	19%	31%	25%	74%
Poultry	92%	54%	35%	49%	0%
Pigs	8%	6%	4%	4%	0%
Smaller species	0%	21%	30%	21%	26%
TOTAL LIVESTOCK	**100%**	**100%**	**100%**	**100%**	**100%**

Source: Author's calculations based on the ENA agricultural survey of 2005. (1) *Sampled Farm Parts* in which the agricultural area is less than or equal to one local *Family Agricultural Unit* UAF, the number of animals is equal to or lower than the limit for small-scale producers defined by the CCI, and the fish farm area is less than five hectares.

C. RESULTS OF THE IMPACT OF THE FTA ON THE SMALL FARM ECONOMY

1. Effects on Net Income and Producer Surplus

i) Total Small-Scale Producers

An estimate of the agricultural income and expenditure structure of small-scale producers found that their gross income amounted to 8.1 billion COP (3.5 billion USD) in the year 2005. The producer surplus or added value generated by this productive system was around 4.9 billion COP (2.1 billion USD), equivalent to 61% of their gross income, while the profit or net income amounted to 2.2 billion COP (1.0 billion USD), or 27% of the total income. (Table 33)

Short-cycle crops contributed 28% of total income from agriculture, 34% of net income and 28% of producer surplus. Permanent crops provided 42% of total income, 49% of net income and 51% of producer surplus, while livestock activities accounted for 31% of total income, 16% of net income and 21% of producer surplus.

On introducing the changes in domestic prices, areas cultivated and production that would result with the tariff phase-out of the FTA in a scenario of average prices and exchange rates, it is found that the total agricultural income of small-scale productive units would fall by 0.82 billion COP (0.36 billion USD), a drop of 10% in relative terms. Likewise, the producer surplus would fall by 0.51 billion COP (0.22 billion USD), a reduction of 10%, and the net income would fall by 0.36 billion COP (0.16 billion USD), or 16% less than without the FTA. (Table 34)

It is also seen that, for practically all activities that compete with imports, the net income or profit would decrease to zero (it may be negative, but the minimum value used in the calculations is zero, so as to avoid overestimates of the impact). This would occur in the cases of rice (mechanized production), barley, beans, maize (mechanized production), sorghum, wheat, chicken, and pork. This means that the price would decrease to levels lower than the average costs and would not provide profit or remunerate the farmer's own labor. In this situation, if it is not possible to reduce fixed costs, such as those of land or capital (financing), small-scale producers may choose to abandon the above activities, and, in cases where viable productive alternatives are not found, the impact may be greater than that estimated.

Table 33. *Income of Small-Scale Producers - Without FTA - 2005* [1]

CROP	SUPPLY [2]		UNIT COSTS [3]			INCOME & VALUE ADDED WITHOUT FTA			
	Area Cultivated (ha)	Production (t)	Labor Cost (COP/t)	Variable Costs (COP/t)	Total Cost (COP/t)	Sale Price (COP/t)	Gross Income (m COP)	Net Income (m COP)	Producer Surplus (m COP)
	a	b	c	d	e	f	g = f*b	h = g -e*b+c*b/3	i = g - d*b
Short-Cycle Crops	**654,541**	**3,731,511**	**N.A.**	**N.A.**	**N.A.**	**N.A.**	**2,235,101**	**761,151**	**1,378,160**
Cotton	33,386	67,685	420,995	509,405	1,113,949	1,203,762	81,477	15,577	46,998
Rice total	126,329	734,399	N.A.	N.A.	N.A.	N.A.	415,559	73,295	187,633
Rice mechanized	*124,696*	*725,902*	*55,690*	*312,318*	*485,121*	*565,849*	*410,751*	*72,075*	*184,038*
Rice manual	*1,633*	*8,498*	*318,747*	*142,828*	*528,534*	*565,849*	*4,808*	*1,220*	*3,595*
Peas [4]	20,062	48,754	N.D.	N.D.	N.D.	1,706,488	83,198	39,949	63,874
Barley [5]	4,455	7,199	92,673	300,054	578,711	578,711	4,166	222	2,006
Onions	8,498	163,566	161,572	178,461	393,580	721,218	117,967	62,400	88,777
Scallions [6]	11,926	395,995	N.D.	N.D.	N.D.	N.D.	165,563	87,576	124,595
Beans	52,372	59,098	593,354	619,972	1,585,332	2,669,253	157,749	75,747	121,109
Broad Beans [4]	4,103	15,925	N.D.	N.D.	N.D.	826,958	13,169	6,323	10,110
Other vegetables [7]	14,637	N.D.	N.D.	N.D.	N.D.	N.D.	46,700	14,847	27,918
Maize total	207,222	524,232	N.A.	N.A.	N.A.	N.A.	261,774	94,695	176,865
Maize yellow mechanized	*38,113*	*183,055*	*67,619*	*238,795*	*386,942*	*478,478*	*87,588*	*20,882*	*43,875*
Maize yellow traditional	*99,637*	*136,547*	*180,911*	*80,435*	*329,348*	*478,478*	*65,335*	*28,597*	*54,351*
Maize white mechanized	*32,379*	*148,459*	*100,072*	*173,079*	*360,205*	*531,945*	*78,972*	*30,449*	*53,277*
Maize white traditional	*37,093*	*56,170*	*180,911*	*80,435*	*329,348*	*531,945*	*29,880*	*14,767*	*25,361*
Potatoes total	68,173	1,035,911	129,908	265,724	452,151	520,984	539,693	116,163	264,426
Sorghum	8,571	28,103	68,083	207,723	338,145	444,984	12,505	3,640	6,668
Soybeans	3,486	7,578	62,357	570,251	786,804	828,010	6,275	470	1,953
Tobacco total	12,789	23,289	N.A.	N.A.	N.A.	N.A.	112,298	54,703	89,174
Dark tobacco	*3,242*	*5,232*	*2,247,131*	*698,021*	*3,265,402*	*4,822,000*	*25,227*	*12,062*	*21,575*
Virginia tobacco	*9,547*	*18,057*	*1,486,918*	*1,078,383*	*2,956,180*	*4,822,000*	*87,071*	*42,641*	*67,598*
Tomatoes [7]	4,242	90,403	N.D.	N.D.	N.D.	N.D.	13,535	4,303	8,092
Wheat	15,669	28,918	149,327	282,978	564,765	564,765	16,332	1,439	8,149
Cassava	54,324	400,457	88,378	79,450	199,250	433,099	173,437	105,443	141,621
Carrots [7]	4,295	100,000	N.D.	N.D.	N.D.	N.D.	13,704	4,357	8,193

CROP	SUPPLY [2]		UNIT COSTS [3]			INCOME & VALUE ADDED WITHOUT FTA			
	Area Cultivated (ha)	Production (t)	Labor Cost (COP/t)	Variable Costs (COP/t)	Total Cost (COP/t)	Sale Price (COP/t)	Gross Income (m COP)	Net Income (m COP)	Producer Surplus (m COP)
	a	b	c	d	e	f	g = f*b	h = g -e*b+c*b/3	i = g - d*b
Permanent Crops	**938,843**	**7,519,991**	**N.A.**	**N.A.**	**N.A.**	**N.A.**	**3,362,549**	**1,095,364**	**2,508,848**
Other Fruits [8]	22,939	N.D.	N.D.	N.D.	N.D.	N.D.	82,157	26,763	61,299
Banana [5]	29,829	153,686	407,357	176,581	665,273	665,273	102,243	20,868	75,105
Cocoa	56,078	25,203	1,706,045	1,196,103	3,407,411	3,704,867	93,373	21,829	63,228
Coffee [5]	493,177	441,938	2,279,287	1,077,252	3,974,327	3,974,327	1,756,404	335,768	1,280,326
Sugar cane for brown sugarloaf [8]	104,355	5,070,252	N.D.	N.D.	N.D.	N.D.	373,758	121,753	278,866
Plantain	232,465	1,828,913	75,527	111,864	236,356	521.957	954,614	568,383	750,024
SUBTOTAL CROPS	**1,593,384**	**11,251,501**				**N.A.**	**5,597,649**	**1,856,514**	**3,887,008**
LIVESTOCK ACTIVITY	**No of Animals**	**Production (Units)**	**Labor Cost (COP/t)**	**Variable Costs (COP/t)**	**Total Cost (COP/t)**	**Sale Price (COP/t)**	**Gross Income (m COP)**	**Net Income (m COP)**	**Producer Surplus (m COP)**
	a	b	c	d	e	f	g = f*b	h = g -e*b+c*b/3	i = g - d*b
Cattle	**2,327,882**						**1,817,474**	**301,818**	**877,996**
Meat cattle (carcass/t)	*851,521*	*196,599*	*761,954*	*2,914,021*	*3,992,240*	*4,329,993*	*851,274*	*116,335*	*278,379*
Milk or double purpose cows (m/l)	*1,476,361*	*1,704,298*	*196,541*	*215,093*	*523,601*	*566,920*	*966,200*	*185,483*	*599,617*
Poultry	***31,962,135***						**455,384**	**50,478**	**100,755**
Laying hens (m eggs)	*3,196,213*	*862,978*	*1,671*	*175,722*	*196,153*	*207,000*	*178,636*	*9,841*	*26,992*
Chickens (carcass/t)	*28,765,921*	*77,265*	*205,023*	*2,627,119*	*3,124,191*	*3,581,786*	*276,748*	*40,637*	*73,763*
Pigs (carcass/t)	604,769	45,648	465,931	3,896,015	4,812,051	4,951,445	226,023	13,453	48,178
SUBTOTAL LIVESTOCK						**N.A.**	**2,498,881**	**365,749**	**1,026,929**
TOTAL AGRICULTURAL (m COP)						**N.A.**	**8,096,531**	**2,222,263**	**4,913,937**
TOTAL AGRICULTURAL (m USD) [9]						*N.A.*	*3,487*	*957*	*2,117*

Source: Author's calculations based on the *ENA* agricultural survey of 2005. (m = million, t = ton) (1) *Sampled Farm Parts* in which the agricultural area is less than or equal to one local *Family Agricultural Unit (UAF)*, the number of animals is equal to or lower than the limit for small-scale producers defined by the *CCI*, and the fish farm area is less than five hectares. (2) Results of the *ENA* agricultural survey expanded to national level. (3) Production costs *CCI* 2007. For beans and barley the costs used were taken from Maldonado et al. (2007). (4) The net income and surplus percentage (with regard to the gross income) was assumed to be the same as that calculated for beans. (5) Given that the available market price was lower than the unit cost, the price was assumed to be equal to the unit cost. (6) The gross and net incomes, and surplus per hectare was assumed to be the same as that calculated for onions. (7) The gross and net incomes, and surplus per hectare was assumed to be the same as that calculated for other short-cycle crops. (8) The gross and net incomes, and surplus per hectare was assumed to be the same as that calculated for other permanent crops. (9) At the Colombian representative market exchange rate (*Tasa Representativa del Mercado TRM*).

Table 34. *Income of Small-Scale Producers - With FTA - Scenario of Average Prices and Exchange Rates - 2005* [1]

CROP	SUPPLY [2]		UNIT COSTS[3]			INCOME & VALUE ADDED WITHOUT FTA			
	Area Cultivated (ha)	Production (t)	Labor Cost (COP/t)	Variable Costs (COP/t)	Total Cost (COP/t)	Sale Price (COP/t)	Gross Income (m COP)	Net Income (m COP)	Producer Surplus (m COP)
	a	b	c	d	e	f	g = f*b	h = g -e*b+c*b/3	i = g - d*b
Short-Cycle Crops	**550,029**	**3,430,305**	**N.A.**	**N.A.**	**N.A.**	**N.A.**	**1,746,809**	**456,350**	**976,018**
Cotton	33,386	67,685	420,995	509,405	1,113,949	1,203,762	81,477	15,577	46,998
Rice total	102,350	596,289	N.A.	N.A.	N.A.	N.A.	269,606	206	84,544
Rice mechanized	*101,026*	*589,389*	*55,690*	*312,318*	*485,121*	*452,140*	*266,486*	*0*	*82,409*
Rice manual	*1,323*	*6,899*	*318,747*	*142,828*	*528,534*	*452,140*	*3,120*	*206*	*2,134*
Peas [4]	20,062	48,754	N.D.	N.D.	N.D.	1,450,515	70,718	27,470	51,394
Barley [5]	4,455	7,199	92,673	300,054	578,711	491,904	3,541	0	1,381
Onions	8,498	163,566	161,572	178,461	393,580	613,035	100,272	44,705	71,082
Scallions [6]	11,926	395,995	N.D.	N.D.	N.D.	N.D.	140,728	62,742	99,761
Beans	34,675	27,354	593,354	619,972	1,585,332	1,196,789	32,737	0	15,778
Broad Beans [4]	4,103	15,925	N.D.	N.D.	N.D.	826,958	13,169	6,323	10,110
Other vegetables [7]	14,637	N.D.	N.D.	N.D.	N.D.	N.D.	46,700	14,847	27,918
Maize total	159,819	418,795	N.A.	N.A.	N.A.	N.A.	122,503	3,127	54,757
Maize yellow mechanized	*29,065*	*144,145*	*67,619*	*238,795*	*386,942*	*280,212*	*40,391*	*0*	*5,970*
Maize yellow traditional	*75,983*	*107,522*	*180,911*	*80,435*	*329,348*	*280,212*	*30,129*	*1,201*	*21,481*
Maize white mechanized	*25,528*	*121,251*	*100,072*	*173,079*	*360,205*	*311,035*	*37,713*	*0*	*16,727*
Maize white traditional	*29,244*	*45,876*	*180,911*	*80,435*	*329,348*	*311,035*	*14,269*	*1,926*	*10,579*
Potatoes total	68,173	1,035,911	129,908	265,724	452,151	520,984	539,693	116,163	264,426
Sorghum	5,168	16,276	68,083	207,723	338,145	260,598	4,241	0	861
Soybeans	3,486	7,578	62,357	570,251	786,804	828,010	6,275	470	1,953
Tobacco total	12,789	23,289	N.A.	N.A.	N.A.	N.A.	112,298	54,703	89,174
Dark tobacco	*3,242*	*5,232*	*2,247,131*	*698,021*	*3,265,402*	*4,822,000*	*25,227*	*12,062*	*21,575*
Virginia tobacco	*9,547*	*18,057*	*1,486,918*	*1,078,383*	*2,956,180*	*4,822,000*	*87,071*	*42,641*	*67,598*
Tomatoes [7]	4,242	90,403	N.D.	N.D.	N.D.	N.D.	11,505	2,273	6,061
Wheat	3,640	14,831	149,327	282,978	564,765	422,069	6,260	0	2,063
Cassava	54,324	400,457	88,378	79,450	199,250	433,099	173,437	105,443	141,621
Carrots [7]	4,295	100,000	N.D.	N.D.	N.D.	N.D.	11,649	2,301	6,137

CROP	SUPPLY [2]		UNIT COSTS[3]			INCOME & VALUE ADDED WITHOUT FTA			
	Area Cultivated (ha)	Production (t)	Labor Cost (COP/t)	Variable Costs (COP/t)	Total Cost (COP/t)	Sale Price (COP/t)	Gross Income (m COP)	Net Income (m COP)	Producer Surplus (m COP)
	a	b	c	d	e	f	g = f*b	h = g -e*b+c*b/3	i = g - d*b
Permanent Crops	**938,843**	**7,519,991**	**N.A.**	**N.A.**	**N.A.**	**N.A.**	**3,362,549**	**1,095,364**	**2,508,848**
Other Fruits [8]	22,939	N.D.	N.D.	N.D.	N.D.	N.D.	82,157	26,763	61,299
Banana [5]	29,829	153,686	407,357	176,581	665,273	665,273	102,243	20,868	75,105
Cocoa	56,078	25,203	1,706,045	1,196,103	3,407,411	3,704,867	93,373	21,829	63,228
Coffee [5]	493,177	441,938	2,279,287	1,077,252	3,974,327	3,974,327	1,756,404	335,768	1,280,326
Sugar cane for brown sugarloaf [8]	104,355	5,070,252	N.D.	N.D.	N.D.	N.D.	373,758	121,753	278,866
Plantain	232,465	1,828,913	75,527	111,864	236,356	521,957	954,614	568,383	750,024
SUBTOTAL CROPS	**1,488,872**	**10,950,296**				**N.A.**	**5,109,358**	**1,551,713**	**3,484,866**
LIVESTOCK ACTIVITY	**No of Animals**	**Production (Units)**	**Labor Cost (COP/t)**	**Variable Costs (COP/t)**	**Total Cost (COP/t)**	**Sale Price**	**Gross Income (m COP)**	**Net Income (m COP)**	**Producer Surplus (m COP)**
	a	b	c	d	e	f	g = f*b	h = g -e*b+c*b/3	i = g - d*b
Cattle	**2,327,882**						**1,817,474**	**301,818**	**877,996**
Meat cattle (carcass/t)	*851,521*	*196,599*	*761,954*	*2,914,021*	*3,992,240*	*4,329,993*	*851,274*	*116,335*	*278,379*
Milk or double purpose cows (m/l)	*1,476,361*	*1,704,298*	*196,541*	*215,093*	*523,601*	*566,920*	*966,200*	*185,483*	*599,617*
Poultry	***31,962,135***						**266,920**	**9,841**	**26,992**
Laying hens (m/eggs)	*3,196,213*	*862,978*	*1,671*	*175,722*	*196,153*	*207,000*	*178,636*	*9,841*	*26,992*
Chickens (carcass/t)	*18,608,044*	*49,981*	*205,023*	*1,860,424*	*2,356,033*	*1,766,333*	*88,283*	*0*	*0*
Pigs (carcass/t)	293,504	22,154	465,931	*2,965,971*	*3,882,049*	3,562,375	78,920	0	13,213
SUBTOTAL LIVESTOCK						**N.A.**	**2,163,314**	**311,659**	**918,201**
TOTAL AGRICULTURAL (m COP)						**N.A.**	**7,272,671**	**1,863,373**	**4,403,067**
TOTAL AGRICULTURAL (m USD) [9]						*N.A.*	*3,133*	*803*	*1,897*

Source: Author's calculations based on the *ENA* agricultural survey of 2005. (m = million, t = ton) (1) *Sampled Farm Parts* in which the agricultural area is less than or equal to one local *Family Agricultural Unit (UAF)*, the number of animals is equal to or lower than the limit for small-scale producers defined by the *CCI*, and the fish farm area is less than five hectares. (2) Results of the *ENA* agricultural survey expanded to national level. (3) Production costs *CCI* 2007. For beans and barley the costs used were taken from Maldonado et al. (2007). (4) The net income and surplus percentage (with regard to the gross income) was assumed to be the same as that calculated for beans. (5) Given that the available market price was lower than the unit cost, the price was assumed to be equal to the unit cost. (6) The gross and net incomes, and surplus per hectare was assumed to be the same as that calculated for onions. (7) The gross and net incomes, and surplus per hectare was assumed to be the same as that calculated for other short-cycle crops. (8) The gross and net incomes, and surplus per hectare was assumed to be the same as that calculated for other permanent crops. (9) At the Colombian representative market exchange rate (*Tasa Representativa del Mercado TRM*).

ii) Producers Subject to Full Impact

An estimate of income and expenditure found that the gross income of small-scale producers in the category of full impact from the FTA in the year 2005 was 0.67 billion COP (0.29 billion USD). Their producer surplus or value added was around 0.35 billion COP (0.15 billion USD), equivalent to 53% of gross income, while profit or net income amounted to 0.18 billion COP (0.08 billion USD), 27% of total income. (Table 35)

For producers in the full impact category, short-cycle crops accounted for 86% of the total income from farming, 95% of net income and 94% of producer surplus. Livestock activities added 14%, 5% and 6% respectively.

Changes in domestic prices, areas cultivated and production obtained as a result of the tariff phase out agreed in the FTA were introduced for a scenario of average prices and exchange rates. The total agricultural income generated by small-scale productive units subject to full impact would fall by 0.25 billion COP (0.11 billion USD), a change equivalent to 37% in comparison to the value without the FTA. Likewise, the producer surplus would decrease by 0.18 billion COP (0.08 billion USD), or 50% in relative terms, and gross income would fall by 0.13 billion COP (0.06 billion USD), 70% in relative terms. (Table 36)

Table 35. *Income of Small-Scale Producers Subject to Full Impact - Without the FTA - 2005*[1]

CROP	SUPPLY [2]		UNIT COSTS[3]			INCOME & VALUE ADDED WITHOUT FTA			
	Area Cultivated (ha)	Production (t)	Labor Cost (COP/t)	Variable Costs (COP/t)	Total Cost (COP/t)	Sale Price (COP/t)	Gross Income (m COP)	Net Income (m COP)	Producer Surplus (m COP)
	a	b	c	d	e	f	g = f*b	h = g -e*b+c*b/3	i = g - d*b
Short-Cycle Crops	**138,389**	**695,743**	**N.A.**	**N.A.**	**N.A.**	**N.A.**	**577,957**	**172,667**	**329,591**
Cotton	0	0	420,995	509,405	1,113,949	1,203,762	0	0	0
Rice total	41,518	240,929	N.A.	N.A.	N.A.	N.A.	312,875	55,022	140,650
Rice mechanized	*94,511*	*550,185*	*55,690*	*312,318*	*485,121*	*565,849*	*311,321*	*54,628*	*139,489*
Rice manual	*528*	*2,745*	*318,747*	*142,828*	*528,534*	*565,849*	*1,553*	*394*	*1,161*
Peas [4]	5,508	13,385	N.D.	N.D.	N.D.	1,706,488	22,842	10,968	17,536
Barley [5]	1,644	2,656	92,673	300,054	578,711	578,711	1,537	82	740
Onions	2,824	54,360	161,572	178,461	393,580	721,218	39,206	20,738	29,504
Scallions [6]	5,322	176,700	N.D.	N.D.	N.D.	N.D.	73,877	39,078	55,597
Beans	14,530	16,396	593,354	619,972	1,585,332	2,669,253	43,766	21,015	33,601
Broad Beans [4]	0	0	N.D.	N.D.	N.D.	826,958	0	0	0
Other vegetables [7]	0	N.D.	N.D.	N.D.	N.D.	N.D.	0	0	0
Maize total	53,122	126,396	N.A.	N.A.	N.A.	N.A.	62,222	21,844	41,527
Maize yellow mechanized	*11,910*	*57,202*	*67,619*	*238,795*	*386,942*	*478,478*	*27,370*	*6,525*	*13,710*
Maize yellow traditional	*26,684*	*36,569*	*180,911*	*80,435*	*329,348*	*478,478*	*17,497*	*7,659*	*14,556*
Maize white mechanized	*3,460*	*15,865*	*100,072*	*173,079*	*360,205*	*531,945*	*8,440*	*3,254*	*5,694*
Maize white traditional	*11,068*	*16,760*	*180,911*	*80,435*	*329,348*	*531,945*	*8,915*	*4,406*	*7,567*
Potatoes total	0	0	129,908	265,724	452,151	520,984	0	0	0
Sorghum	2,887	9,466	68,083	207,723	338,145	444,984	4,212	1,226	2,246
Soybeans	3,054	6,638	62,357	570,251	786,804	828,010	5,496	411	1,711
Tobacco total	0	0	N.A.	N.A.	N.A.	N.A.	0	0	0
Dark tobacco	*0*	*0*	*2,247,131*	*698,021*	*3,265,402*	*4,822,000*	*0*	*0*	*0*
Virginia tobacco	*0*	*0*	*1,486,918*	*1,078,383*	*2,956,180*	*4,822,000*	*0*	*0*	*0*
Tomatoes [7]	963	20,519	N.D.	N.D.	N.D.	N.D.	3,072	977	1,837
Wheat	6,301	11,629	149,327	282,978	564,765	564.765	6,568	579	3,277
Cassava	0	0	88,378	79,450	199,250	433.099	0	0	0
Carrots [7]	716	16,668	N.D.	N.D.	N.D.	N.D.	2,284	726	1,366

CROP	SUPPLY [2]		UNIT COSTS[3]			INCOME & VALUE ADDED WITHOUT FTA			
	Area Cultivated (ha)	Production (t)	Labor Cost (COP/t)	Variable Costs (COP/t)	Total Cost (COP/t)	Sale Price (COP/t)	Gross Income (m COP)	Net Income (m COP)	Producer Surplus (m COP)
	a	b	c	d	e	f	g = f*b	h = g -e*b+c*b/3	i = g - d*b
Permanent Crops	**0**	**0**	**N.A.**	**N.A.**	**N.A.**	**N.A.**	**0**	**0**	**0**
Other Fruits [8]	0	N.D.	N.D.	N.D.	N.D.	N.D.	0	0	0
Banana [5]	0	0	407,357	176,581	665,273	665,273	0	0	0
Cocoa	0	0	1,706,045	1,196,103	3,407,411	3,704,867	0	0	0
Coffee [5]	0	0	2,279,287	1,077,252	3,974,327	3,974,327	0	0	0
Sugar cane for brown sugarloaf [8]	0	0	N.D.	N.D.	N.D.	N.D.	0	0	0
Plantain	0	0	75,527	111,864	236,356	521,957	0	0	0
SUBTOTAL CROPS	**138,389**	**695,743**				**N.A.**	**577,957**	**172,667**	**329,591**
LIVESTOCK ACTIVITY	**No of Animals**	**Production (Units)**	**Labor Cost (COP/t)**	**Variable Costs (COP/t)**	**Total Cost (COP/t)**	**Sale Price (COP/t)**	**Gross Income (m COP)**	**Net Income (m COP)**	**Producer Surplus (m COP)**
	a	b	c	d	e	f	g = f*b	h = g -e*b+c*b/3	i = g - d*b
Cattle	**0**						**0**	**0**	**0**
Meat cattle (carcass/t)	*0*	*0*	*761,954*	*2,914,021*	*3,992,240*	*4,329,993*	*0*	*0*	*0*
Milk or double purpose cows (m/l)	*0*	*0*	*196,541*	*215,093*	*523,601*	*566,920*	*0*	*0*	*0*
Poultry	***4,495,608***						**64,052**	**7,100**	**14,172**
Laying hens (m/eggs)	*449,561*	*121,381*	*1,671*	*175,722*	*196,153*	*207,000*	*25,126*	*1,384*	*3,797*
Chickens (carcass/t)	*4,046,047*	*10,868*	*205,023*	*2,627,119*	*3,124,191*	*3,581,786*	*38,926*	*5,716*	*10,375*
Pigs (carcass/t)	75,215	5,677	465,931	3,896,015	4,812,051	4,951,445	28,111	1,673	5,992
SUBTOTAL LIVESTOCK						**N.A.**	**92,162**	**8,773**	**20,164**
TOTAL AGRICULTURAL (m COP)						**N.A.**	**670,119**	**181,440**	**349,755**
TOTAL AGRICULTURAL (m USD) [9]						*N.A.*	*289*	*78*	*151*

Source: Author's calculations based on the *ENA* agricultural survey of 2005. (m = million, t = ton) (1) *Sampled Farm Parts* in which the agricultural area is less than or equal to one local *Family Agricultural Unit (UAF)*, the number of animals is equal to or lower than the limit for small-scale producers defined by the *CCI*, and the fish farm area is less than five hectares. (2) Results of the *ENA* agricultural survey expanded to national level. (3) Production costs *CCI* 2007. For beans and barley the costs used were taken from Maldonado et al (2007). (4) The net income and surplus percentage (with regard to the gross income) was assumed to be the same as that calculated for beans. (5) Given that the available market price was lower than the unit cost, the price was assumed to be equal to the unit cost. (6) The gross and net incomes, and surplus per hectare was assumed to be the same as that calculated for onions. (7) The gross and net incomes, and surplus per hectare was assumed to be the same as that calculated for other short-cycle crops. (8) The gross and net incomes, and surplus per hectare was assumed to be the same as that calculated for other permanent crops. (9) At the Colombian representative market exchange rate (*Tasa Representativa del Mercado TRM*).

Table 36. *Income of Small-Scale Producers Subject to Full Impact - With FTA - Scenario of Average Prices and Exchange Rates - 2005*[1]

CROP	SUPPLY [2]		UNIT COSTS[3]			INCOME & VALUE ADDED WITHOUT FTA			
	Area Cultivated (ha)	Production (t)	Labor Cost (COP/t)	Variable Costs (COP/t)	Total Cost (COP/t)	Sale Price (COP/t)	Gross Income (m COP)	Net Income (m COP)	Producer Surplus (m COP)
	a	b	c	d	e	f	g = f*b	h = g -e*b+c*b/3	i = g - d*b
Short-Cycle Crops	**150,739**	**859,393**	**N.A.**	**N.A.**	**N.A.**	**N.A.**	**371,885**	**52,669**	**168,078**
Cotton	0	0	420,995	509,405	1,113,949	1,203,762	0	0	0
Rice total	76,999	448,946	N.A.	N.A.	N.A.	N.A.	202,986	67	63,150
Rice mechanized	*76,571*	*446,717*	*55,690*	*312,318*	*485,121*	*452,140*	*201,979*	*0*	*62,461*
Rice manual	*427*	*2,229*	*318,747*	*142,828*	*528,534*	*452,140*	*1,008*	*67*	*689*
Peas [4]	5,508	13,385	N.D.	N.D.	N.D.	1,450,515	19,415	7,542	14,110
Barley [5]	1,644	2,656	92,673	300,054	578,711	491,904	1,306	0	509
Onions	2,824	54,360	161,572	178,461	393,580	613,035	33,325	14,857	23,624
Scallions [6]	5,322	176,700	N.D.	N.D.	N.D.	N.D.	62,795	27,996	44,515
Beans	9,620	7,589	593,354	619,972	1,585,332	1,196,789	9,083	0	4,378
Broad Beans [4]	0	0	N.D.	N.D.	N.D.	826,958	0	0	0
Other vegetables [7]	0	N.D.	N.D.	N.D.	N.D.	N.D.	0	0	0
Maize total	40,885	100,485	N.A.	N.A.	N.A.	N.A.	28,978	896	12,562
Maize yellow mechanized	*9,082*	*45,043*	*67,619*	*238,795*	*386,942*	*280,212*	*12,622*	*0*	*1,866*
Maize yellow traditional	*20,349*	*28,796*	*180,911*	*80,435*	*329,348*	*280,212*	*8,069*	*322*	*5,753*
Maize white mechanized	*2,728*	*12,958*	*100,072*	*173,079*	*360,205*	*311,035*	*4,030*	*0*	*1,788*
Maize white traditional	*8,726*	*13,688*	*180,911*	*80,435*	*329,348*	*311,035*	*4,258*	*575*	*3,157*
Potatoes total	0	0	129,908	265,724	452,151	520,984	0	0	0
Sorghum	1,741	5,482	68,083	207,723	338,145	260,598	1,429	0	290
Soybeans	3,054	6,638	62,357	570,251	786,804	828,010	5,496	411	1,711
Tobacco total	0	0	N.A.	N.A.	N.A.	N.A.	0	0	0
Dark tobacco	*0*	*0*	*2,247,131*	*698,021*	*3,265,402*	*4,822,000*	*0*	*0*	*0*
Virginia tobacco	*0*	*0*	*1,486,918*	*1,078,383*	*2,956,180*	*4,822,000*	*0*	*0*	*0*
Tomatoes [7]	963	20,519	N.D.	N.D.	N.D.	N.D.	2,611	516	1,376
Wheat	1,464	5,965	149,327	282,978	564,765	422,069	2,517	0	830
Cassava	0	0	88,378	79,450	199,250	433,099	0	0	0
Carrots [7]	716	16,668	N.D.	N.D.	N.D.	N.D.	1,942	384	1,023

CROP	SUPPLY [2]		UNIT COSTS[3]			INCOME & VALUE ADDED WITHOUT FTA			
	Area Cultivated (ha)	Production (t)	Labor Cost (COP/t)	Variable Costs (COP/t)	Total Cost (COP/t)	Sale Price (COP/t)	Gross Income (m COP)	Net Income (m COP)	Producer Surplus (m COP)
	a	b	c	d	e	f	g = f*b	h = g -e*b+c*b/3	i = g - d*b
Permanent Crops	**0**	**0**	**N.A.**	**N.A.**	**N.A.**	**N.A.**	**0**	**0**	**0**
Other Fruits[8]	0	N.D.	N.D.	N.D.	N.D.	N.D.	0	0	0
Banana [5]	0	0	407,357	176,581	665,273	665,273	0	0	0
Cocoa	0	0	1,706,045	1,196,103	3,407,411	3,704,867	0	0	0
Coffee [5]	0	0	2,279,287	1,077,252	3,974,327	3,974,327	0	0	0
Sugar cane for brown sugarloaf [8]	0	0	N.D.	N.D.	N.D.	N.D.	0	0	0
Plantain	0	0	75,527	111,864	236,356	521,957	0	0	0
SUBTOTAL CROPS	**150,739**	**859,393**				**N.A.**	**371,885**	**52,669**	**168,078**
LIVESTOCK ACTIVITY	**No of Animals**	**Production (Units)**	**Labor Cost (COP/t)**	**Variable Costs (COP/t)**	**Total Cost (COP/t)**	**Sale Price (COP/t)**	**Gross Income (m COP)**	**Net Income (m COP)**	**Producer Surplus (m COP)**
	a	b	c	d	e	f	g = f*b	h = g -e*b+c*b/3	i = g - d*b
Cattle	**2,327,882**						**0**	**0**	**0**
Meat cattle (carcass/t)	*0*	*0*	*761,954*	*2,914,021*	*3,992,240*	*4,329,993*	*0*	*0*	*0*
Milk or double purpose cows (m/l)	*0*	*0*	*196,541*	*215,093*	*523,601*	*566,920*	*0*	*0*	*0*
Poultry	***31,962,135***						**37,543**	**1,384**	**3,797**
Laying hens (m/eggs)	*449,561*	*121,381*	*1,671*	*175,722*	*196,153*	*207,000*	*25,126*	*1,384*	*3,797*
Chickens (carcass/t)	*2,617,299*	*7,030*	*205,023*	*1,860,424*	*2,356,033*	*1,766,333*	*12,417*	*0*	*0*
Pigs (carcass/t)	36,503	2,755	465,931	*2,965,971*	*3,882,049*	3,562,375	9,815	0	1,643
SUBTOTAL LIVESTOCK						**N.A.**	**47,359**	**1,384**	**5,440**
TOTAL AGRICULTURAL (m COP)						**N.A.**	**419,244**	**54,054**	**173,518**
TOTAL AGRICULTURAL (m USD) [9]						*N.A.*	*181*	*23*	*75*

Source: Author's calculations based on the *ENA* agricultural survey of 2005. (m = million, t = ton) (1) *Sampled Farm Parts* in which the agricultural area is less than or equal to one local *Family Agricultural Unit (UAF)*, the number of animals is equal to or lower than the limit for small-scale producers defined by the *CCI*, and the fish farm area is less than five hectares. (2) Results of the *ENA* agricultural survey expanded to national level. (3) Production costs *CCI* 2007. For beans and barley the costs used were taken from Maldonado et al. (2007). (4) The net income and surplus percentage (with regard to the gross income) was assumed to be the same as that calculated for beans. (5) Given that the available market price was lower than the unit cost, the price was assumed to be equal to the unit cost. (6) The gross and net incomes, and surplus per hectare was assumed to be the same as that calculated for onions. (7) The gross and net incomes, and surplus per hectare was assumed to be the same as that calculated for other short-cycle crops. (8) The gross and net incomes, and surplus per hectare was assumed to be the same as that calculated for other permanent crops. (9) At the Colombian representative market exchange rate (*Tasa Representativa del Mercado TRM*).

iii) Producers Subject to High Impact

An estimate of income and expenditure for small-scale producers in the category of high impact from the FTA found that their gross income in the year 2005 was 0.83 billion COP (0.36 billion USD). The producer surplus or value added generated by these producers was around 0.43 billion COP (0.18 billion USD), equivalent to 51% of gross income, while profit or net income from agricultural activities amounted to 0.21 billion COP (0.09 billion USD), 27% of total income. (Table 37)

In this category of producers, short-cycle crops accounted for 45% of the total income from farming, 67% of net income and 59% of producer surplus. Permanent crops accounted for 3%, 5%, and 5% of these amounts, while livestock activities added 52%, 27% and 36% respectively.

On introducing the changes in domestic prices, areas cultivated and production resulting from FTA tariff phase out in a scenario of average prices and exchange rates, the total agricultural income generated in small-scale productive units subject to high impact would fall by 0.23 billion COP (0.10 billion USD), a change equivalent to 28% in comparison to the value without the FTA. Likewise, the producer surplus would decrease by 0.14 billion COP (0.06 billion USD), or 34% in relative terms, and the net income would fall by 0.10 billion COP (0.04 billion USD), or 49% in relative terms. (Table 38)

Table 37. *Income of Small-Scale Producers Subject to High Impact - Without FTA - 2005*[1]

CROP	SUPPLY [2]		UNIT COSTS [3]			INCOME & VALUE ADDED WITHOUT FTA			
	Area Cultivated (ha)	Production (t)	Labor Cost (COP/t)	Area Cultivated (ha)	Production (t)	Sale Price (COP/t)	Gross Income (m COP)	Net Income (m COP)	Producer Surplus (m COP)
	a	b	c	d	e	f	g = f*b	h = g -e*b+c*b/3	i = g - d*b
Short-Cycle Crops	**184,954**	**809,039**	**N.A.**	**N.A.**	**N.A.**	**N.A.**	**374,739**	**142,525**	**249,957**
Cotton	9,511	19,281	420,995	509,405	1,113,949	1,203,762	23,210	4,438	13,388
Rice total	58,100	338,064	N.A.	N.A.	N.A.	N.A.	65,740	11,710	30,123
Rice mechanized	*19,280*	*112,238*	*55,690*	*312,318*	*485,121*	*565,849*	*63,510*	*11,144*	*28,456*
Rice manual	*758*	*3,942*	*318,747*	*142,828*	*528,534*	*565,849*	*2,231*	*566*	*1,668*
Peas [4]	4,504	10,945	N.D.	N.D.	N.D.	1,706,488	18,677	8,968	14,339
Barley [5]	1,217	1,966	92,673	300,054	578,711	578,711	1,138	61	548
Onions	2,152	41,418	161,572	178,461	393,580	721,218	29,871	15,801	22,480
Scallions [6]	2,711	90,009	N.D.	N.D.	N.D.	N.D.	37,632	19,906	28,320
Beans	21,133	23,847	593,354	619,972	1,585,332	2,669,253	63,655	30,565	48,870
Broad Beans [4]	222	860	N.D.	N.D.	N.D.	826,958	712	342	546
Other vegetables [7]	951	N.D.	N.D.	N.D.	N.D.	N.D.	3,035	965	1,814
Maize total	69,123	164,066	N.A.	N.A.	N.A.	N.A.	82,671	31,623	58,201
Maize yellow mechanized	*7,661*	*36,797*	*67,619*	*238,795*	*386,942*	*478,478*	*17,607*	*4,198*	*8,820*
Maize yellow traditional	*35,967*	*49,291*	*180,911*	*80,435*	*329,348*	*478,478*	*23,585*	*10,323*	*19,620*
Maize white mechanized	*12,822*	*58,787*	*100,072*	*173,079*	*360,205*	*531,945*	*31,272*	*12,057*	*21,097*
Maize white traditional	*12,672*	*19,190*	*180,911*	*80,435*	*329,348*	*531,945*	*10,208*	*5,045*	*8,664*
Potatoes total	1,579	23,992	129,908	265,724	452,151	520,984	12,499	2,690	6,124
Sorghum	1,492	4,893	68,083	207,723	338,145	444,984	2,177	634	1,161
Soybeans	376	818	62,357	570,251	786,804	828,010	677	51	211
Tobacco total	855	1,560	N.A.	N.A.	N.A.	N.A.	7,523	3,666	5,968
Dark tobacco	*208*	*336*	*2,247,131*	*698,021*	*3,265,402*	*4,822,000*	*1,618*	*774*	*1,384*
Virginia tobacco	*647*	*1,225*	*1,486,918*	*1,078,383*	*2,956,180*	*4,822,000*	*5,905*	*2,892*	*4,584*
Tomatoes [7]	1,479	31,517	N.D.	N.D.	N.D.	N.D.	4,719	1,500	2,821
Wheat	4,505	8,314	149,327	282,978	564,765	564,765	4,696	414	2,343
Cassava	4,398	32,417	88,378	79,450	199,250	433,099	14,040	8,536	11,464
Carrots [7]	647	15,071	N.D.	N.D.	N.D.	N.D.	2,065	657	1,235

CROP	SUPPLY [2]		UNIT COSTS [3]			INCOME & VALUE ADDED WITHOUT FTA			
	Area Cultivated (ha)	Production (t)	Labor Cost (COP/t)	Area Cultivated (ha)	Production (t)	Sale Price (COP/t)	Gross Income (m COP)	Net Income (m COP)	Producer Surplus (m COP)
	a	b	c	d	e	f	g = f*b	h = g -e*b+c*b/3	i = g - d*b
Permanent Crops	**7,790**	**53,332**	**N.A.**	**N.A.**	**N.A.**	**N.A.**	**27,021**	**11,323**	**20,428**
Other Fruits[8]	247	N.D.	N.D.	N.D.	N.D.	N.D.	886	289	661
Banana [5]	175	901	407,357	176,581	665,273	665,273	599	122	440
Cocoa	1,363	613	1,706,045	1,196,103	3,407,411	3,704,867	2,270	531	1,537
Coffee [5]	2,095	1,878	2,279,287	1,077,252	3,974,327	3,974,327	7,462	1,427	5,439
Sugar cane for brown sugarloaf [8]	471	22,897	N.D.	N.D.	N.D.	N.D.	1,688	550	1,259
Plantain	3,437	27,044	75,527	111,864	236,356	521,957	14,116	8,404	11,090
SUBTOTAL CROPS	**192,744**	**862,371**				**N.A.**	**401,760**	**153,848**	**270,385**
LIVESTOCK ACTIVITY	**No of Animals**	**Production (Units)**	**Labor Cost (COP/t)**	**Variable Costs (COP/t)**	**Total Cost (COP/t)**	**Sale Price (COP/t)**	**Gross Income (m COP)**	**Net Income (m COP)**	**Producer Surplus (m COP)**
	a	b	c	d	e	f	g = f*b	h = g -e*b+c*b/3	i = g - d*b
Cattle	**308,374**						**242,307**	**40,031**	**115,953**
Meat cattle (carcass/t)	*117,282*	*27,078*	*761,954*	*2,914,021*	*3,992,240*	*4,329,993*	*117,248*	*16,023*	*38,342*
Milk or double purpose cows (m/l)	*191,091*	*220,594*	*196,541*	*215,093*	*523,601*	*566,920*	*125,059*	*24,008*	*77,611*
Poultry	***8,559,837***						**121,957**	**13,519**	**26,983**
Laying hens (m/eggs)	*855,984*	*231,116*	*1,671*	*175,722*	*196,153*	*207,000*	*47,841*	*2,636*	*7,229*
Chickens (carcass/t)	*7,703,853*	*20,693*	*205,023*	*2,627,119*	*3,124,191*	*3,581,786*	*74,116*	*10,883*	*19,754*
Pigs (carcass/t)	174,443	13,167	465,931	3,896,015	4,812,051	4,951,445	65,195	3,880	13,897
SUBTOTAL LIVESTOCK						**N.A.**	**429,460**	**57,430**	**156,833**
TOTAL AGRICULTURAL (m COP)						**N.A.**	**831,220**	**211,277**	**427,218**
TOTAL AGRICULTURAL (m USD) [9]						*N.A.*	*358*	*91*	*184*

Source: Author's calculations based on the *ENA* agricultural survey of 2005. (m = million, t = ton) (1) *Sampled Farm Parts* in which the agricultural area is less than or equal to one local *Family Agricultural Unit (UAF)*, the number of animals is equal to or lower than the limit for small-scale producers defined by the *CCI*, and the fish farm area is less than five hectares. (2) Results of the *ENA* agricultural survey expanded to national level. (3) Production costs *CCI* 2007. For beans and barley the costs used were taken from Maldonado et al. (2007). (4) The net income and surplus percentage (with regard to the gross income) was assumed to be the same as that calculated for beans. (5) Given that the available market price was lower than the unit cost, the price was assumed to be equal to the unit cost. (6) The gross and net incomes, and surplus per hectare was assumed to be the same as that calculated for onions. (7) The gross and net incomes, and surplus per hectare was assumed to be the same as that calculated for other short-cycle crops. (8) The gross and net incomes, and surplus per hectare was assumed to be the same as that calculated for other permanent crops. (9) At the Colombian representative market exchange rate (*Tasa Representativa del Mercado TRM*).

Table 38. *Income of Small-Scale Producers Subject to High Impact - With FTA - Scenario of Average Prices and Exchange Rate - 2005*[1]

CROP	SUPPLY [2]		UNIT COSTS[3]			INCOME & VALUE ADDED WITHOUT FTA			
	Area Cultivated (ha)	Production (t)	Labor Cost (COP/t)	Variable Costs (COP/t)	Total Cost (COP/t)	Sale Price (COP/t)	Gross Income (m COP)	Net Income (m COP)	Producer Surplus (m COP)
	a	b	c	d	e	f	g = f*b	h = g -e*b+c*b/3	i = g - d*b
Short-Cycle Crops	**116,145**	**513,798**	**N.A.**	**N.A.**	**N.A.**	**N.A.**	**238,887**	**54,760**	**135,178**
Cotton	9,511	19,281	420,995	509,405	1,113,949	1,203,762	23,210	4,438	13,388
Rice total	16,234	94,332	N.A.	N.A.	N.A.	N.A.,	42,651	96	13,732
Rice mechanized	*15,621*	*91,131*	*55,690*	*312,318*	*485,121*	*452,140*	*41,204*	*0*	*12,742*
Rice manual	*614*	*3,201*	*318,747*	*142,828*	*528,534*	*452,140*	*1,447*	*96*	*990*
Peas [4]	4,504	10,945	N.D.	N.D.	N.D.	1,450,515	15,875	6,167	11,537
Barley [5]	1,217	1,966	92,673	300,054	578,711	491,904	967	0	377
Onions	2,152	41,418	161,572	178,461	393,580	613,035	25,391	11,320	17,999
Scallions [6]	2,711	90,009	N.D.	N.D.	N.D.	N.D.	31,987	14,261	22,675
Beans	13,992	11,038	593,354	619,972	1,585,332	1,196,789	13,210	0	6,367
Broad Beans [4]	222	860	N.D.	N.D.	N.D.	826,958	712	342	546
Other vegetables [7]	951	N.D.	N.D.	N.D.	N.D.	N.D.	3,035	965	1,814
Maize total	53,371	131,476	N.A.	N.A.	N.A.	N.A.	38,804	1,092	19,192
Maize yellow mechanized	*5,843*	*28,976*	*67,619*	*238,795*	*386,942*	*280,212*	*8,119*	*0*	*1,200*
Maize yellow traditional	*27,429*	*38,814*	*180,911*	*80,435*	*329,348*	*280,212*	*10,876*	*433*	*7,754*
Maize white mechanized	*10,108*	*48,014*	*100,072*	*173,079*	*360,205*	*311,035*	*14,934*	*0*	*6,624*
Maize white traditional	*9,991*	*15,673*	*180,911*	*80,435*	*329,348*	*311,035*	*4,875*	*658*	*3,614*
Potatoes total	1,579	23,992	129,908	265,724	452,151	520,984	12,499	2,690	6,124
Sorghum	900	2,834	68,083	207,723	338,145	260,598	738	0	150
Soybeans	376	818	62,357	570,251	786,804	828,010	677	51	211
Tobacco total	855	1,560	N.A.	N.A.	N.A.	N.A.	7,523	3,666	5,968
Dark tobacco	*208*	*336*	*2,247,131*	*698,021*	*3,265,402*	*4,822,000*	*1,618*	*774*	*1,384*
Virginia tobacco	*647*	*1,225*	*1,486,918*	*1,078,383*	*2,956,180*	*4,822,000*	*5,905*	*2,892*	*4,584*
Tomatoes [7]	1,479	31,517	N.D.	N.D.	N.D.	N.D.	4,011	792	2,113
Wheat	1,046	4,264	149,327	282,978	564,765	422,069	1,800	0	593
Cassava	4,398	32,417	88,378	79,450	199,250	433,099	14,040	8,536	11,464
Carrots [7]	647	15,071	N.D.	N.D.	N.D.	N.D.	1,756	347	925

CROP	SUPPLY [2]		UNIT COSTS[3]			INCOME & VALUE ADDED WITHOUT FTA			
	Area Cultivated (ha)	Production (t)	Labor Cost (COP/t)	Variable Costs (COP/t)	Total Cost (COP/t)	Sale Price (COP/t)	Gross Income (m COP)	Net Income (m COP)	Producer Surplus (m COP)
	a	b	c	d	e	f	g = f*b	h = g -e*b+c*b/3	i = g - d*b
Permanent Crops	**7,790**	**53,332**	**N.A.**	**N.A.**	**N.A.**	**N.A.**	**27,021**	**11,323**	**20,428**
Other Fruits[8]	247	N,D,	N.D.	N.D.	N.D.	N.D.	886	289	661
Banana [5]	175	901	407,357	176,581	665,273	665,273	599	122	440
Cocoa	1,363	613	1,706,045	1,196,103	3,407,411	3,704,867	2,270	531	1,537
Coffee [5]	2,095	1,878	2,279,287	1,077,252	3,974,327	3,974,327	7,462	1,427	5,439
Sugar cane for brown sugarloaf [8]	471	22,897	N.D.	N.D.	N.D.	N.D.	1,688	550	1,259
Plantain	3,437	27,044	75,527	111,864	236,356	521,957	14,116	8,404	11,090
SUBTOTAL CROPS	**123,934**	**567,130**				**N.A.**	**265,909**	**66,083**	**155,606**
LIVESTOCK ACTIVITY	**No of Animals**	**Production (Units)**	**Labor Cost (COP/t)**	**Variable Costs (COP/t)**	**Total Cost (COP/t)**	**Sale Price (COP/t)**	**Gross Income (m COP)**	**Net Income (m COP)**	**Producer Surplus (m COP)**
	a	b	c	d	e	f	g = f*b	h = g -e*b+c*b/3	i = g - d*b
Cattle	**2,327,882**						**242,307**	**40,031**	**115,953**
Meat cattle (carcass/t)	*117,282*	*27,078*	*761,954*	*2,914,021*	*3,992,240*	*4,329,993*	*117,248*	*16,023*	*38,342*
Milk or double purpose cows (m/l)	*191,091*	*220,594*	*196,541*	*215,093*	*523,601*	*566,920*	*125,059*	*24,008*	*77,611*
Poultry	***31,962,135***						**71,484**	**2,636**	**7,229**
Laying hens (m/eggs)	*855,984*	*231,116*	*1,671*	*175,722*	*196,153*	*207,000*	*47,841*	*2,636*	*7,229*
Chickens (carcass/t)	*4,983,454*	*13,386*	*205,023*	*1,860,424*	*2,356,033*	*1,766,333*	*23,643*	*0*	*0*
Pigs (carcass/t)	84,660	6,390	465,931	*2,965,971*	*3,882,049*	3,562,375	22,764	0	3,811
SUBTOTAL LIVESTOCK						**N.A.**	**336,556**	**42,667**	**126,993**
TOTAL AGRICULTURAL (m COP)						**N.A.**	**602,464**	**108,750**	**282,599**
TOTAL AGRICULTURAL (m USD) [9]						*N.A.*	*260*	*47*	*122*

Source: Author's calculations based on the *ENA* agricultural survey of 2005. (m = million, t = ton) (1) *Sampled Farm Parts* in which the agricultural area is less than or equal to one local *Family Agricultural Unit (UAF)*, the number of animals is equal to or lower than the limit for small-scale producers defined by the *CCI*, and the fish farm area is less than five hectares. (2) Results of the *ENA* agricultural survey expanded to national level. (3) Production costs *CCI* 2007. For beans and barley the costs used were taken from Maldonado et al. (2007). (4) The net income and surplus percentage (with regard to the gross income) was assumed to be the same as that calculated for beans. (5) Given that the available market price was lower than the unit cost, the price was assumed to be equal to the unit cost. (6) The gross and net incomes, and surplus/ha. was assumed to be the same as that calculated for onions. (7) The gross and net incomes, and surplus/ha. was assumed to be the same as that calculated for other short-cycle crops. (8) The gross and net incomes, and surplus per hectare was assumed to be the same as that calculated for other permanent crops. (9) At the Colombian representative market exchange rate (*Tasa Representativa del Mercado TRM*).

iv) Producers Subject to Moderate Impact

An estimate of income and expenditure for small-scale producers in the category of moderate impact from the FTA found that their total gross income in the year 2005 was 1.07 billion COP (0.46 billion USD). Their producer surplus or value added was around 0.60 billion COP, (0.26 billion USD), equivalent to 56% of gross income, while profit or net income amounted to 0.29 billion COP (0.12 billion USD), 27% of total income. (Table 39)

As regards the productive structure in the moderate impact category, short-cycle crops accounted for 44% of the total income from farming, 63% of net income and 52% of producer surplus. Permanent crops accounted for 9%, 11%, and 12% of these, while livestock activities added 47%, 26% and 36% respectively.

On introducing the changes that would result in domestic prices, areas cultivated and production obtained through the tariff phase out agreed in the FTA in a scenario of average prices and exchange rates, the total agricultural income generated by small-scale productive units subject to moderate impact would fall by 0.15 billion COP (0.07 billion USD), a change equivalent to 14% in comparison to the value without the FTA. Likewise, the producer surplus would decrease by 0.10 billion COP (0.04 billion USD), or 17% in relative terms, and the net income would fall by 0.07 billion COP (0.03 billion USD), or 25% in relative terms. (Table 40)

Table 39. *Income of Small-Scale Producers Subject to Moderate Impact - Without FTA - 2005*[1]

CROP	SUPPLY [2]		UNIT COSTS [3]			INCOME & VALUE ADDED WITHOUT FTA			
	Area Cultivated (ha)	Production (t)	Labor Cost (COP/t)	Variable Costs (COP/t)	Total Cost (COP/t)	Sale Price (COP/t)	Gross Income (m COP)	Net Income (m COP)	Producer Surplus (m COP)
	a	b	c	d	e	f	g = f*b	h = g -e*b+c*b/3	i = g - d*b
Short-Cycle Crops	**156,592**	**809,421**	**N.A.**	**N.A.**	**N.A.**	**N.A.**	**470,365**	**179,550**	**311,917**
Cotton	18,979	38,476	420,995	509,405	1,113,949	1,203,762	46,317	8,855	26,716
Rice total	13,025	75,777	N.A.	N.A.	N.A.	N.A.	19,322	3,430	8,807
Rice mechanized	*5,714*	*33,265*	*55,690*	*312,318*	*485,121*	*565,849*	*18,823*	*3,303*	*8,434*
Rice manual	*170*	*882*	*318,747*	*142,828*	*528,534*	*565,849*	*499*	*127*	*373*
Peas [4]	5,187	12,604	N.D.	N.D.	N.D.	1,706,488	21,509	10,328	16,513
Barley [5]	278	450	92,673	300,054	578,711	578,711	260	14	125
Onions	1,574	30,302	161,572	178,461	393,580	721,218	21,855	11,560	16,447
Scallions [6]	2,789	92,612	N.D.	N.D.	N.D.	N.D.	38,720	20,481	29,139
Beans	9,624	10,860	593,354	619,972	1,585,332	2,669,253	28,988	13,919	22,255
Broad Beans [4]	1,207	4,685	N.D.	N.D.	N.D.	826,958	3,874	1,860	2,974
Other vegetables [7]	2,249	N.D.	N.D.	N.D.	N.D.	N.D.	7,176	2,281	4,290
Maize total	60,476	177,365	N.A.	N.A.	N.A.	N.A.	89,122	31,333	58,355
Maize yellow mechanized	*13,622*	*65,426*	*67,619*	*238,795*	*386,942*	*478,478*	*31,305*	*7,464*	*15,681*
Maize yellow traditional	*23,593*	*32,332*	*180,911*	*80,435*	*329,348*	*478,478*	*15,470*	*6,771*	*12,870*
Maize white mechanized	*14,453*	*66,268*	*100,072*	*173,079*	*360,205*	*531,945*	*35,251*	*13,591*	*23,781*
Maize white traditional	*8,808*	*13,339*	*180,911*	*80,435*	*329,348*	*531,945*	*7,095*	*3,507*	*6,023*
Potatoes total	10,115	153,700	129,908	265,724	452,151	520,984	80,075	17,235	39,233
Sorghum	3,902	12,793	68,083	207,723	338,145	444,984	5,693	1,657	3,035
Soybeans	0	0	62,357	570,251	786,804	828,010	0	0	0
Tobacco total	4,638	8,503	N.A.	N.A.	N.A.	N.A.	41,001	19,992	32,428
Dark tobacco	*971*	*1,567*	*2,247,131*	*698,021*	*3,265,402*	*4,822,000*	*7,555*	*3,612*	*6,461*
Virginia tobacco	*3,667*	*6,936*	*1,486,918*	*1,078,383*	*2,956,180*	*4,822,000*	*33,447*	*16,380*	*25,967*
Tomatoes [7]	1,042	22,197	N.D.	N.D.	N.D.	N.D.	3,323	1,057	1,987
Wheat	2,572	4,746	149,327	282,978	564,765	564,765	2,681	236	1,337
Cassava	17,378	128,103	88,378	79,450	199,250	433,099	55,481	33,730	45,303
Carrots [7]	1,557	36,247	N.D.	N.D.	N.D.	N.D.	4,967	1,579	2,970

CROP	SUPPLY [2]		UNIT COSTS [3]			INCOME & VALUE ADDED WITHOUT FTA			
	Area Cultivated (ha)	Production (t)	Labor Cost (COP/t)	Variable Costs (COP/t)	Total Cost (COP/t)	Sale Price (COP/t)	Gross Income (m COP)	Net Income (m COP)	Producer Surplus (m COP)
	a	b	c	d	e	f	g = f*b	h = g -e*b+c*b/3	i = g - d*b
Permanent Crops	**28,114**	**330,174**	**N.A.**	**N.A.**	**N.A.**	**N.A.**	**99,613**	**32,285**	**74,276**
Other Fruits[8]	1,061	N.D.	N.D.	N.D.	N.D.	N.D.	3,799	1,238	2,834
Banana [5]	2,146	11,055	407,357	176,581	665,273	665,273	7,355	1,501	5,403
Cocoa	1,903	855	1,706,045	1,196,103	3,407,411	3,704,867	3,169	741	2,146
Coffee [5]	11,664	10,452	2,279,287	1,077,252	3,974,327	3,974,327	41,540	7,941	30,281
Sugar cane for brown sugarloaf [8]	5,368	260,830	N.D.	N.D.	N.D.	N.D.	19,227	6,263	14,346
Plantain	5,971	46,981	75,527	111,864	236,356	521,957	24,522	14,600	19,266
SUBTOTAL CROPS	**184,706**	**1,139,594**				**N.A.**	**569,978**	**211,834**	**386,193**
LIVESTOCK ACTIVITY	**No of Animals**	**Production (Units)**	**Labor Cost (COP/t)**	**Variable Costs (COP/t)**	**Total Cost (COP/t)**	**Sale Price (COP/t)**	**Gross Income (m COP)**	**Net Income (m COP)**	**Producer Surplus (m COP)**
	a	b	c	d	e	f	g = f*b	h = g -e*b+c*b/3	i = g - d*b
Cattle	**497,110**						**384,841**	**64,348**	**188,244**
Meat cattle (carcass/t)	*172,359*	*39,794*	*761,954*	*2,914,021*	*3,992,240*	*4,329,993*	*172,309*	*23,548*	*56,348*
Milk or double purpose cows (m/l)	*324,751*	*374,889*	*196,541*	*215,093*	*523,601*	*566,920*	*212,532*	*40,800*	*131,896*
Poultry	***5,219,371***						**74,364**	**8,243**	**16,453**
Laying hens (m/eggs)	*521,937*	*140,923*	*1,671*	*175,722*	*196,153*	*207,000*	*29,171*	*1,607*	*4,408*
Chickens (carcass/t)	*4,697,434*	*12,617*	*205,023*	*2,627,119*	*3,124,191*	*3,581,786*	*45,192*	*6,636*	*12,045*
Pigs (carcass/t)	106,965	8,074	465,931	3,896,015	4,812,051	4,951,445	39,976	2,379	8,521
SUBTOTAL LIVESTOCK						**N.A.**	**499,181**	**74,970**	**213,218**
TOTAL AGRICULTURAL (m COP)						**N.A.**	**1,069,159**	**286,804**	**599,411**
TOTAL AGRICULTURAL (m USD) [9]						*N.A.*	*461*	*124*	*258*

Source: Author's calculations based on the *ENA* agricultural survey of 2005. (m = million, t = ton) (1) *Sampled Farm Parts* in which the agricultural area is less than or equal to one local *Family Agricultural Unit (UAF)*, the number of animals is equal to or lower than the limit for small-scale producers defined by the *CCI*, and the fish farm area is less than five hectares. (2) Results of the *ENA* agricultural survey expanded to national level. (3) Production costs *CCI* 2007. For beans and barley the costs used were taken from in Maldonado et al. (2007). (4) The net income and surplus percentage (with regard to the gross income) was assumed to be the same as that calculated for beans. (5) Given that the available market price was lower than the unit cost, the price was assumed to be equal to the unit cost. (6) The gross and net incomes, and surplus per hectare was assumed to be the same as that calculated for onions. (7) The gross and net incomes, and surplus per hectare was assumed to be the same as that calculated for other short-cycle crops. (8) The gross and net incomes, and surplus per hectare was assumed to be the same as that calculated for other permanent crops. (9) At the Colombian representative market exchange rate (*Tasa Representativa del Mercado TRM*).

Table 40. *Income of Small-Scale Producers Subject to Moderate Impact - With FTA - Scenario of Average Prices and Exchange Rates - 2005*[1]

CROP	SUPPLY [2]		UNIT COSTS [3]			INCOME & VALUE ADDED WITHOUT FTA			
	Area Cultivated (ha)	Production (t)	Labor Cost (COP/t)	Variable Costs (COP/t)	Total Cost (COP/t)	Sale Price (COP/t)	Gross Income (m COP)	Net Income (m COP)	Producer Surplus (m COP)
	a	b	c	d	e	f	g = f*b	h = g -e*b+c*b/3	i = g - d*b
Short-Cycle Crops	**127,801**	**712,471**	**N.A.**	**N.A.**	**N.A.**	**N.A.**	**374,268**	**116,167**	**229,358**
Cotton	18,979	38,476	420,995	509,405	1,113,949	1,203,762	46,317	8,855	26,716
Rice total	4,767	27,726	N.A.	N.A.	N.A.	N.A.	12,536	21	3,998
Rice mechanized	*4,630*	*27,009*	*55,690*	*312,318*	*485,121*	*452,140*	*12,212*	*0*	*3,776*
Rice manual	*137*	*717*	*318,747*	*142,828*	*528,534*	*452,140*	*324*	*21*	*222*
Peas [4]	5,187	12,604	N.D.	N.D.	N.D.	1,450,515	18,283	7,102	13,287
Barley [5]	278	450	92,673	300,054	578,711	491,904	221	0	86
Onions	1,574	30,302	161,572	178,461	393,580	613,035	18,576	8,282	13,169
Scallions [6]	2,789	92,612	N.D.	N.D.	N.D.	N.D.	32,912	14,673	23,331
Beans	6,372	5,027	593,354	619,972	1,585,332	1,196,789	6,016	0	2,899
Broad Beans [4]	1,207	4,685	N.D.	N.D.	N.D.	826,958	3,874	1,860	2,974
Other vegetables [7]	2,249	N.D.	N.D.	N.D.	N.D.	N.D.	7,176	2,281	4,290
Maize total	46,719	141,996	N.A.	N.A.	N.A.	N.A.	41,793	742	17,199
Maize yellow mechanized	*10,388*	*51,519*	*67,619*	*238,795*	*386,942*	*280,212*	*14,436*	*0*	*2,134*
Maize yellow traditional	*17,992*	*25,460*	*180,911*	*80,435*	*329,348*	*280,212*	*7,134*	*284*	*5,086*
Maize white mechanized	*11,395*	*54,123*	*100,072*	*173,079*	*360,205*	*311,035*	*16,834*	*0*	*7,467*
Maize white traditional	*6,945*	*10,894*	*180,911*	*80,435*	*329,348*	*311,035*	*3,388*	*457*	*2,512*
Potatoes total	10,115	153,700	129,908	265,724	452,151	520,984	80,075	17,235	39,233
Sorghum	2,352	7,409	68,083	207,723	338,145	260,598	1,931	0	392
Soybeans	0	0	62,357	570,251	786,804	828,010	0	0	0
Tobacco total	4,638	8,503	N.A.	N.A.	N.A.	N.A.	41,001	19,992	32,428
Dark tobacco	*971*	*1,567*	*2,247,131*	*698,021*	*3,265,402*	*4,822,000*	*7,555*	*3,612*	*6,461*
Virginia tobacco	*3,667*	*6,936*	*1,486,918*	*1,078,383*	*2,956,180*	*4,822,000*	*33,447*	*16,380*	*25,967*
Tomatoes [7]	1,042	22,197	N.D.	N.D.	N.D.	N.D.	2,825	558	1,488
Wheat	597	2,434	149,327	282,978	564,765	422,069	1,027	0	339
Cassava	17,378	128,103	88,378	79,450	199,250	433,099	55,481	33,730	45,303
Carrots [7]	1,557	36,247	N.D.	N.D.	N.D.	N.D.	4,222	834	2,224

CROP	SUPPLY [2]		UNIT COSTS [3]			INCOME & VALUE ADDED WITHOUT FTA			
	Area Cultivated (ha)	Production (t)	Labor Cost (COP/t)	Variable Costs (COP/t)	Total Cost (COP/t)	Sale Price (COP/t)	Gross Income (m COP)	Net Income (m COP)	Producer Surplus (m COP)
	a	b	c	d	e	f	g = f*b	h = g -e*b+c*b/3	i = g - d*b
Permanent Crops	**28,114**	**330,174**	**N.A.**	**N.A.**	**N.A.**	**N.A.**	**99,613**	**32,285**	**74,276**
Other Fruits[8]	1,061	N.D.	N.D.	N.D.	N.D.	N.D.	3,799	1,238	2,834
Banana [5]	2,146	11,055	407,357	176,581	665,273	665.273	7,355	1,501	5,403
Cocoa	1,903	855	1,706,045	1,196,103	3,407,411	3.704.867	3,169	741	2,146
Coffee [5]	11,664	10,452	2,279,287	1,077,252	3,974,327	3.974.327	41,540	7,941	30,281
Sugar cane for brown sugarloaf [8]	5,368	260,830	N.D.	N.D.	N.D.	N.D.	19,227	6,263	14,346
Plantain	5,971	46,981	75,527	111,864	236,356	521.957	24,522	14,600	19,266
SUBTOTAL CROPS	**155,915**	**1,042,645**				**N.A.**	**473,880**	**148,452**	**303,634**
LIVESTOCK ACTIVITY	**No of Animals**	**Production (Units)**	**Labor Cost (COP/t)**	**Variable Costs (COP/t)**	**Total Cost (COP/t)**	**Price to Producer (COP/t)**	**Gross Income (m COP)**	**Net Income (m COP)**	**Producer Surplus (m COP)**
	a	b	c	d	e	f	g = f*b	h = g -e*b+c*b/3	i = g - d*b
Cattle	**2,327,882**						**384,841**	**64,348**	**188,244**
Meat cattle (carcass/t)	*172,359*	*39,794*	*761,954*	*2,914,021*	*3,992,240*	*4,329,993*	*172,309*	*23,548*	*56,348*
Milk or double purpose cows (m/l)	*324,751*	*374,889*	*196,541*	*215,093*	*523,601*	*566,920*	*212,532*	*40,800*	*131,896*
Poultry	***31,962,135***						**43,588**	**1,607**	**4,408**
Laying hens (m/eggs)	*521,937*	*140,923*	*1,671*	*175,722*	*196,153*	*207,000*	*29,171*	*1,607*	*4,408*
Chickens (carcass/t)	*3,038,667*	*8,162*	*205,023*	*1,860,424*	*2,356,033*	*1,766,333*	*14,417*	*0*	*0*
Pigs (carcass/t)	51,912	3,918	465,931	*2,965,971*	*3,882,049*	3,562,375	13,958	0	2,337
SUBTOTAL LIVESTOCK						**N.A.**	**442,387**	**65,955**	**194,988**
TOTAL AGRICULTURAL (m COP)						**N.A.**	**916,268**	**214,407**	**498,622**
TOTAL AGRICULTURAL (m USD) [9]						*N.A.*	*395*	*92*	*215*

Source: Author's calculations based on the *ENA* agricultural survey of 2005. (m = million, t = ton) (1) *Sampled Farm Parts* in which the agricultural area is less than or equal to one local *Family Agricultural Unit (UAF)*, the number of animals is equal to or lower than the limit for small-scale producers defined by the *CCI*, and the fish farm area is less than five hectares. (2) Results of the *ENA* agricultural survey expanded to national level. (3) Production costs *CCI* 2007. For beans and barley the costs used were taken from Maldonado et al. (2007). (4) The net income and surplus percentage (with regard to the gross income) was assumed to be the same as that calculated for beans. (5) Given that the available market price was lower than the unit cost, the price was assumed to be equal to the unit cost. (6) The gross and net incomes, and surplus per hectare was assumed to be the same as that calculated for onions. (7) The gross and net incomes, and surplus/ha. was assumed to be the same as that calculated for other short-cycle crops. (8) The gross and net incomes, and surplus/ha. was assumed to be the same as that calculated for other permanent crops. (9) At the Colombian representative market exchange rate (*Tasa Representativa del Mercado TRM)*

v) Producers Subject to a Low Impact

An estimate of the income and expenditure for small-scale producers in the category of low impact from the FTA found that their total gross income in the year 2005 was 3.75 billion COP (1.61 billion USD). Their producer surplus or value added was around 2.43 billion COP (1.05 billion USD), 65% of gross income, while profit or net income amounted to 1.07 billion COP (0.46 billion USD), 29% of total income. (Table 41)

As regards the productive structure in the low impact category, short-cycle crops accounted for 14% of the total income from farming, 17% of net income and 14% of producer surplus. Permanent crops accounted for 63%, 71% and 72% of these, while livestock activities added 23%, 11% and 14%, respectively.

On introducing changes in domestic prices, areas cultivated and production obtained as a result of the tariff phase out agreed in the FTA, in a scenario of average prices and exchange rates, it is found that the total agricultural income generated by small-scale productive units subject to moderate impact would fall by 0.19 billion COP (0.08 billion USD). This represents a change equivalent to 5% in comparison to the value without the FTA. Likewise, the producer surplus would decrease by 0.09 billion COP (0.04 billion USD), or 4% in relative terms, and the net income would fall by 0.06 billion COP (0.02 billion USD), or 5% in relative terms. (Table 42)

Table 41. *Income of Small-Scale Producers Subject to a Low Impact – Without FTA - 2005* [1]

CROP	SUPPLY [2]		UNIT COSTS [3]			INCOME & VALUE ADDED WITHOUT FTA			
	Area Cultivated (ha)	Production (tons)	Labor Cost (COP/t)	Variable Costs (COP/t)	Total Cost (COP/t)	Sale Price (COP/t)	Gross Income (m COP)	Net Income (m COP)	Producer Surplus (m COP)
	a	b	c	d	e	f	g = f*b	h = g -e*b+c*b/3	i = g - d*b
Short-Cycle Crops	**130,238**	**924,469**	**N.A.**	**N.A.**	**N.A.**	**N.A.**	**532,458**	**187,202**	**332,081**
Cotton	4,156	8,425	420,995	509,405	1,113,949	1,203,762	10,142	1,939	5,850
Rice total	13,686	79,630	N.A.	N.A.	N.A.	N.A.	17,621	3,133	8,053
Rice mechanized	*5,190*	*30,213*	*55,690*	*312,318*	*485,121*	*565,849*	*17,096*	*3,000*	*7,660*
Rice manual	*178*	*928*	*318,747*	*142,828*	*528,534*	*565,849*	*525*	*133*	*393*
Peas [4]	4,864	11,819	N.D.	N.D.	N.D.	1,706,488	20,170	9,685	15,485
Barley [5]	1,316	2,127	92,673	300,054	578,711	578,711	1,231	66	593
Onions	1,947	37,485	161,572	178,461	393,580	721,218	27,035	14,300	20,345
Scallions [6]	1,105	36,674	N.D.	N.D.	N.D.	N.D.	15,333	8,111	11,539
Beans	7,084	7,994	593,354	619,972	1,585,332	2,669,253	21,339	10,247	16,383
Broad Beans [4]	1,336	5,187	N.D.	N.D.	N.D.	826,958	4,290	2,060	3,293
Other vegetables [7]	7,772	N.D.	N.D.	N.D.	N.D.	N.D.	24,795	7,883	14,823
Maize total	24,502	56,405	N.A.	N.A.	N.A.	N.A.	27,759	9,895	18,782
Maize yellow mechanized	*4,920*	*23,630*	*67,619*	*238,795*	*386,942*	*478,478*	*11,306*	*2,696*	*5,664*
Maize yellow traditional	*13,393*	*18,354*	*180,911*	*80,435*	*329,348*	*478,478*	*8,782*	*3,844*	*7,306*
Maize white mechanized	*1,644*	*7,539*	*100,072*	*173,079*	*360,205*	*531,945*	*4,010*	*1,546*	*2,705*
Maize white traditional	*4,545*	*6,882*	*180,911*	*80,435*	*329,348*	*531,945*	*3,661*	*1,809*	*3,107*
Potatoes total	29,431	447,211	129,908	265,724	452,151	520,984	232,990	50,148	114,155
Sorghum	290	952	68,083	207,723	338,145	444,984	423	123	226
Soybeans	56	122	62,357	570,251	786,804	828,010	101	8	32
Tobacco total	5,445	9,781	N.A.	N.A.	N.A.	N.A.	47,165	22,930	37,762
Dark tobacco	*1,865*	*3,009*	*2,247,131*	*698,021*	*3,265,402*	*4,822,000*	*14,512*	*6,939*	*12,411*
Virginia tobacco	*3,580*	*6,772*	*1,486,918*	*1,078,383*	*2,956,180*	*4,822,000*	*32,653*	*15,991*	*25,351*
Tomatoes [7]	759	16,170	N.D.	N.D.	N.D.	N.D.	2,421	770	1,447
Wheat	2,291	4,227	149,327	282,978	564,765	564,765	2,387	210	1,191
Cassava	22,823	168,245	88,378	79,450	199,250	433,099	72,867	44,300	59,499
Carrots [7]	1,375	32,013	N.D.	N.D.	N.D.	N.D.	4,387	1,395	2,623

CROP	SUPPLY [2]		UNIT COSTS [3]			INCOME & VALUE ADDED WITHOUT FTA			
	Area Cultivated (ha)	Production (tons)	Labor Cost (COP/t)	Variable Costs (COP/t)	Total Cost (COP/t)	Sale Price (COP/t)	Gross Income (m COP)	Net Income (m COP)	Producer Surplus (m COP)
	a	b	c	d	e	f	g = f*b	h = g -e*b+c*b/3	i = g - d*b
Permanent Crops	**659,050**	**5,349,114**	**N.A.**	**N.A.**	**N.A.**	**N.A.**	**2,356,630**	**764,405**	**1,757,714**
Other Fruits [8]	13,127	N.D.	N.D.	N.D.	N.D.	N.D.	47,017	15,316	35,080
Banana [5]	20,614	106,209	407,357	176,581	665,273	665,273	70,658	14,422	51,904
Cocoa	40,819	18,345	1,706,045	1,196,103	3,407,411	3,704,867	67,966	15,889	46,023
Coffee [5]	348,280	312,095	2,279,287	1,077,252	3,974,327	3,974,327	1,240,368	237,118	904,163
Sugar cane for brown sugarloaf [8]	75,004	3,644,185	N.D.	N.D.	N.D.	N.D.	268,634	87,509	200,432
Plantain	161,205	1,268,280	75,527	111,864	236,356	521,957	661,987	394,151	520,112
SUBTOTAL CROPS	**789,289**	**6,273,583**				**N.A.**	**2,889,088**	**951,607**	**2,089,795**
LIVESTOCK ACTIVITY	**No of Animals**	**Production (Units)**	**Labor Cost (COP/t)**	**Variable Costs (COP/t)**	**Total Cost (COP/t)**	**Sale Price (COP/t)**	**Gross Income (m COP)**	**Net Income (m COP)**	**Producer Surplus (m COP)**
	a	b	c	d	e	f	g = f*b	h = g -e*b+c*b/3	i = g - d*b
Cattle	**727,544**						**568,414**	**94,341**	**274,315**
Meat cattle (carcass/t)	*267,260*	*61,705*	*761,954*	*2,914,021*	*3,992,240*	*4,329,993*	*267,183*	*36,513*	*87,373*
Milk or double purpose cows (m/l)	*460,283*	*531,347*	*196,541*	*215,093*	*523,601*	*566,920*	*301,231*	*57,828*	*186,942*
Poultry	***13,687,319***						**195,012**	**21,616**	**43,147**
Laying hens (m/eggs)	*1,368,732*	*369,558*	*1,671*	*175,722*	*196,153*	*207,000*	*76,498*	*4,214*	*11,559*
Chickens (carcass/t)	*12,318,587*	*33,088*	*205,023*	*2,627,119*	*3,124,191*	*3,581,786*	*118,513*	*17,402*	*31,588*
Pigs (carcass/t)	248,146	18,730	465,931	3,896,015	4,812,051	4,951,445	92,741	5,520	19,768
SUBTOTAL LIVESTOCK						**N.A.**	**856,166**	**121,477**	**337,230**
TOTAL AGRICULTURAL (m COP)						**N.A.**	**3,745,255**	**1,073,085**	**2,427,025**
TOTAL AGRICULTURAL (m USD) [9]						*N.A.*	*1,613*	*462*	*1,045*

Source: Author's calculations based on the *ENA* agricultural survey of 2005. (m = million, t = ton) (1) *Sampled Farm Parts* in which the agricultural area is less than or equal to one local *Family Agricultural Unit (UAF)*, the number of animals is equal to or lower than the limit for small-scale producers defined by the *CCI*, and the fish farm area is less than five hectares. (2) Results of the *ENA* agricultural survey expanded to national level. (3) Production costs *CCI* 2007. For beans and barley the costs used were taken from Maldonado et al. (2007). (4) The net income and surplus percentage (with regard to the gross income) was assumed to be the same as that calculated for beans. (5) Given that the available market price was lower than the unit cost, the price was assumed to be equal to the unit cost. (6) The gross and net incomes, and surplus per hectare was assumed to be the same as that calculated for onions. (7) The gross and net incomes, and surplus per hectare was assumed to be the same as that calculated for other short-cycle crops. (8) The gross and net incomes, and surplus per hectare was assumed to be the same as that calculated for other permanent crops. (9) At the Colombian representative market exchange rate (*Tasa Representativa del Mercado TRM).*

Table 42. *Income of Small-Scale Producers Subject to Low Impact - With FTA - Scenario of Average Prices and Exchange Rates 2005* [1]

CROP	SUPPLY [2]		UNIT COSTS[3]			INCOME & ADDED VALUE WITHOUT FTA			
	Area Cultivated (ha)	Production (t)	Labor Cost (COP/t)	Variable Costs (COP/t)	Total Cost (COP/t)	Sale Price (COP/t)	Gross Income (m COP)	Net Income (m COP)	Producer Surplus (m COP)
	a	b	c	d	e	f	g = f*b	h = g -e*b+c*b/3	i = g - d*b
Short-Cycle Crops	**110,977**	**851,803**	**N.A.**	**N.A.**	**N.A.**	**N.A.**	**482,187**	**153,546**	**288,792**
Cotton	4,156	8,425	420,995	509,405	1,113,949	1,203,762	10,142	1,939	5,850
Rice total	4,349	25,285	N.A.	N.A.	N.A.	N.A.	11,432	22	3,663
Rice mechanized	*4,205*	*24,532*	*55,690*	*312,318*	*485,121*	*452,140*	*11,092*	*0*	*3,430*
Rice manual	*145*	*753*	*318,747*	*142,828*	*528,534*	*452,140*	*341*	*22*	*233*
Peas [4]	4,864	11,819	N.D.	N.D.	N.D.	1,450,515	17,144	6,660	12,460
Barley [5]	1,316	2,127	92,673	300,054	578,711	491,904	1,046	0	408
Onions	1,947	37,485	161,572	178,461	393,580	613,035	22,980	10,245	16,290
Scallions [6]	1,105	36,674	N.D.	N.D.	N.D.	N.D.	13,033	5,811	9,239
Beans	4,691	3,700	593,354	619,972	1,585,332	1,196,789	4,428	0	2,134
Broad Beans [4]	1,336	5,187	N.D.	N.D.	N.D.	826,958	4,290	2,060	3,293
Other vegetables [7]	7.772	N.D.	N.D.	N.D.	N.D.	N.D.	24,795	7,883	14,823
Maize total	18,844	44,838	N.A.	N.A.	N.A.	N.A.	12,927	397	5,804
Maize yellow mechanized	*3,752*	*18,607*	*67,619*	*238,795*	*386,942*	*280,212*	*5,214*	*0*	*771*
Maize yellow traditional	*10,213*	*14,453*	*180,911*	*80,435*	*329,348*	*280,212*	*4,050*	*161*	*2,887*
Maize white mechanized	*1,296*	*6,157*	*100,072*	*173,079*	*360,205*	*311,035*	*1,915*	*0*	*849*
Maize white traditional	*3,583*	*5,621*	*180,911*	*80,435*	*329,348*	*311,035*	*1,748*	*236*	*1,296*
Potatoes total	29,431	447,211	129,908	265,724	452,151	520,984	232,990	50,148	114,155
Sorghum	175	551	68,083	207,723	338,145	260,598	144	0	29
Soybeans	56	122	62,357	570,251	786,804	828,010	101	8	32
Tobacco total	5,445	9,781	N.A.	N.A.	N.A.	N.A.	47,165	22,930	37,762
Dark tobacco	*1,865*	*3,009*	*2,247,131*	*698,021*	*3,265,402*	*4,822,000*	*14,512*	*6,939*	*12,411*
Virginia tobacco	*3,580*	*6,772*	*1,486,918*	*1,078,383*	*2,956,180*	*4,822,000*	*32,653*	*15,991*	*25,351*
Tomatoes [7]	759	16,170	N.D.	N.D.	N.D.	N.D.	2,058	407	1,084
Wheat	532	2,168	149,327	282,978	564,765	422,069	915	0	302
Cassava	22,823	168,245	88,378	79,450	199,250	433,099	72,867	44,300	59,499
Carrots [7]	1,375	32,013	N.D.	N.D.	N.D.	N.D.	3,729	737	1.965

CROP	SUPPLY [2]		UNIT COSTS[3]			INCOME & ADDED VALUE WITHOUT FTA			
	Area Cultivated (ha)	Production (t)	Labor Cost (COP/t)	Variable Costs (COP/t)	Total Cost (COP/t)	Sale Price (COP/t)	Gross Income (m COP)	Net Income (m COP)	Producer Surplus (m COP)
	a	b	c	d	e	f	g = f*b	h = g -e*b+c*b/3	i = g - d*b
Permanent Crops	**659,050**	**5,349,114**	**N.A.**	**N.A.**	**N.A.**	**N.A.**	**2,356,630**	**764,405**	**1,757,714**
Other Fruits[8]	13,127	N.D.	N.D.	N.D.	N.D.	N.D.	47,017	15,316	35,080
Banana [5]	20,614	106,209	407,357	176,581	665,273	665,273	70,658	14,422	51,904
Cocoa	40,819	18,345	1,706,045	1,196,103	3,407,411	3,704,867	67,966	15,889	46,023
Coffee [5]	348,280	312,095	2,279,287	1,077,252	3,974,327	3,974,327	1,240,368	237,118	904,163
Sugar cane for brown sugarloaf [8]	75,004	3,644,185	N.D.	N.D.	N.D.	N.D.	268,634	87,509	200,432
Plantain	161,205	1,268,280	75,527	111,864	236,356	521,957	661,987	394,151	520,112
SUBTOTAL CROPS	**770,027**	**6,200,917**				**N.A.**	**2,838,817**	**917,951**	**2,046,506**
LIVESTOCK ACTIVITY	**No of Animals**	**Production (Units)**	**Labor Cost (COP/t)**	**Variable Costs (COP/t)**	**Total Cost (COP/t)**	**Sale Price (COP/t)**	**Gross Income (m COP)**	**Net Income (m COP)**	**Producer Surplus (m COP)**
	a	b	c	d	e	f	g = f*b	h = g -e*b+c*b/3	i = g - d*b
Cattle	**2,327,882**						**568,414**	**94,341**	**274,315**
Meat cattle (carcass/t)	*267,260*	*61,705*	*761,954*	*2,914,021*	*3,992,240*	*4,329,993*	*267,183*	*36,513*	*87,373*
Milk or double purpose cows (m/l)	*460,283*	*531,347*	*196,541*	*215,093*	*523,601*	*566,920*	*301,231*	*57,828*	*186,942*
Poultry	***31,962,135***						**114,305**	**4,214**	**11,559**
Laying hens (m/eggs)	*1,368,732*	*369,558*	*1,671*	*175,722*	*196,153*	*207,000*	*76,498*	*4,214*	*11,559*
Chickens (carcass/t)	*7,968,624*	*21,404*	*205,023*	*1,860,424*	*2,356,033*	*1,766,333*	*37,806*	*0*	*0*
Pigs (carcass/t)	120,429	9,090	465,931	*2,965,971*	*3,882,049*	3,562,375	32,382	0	5,421
SUBTOTAL LIVESTOCK						**N.A.**	**715,100**	**98,555**	**291,295**
TOTAL AGRICULTURAL (m COP)						**N.A.**	**3,553,918**	**1,016,507**	**2,337,801**
TOTAL AGRICULTURAL (m USD) [9]						*N.A.*	*1,531*	*438*	*1,007*

Source: Author's calculations based on the *ENA* agricultural survey of 2005. (m = million, t = ton) (1) *Sampled Farm Parts* in which the agricultural area is less than or equal to one local *Family Agricultural Unit (UAF)*, the number of animals is equal to or lower than the limit for small-scale producers defined by the *CCI*, and the fish farm area is less than five hectares. (2) Results of the *ENA* agricultural survey expanded to national level. (3) Production costs *CCI* 2007. For beans and barley the costs used were taken from Maldonado et al. (2007). (4) The net income and surplus percentage (with regard to the gross income) was assumed to be the same as that calculated for beans. (5) Given that the available market price was lower than the unit cost, the price was assumed to be equal to the unit cost. (6) The gross and net incomes, and surplus per hectare was assumed to be the same as that calculated for onions. (7) The gross and net incomes, and surplus per hectare was assumed to be the same as that calculated for other short-cycle crops. (8) The gross and net incomes, and surplus per hectare was assumed to be the same as that calculated for other permanent crops. (9) At the Colombian representative market exchange rate (*Tasa Representativa del Mercado TRM).*

vi) Producers without Impact

An estimate of the income and expenditure for small-scale producers in the category without impact from the FTA found that their total gross income in the year 2005 was 1.78 billion COP (0.77 billion USD). Their producer surplus or value added was around 1.11 billion COP (0.48 billion USD), equivalent to 62% of gross income, while profit or net income amounted to 0.47 billion COP (0.20 billion USD), 26% of total income. (Table 43)

As regards the productive structure for producers in the category without impact, short-cycle crops accounted for 16% of the total income from farming, 17% of net income and 14% of producer surplus. Permanent crops accounted for 49%, 61% and 59% of these, while livestock activities added 35%, 22% and 27%, respectively.

Table 43. *Income of Small-Scale Producers with No Impact from the FTA - 2005*[1]

CROP	SUPPLY [2]		UNIT COSTS[3]			INCOME & VALUE ADDED WITHOUT FTA			
	Area Cultivated (ha)	Production (t)	Labor Cost (COP/t)	Variable Costs (COP/t)	Total Cost (COP/t)	Sale Price (COP/t)	Gross Income (m COP)	Net Income (m COP)	Producer Surplus (m COP)
	a	b	c	d	E	f	g = f*b	h = g -e*b+c*b/3	i = g - d*b
Short-Cycle Crops	**44,368**	**492,839**	**N.A.**	**N.A.**	**N.A.**	**N.A.**	**279,582**	**79,206**	**154,613**
Cotton	741	1,503	420,995	509,405	1,113,949	1,203,762	1,809	346	1,043
Rice total	0	0	N.A.	N.A.	N.A.	N.A.	0	0	0
Rice mechanized	*0*	*0*	*55,690*	*312,318*	*485,121*	*565,849*	*0*	*0*	*0*
Rice manual	*0*	*0*	*318,747*	*142,828*	*528,534*	*565,849*	*0*	*0*	*0*
Peas [4]	0	0	N.D.	N.D.	N.D.	1,706,488	0	0	0
Barley [5]	0	0	92,673	300,054	578,711	578,711	0	0	0
Onions	0	0	161,572	178,461	393,580	721,218	0	0	0
Scallions [6]	0	0	N.D.	N.D.	N.D.	N.D.	0	0	0
Beans	0	0	593,354	619,972	1,585,332	2,669,253	0	0	0
Broad Beans [4]	1,338	5,192	N.D.	N.D.	N.D.	826,958	4,294	2,062	3,296
Other vegetables [7]	3,665	N.D.	N.D.	N.D.	N.D.	N.D.	11,693	3,717	6,990
Maize total	0	0	N.A.	N.A.	N.A.	N.A.	0	0	0
Maize yellow mechanized	*0*	*0*	*67,619*	*238,795*	*386,942*	*478,478*	*0*	*0*	*0*
Maize yellow traditional	*0*	*0*	*180,911*	*80,435*	*329,348*	*478,478*	*0*	*0*	*0*
Maize white mechanized	*0*	*0*	*100,072*	*173,079*	*360,205*	*531,945*	*0*	*0*	*0*
Maize white traditional	*0*	*0*	*180,911*	*80,435*	*329,348*	*531,945*	*0*	*0*	*0*
Potatoes total	27,048	411,008	129,908	265,724	452,151	520,984	214,129	46,089	104,914
Sorghum	0	0	68,083	207,723	338,145	444,984	0	0	0
Soybeans	0	0	62,357	570,251	786,804	828,010	0	0	0
Tobacco total	1,850	3,444	N.A.	N.A.	N.A.	N.A.	16,608	8,116	13,016
Dark tobacco	*198*	*320*	*2,247,131*	*698,021*	*3,265,402*	*4,822,000*	*1,542*	*738*	*1,319*
Virginia tobacco	*1,652*	*3,124*	*1,486,918*	*1,078,383*	*2,956,180*	*4,822,000*	*15,066*	*7,378*	*11,696*
Tomatoes [7]	0	0	N.D.	N.D.	N.D.	N.D.	0	0	0
Wheat	0	0	149,327	282,978	564,765	564,765	0	0	0
Cassava	9,725	71,692	88,378	79,450	199,250	433,099	31,050	18,877	25,354
Carrots [7]	0	0	N.D.	N.D.	N.D.	N.D.	0	0	0

CROP	SUPPLY [2]		UNIT COSTS[3]			INCOME & VALUE ADDED WITHOUT FTA			
	Area Cultivated (ha)	Production (t)	Labor Cost (COP/t)	Variable Costs (COP/t)	Total Cost (COP/t)	Sale Price (COP/t)	Gross Income (m COP)	Net Income (m COP)	Producer Surplus (m COP)
	a	b	c	d	E	f	g = f*b	h = g -e*b+c*b/3	i = g - d*b
Permanent Crops	**243,889**	**1,787,371**	**N.A.**	**N.A.**	**N.A.**	**N.A.**	**879,285**	**287,352**	**656,430**
Other Fruits[8]	8,503	N.D.	N.D.	N.D.	N.D.	N.D.	30,455	9,921	22,723
Banana [5]	6,894	35,520	407,357	176,581	665,273	665,273	23,631	4,823	17,358
Cocoa	11,992	5,390	1,706,045	1,196,103	3,407,411	3,704,867	19,968	4,668	13,521
Coffee [5]	131,137	117,513	2,279,287	1,077,252	3,974,327	3,974,327	467,034	89,282	340,443
Sugar cane for brown sugarloaf [8]	23,511	1,142,339	N.D.	N.D.	N.D.	N.D.	84,208	27,431	62,829
Plantain	61,851	486,609	75,527	111,864	236,356	521,957	253,989	151,227	199,555
SUBTOTAL CROPS	**288,257**	**2,280,209**				**N.A.**	**1,158,867**	**366,558**	**811,043**
LIVESTOCK ACTIVITY	**No of Animals**	**Production (Units)**	**Labor Cost (COP/t)**	**Variable Costs (COP/t)**	**Total Cost (COP/t)**	**Sale Price (COP/t)**	**Gross Income (m COP)**	**Net Income (m COP)**	**Producer Surplus (m COP)**
	a	b	c	d	E	f	g = f*b	h = g -e*b+c*b/3	i = g - d*b
Cattle	**794,855**						**621,911**	**103,098**	**299,485**
Meat cattle (carcass/t)	*294,620*	*68,022*	*761,954*	*2,914,021*	*3,992,240*	*4,329,993*	*294,534*	*40,251*	*96,317*
Milk or double purpose cows (m/l)	*500,235*	*577,467*	*196,541*	*215,093*	*523,601*	*566,920*	*327,378*	*62,847*	*203,168*
Poultry	***0***						**0**	**0**	**0**
Laying hens (m/eggs)	*0*	*0*	*1,671*	*175,722*	*196,153*	*207,000*	*0*	*0*	*0*
Chickens (carcass/t)	*0*	*0*	*205,023*	*2,627,119*	*3,124,191*	*3,581,786*	*0*	*0*	*0*
Pigs (carcass/t)	0	0	465,931	3,896,015	4,812,051	4,951,445	0	0	0
SUBTOTAL LIVESTOCK						**N.A.**	**621,911**	**103,098**	**299,485**
TOTAL AGRICULTURAL (m COP)						**N.A.**	**1,780,778**	**469,656**	**1,110,528**
TOTAL AGRICULTURAL (m USD) [9]						*N.A.*	*767*	*202*	*478*

Source: Author's calculations based on the *ENA* agricultural survey of 2005. (m = million, t = ton) (1) *Sampled Farm Parts* in which the agricultural area is less than or equal to one local *Family Agricultural Unit (UAF)*, the number of animals is equal to or lower than the limit for small-scale producers defined by the *CCI*, and the fish farm area is less than five hectares. (2) Results of the *ENA* agricultural survey expanded to national level. (3) Production costs *CCI* 2007. For beans and barley the costs used were taken from Maldonado et al. (2007). (4) The net income and surplus percentage (with regard to the gross income) was assumed to be the same as that calculated for beans. (5) Given that the available market price was lower than the unit cost, the price was assumed to be equal to the unit cost. (6) The gross and net incomes, and surplus per hectare was assumed to be the same as that calculated for onions. (7) The gross and net incomes, and surplus/ha. was assumed to be the same as that calculated for other short-cycle crops. (8) The gross and net incomes, and surplus per/ha. was assumed to be the same as that calculated for other permanent crops. (9) At the Colombian representative market exchange rate (*Tasa Representativa del Mercado TRM).*

vii) Summary of Impact under Various Scenarios

In the same way as the estimate of the effects of the FTA on agricultural products are shown above, the effects on the small-scale producers themselves were calculated for scenarios of average, high and low prices, as well as average, high (devaluating) and low (revaluating) exchange rates. These are shown in tables 44, 45, and 46.

It can be seen that the FTA would have a considerable effect on those producers classified in the full impact category, 100% of whose area or inventory depends on activities that compete with exports. In a scenario of average prices and exchange rates, these producers could accumulate losses of around 37% of gross income, 70% of net annual income, and 50% of their producer surplus.

Losses would be significant for producers classified in the high impact category, those with between 66.6% and 99.9% of the area cultivated or livestock inventory in activities that compete with imports. There would be losses of around 28% of gross income, 49% of net income, and 34% of producer surplus, in a scenario of average prices and exchange rates.

In the case of producers in the moderate impact category, those with between 33.3% and 66.6% of their area or inventory in activities that compete with imports, the losses would amount to 14% of gross income, 25% of annual net income, and 17% of producer surplus in a scenario of average prices and exchange rates.

Finally, for those producers in the low impact category, with less than 33.3% of their area or inventory in activities that compete with imports, the losses would be minimal, with reductions of 5% in gross income, 5% of net income, and 4% of producer surplus in a scenario of average prices and exchange rates.

Table 44. *Summary of Effects of the FTA on Producers of the Small Farm Economy - Scenario of Average Prices and Exchange Rates – 2005*

Impact Category	Change in Gross Income		Change in Net Income		Change in Producer Surplus	
	(COP m)	%	(COP m)	%	(COP m)	%
Full Impact	-250,876	-37.4%	-127,387	-70.2%	-176,237	-50.4%
High Impact	-228,755	-27.5%	-102,528	-48.5%	-144,620	-33.9%
Moderate Impact	-152,892	-14.3%	-72,398	-25.2%	-100,788	-16.8%
Low Impact	-191,337	-5.1%	-56,578	-5.3%	-89,224	-3.7%
No Impact	0	0.0%	0	0.0%	0	0.0%
Total (COP m)	**-823,859**	**-10.2%**	**-358,890**	**-16.1%**	**-510,869**	**-10.4%**
Total (USD m)	*-355*		*-155*		*-220*	

Source: Author's calculations: please see Statistical Annexes.

Briefly, in a scenario of average prices and exchange rates, the total impact for small-scale producers would amount to a loss of 10.2% of annual gross income (0.82 billion COP/0.35

billion USD), a loss of 16.1% in annual net income (0.36 billion COP/0.15 billion USD), and a loss of 10.4% of producer surplus (0.51 billion COP/0.22 billion USD).

In a scenario of low prices and revaluing exchange rates, gross income could fall by up to 13.7% (1.1 billion COP/0.48 billion USD), producer surplus by 13.1% (0.65 billion COP/0.28 billion USD), and net income by 16.3%. On the other hand, in a scenario of high prices and exchange rates, the losses would be reduced to 5.6% of gross income (0.5 billion COP/0.2 billion USD), 6.2% of producer surplus, and 10.8% of net income (0.3 billion COP/0.1 billion USD).

Table 45. *Summary of the Effects of the FTA on Producers in the Small Farm Economy - Scenario of Low Prices and Exchange Rates - 2005*

Impact Category	Change in Gross Income		Change in Net Income		Change in Producer Surplus	
	(COP m)	%	(COP m)	%	(COP m)	%
Full Impact	-382,668	-57.1%	-128,350	-70.7%	-250,275	-71.6%
High Impact	-294,155	-35.4%	-103,715	-49.1%	-174,601	-40.9%
Moderate Impact	-191,311	-17.9%	-73,161	-25.5%	-117,977	-19.7%
Low Impact	-241,752	-6.5%	-56,998	-5.3%	-102,447	-4.2%
No Impact	0	0.0%	0	0.0%	0	0.0%
Total (COP m)	**-1,109,886**	**-13.7%**	**-362,223**	**-16.3%**	**-645,301**	**-13.1%**
Total (USD m)	*-478*		*-156*		*-278*	

Source: Author's calculations: please see Statistical Annexes.

Table 46. *Summary of the Effects of the FTA on Producers in the Small Farm Economy - Scenario of High Prices and Exchange Rates - 2005*

Impact Category	Change in Gross Income		Change in Net Income		Change in Producer Surplus	
	(COP m)	%	(COP m)	%	(COP m)	%
Full Impact	-102,152	-15,2%	-64,643	-35.6%	-77,953	-22.3%
High Impact	-140,460	-16,9%	-76,554	-36.2%	-96,849	-22.7%
Moderate Impact	-99,957	-9,3%	-58,725	-20.5%	-71,826	-12.0%
Low Impact	-112,442	-3,0%	-41,086	-3.8%	-57,785	-2.4%
No Impact	0	0,0%	0	0.0%	0	0.0%
Total (COP m)	**-455,011**	**-5,6%**	**-241,007**	**-10.8%**	**-304,413**	**-6.2%**
Total (USD m)	*-196*		*-104*		*-131*	

Source: Author's calculations: please see Statistical Annexes.

2. Total Effect on the Income of Small-Scale Producers' Households

Taking into account the estimated impact on the net income of small-scale producers shown in the previous section, the total net income for all the households of these producers (1.4 million households) would fall by 10.5% in a scenario of average prices and exchange rates, to an average monthly value of 304,642 COP (131.26 USD)[42] per household, the equivalent of 80% of the statutory minimum wage for the year 2005 (9 percentage points lower than the proportion observed without the FTA). (Table 47)

In a scenario of average prices and exchange rates, the subset of small-scale producers subject to full impact from the FTA (14% of the total) would experience a reduction of 45% in total household income. Their average monthly income would fall to 185,618 COP (79.98 USD) per household, equivalent to 58% of the statutory minimum wage of 2005 (41 percentage points lower than the scenario without the FTA).

For the subset of small-scale producers subject to high impact from the FTA (14% of the total), a fall of 31.4% in total household income would be observed, resulting in an average monthly value of 233,354 (100.55 USD) per household, equivalent to 73% of the statutory monthly wage for the year 2005 (28 percentage points lower than the situation without the FTA).

The subset of small-scale producers subject to moderate impact from the FTA (13% of the total) would experience a reduction of 16.3% in total income. This would then have an average monthly value of 284,621 (122.68 USD) per household, equivalent to 89% of the statutory minimum wage for the year 2005 (15 percentage points below the value observed without the FTA).

A reduction of 3.4% in the total household income would be recorded for the subset of small-scale producers subject to low impact from the FTA (31% of the total). Income would fall to an average monthly value of 328,591 COP (141.58 USD) per household, equivalent to 102% of the statutory minimum wage for the year 2005 (3 percentage points less than the proportion observed without the FTA).

It should be noted that, in a scenario of low prices and a revaluing exchange rate, there would be a reduction of 10.5% in the total income of these small farm households. This would fall to an average monthly value of 304,312 COP (131.12 USD) per household, equivalent to 80% of the statutory minimum wage for the year 2005 (9 percentage points lower than the proportion observed without the FTA). On the other hand, in a scenario of high prices and a devaluing exchange rate, a reduction of 7% in the total income of small farm households would be experienced, giving an average monthly value of 316,322 COP (136.30 USD) per household, equivalent to 83% of the statutory minimum wage of 2005 (6

[42] Calculated in dollars at the average annual representative market exchange rate published by the *Banco de la República* (Colombian central bank) for the year 2005 (2320.77 COP per USD).

percentage points lower than the proportion observed for a situation without the FTA). (Tables 48 and 49)

Table 47. *Average Monthly Income of Small Farm Households by Category of Impact - With FTA in Comparison to Without FTA - Scenario of Average Prices and Exchange Rates*

Impact Category	Average Income per Household without FTA (COP 2005)			Average Income per Household with FTA (COP 2005)			Percentage Changes with FTA		
	Net Agric. Income	Other Income	Total Income	Net Agric. Income	Other Income	Total Income	Net Agric. Income	Other Income	Total Income
Full	220,175	120,025	340,200	65,593	120,025	185,618	-70.2%	0.0%	-45.4%
High	220,175	120,025	340,200	113,330	120,025	233,354	-48.5%	0.0%	-31.4%
Moderate	220,175	120,025	340,200	164,597	120,025	284,621	-25.2%	0.0%	-16.3%
Low	220,175	120,025	340,200	208,567	120,025	328,591	-5.3%	0.0%	-3.4%
No Impact	220,175	120,025	340,200	220,175	120,025	340,200	0.0%	0.0%	0.0%
Total COP	**220,175**	**120,025**	**340,200**	**184,617**	**120,025**	**304,642**	**-16.1%**	**0.0%**	**-10.5%**
Total USD	**94.87**	**51.71**	**146.58**	**79.54**	**51.71**	**131.26**			

Source: Author's calculations: please see Statistical Annexes

Table 48. *Average Monthly Income of Small Farm Households by Category of Impact - With FTA in Comparison to Without FTA - Scenario of Low Prices and Exchange Rates*

Impact Category	Average Income per Household without FTA (COP 2005)			Average Income per Household with FTA (COP 2005			Percentage Changes with FTA		
	Net Agric. Income	Other Income	Total Income	Net Agric. Income	Other Income	Total Income	Net Agric. Income	Other Income	Total Income
Full	220,175	120,025	340,200	64,425	120,025	184,449	-70.7%	0.0%	-45.8%
High	220,175	120,025	340,200	112,092	120,025	232,117	-49.1%	0.0%	-31.8%
Moderate	220,175	120,025	340,200	164,011	120,025	284,036	-25.5%	0.0%	-16.5%
Low	220,175	120,025	340,200	208,480	120,025	328,505	-5.3%	0.0%	-3.4%
No Impact	220,175	120,025	340,200	220,175	120,025	340,200	0.0%	0.0%	0.0%
Total COP	**220,175**	**120,025**	**340,200**	**184,287**	**120,025**	**304,312**	**-16.3%**	**0.0%**	**-10.5%**
Total USD	**94.87**	**51.71**	**146.58**	**79.54**	**51.71**	**131.26**			

Source: Author's calculations: please see Statistical Annexes

Table 49. *Average Monthly Income of Small Farm Households by Category of Impact - With FTA in Comparison to Without FTA - Scenario of High Prices and Exchange Rates*

Impact Category	Average Income per Household without FTA (COP 2005)			Average Income per Household with FTA (COP 2005			Percentage Changes with FTA		
	Net Agric. Income	Other Income	Total Income	Net Agric. Income	Other Income	Total Income	Net Agric. Income	Other Income	Total Income
Full	220,175	120,025	340,200	141,732	120,025	261,757	-35.6%	0.0%	-23.1%
High	220,175	120,025	340,200	140,398	120,025	260,423	-36.2%	0.0%	-23.5%
Moderate	220,175	120,025	340,200	175,093	120,025	295,118	-20.5%	0.0%	-13.3%
Low	220,175	120,025	340,200	211,745	120,025	331,770	-3.8%	0.0%	-2.5%
No Impact	220,175	120,025	340,200	220,175	120,025	340,200	0.0%	0.0%	0.0%
Total COP	**220,175**	**120,025**	**340,200**	**196,297**	**120,025**	**316,322**	**-10.8%**	**0.0%**	**-7.0%**
Total USD	**94.87**	**51.71**	**146.58**	**84.58**	**51.71**	**136.30**			

Source: Author's calculations: please see Statistical Annexes

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