More Than Food on the Table: Agriculture's True Contribution to the Economy

IICA

MORE THAN FOOD ON THE TABLE:
AGRICULTURE'S TRUE CONTRIBUTION
TO THE ECONOMY

IICA **INTER-AMERICAN INSTITUTE FOR COOPERATION AND AGRICULTURE**

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Development.

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FOREWORD

*F*ood production has always been a precondition for the development of civilization. The systems linked to agriculture, especially as regards its relationship to the environment, industry, finance, trade and consumers, have become more intricate and complex. Therefore, new paradigms and new policy instruments are needed to meet society's need for food security.

The idea of analyzing agriculture's true contribution to economic development surfaced at the meeting of the Inter-Agency Group on Rural Development (IGRD) held in 2002 in Cuba. IICA agreed to perform the first tasks involved in this important joint research initiative.

This document quantifies agriculture's true contribution to the economy in 11 countries that are members of the Inter-American System, using social accounting matrixes (SAM) to estimate multiplier effects between sectors. Agriculture has been identified as an important supplier of inputs and a generator of value added that plays a key role in the distribution of the income between urban and rural regions.

This report provides evidence that investment in agriculture should be seen as an investment in the entire economy and that the differentiated impact of sectoral policies for urban and rural regions should not be ignored. The study shows clearly that agriculture promotes sustainable development and the inclusion of rural communities, especially the poorest, in economy activity.

IICA hopes these research findings will be subjected to technical scrutiny, so that, together with its partners, the Institute can continue developing sound methodological and conceptual approaches that offer a fairer assessment of agriculture's importance in the countries, and help reposition it in political circles.

Dr. *Chelston W.D. Brathwaite*
DIRECTOR GENERAL

LIST OF TABLES

ACRONYMS

AgGDP	Agriculture Gross domestic product
CGE	Computable General Equilibrium Models
DIPEMI	Directorate of Strategic Planning and Institutional Modernization
ECLAC	Economic Commission for Latin America and the Caribbean
FAO	Food and Agriculture Organization of the United Nations
GDP	Gross Domestic Product
GEM	General Equilibrium Models
GTAP	Global Trade Analysis Project (Universidad de Purdue)
GTZ	Deutsche Gesellschaft für Tecnische Zusammenarbeit
IDB	Inter-American Development Bank
IFAD	International Fund for Agricultural Development
IGRD	Interagency Group on Rural Development
IICA	Inter-American Institute for Cooperation on Agriculture
ISIC	International Standard Industrial Clasification
LAC	Latin America and the Caribbean
Lc	Remuneration to skilled labor
LIM	Leontief Inverse Matrix
Lnc	Remuneration to unskilled labor
OAS	Organization of American States
SAM	Social Accounting Matrix
SNC	System of National Accounts
SRD	Sustainable Rural Development
USAID	The United States Agency for International Development

EXECUTIVE SUMMARY

Background

Agriculture is more than agricultural production and food: today, all nations regard it as a strategic asset. However, the importance attached to it in political circles and among decision makers varies. In some countries, its political importance is on the decline and support for it is limited; in others, especially the most developed nations, increasing amounts of resources are being allocated to it in the form of subsidies and external aids.[1]

The ministers of agriculture of the Americas have expressed concern at the way in which agriculture's value is underestimated. Given the challenges posed by the new environment, agriculture must be viewed differently if it is to be repositioned at policy-making level.[2]

In recent decades, recognition of the interdependence between agriculture and industry has been growing. The production systems linked to agriculture -agroindustry, for example- have become more intricate and complex, and more sophisticated and dynamic food distribution networks are needed.

However, agriculture's performance and its contribution to our countries' economic development has traditionally been undervalued, since it is measured using information about harvests and the sale of raw materials, mainly crops and livestock. As a result, the backward and forward linkages with agroindustry, the services and trade sectors, and, in general, the rest of the economy, are undervalued. The value added generated by these linkages throughout the economy does not appear in the basic agricultural statistics of most countries.

The methods traditionally used to measure agriculture's contribution also overlook its role in meeting the growing demand for environmental goods and services from urban centers. As an economic bridge between rural and urban areas, agriculture provides food, work and natural resource services to urban dwellers.

To properly measure agriculture's performance and contribution, account must be taken of its effects on the distribution of income among rural and urban households, wage earners and

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1. In 2002 alone, the developed countries invested US$350 billion in government subsidies to support their farmers. (www.oecd.org)
2. The Interagency Group on Rural Development took up this concern. At the meeting in Havana (2002), IICA offered to conduct the necessary analyses.

owners. This is key to evaluating its impact on poverty alleviation strategies and, in particular, on the livelihoods of rural dwellers.[3]

Objective of the research

The first stage of the research called for the development of a methodology for estimating the true importance of agriculture to our countries' economic development. This methodology empirically addresses the concept of agriculture and agrifood[4]; calculates agricultural linkages; and simulates agriculture's impact on the economic activity of the countries.

Another goal is to highlight agriculture's contribution to the livelihoods of rural dwellers and the sector's potential for contributing to the development of national economies.[5]

Methodology

The study focuses on 11 countries in the western hemisphere: Argentina, Brazil, Canada, Chile, Colombia, Costa Rica, Mexico, Peru, United States, Uruguay and Venezuela.[6]

A consistent accounting framework was required to facilitate the measurement of agriculture's contribution to GDP, and to assess the strength of its linkages with other sectors of the economy. Social accounting matrixes (SAM) offer a suitable accounting framework, since they make it possible to examine the structural links between production, consumption, trade and the accumulation and distribution of income. They can also be used to develop economic models that simulate the impact of public policies and other exogenous changes on the entire economy.

The greatest virtue of a social accounting matrix is that it explicitly describes the flow of income and makes it possible to analyze issues related to income distribution. As databases, matrixes have been widely used to study trade policy, income distribution, fiscal policy, external impacts and structural adjustment issues.

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3. In a globalized world, a country's food security can only be assured if rural livelihoods are strengthened. It is also a key condition for achieving the Millennium Development Goals set for 2015 for health and nutrition.

4. The concept of "agriculture and agrifood" includes in the measurement of agricultural aggregates, those sectors that are linked by their requirement for agricultural inputs, such as the food processing sector and the agroindustrial sector. Some authors have used "wider agriculture," "extended agriculture," "agro-based sectors," and other similar terms, when referring to the same concept.

5. Future stages will include dimensions that are important for rural economies, especially the natural resources sector, through the so-called "Green Accounts" (already in progress); the specification of regional accounts; and a better specification of promising activities such as agrotourism. In addition, an analytical framework will be developed for detecting other, harder to quantify contributions related to the social, cultural and environmental dimensions.

6. The information used to create the SAM for 10 countries (Argentina, Brazil, Canada, Chile, Colombia, Mexico, Peru, Uruguay, United States, Venezuela) was obtained from the GTAP database (Global Trade Analysis Project, Purdue University). For Costa Rica, the study used the matrix developed by IICA which uses 1974 as the baseline. (IICA, 2004)

Multipliers are used to quantify the effects of a given activity, in this case agriculture, on the rest of the economy. The bigger the multiplier, the bigger its impact on the economy.

RESULTS

The results are presented in three sections. The first figure obtained was agriculture and agrifood's contribution to gross domestic product, expressed as a percentage, in the countries included in the study. Agriculture's linkages were then estimated, using the information in the social accounting matrixes. Finally, using the multiplier model, external impacts on the economies were simulated. Linkages[7] were analyzed to determine both the effects on other production processes and on the generation and use of income. The research analyzes these linkages by studying the use to which agricultural production is put.

By analyzing the production costs of agriculture, the study also examined the links between the place where income is generated and the place where it is used.

Agriculture and agrifood *vs.* primary agriculture

Traditional measurements of agriculture's contribution to gross domestic product suggest that it is declining and that, on average, it is less than 10%. Measured in this way, the agricultural gross domestic product (AgGDP) of the countries included in the study was around 7% in 1997 (Costa Rica was the exception, at roughly 11.34%).

If agriculture's contribution is calculated using the extended approach that takes into account its interdependence with the food and agroindustry sector, the figures are usually higher than those of official statistics. Measured in this way, AgGDP ranges from 8.12% in the case of the United States to 34.75% in the case of Uruguay.

This new indicator suggests that agriculture and agrifood's true contribution to GDP is considerably greater, ranging from three times more (in the case of Costa Rica) to a maximum of 11.6 times for the United States. This means that, except in the United States, Canada and Venezuela, where the percentage is lower, in the countries studied agriculture and agrifood contributed around 30% of GDP during 1997. This is much higher than reported by official statistics (7%).

Agricultural linkages

The reason for the above is that, as an economy develops and diversifies, the primary agricultural sector loses relative weight in terms of GDP but develops strong linkages with the

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7. The linkage between production processes means the link between one production sector and another – either as a supplier or purchaser of inputs.

rest of the economy. This can be confirmed by analyzing the use to which agricultural production is put. Perhaps the most important finding of the study is that agriculture is an important source of inputs for other production activities. In fact, intermediate demand for agricultural products absorbs 74% of primary agricultural production, i.e., ¾ of agricultural production is used as an input for other industries/sectors. Some 44% of the output of other industries is used in the form of inputs, which confirms the fact that agriculture's linkages with the rest of the economy are not only important but usually underestimated.

In the countries covered by the study, 12% of primary agricultural production generates foreign exchange. This is almost double what the other sectors of the economy contribute to exports (6.7%), except in the case of Venezuela.

Final consumption of primary agricultural products absorbs high percentages of total agricultural output in Venezuela, Mexico and Peru (>35%). Exports absorb high percentages in Colombia, Canada and Costa Rica – as much as 43.3% in the latter. Although taken together the countries studied do not require large percentages of agricultural imports to complete the aggregate supply, Mexico, Peru, and Venezuela recorded a deficit, as the value of their imports is greater than that of their exports. In the case of Mexico and Peru, the deficit is less than 2% of national output; and in the case of Venezuela, it is 8%.

The costs incurred by primary agriculture are broken down as follows: 46.7% involve payments for inputs, 19.6% labor remuneration, 20.1% capital profits, 12.7% land rent and 0.9% tax payments.

The study also revealed that 53 cents of every dollar produced by agriculture is in the form of value added. When the United States and Canada were removed from the sample, the figure for value added rose to 70 cents. The food and agroindustrial sectors generate 42 cents of value added for each dollar produced, and they pay 58 cents for inputs for every dollar in production.

Another interesting result has to do with the beneficiaries of the payments made by primary agriculture. Although most of the countries do not break this information down by urban or rural considerations[*], we can assume that most of the remuneration for skilled and unskilled labor, land and capital stays in the regions where the primary agricultural product is produced. At least 53 cents of every dollar generated by primary agriculture remains in rural areas (the figure rises to 70 cents when the United States and Canada are omitted from the sample).

An analysis of the costs suggests that, on average, barely 1% of the costs of the primary sector of agriculture involve payments for skilled labor, while the percentage for unskilled labor is 19%. In the case of agriculture and agrifood, the percentage for skilled labor is 3.5% and 14.8% for unskilled labor. This confirms the link between agricultural production and unskilled labor, and the fact that the link with skilled labor increases as we move from primary to agriculture and agrifood.

The analysis of agricultural linkages indirectly shows the importance of agriculture in these countries, as it is a source of inputs for other industries, a source of foreign exchange and an important generator of value added, which remains in rural areas.

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* Except in the SAM for Costa Rica

Agriculture's multiplier effects

The analysis of multipliers shows that each additional unit demanded from the primary sector has a strong effect on other sectors. In Canada, 3.1 additional units derived output are generated, and in Argentina as many as 5.5. The multipliers for agriculture are similar to those for other sectors, which seems to contradict the accepted wisdom that agriculture has fewer effects than other activities, especially the industrial sectors.

An additional injection in agriculture, or a one-unit increase in demand for its exports, generates growth in the production of the food sector (from 0.16 in Canada to 0.73 in Argentina) and the agroindustrial sector (from 0.10 in Canada to 0.56 in Argentina).

A one-dollar increase in primary agricultural exports also has a very positive effect on factor of production remuneration (labor, capital and land), ranging from US$1.421 in Canada to US$3.34 in Argentina. Except for Canada and Brazil, unskilled labor remuneration is higher in the agricultural sector than in the other economic sectors (ranging from US$0.58 in Peru to US$1.30 in Argentina).

Every extra dollar of demand for primary agricultural production generates an increase in household income of between US$1.42 (Canada) and US$3.34 (Argentina). This is an extremely important statistic, given that agriculture generates more household income than other industries.[9]

The study also revealed that every dollar of government funds transferred to household income will generate another US$1.50: 78 cents in the form of capital remuneration, 4 cents in land rent and 68 cents in the form of labor remuneration (47 and 21 cents for unskilled and skilled labor, respectively). The industries that benefit most from higher demand vary from country to country, but those that benefit most from the transfer of income to households are commerce and sales (multiplier of 0.41), real estate and rents (0.17), administrative services provided by the state (0.16), and foods produced from fish, vegetables and fruits (0.15).

In the case of Costa Rica, it was possible to conduct an even more exhaustive analysis. Having a social accounting matrix with more detailed information about institutions and factors of production made it possible to pinpoint agriculture's role in rural economic development. For Costa Rica the agricultural sectors of green coffee, livestock, tobacco, meat and milk production, sugar and ripe coffee produce multipliers of more than 2, which means that a one-dollar increase in demand produces more than one extra dollar in the other industries. These multipliers only are bettered by the multiplier for construction, services and administrative services.

The coffee, sugar, livestock and milk sectors make high payments to rural labor while tobacco makes a higher contribution to urban wages. Specifically, a one-dollar increase in green coffee exports generates 20 cents of urban labor, 45 cents of rural labor, 4 cents of taxes and 84 cents as capital profits (including land rent).

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9. In the case of Peru, the multiplier for agroindustry is slightly higher than for the primary agricultural sector.

A one-dollar increase in exports of green coffee from Costa Rica generates an increase of US$1.18 in family income. This multiplier is the second highest, bettered only by the multiplier for the services sector. Other sectors that generate high multipliers of income for families are ripe coffee, unprocessed tobacco, livestock, bananas and sugar.

For Costa Rica, it was also possible to estimate the effect of a direct transfer from the government to the households. Each dollar transferred to the households would produce another 99 cents of value added: 22 cents in urban labor remuneration, 16 cents in rural labor remuneration, 54 cents in capital profits and 3 cents in taxes.

Simulations and policy analysis

The analysis of multipliers by means of SAMs makes it possible to generate simulations that provide the criteria for identifying key sectors of the economy. They identify not only those with greater production linkages but also those that generate more value added and have better effects on the distribution of income between rural and urban households.

At the end of the document, a series of simulations are performed for the countries included in the study to demonstrate the usefulness of the instrument. The first is a simulation of an aggregate change in agricultural exports, followed by a simulation of changes in the specific exports of some sectors.

By way of example, an analysis was made of the effect on the economy of a 10% increase in the demand for Peruvian agricultural exports (including the primary, food and agroindustry subsectors). A US$277 million increase in exports (0.26% of Peru's total production) generates a further US$750 million in other production activities, US$550 million in factor of production remuneration (US$140 million for labor, US$373 million for capital) and a similar increase in the net income of the country's households and families. In percentages, a 0.26% increase in food production produces 0.93% growth in total output, and a 0.95% rise in factor of production remuneration. Similar simulations are performed with changes in investment, foreign trade and other variables. The results show clearly that in order to improve the well-being of the communities, investments must be made, and support provided for, the agricultural sector of the economies of countries in the Americas.

A 10% increase in wheat exports in Argentina and Uruguay (equivalent to only 0.03% and 0.01% of the countries' total output) generates a 0.15% and 0.06% growth in the output of other industries, and increases of 0.17% and 0.06% in family incomes, respectively. The biggest increase in factor of production remuneration in both countries is for land (0.46% in Argentina and 0.18% in Uruguay).

The results of a simulated 10% increase in exports for the oil-seed sectors of Brazil, Canada, Uruguay and the United States suggest that the impact would be similar in all three countries: 0.03-0.05% growth in total output. Households would also benefit, with increases in income of 0.03-0.05%. However, the factor of production remuneration generated by the growth in production varies from country to country. For example, the figure for land retribution is

largest for Canada (0.71%) and smallest for Uruguay (0.14%). This suggests that land is a bigger constraint in Canada than in Uruguay, as far as a possible growth in exports is concerned.

Simulating a 10% increase in demand for the corn, barley, oats and other sector confirmed just how important this sector is for Argentina. A US$141 million increase in demand in Argentina would generate 0.60% more throughout the agricultural primary sector and 0.14% in all the economy. In other words, each dollar invested would produce another US$5.4 of value.

A simulation also revealed that a 10% growth in Costa Rica's coffee exports[10] would generate an increase of almost 1% in the total value added of the economy. Furthermore, rural work remuneration would increase significantly, by 0.75% or nearly three times the increase in urban work remuneration (0.28%) and more than the figure for capital remuneration (0.63%).

The impact of a 10% increase in the demand for coffee varies considerably in the cases of Brazil, Colombia, Peru and Costa Rica. For Brazil, a US$274 million increase in exports would cause the country's total production to grow by US$1139 million and households would receive US$600 million more in income. As a percentage, this is an increase of 0.08% in both total production and household income. For Colombia, while the dollar values are very similar (a US$225 million rise in exports would generate US$900 million in additional production and a US$500-million increase in income) the percentages are not (0.53% in production and 0.57% in income). This is due to the greater relative importance of coffee to Colombia than to Brazil. A US$41 million increase in the coffee sector in Peru has a spillover effect of only US$55 million on the country's economy as a whole.

A study was also conducted of the vegetable, fruit and nuts sector of Argentina, Chile, Colombia, Mexico, Uruguay and Costa Rica. The effect of a 10% growth in the exports of this sector is similar in all the countries barring Costa Rica: the initial injection produces a fourfold increase in total economic output. In the case of Costa Rica, the increase is twofold. Nor are there marked differences between the countries with regard to the generation of household income. Of all the sectors analyzed, this turned out to be the one whose results were most similar for all the countries studied.

CONCLUSIONS

The study demonstrated clearly the importance of the value added of the agricultural production chain to the domestic economies of all the countries in the Americas, thus correcting the traditional skewed view of agriculture's contribution and its potential for economic development. The study validated the methodology in 11 countries and underscored the role of agriculture as a supplier of inputs, a generator of value added and foreign exchange, and an important factor in the redistribution of income.

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10. For Costa Rica, a 10% increase in coffee exports represents 0.26% of total national output (GDP) in 1997.

When analyzing agriculture's true contribution to our countries' economic development, the analytical framework of SAM multipliers makes it possible to factor in considerations regarding the generation and use of income, since it gives decision makers indicators of the effects on labor, capital, land and family income. This information is important when negotiating development strategies, since it makes it possible to identify sectors that not only have a significant multiplier effect on production but that can also have important effects on the distribution of income and the value added generated.

Using these methods to measure agriculture's true contribution to the economy clearly demonstrates agriculture's importance to development. This, in turn, will make it possible to improve decisions regarding investments and policy-making for agriculture, so that they contribute more effectively to development and poverty reduction.

1. Introduction

Background to the Study

Agriculture is something more than crops and food: nowadays all countries regard it as a strategic asset. However, the importance attached to it in political circles and among decision-makers varies. In some countries, its political importance is declining and the support it receives is limited, while in others, especially in the most developed, increasing amounts of resources are being allocated to agriculture in the form of subsidies and external support. In 2002 alone, developed countries invested around $350 billion in government subsidies to support their farmers.

The underestimation of the value of agriculture is a concern that has been clearly expressed by the Ministers of Agriculture of the Americas and, given the challenges posed by the new environment, it is essential to view agriculture in a new light in order to reposition it at the policymaking level. This concern was addressed by the Interagency Group on Rural Development, IGRD[11]. At a meeting in Havana (2001), IICA agreed to carry out the necessary analyses to determine agriculture's true contribution to rural livelihoods and the sector's importance for the economic development of national economies. The present study is a response to that commitment.

The Role of Agriculture in Economic Development

During the 50s, 60s and 70s it was believed that an economic development model based on import substitution and the promotion of industrialization would be capable of imitating the success achieved by developed countries. This model promoted growth on the basis of "star" sectors, disengaging agriculture from the motor of economic development. It was argued that these "star" sectors must have strong production links with other industrial sectors and that, since agriculture did not have strong forward and backward linkages with the rest of the economy[12], it could not generate growth. Today it is recognized that agriculture generates important production chains and intersectoral links, which generate value added beyond their own activity. Agriculture is not an isolated sector, but is interconnected with other sectors of the economy and contributes to growth through: the absorption of labor, mainly unskilled and rural

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11. ECLAC, FAO, GTZ, IICA, IDB, IFAD, USAID and World Bank, .
12. The measurement of these chains or linkages was based on input–output techniques, e.g., Input –Output matrices based on National Accounts.

labor; the generation of foreign exchange; the use and conservation of natural resources; the generation of investment capital; and, the generation of strong linkages, for example with trade, financial services, transportation and storage, among others.

The debate on agriculture's role in the economic development of countries is still "unfold." Although the days of theories and doctrines that considered the industrial sector to be the exclusive engine of the development[13] are over, among policymakers the role of agriculture still appears to be unclear, misunderstood and even confused.

However, three aspects may be emphasized in the current debate on the role. Firstly, it is necessary to recognize the interdependence between agriculture and the rest of the economy. For economic growth to occur, agriculture and the other sectors must carry out functions that are intrinsically related to each other (Hayani and Ruttan, 1985). Agriculture should contribute – as a whole and in coordination with the rest of the economic sectors - to maximize the use of competitive advantages and participate in the process of capital accumulation, within an environmentally sustainable scenario (FAO, 1995).

Indeed, in the context of the continuous search for competitiveness, it is only by paying attention to all the links of the productive process that it is possible to achieve the yields and quality of products necessary to enter and remain in the markets (ECLAC, 2001). The production systems linked to agriculture – agroindustry, for example - have become more intricate and complex, and require more sophisticated and dynamic food distribution networks. Thus, the coordination of functions between agriculture and other sectors becomes indispensable.

Secondly, it is necessary to recognize the stabilizing role of agriculture on rural livelihoods and food security. Although food production has always been regarded as an essential requirement for the development of civilization, its role in bringing stability to rural livelihoods and in the sustainability of the rural territories is not clearly perceived. The following citation summarizes the argument:

> *"The abatement of rural poverty should be based, above all, on the economic activation of the [rural] territories, based on a vision of territorial development in which the implementation of a dynamic and competitive agriculture plays a decisive role as the pivotal point for the articulation of different business activities that generate employment. This in turn would create a spiral of demand for services and products, making economic dynamism sustainable" (ECLAC, 2001).*

Recent publications mention agriculture and sustainable rural livelihoods as key ingredients to reduce poverty levels in developing nations and to achieve the Millennium Development Goals for the year 2015 in the areas of health and nutrition. More than 800 million poor people throughout the world, and more than 200 million in Latin America and the Caribbean, are faced with serious problems in terms of their ability to satisfy their basic nutritional requirements. Nowadays, in our globalized world, the issue of food security has once again emerged as the main challenge facing humankind; it is a source of institutional tensions, trade disputes and it also poses moral questions.

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13. See Hirschman (1958) as the proponent of this model. For a general discussion on agriculture in economic development theories see chapter two of Hayani & Ruttan (1991).

Thirdly, the multi-functionality of agriculture involves the economic and the non-economic dimensions of agriculture. Rural and urban inhabitants place increasing demands to the ecosystem services of the agriculture (protection of water sources, recreational areas, etc.). The following citation clarifies the concept of multi-functionality.

> *"The multi-functionality of agriculture is determined by a set of externalities, in other words, the additional benefits or damage generated by the activity itself. Aside from the goods it produces, agriculture generates a set of collateral effects that are not incorporated into the functions of production, or into the costs and income structures of productive activities, nor are they part of the financial analysis of an entrepreneur. Rather, they are effects that escape from its productive activity, but that affect the whole of society." (Echeverri and Pillar, 2002).*

In specific terms, much of the debate on agriculture's contribution to the development of countries ignores issues such as agriculture's role in the conservation of natural resources and the environment; the treatment of certain problems of a global character (climate change, biodiversity, desertification and others) and the development of social capital and the preservation of community life.

Any attempt to properly measure agriculture's contribution and define its role in economic development should therefore consider the three arguments outlined above.

Measuring Agriculture's Contribution to Economic Development

Agriculture's performance and its contribution to our countries' economic development has traditionally been undervalued, since it is measured using information about harvests and the sale of raw materials, mainly crops and livestock. As a result, the backward and forward linkages with agroindustry, the services and trade sectors and, in general, the rest of the economy, are overlooked. Thus, the value added generated by these linkages throughout the economy does not appear in the basic agricultural statistics of most countries.

Some studies have attempted to measure agriculture's true contribution to the development of the Latin American countries, using input-output (I-O) matrices to estimate the multipliers[14], and trying to incorporate agriculture's linkages with related sectors into the measurement. In fact, a study for El Salvador determined that agriculture and agrifood is the sector with the greatest capacity to boost the economy, since a 10% increase in the sector adds 3.36% to the gross value of domestic output. Furthermore, it was estimated that in 1996 the agricultural sector represented 32.2% of the gross value of production, equivalent to more than 23% of GDP, 31.3% of intermediate domestic demand and 32.8% of final demand (Ramos and Pérez, 1999).

Another study conducted in 1996 for the Chilean economy shows that, taking into account only the direct linkages with the manufacturing sector, agriculture's direct share of GDP

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14. In this study the word multiplier is used to designate the multiplying effect or the increase by repetition and accumulation that an initial injection in a sector of the economy has on the economy as a whole.

increased from 4.4 to 15.1%; employment increased from 14.1% of the economically active population to 22.1%; and total exports increased from 4.8% to 19.9%. In other words, the importance of the agricultural sector is multiplied by 3.4, 1.5, and 4.1 times in the respective parameters (Dirven, 2002). In the case of Guatemala, Navas and Toro (1991) underscore the importance of agriculture and agrifood in terms of its share of aggregate demand (33.1%) and its aggregate value in relation to the sector's absorption (74.5%). They also conducted an exercise to calculate the multipliers, which confirmed the importance of the agricultural sector's linkages.

The True Measurement of the Agriculture's Contribution

These attempts to measure agriculture's contribution would appear to prove the hypothesis that, if the added value of pre-harvest and post-harvest production chains is included in the analysis, agriculture becomes a significant contributor to GDP. However, these efforts do little to measure agriculture's role in generating value added and in the redistribution of income. Nor do they measure the contributions of environmental and other services provided by agriculture.

To properly measure agriculture's performance and contribution, account must be taken of its effects on the distribution of income among rural and urban households, wage earners and owners. These aspects are essential to evaluate its impact on poverty alleviation strategies and, in particular, on the livelihoods of rural populations. Furthermore, a true measurement of agriculture's contribution should not overlook its role in meeting the growing demand for environmental goods and services from urban centers. As an economic bridge between rural and urban areas, agriculture provides food, employment and natural resource services to urban dwellers. In a globalized world, a country's food security can only be assured if rural livelihoods are strengthened.

Objective of the Study

The aim of the study was to develop a methodology to estimate agriculture's true contribution to our countries' economic development. This methodology empirically addresses the concept of agriculture and agrifood; calculates agricultural linkages; and simulates the impact of agriculture on the countries' overall economic activity.

Another goal is to highlight agriculture's contribution to the livelihoods of rural dwellers and the sector's potential for contributing to the development of national economies.[15]

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15. Future stages will include dimensions that are important for rural economies, especially the natural resources sector, through the so-called "Green Accounts" (already in progress); the specification of regional accounts; and a better specification of promising activities such as agro tourism. In addition, an analytical framework will be developed for detecting other, harder to quantify contributions related to the social, cultural and environmental dimensions.

Scope of the Research

This document attempts to highlight agriculture's contribution to the livelihoods of rural dwellers and the sector's potential for contributing to the development of national economies. Future stages of the study will include other dimensions that are important for rural economies, particularly the natural resources sector, through the so-called "Green Accounting" (already in progress); the specification of regional accounts; and a better specification of promising activities such as the agro-tourism. In addition, an analytical framework will be developed to detect other contributions that are harder to quantify, related to social, cultural and environmental dimensions.

As part of a joint research initiative within the framework of the IGRD, this report presents the results of Phases I and II of the study's first component. Feedback will make it possible to refine and complement current efforts to produce an analytical framework that incorporates green accounts and will also facilitate the development of Computable General Equilibrium models. The capability developed will make it possible to improve policy analysis by providing an analytical framework that integrates the social, economic and environmental dimensions of rural development.

2. METHODOLOGY

Procedure

In order to develop and validate the methodology to measure agriculture's true contribution to economic development, it was first necessary to establish the data requirements and select the countries to be studied. Thus eleven Social Accounting Matrices were calculated. The study then proceeded to calculate the percentages of the productive sectors' share of the gross domestic product (GDP), complementing this with an estimate of the relative share of "agriculture and agrifood." Then the destination (use) of agricultural production was analyzed, along with the payments made by this sector, placing special emphasis on compensation to the factors of production (factor payments). The next step was to calculate a socioeconomic model known as SAM Multipliers, which facilitates analysis of the possible effects of external injections (through increased demand for exports, foreign investment, transfers and external donations, among others) on the economy of the countries studied. This analysis provides a direct measurement of the linkages between agriculture and the rest of the economy. Finally, simulations were carried out for some of the most important agricultural sectors for groups of countries.

The Social Accounting Matrix[16]

As mentioned in the introduction, the methods used to assess the true contribution of agriculture should: measure the impact of agriculture and its linkages; consider the generation of value added and the distribution of income; and measure the impact on the environment. In practice, however, this approach is limited by the methods used to collect statistical data and by the limited financial resources available to update cost structures and more efficiently record intermediate consumption and value added in the economy.

Nowadays, countries make considerable efforts to gather and compile such information in a series of national accounts and, as a result, most countries have a matrix or a table showing the supply and use of production. In fact, these national accounts are the richest and most consistent source of information available to us. For this reason, the present study utilizes the social accounting matrixes of the different countries as a database, since these are based on national accounts.

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16. For more information on the methodological aspects of the SAM and the model of SAM multipliers, see Annex A.

In general, a Social Accounting Matrix (SAM) is a database in matrix format that consistently represents all monetary flows of goods, services and income formation between all the agents of an economy within a reference period (Ferri and Uriel, 2000). A SAM reflects these relationships as well as broader linkages, making it possible to examine the structural links between production, consumption, trade and the accumulation and distribution of income. The most important characteristics that make the SAM suitable for the purposes of this research are (Alarcón, in Adamson et al, 1999):

- Comprehensive: the SAM reflects the total circular flow of the economy as a whole.

- Consistent: it complies with the Walrasian general equilibrium rule; all markets are in balance.

- Transparent: the SAM provides an objective view of the structural socioeconomic relations of the economy under study.

- Flexible: it may be utilized as a basis for developing Computable General Equilibrium (CGE) models or to expand these by including additional modules that are considered relevant, such as demographic data, social and environmental indicators or both.

The greatest virtue of a social accounting matrix is that it explicitly describes the flow of income and makes it possible to analyze issues related to income distribution. As databases, these matrixes have also been widely used to study trade policy, income distribution, fiscal policy, external impacts and structural adjustment issues, among others. Furthermore, they can be used to develop socioeconomic models that simulate the impact of public policies and of other exogenous changes on the economy as a whole.

The information used to create the SAMs for 10 of the countries in the study (Argentina, Brazil, Canada, Chile, Colombia, Mexico, Peru, Uruguay, the United States and Venezuela) was obtained from the GTAP database (Global Trade Analysis Project, Purdue University). For Costa Rica, the study used a SAM developed by IICA (IICA, 2004) based on the year 1997 (this is also useful because the GTAP database uses 1997 as its base year) and including 41 different sectors of the economy. Based on these 11 SAMs (presented in an abbreviated form in Annex B), the multipliers were estimated.[17]

It should be noted that, although the SAM is an accounting framework consistent with the monetary flows of the economy, there are some important monetary flows that are not incorporated in it. For example, certain productive sectors such as personal consumption or the informal sector are unaccounted for, due to a lack of statistical data. Nevertheless, the information provided by SAMs is far more comprehensive than that derived from input-output matrices, and significantly improves the measurement of agriculture's true contribution to economic development.

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17. For Costa Rica's SAM in all extension (115 X 115 sectors), please see (IICA, 2004) or contact the web site: www.iica.int.

The SAM Multiplier Model

One of the socioeconomic models that can be generated from a social accounting matrix is the SAM Multiplier model. As a model, a SAM multiplier is an extension of input-output multipliers (I-O models) popular in the industrial analysis literature of the 1970s and 1980s. However, SAM multipliers are more complete and yield greater values that those obtained from an input-output matrix. For more information, see De Janvry and Sadoulet (1995).

The analysis of multipliers is based on the premise that in order to produce more in one sector, it is necessary to acquire inputs from another. This is known as direct input requirements. But in order to supply these inputs, the different sectors of the economy also need to use inputs from other activities and so the process is repeated, creating a long chain of what are known as indirect input requirements. The SAM multiplier model reflects the total input requirements, both direct and indirect. This process also generates changes in factor payments, in the national income and in its distribution.

SAM multipliers (see Annex D) are used to quantify the links between a particular activity - in this case agriculture - and the rest of the economy. For example, if a change occurs in agricultural output, this also produces changes in demand for inputs, employment and the generation of income in rural areas. Conversely, changes in other sectors of the economy affect agricultural production, agricultural employment and the distribution of farm incomes. The bigger the multiplier, the greater its impact on the economy.

An analysis of SAM multipliers may provide the criteria for identifying key sectors of the economy, where new investments may create opportunities for growth. By focusing efforts on those sectors with strong backward and forward linkages to production, and through a proper generation and distribution of income, the process of economic growth can be accelerated[18].

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18. Unlike the analysis of input –output multipliers that only take into account the linkages between industries but not the effects on the generation and use of value added (see Sadoulet & De Janvry; Holland & Wyeth)

3. AGRICULTURE'S TRUE
CONTRIBUTION TO THE ECONOMY

The results are presented in three sections. The first figures obtained show the contribution of agriculture and agrifood, expressed as a percentage, to gross domestic product in the countries studied. Agriculture's linkages were then estimated, using information from the social accounting matrixes. These linkages were analyzed to determine both the effects on other production processes and on the generation and use of income. The effects on production were analyzed by studying the use given to the agricultural output (its destination); and the linkages with the generation and use of income were examined through an analysis of agricultural production costs.

Finally, using the SAM multiplier model, the study simulated external impacts on the countries' economies.

Primary Agriculture *vs* "Agriculture and Agrifood"

To corroborate, at least in a general way, the hypothesis that agriculture's true contribution to the economy is greater than what is usually reported and believed, we turn once again to the concept of agriculture and agrifood. This means adding to the measurement of the agricultural aggregates those sectors that are linked by their requirement for agricultural inputs, such as the production of processed foods and the agroindustrial sector. The concept of agriculture and agrifood as a group of interdependent sectors closely linked to the primary agricultural sector, opens up the possibility of reappraising the value of agriculture. Manufacturing industries based on natural resources do not usually enter into statistical data as agriculture but as industry; for example, the food processing industry, the clothing industry that relies on cotton and the furniture and paper industries that depend on timber. All these economic activities are based on raw materials from rural areas and on primary agriculture, and help us to better understand what we wish to add to the concept of agriculture and agrifood.

Table 1 shows the contribution of primary agriculture and "agriculture and agrifood" to the Gross Domestic Product. For the 10 countries with the GTAP database the primary agricultural sector is defined as agriculture, forestry, and fisheries (Chapters 1- 4 of the CPC and 5 of the ISIC) and "agriculture and agrifood" is defined as the primary sector plus processed foods and manufactures derived either from this sector or from agroindustry (Chapters 21-25 of the CPC and Chapters 17- 22 of the ISIC). For Costa Rica, the primary sector consists of the first 9 lines of the Social Accounting Matrix of 1997 (banana, ripe coffee, sugarcane, cacao in beans, crude

	GDP (1)	AgGDP[1] (2)	AgGDP/GDP (3)	Agriculture and Agrifood GDP[2] (4)	Agriculture and Agrifood GDP/GDP (5)	Ratio Agriculture and Agrifood GDP/AgGDP (6=4/2)
TABLE 1						
Gross domestic product and agricultural value added in US$ thousand millions and as a percentage, for 1997						
Argentina	326	14.9	4.60%	104.9	32.20%	7.0
Brazil	789.7	34.0	4.30%	206.9	26.20%	6.1
Canada	631.1	11.5	1.80%	96.5	15.30%	8.4
Chile	76.1	4.3	5.60%	24.4	32.10%	5.7
Colombia	94.6	7.6	8.00%	30.4	32.10%	4.0
Mexico	388.8	17.9	4.60%	95.2	24.50%	5.3
Peru	64.9	4.3	6.60%	20.6	31.80%	4.8
Uruguay	19.1	1.2	6.20%	6.6	34.80%	5.6
United States	7,945.2	55.4	0.70%	644.9	8.10%	11.6
Venezuela	83.7	3.4	4.00%	17.2	20.50%	5.1
Costa Rica[3]	22.0	2.5	11.30%	7.2	32.50%	2.9

Source: IICA. Based on data from GTAP 5.0 and the SAM of Costa Rica for 1997 (IICA)

1 Includes: agriculture. forestry and fishing (chapters 01 to 04 of the CPC and 05 of the ISIC)

2 Includes: primary sector plus food and manufactured goods derived from this sector (chapters 21 to 25 of the CPC and 17 to 22 of the ISIC)

3 For Costa Rica, the primary sector consists of the first 9 lines of the SAM97; for agriculture and agrifood, 10 through 23 are added.

or roasted, basic grains, unprocessed tobacco, livestock, forestry and fisheries, and other agricultural commodities), and for agriculture and agrifood lines 10 to 23 are added.

Traditional measurements of agriculture's contribution to Gross Domestic Product suggest that it is declining and that, on average, it is equivalent to less than 10% of GDP. Measured in this way, Table 1 shows that the Agricultural Gross Domestic Product (Ag GDP) of the countries included in the study was just fewer than 7% in 1997, except for Costa Rica (11.34%) and Colombia (8.00%).

By contrast, agriculture and agrifood accounted for around 30% of total output for Argentina, Brazil, Chile, Colombia, Mexico, Peru, Uruguay, and Costa Rica, showing it has a similar level of importance in these countries. The figures for the United States and Canada are below the average for the rest of countries, and in Venezuela the percentage is 20.53%, lower than other Latin American countries, due to the relative importance of that country's oil sector.

The new indicator shows that the real contribution of agriculture and agrifood to GDP is considerably greater, ranging from a minimum of three times more for Costa Rica, to a maximum of 11.6 times for the United States. Thus, for the countries in the study, agriculture and agrifood contributed around 30% of the Gross Domestic Product in 1997. This is much higher than the 7% reported by official statistics.

It is interesting to note that, the greater the level of diversification of a country's economic structure, the greater the weight of the food and manufactured products that transform the inputs of primary agriculture, particularly in the cases of the U.S., Canada, Argentina and Brazil.

Agricultural Linkages

As an economy develops and becomes more diversified, the primary agricultural sector loses relative weight in terms of GDP, but develops strong linkages with the rest of the economy.

This can be confirmed by using the SAM to examine the important linkages that exist between agriculture and the rest of the economy. The extent of these linkages may be identified by analyzing the use of agricultural production (its destination). If a substantial part of agriculture is intended for intermediate uses (for example, for food processing) we should expect strong linkages between industries.

The destination of agricultural output is studied by analyzing the transactions between each of the different national accounts, starting with the following equation:

$$Q = D + I + C + X + G - M \qquad (1)$$

Where Q: gross output[19]; D: intermediate demand; I: investment; C: private household consumption; X: exports; G: government consumption; and, M: imports.
It is also necessary to divide the economy into 5 sectors, as follows:

- Primary sector: made up of agriculture, forestry, and fisheries (Chapters 1- 4 of the CPC and 5 of the ISIC) for the 10 GTAP countries, for Costa Rica the first 9 lines of the SAM97.
- Processed Food: includes Chapters 21-25 of the CPC classification; for Costa Rica, lines 10 - 16 and 18 of the SAM97.
- Agroindustry: defined in Chapters 17- 22 of the ISIC; for Costa Rica, lines 17 and 19 -23 of the SAM97.
- Natural Resources: Chapters 10-14 of the ISIC; for Costa Rica, there is no disaggregation for this sector.
- Rest of the Economy: Chapters 23-99 of the ISIC; for Costa Rica lines 24-41.

The results obtained by following equation 1 are shown in Table 2. Analysis of the destination of the countries' agricultural output (excluding Costa Rica[20]) shows that agriculture is an important source of inputs for other productive activities: intermediate demand for agricultural commodities absorbs 74% of primary agricultural output. In other words, ¾ of agricultural

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19. The concept of gross output is sometimes confused with Gross Domestic Product (GDP). The difference between both is that to estimate the GDP is the value of inputs used in the production is subtracted from gross output

20. Costa Rica's exclusion from the total is due to the fact that its data comes from a different source and the consolidation must be done thoroughly. Also, the small size of its economy does not alter the total results.

TABLE 2
Use Made of the gross output for 10 Countries in the Americas
(in percentages, by sector)

Sector	D	I	C	X	G	M	Q
Total Agriculture and Agrifood	54.3%	2.1%	43.1%	9.3%	1.7%	10.4%	100.0%
Primary	73.8%	1.1%	19.6%	11.5%	0.5%	6.5%	100.0%
Food and Agroindustry	48.8%	0.0%	49.7%	8.7%	2.0%	11.5%	100.0%
Natural Resources	109.5%	0.1%	0.2%	25.8%	0.1%	35.8%	100.0%
Rest economy	43.1%	11.4%	37.0%	6.7%	9.5%	7.7%	100.0%
Total	45.5%	10.0%	37.4%	7.3%	8.3%	8.4%	100.0%

Source: IICA. Based on data from GTAP 5.0
Q: gross output; D: intermediate demand; I: investment; C: private household consumption; X: exports; G: government consumption; and, M: imports.The results are for the weighted average of the 10 countries studied (Argentina. Brazil. Canada. Chile. Colombia. Mexico Peru. Uruguay. the United States. Venezuela). Costa Rica is not included.
Where the percentage is more than 100, the imported supply is included.

production is used as input for other industries/sectors. A comparison of this percentage with the percentage of output from other sectors of the economy that is used as input (43%), confirms the hypothesis that agriculture's linkages with the rest of the economy are not only important but usually underestimated.

Agricultural production is also a major contributor to private consumption and exports, at least in higher percentages than other sectors of the economy. In fact, the agricultural sector's real importance to national production lies in its capacity to generate intermediate goods.

A similar situation, but on a smaller scale, is evident in the processed food and agroindustrial sectors, where 48.8% of domestic output goes to intermediate demand and, if these percentages are weighted, the result for agriculture and agrifood is 54.3%.

Furthermore, 12% of primary agricultural production generates foreign exchange for the countries studied. This percentage is almost double what the other sectors of the economy contribute to exports (6.7%), with the exception of Venezuela. (See Table 3 containing the results for all the countries).

Final consumption of primary agricultural products absorbs high percentages of total agricultural output in countries such as Venezuela, Mexico and Peru (more than 35%). Exports absorb high percentages in Colombia, Canada, and Costa Rica - the latter exports 43.3% of its primary agricultural output. Although taken together the countries studied do not require large percentages of agricultural imports to complete their aggregate supply, Mexico, Peru, and Venezuela recorded a deficit, as the value of their imports is greater than the value of their exports. In the case of Mexico and Peru, the deficit is less than 2% of national output and in the case of Venezuela, it is 8%.

For Costa Rica, Annex C shows the destination of output, by productive activity: 57% of the gross agricultural output goes to intermediate consumption by other industries, 43.3% to

TABLE 3 **Use Made of the gross output by Country (in percentages, by sector)**							
Sector	**D**	**I**	**C**	**X**	**G**	**M**	**Q**
ARGENTINA							
Total Agriculture and Agrifood	44.3%	1.0%	48.9%	7.9%	0.7%	2.8%	100.0%
Primary	69.2%	2.8%	19.1%	10.4%	0.1%	1.6%	100.0%
Food and Agroindustry	35.6%	0.4%	59.3%	7.1%	0.9%	3.2%	100.0%
Natural Resources	79.7%	0.0%	0.0%	26.4%	0.0%	6.1%	100.0%
Rest economy	40.3%	18.0%	44.8%	3.4%	2.6%	9.0%	100.0%
Total	42.2%	11.9%	45.5%	5.3%	1.9%	6.8%	100.0%
BRAZIL							
Total Agriculture and Agrifood	52.7%	1.4%	44.0%	5.3%	0.0%	3.3%	100.0%
Primary	72.0%	2.4%	24.0%	4.9%	0.0%	3.3%	100.0%
Food and Agroindustry	44.2%	0.9%	52.7%	5.5%	0.0%	3.4%	100.0%
Natural Resources	111.8%	0.0%	0.0%	17.4%	0.0%	29.2%	100.0%
Rest economy	51.2%	12.8%	26.5%	2.9%	13.1%	6.5%	100.0%
Total	52.3%	9.8%	30.5%	3.7%	9.7%	6.0%	100.0%
CANADA							
Total Agriculture and Agrifood	51.6%	1.0%	30.7%	29.3%	5.0%	17.6%	100.0%
Primary	73.9%	0.0%	10.9%	22.9%	2.5%	10.2%	100.0%
Food and Agroindustry	44.9%	1.3%	36.6%	31.2%	5.8%	19.8%	100.0%
Natural Resources	63.8%	0.0%	1.1%	52.0%	0.9%	17.7%	100.0%
Rest economy	45.3%	12.7%	31.4%	18.1%	12.9%	20.5%	100.0%
Total	47.0%	10.4%	30.3%	21.2%	11.2%	19.9%	100.0%
CHILE							
Total Agriculture and Agrifood	45.6%	5.0%	42.6%	16.8%	0.0%	10.1%	100.0%
Primary	66.8%	5.1%	17.8%	14.0%	0.0%	3.7%	100.0%
Food and Agroindustry	36.3%	5.0%	53.5%	18.1%	0.0%	12.9%	100.0%
Natural Resources	81.4%	2.9%	0.0%	46.6%	0.0%	30.9%	100.0%
Rest economy	49.5%	18.5%	31.2%	11.6%	8.3%	19.1%	100.0%
Total	49.7%	14.0%	33.2%	14.4%	5.6%	17.0%	100.0%
COLOMBIA							
Total Agriculture and Agrifood	39.5%	0.9%	55.9%	11.1%	0.0%	7.4%	100.0%
Primary	54.1%	1.6%	30.5%	19.8%	0.0%	6.0%	100.0%
Food and Agroindustry	32.1%	0.6%	68.8%	6.6%	0.0%	8.1%	100.0%
Natural Resources	44.6%	0.0%	0.0%	56.1%	0.0%	0.7%	100.0%
Rest economy	50.1%	13.1%	31.3%	5.9%	13.5%	13.8%	100.0%
Total	46.9%	9.2%	37.0%	9.2%	9.2%	11.6%	100.0%
UNITED STATES							
Total Agriculture and Agrifood	58.6%	2.6%	41.4%	7.6%	2.1%	12.3%	100.0%
Primary	79.8%	0.0%	14.1%	13.3%	0.6%	7.7%	100.0%
Food and Agroindustry	54.1%	3.2%	47.2%	6.4%	2.4%	13.3%	100.0%
Natural Resources	154.9%	0.1%	0.1%	5.5%	0.0%	60.6%	100.0%

Sector	D	I	C	X	G	M	Q
Rest economy	42.2%	10.7%	38.3%	5.9%	9.2%	6.2%	100.0%
Total	44.8%	9 7%	38.3%	6.1%	8.4%	7.3%	100.0%
MEXICO							
Total Agriculture and Agrifood	43.1%	0.7%	55.6%	11.2%	0.8%	11.4%	100.0%
Primary	64.9%	1.4%	35.6%	7.5%	0.4%	9.7%	100.0%
Food and Agroindustry	33.8%	0.4%	64.1%	12.8%	1.0%	12.1%	100.0%
Natural Resources	59.1%	0.2%	0.0%	43.1%	0.0%	2.4%	100.0%
Rest economy	42.3%	16.0%	35.2%	17.7%	6.7%	17.8%	100.0%
Total	43.1%	11.7%	38.8%	17.1%	5.0%	15.7%	100.0%
PERU							
Total Agriculture and Agrifood	40.1%	0.7%	57.2%	8.3%	0.0%	6.3%	100.0%
Primary	54.4%	0.8%	45.2%	5.9%	0.0%	6.3%	100.0%
Food and Agroindustry	34.7%	0.6%	61.8%	9.2%	0.1%	6.3%	100.0%
Natural Resources	80.0%	0.0%	0.0%	47.5%	0.0%	27.5%	100.0%
Rest economy	42.6%	21.9%	30.5%	5.3%	10.4%	10.8%	100.0%
Total	42.7%	14.7%	38.1%	7.2%	6.9%	9.8%	100.0%
URUGUAY							
Total Agriculture and Agrifood	42.1%	0.4%	42.7%	22.3%	4.8%	12.4%	100.0%
Primary	65.3%	0.8%	21.3%	11.8%	5.5%	4.7%	100.0%
Food and Agroindustry	30.8%	0.2%	53.1%	27.5%	4.5%	16.1%	100.0%
Natural Resources	283.2%	0.0%	0.0%	6.0%	18.2%	207.4%	100.0%
Rest economy	46.6%	10.2%	43.1%	9.8%	9.9%	19.6%	100.0%
Total	45.7%	6.9%	42.9%	13.9%	8.2%	17.7%	100.0%
VENEZUELA							
Total Agriculture and Agrifood	49.4%	3.5%	55.2%	3.0%	0.8%	11.9%	100.0%
Primary	60.7%	3.3%	43.8%	2.3%	0.1%	10.3%	100.0%
Food and Agroindustry	45.3%	3.5%	59.4%	3.3%	1.0%	12.5%	100.0%
Natural Resources	39.3%	0.1%	0.0%	61.0%	0.0%	0.5%	100.0%
Rest economy	47.6%	13.7%	39.6%	10.7%	5.2%	16.9%	100.0%
Total	46.9%	9.8%	37.8%	15.6%	3.6%	13.7%	100.0%
COSTA RICA							
Total Agriculture and Agrifood	52.7%	1.2%	53.8%	39.3%	-5.3%	41.7%	100.0%
Primary	56.9%	2.1%	11.2%	43.3%	0.1%	13.6%	100.0%
Food and Agroindustry	50.4%	0.7%	76.7%	37.2%	-8.2%	56.8%	100.0%
Natural Resources	44.3%	15.0%	36.7%	16.2%	6.2%	18.3%	100.0%
Rest economy	44.3%	15.0%	36.7%	16.2%	6.2%	18.3%	100.0%
Total	47.0%	10.5%	42.2%	23.7%	2.4%	25.9%	100.0%

Source: IICA. Based on data from GTAP 5.0 and the SAM of Costa Rica for 1997 (IICA)
Q: gross output; D: intermediate demand; I: investment; C: private household consumption; X: exports; G: government consumption; and, M: imports
Where the percentage is more than 100, the imported supply is included..

exports, 11.2% to private consumption, and 2% to investment. The domestic agricultural supply is completed by imports of 13.6%.

In general, the above-mentioned structure of the destination of agricultural production does not vary from country to country. However, Canada, and to a greater extent Costa Rica, stand out as economies that are more "open" to foreign trade, since their exports and imports, for all sectors, as a proportion of the gross output, are higher than the rest of the countries. It is also interesting to note that Chile and Venezuela show higher than average levels of investment in the extended agricultural sector. Finally, Venezuela's export structure is different due to the importance of its oil sector, which means that the natural resources sector accounts for a large proportion of the country's exports.

It is equally important to obtain an idea of agriculture's linkages with the generation and use of income. To examine these linkages the costs incurred by agriculture are studied. As in the previous case, the cost structure may be analyzed for each sector by country, using data from the SAMs and beginning with the following equation:

$$Q = II + Lc + Lnc + K + T + I \qquad (2)$$

where: Q: gross output; II: intermediate inputs; Lc: remuneration to skilled labor; Lnc: remuneration to unskilled labor; K: remuneration to capital; T: land rents; and, I: indirect business tax.

Table 4 shows the results obtained for the aggregate of the countries. This shows that intermediate procurement represents, on average, 47% of the costs incurred by the primary agricultural sector for the countries in the study (excluding Costa Rica). However, if the extended agricultural sector is considered, intermediate procurement represents 55.8% of this sector's costs, both as an average and for each country. Meanwhile, intermediate input procurement by the food and agroindustrial sectors is equivalent to 58 cents for every dollar of production.

TABLE 4 Cost of the gross output for 10 Countries in the Americas (in percentages, by sector)							
Sector	II	Lc	Lnc	K	T	I	Q
Total Agriculture and Agrifood	55.8%	3.5%	14.8%	17.9%	2.8%	5.2%	100%
Primary	46.7%	0.9%	18.7%	20.1%	12.7%	0.9%	100%
Food and Agroindustry	58.3%	4.3%	13.7%	17.3%	0%	6.4%	100%
Natural Resources	33.8%	3.4%	10.8%	26.1%	19.5%	6.4%	100%
Rest economy	38.3%	14.1%	20.2%	22.2%	0%	5.1%	100%
Total	40.7%	12.5%	19.3%	21.7%	0.6%	5.2%	100%

Source: IICA. Based on data from GTAP 5.0.
Q: gross output ; II: Intermediate Inputs; Lc: remuneration to skilled labor; Lnc: remuneration to unskilled labor; K: remuneration to capital; T: land rents; I: indirect business tax.
The results are for the weighted average of the 10 countries studied (Argentina. Brazil. Canada. Chile. Colombia. Mexico Peru. Uruguay. the United States. Venezuela). Costa Rica is not included.

With respect to the generation of value added, the study explicitly shows that for every dollar produced in agriculture, 53 cents is value added. When the United States and Canada are removed from the group of countries studied, the value added is 70 cents. In turn, the food and agroindustrial sectors generate 42 cents in value added for every dollar produced.

Table 4 also provides details on primary agriculture's payments to the factors of production: 19.6% goes to labor remuneration, 20.1% to capital remuneration (very similar to the observed in the rest of the economy), 12.7% to land rent, and 0.9% to tax payments. It is important to point out that the tax burden in the primary sector is almost nil, around 1% on average for the countries listed and is generally lower than for other sectors of the economy in almost all the countries. As far as taxation is concerned, it is interesting to note that some countries appear with negative taxation for primary agriculture, something that may be seen in the most disaggregated data[21]. This would appear to be evidence of the weight of subsidies in this sector.

An analysis of primary sector costs in the countries studied suggests that, on average, only 1% is assigned to the payment of skilled labor, while the percentage for unskilled labor is 19%. This percentage is not surpassed by any other sector of the economy in the Latin American countries[22], except in Brazil as shown in Table 5. The agricultural sector is therefore associated with a less technical labor force. In the case of agriculture and agrifood, however, the percentage for skilled labor increases to 3.5%, while the percentage corresponding to unskilled labor decreases to 14.8%. This confirms the link between agricultural production and unskilled labor and the fact that the link with skilled labor is strengthened as we move from primary to agriculture and agrifood.

The study also highlights an interesting result, which has to do with the distribution of the payments made by agriculture. If it is argued that most of the remuneration to skilled and unskilled labor, land and capital, remains in the regions where agricultural production takes place, then according to this reasoning and based on value added calculations for agriculture, for every dollar produced in primary agriculture at least 53 cents remains in rural areas (or 70 cents, if we remove the United States and Canada from the sample).

It is necessary to clarify two points with respect to Costa Rica, as its data comes from a different source: firstly, the fact that no disaggregated data is available for land rents and secondly, that labor is not divided into categories of skilled and unskilled labor, but rather into rural and urban labor. Therefore, Lc corresponds to urban labor and Lnc to rural labor. As is to be expected, the study shows that agriculture and agrifood assigns a larger proportion of its resources to rural labor remuneration (13.0%) than to urban labor (6.0%). This difference is even more marked in primary agriculture, 23.0% vs. 2.6% (for more details see Annex C).

In general terms, the cost structure of the primary agricultural sector is similar for all the countries studied, although with slight differences, as shown in Table 5. However, in the United States, the primary sector accounts for a greater percentage of intermediate inputs (60.8%) as

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21. For more details see Annex C on the case of Costa Rica.

22. In the case of the United States and Canada the "rest of the economy" sector pays the highest percentage, 21%. For Brazil this percentage is 18%.

TABLE 5 Cost of the gross output by Country (in percentages, by sector)							
Sector	II	Lc	Lnc	K	T	I	Q
ARGENTINA							
Total Agriculture and Agrifood	48.1%	2.3%	19.5%	22.1%	5.5%	2.5%	100.0%
Primary	21.5%	1.0%	35.6%	20.2%	21.3%	0.4%	100.0%
Food and Agroindustry	57.4%	2.7%	13.8%	22.8%	0.0%	3.3%	100.0%
Natural Resources	11.4%	5.0%	20.7%	42.0%	20.4%	0.5%	100.0%
Rest economy	32.6%	10.2%	22.0%	29.1%	0.0%	6.1%	100.0%
Total	37.6%	7.4%	21.1%	26.9%	2.2%	4.8%	100.0%
BRAZIL							
Total Agriculture and Agrifood	59.7%	1.3%	11.4%	21.9%	3.0%	2.7%	100.0%
Primary	39.1%	0.5%	14.1%	36.6%	9.8%	-0.1%	100.0%
Food and Agroindustry	68.7%	1.7%	10.2%	15.4%	0.0%	4.0%	100.0%
Natural Resources	48.2%	1.6%	9.3%	21.4%	12.9%	6.6%	100.0%
Rest economy	44.3%	10.3%	18.2%	23.8%	0.0%	3.4%	100.0%
Total	48.2%	7.9%	16.4%	23.3%	0.9%	3.3%	100.0%
CANADA							
Total Agriculture and Agrifood	51.8%	4.1%	18.2%	12.9%	1.8%	11.2%	100.0%
Primary	51.2%	1.5%	17.6%	15.4%	7.8%	6.5%	100.0%
Food and Agroindustry	51.9%	4.9%	18.4%	12.1%	0.0%	12.6%	100.0%
Natural Resources	40.6%	2.2%	6.0%	18.7%	17.4%	15.2%	100.0%
Rest economy	31.8%	9.3%	21.9%	20.6%	0.0%	16.3%	100.0%
Total	35.4%	8.2%	20.7%	19.3%	0.9%	15.4%	100.0%
CHILE							
Total Agriculture and Agrifood	52.2%	1.3%	13.6%	16.9%	5.1%	11.0%	100.0%
Primary	34.0%	0.4%	23.9%	17.2%	16.6%	7.9%	100.0%
Food and Agroindustry	60.2%	1.6%	9.0%	16.7%	0.0%	12.4%	100.0%
Natural Resources	36.1%	2.1%	12.6%	31.6%	7.3%	10.4%	100.0%
Rest economy	34.6%	7.5%	13.7%	31.9%	0.0%	12.3%	100.0%
Total	39.6%	5.5%	13.6%	27.6%	1.7%	11.8%	100.0%
COLOMBIA							
Total Agriculture and Agrifood	53.5%	1.3%	17.9%	14.5%	6.4%	6.4%	100.0%
Primary	28.4%	0.4%	31.9%	17.0%	19.0%	3.3%	100.0%
Food and Agroindustry	66.3%	1.8%	10.7%	13.2%	0.0%	8.0%	100.0%
Natural Resources	29.0%	1.7%	10.2%	29.7%	22.7%	6.7%	100.0%
Rest economy	36.3%	11.4%	20.4%	24.0%	0.0%	7.9%	100.0%
Total	40.8%	8.2%	19.3%	21.5%	2.6%	7.5%	100.0%
UNITED STATES							
Total Agriculture and Agrifood	58.4%	4.7%	14.8%	16.0%	1.9%	4.3%	100.0%
Primary	60.8%	1.0%	13.7%	14.2%	10.8%	-0.5%	100.0%
Food and Agroindustry	57.9%	5.5%	15.0%	16.4%	0.0%	5.2%	100.0%
Natural Resources	38.6%	5.0%	13.7%	19.8%	20.1%	2.8%	100.0%
Rest economy	38.8%	15.4%	20.7%	21.3%	0.0%	3.8%	100.0%
Total	40.9%	14.2%	20.0%	20.7%	0.4%	3.9%	100.0%

Sector	II	Lc	Lnc	K	T	I	Q
MEXICO							
Total Agriculture and Agrifood	43.5%	1.0%	13.6%	25.1%	5.8%	11.1%	100.0%
Primary	26.5%	0.5%	30.9%	20.9%	19.4%	1.8%	100.0%
Food and Agroindustry	50.7%	1.1%	6.2%	26.9%	0.0%	15.1%	100.0%
Recursos Naturales	15.3%	1.1%	5.4%	51.2%	23.3%	3.7%	100.0%
Rest economy	30.3%	5.8%	11.4%	34.3%	0.0%	18.2%	100.0%
Total	32.9%	4.5%	11.7%	32.7%	2.3%	15.9%	100.0%
PERU							
Total Agriculture and Agrifood	37.0%	0.5%	10.2%	39.5%	5.5%	7.4%	100.0%
Primary	26.0%	0.5%	28.5%	18.8%	19.6%	6.6%	100.0%
Food and Agroindustry	41.3%	0.5%	3.1%	47.5%	0.0%	7.6%	100.0%
Recursos Naturales	28.9%	2.0%	12.1%	21.3%	11.9%	23.8%	100.0%
Rest economy	35.2%	7.9%	11.0%	34.7%	0.0%	11.1%	100.0%
Total	35.6%	5.5%	10.8%	35.9%	2.0%	10.3%	100.0%
URUGUAY							
Total Agriculture and Agrifood	47.6%	1.4%	16.2%	16.6%	5.7%	12.5%	100.0%
Primary	29.8%	0.6%	28.3%	16.2%	17.4%	7.7%	100.0%
Food and Agroindustry	56.3%	1.8%	10.2%	16.8%	0.0%	14.8%	100.0%
Recursos Naturales	37.5%	3.5%	21.0%	27.8%	6.8%	3.4%	100.0%
Rest economy	28.6%	5.8%	14.1%	36.6%	0.0%	15.0%	100.0%
Total	34.9%	4.3%	14.8%	30.0%	1.9%	14.1%	100.0%
VENEZUELA							
Total Agriculture and Agrifood	46.1%	1.4%	15.4%	15.5%	5.2%	16.4%	100.0%
Primary	27.1%	0.6%	30.1%	19.0%	19.2%	4.0%	100.0%
Food and Agroindustry	53.0%	1.8%	9.9%	14.3%	0.0%	21.0%	100.0%
Recursos Naturales	12.9%	1.5%	6.8%	41.0%	25.3%	12.4%	100.0%
Rest economy	39.7%	7.7%	15.4%	30.1%	0.0%	7.1%	100.0%
Total	37.6%	5.6%	14.3%	28.5%	4.3%	9.7%	100.0%
COSTA RICA							
Total Agriculture and Agrifood	58.4%	6.0%	13.0%	21.5%	0.0%	1.1%	100.0%
Primary	40.3%	2.6%	23.0%	32.8%	0.0%	1.3%	100.0%
Food and Agroindustry	68.1%	7.8%	7.6%	15.4%	0.0%	1.0%	100.0%
Natural Resources	41.5%	18.5%	11.2%	27.3%	0.0%	1.5%	100.0%
Rest economy	47.0%	14.4%	11.8%	25.4%	0.0%	1.4%	100.0%
Total	47.0%	14.4%	11.8%	25.4%	0.0%	1.4%	100.0%

Source: IICA. Based on data from GTAP 5.0 and the SAM of Costa Rica for 1997 (IICA).
Q: gross output ; II: Intermediate Inputs; Lc: remuneration to skilled labor; Lnc: remuneration to unskilled labor; K: remuneration to capital; T: land rents; I: indirect business tax.

gross output costs than in the Latin American countries (around 30%). Furthermore, in the US the levels of compensation paid to skilled labor are higher than in the rest of the countries.

The analysis of agricultural linkages, both through the study of the destination of production and production costs, highlights the importance of agriculture in these countries as a source of inputs for other industries, a source of foreign exchange and an important generator of value added. It is also argued here that the income generated by agriculture remains in the rural areas and plays an important role in creating sustainable rural livelihoods.

Agriculture's Multiplier Effects

Agricultural linkages were calculated using the methodology described earlier and according to the technical calculations described in Annex A. For all countries, the SAM is divided into six accounts[23] and the capital, governmental and external sectors were chosen as exogenous accounts. These exogenous accounts facilitate the simulation of policies and external shocks to the model: changes in demand for exports, changes in government transfers and infusions of foreign investment, among others. The multiplier model made it possible to explore the impact of various exogenous changes on the economy: for example, on local supply, income, its distribution among households, the structure of institutional expenditure and capital flight.

For the purposes of this document, the multipliers are summarized in Annex D, which includes the results for the 11 countries.

Multiplier effects on production

Annex D contains tables for each country with the SAM multipliers. The analysis of multipliers shows that each additional unit demanded from the primary sector produces strong impact on other sectors, generating a multiplier effect on the total output of the economy. This effect ranges from 3.076 additional units in Canada, to as many as 5.495 in Argentina. If we compare the multipliers for agriculture with those for other sectors of the economy for the 11 countries, we see that the multipliers for agriculture are similar to those for other sectors. This contradicts the accepted wisdom that agriculture has fewer effects than other activities, especially the industrial sectors.

It was also estimated that every additional unit produced in the primary agricultural sector, significantly increased production in the food sector (from 0.16 in Canada to 0.73 in Argentina) as well as in the agroindustrial sector (from 0.10 in Canada to 0.56 in Argentina).

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23. (1) Activities or Production Account; (2) Commodities Account; (3) Factor Accounts (includes Labor and Capital Remunerations Accounts); (4) Institutional Account (disaggregated into different socioeconomic groups: households, companies and government); (5) Capital Account; and, (6) Rest of the World Account.

Multiplier effects on the generation of value added and income

The multiplier effect on the generation of value added for all the countries in the study is shown in the tables in Annex D. Every additional unit of primary agricultural production demanded also has a very positive effect on factor payments (labor, capital and land): from US$ 1.421 in Canada, to US$ 3.34 in Argentina. Except for Canada and Brazil, unskilled labor remuneration is higher in the agricultural sector than in other sectors of the economy, ranging from US$ 0.58 in Peru up to US $ 1.30 in Argentina.

Every additional dollar of demand for primary agricultural production generates an increase in household incomes, ranging from US$ 1.42 in Canada to US$ 3.34 in Argentina. This statistic is extremely important, given that agriculture generates more household income than other industries. In the case of Peru, the multiplier effect of agroindustry is slightly higher than that of the primary agricultural sector.

Analysis of the multipliers also reveals that every dollar of government funds transferred to household incomes[24] generates another US$ 1.50. Of this, 78 cents is in the form of capital remuneration, 4 cents in land rents and 68 cents in the form of labor remuneration (47 and 21 cents for unskilled and skilled labor, respectively). The industries that benefit most from increased demand vary from country to country, but those that benefit most from government transfers of income to households are commerce and sales (multiplier of 0.41), real estate and rents (0.17), administrative services provided by the state (0.16) and foods produced from fish, vegetables and fruits (0.15).

Multiplier effects in the case of Costa Rica

In the case of Costa Rica, it was possible to conduct an even more exhaustive analysis. The availability of a social accounting matrix with more detailed information about institutions and factors of production made it possible to define agriculture's role in rural economic development. For Costa Rica, the agricultural sectors of green coffee, livestock, tobacco, meat and milk production, sugar and ripe coffee, produce multipliers of more than 2, which means that a one-dollar increase in demand produces more than one extra dollar in the other industries. These multipliers are only surpassed by the multipliers for construction, services and administrative services (see Annex D, Table of SAM Multipliers for Costa Rica).

The coffee, sugar, livestock and milk sectors make high payments to rural labor, while tobacco makes a higher contribution to urban wages. Specifically, a one-dollar increase in production in the green coffee sector generates 20 cents of urban labor, 45 cents of rural labor, 4 cents of taxes and 84 cents as capital profits (including land rents).

Similarly, every additional dollar of production of green coffee in Costa Rica (for example, as a result of increased demand for export coffee), generates an increase of US$ 1.18 in family

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24. This is shown in "Private" account multipliers in the Tables of Annex D. This is the multiplier for shocks or external injections of income to households (private account).

incomes. This multiplier is the second highest, surpassed only by the multiplier for the services sector. Other sectors that generate high multipliers for family incomes are ripe coffee, unprocessed tobacco, livestock, bananas and sugar.

Finally, in the case of Costa Rica it was also possible to estimate the effects of a direct transfer of funds from the government to households. Every dollar transferred to households would generate another 99 cents of value added: 22 cents in urban labor remuneration, 16 cents in rural labor remuneration, 54 cents in capital profits and 3 cents in taxes. The sectors that would benefit most by increasing their output are: chemicals (0.24), social, community and personal services (0.22), meat and milk production (0.21) and other manufactured products (0.15). Although additional information on capital ownership between rural and urban areas is not available, the foregoing analysis indicates that direct income transfers from the government to households could seriously affect the distribution of income between rural and urban households, giving higher remuneration to urban territories, higher payments to urban labor, and bringing more benefits to urban industries and families.

The extensive analysis conducted for Costa Rica underscores the importance of disaggregated SAMs that clearly specify institutions such as rural and urban households, for example. On this point, it is essential to analyze the sectors in a more disaggregated manner, since some linkages may be underestimated or the multiplier of a particular sector may be greater. Furthermore, as we can see in the case of Costa Rica, specific activities, even within the same sector, may affect the economic balance between regions in very different ways. Thus, the better we understand how these differences affect the regions, the better the decision-making process will be and the better our ability to evaluate the impact of policies.

Policy simulations and analysis

The analysis of multipliers using the SAM system is complemented in the following section with a series of simulations performed to demonstrate the usefulness of this instrument in the analysis and design of public policy[25].

The first simulation is of an aggregate change in agricultural exports and an infusion of investment in all the countries studied, followed by simulations of changes in the specific exports of some key agricultural and agroindustrial sectors.

Impact of a change in the exports of the agricultural aggregate

A first simulation is based on an analysis of the effects generated in the countries by a growth in exports of the extended agricultural sector (including the primary, food and agroindustry subsectors). Such an increase is considered exogenous, i.e. due to a hypothetical increase in demand

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25. For a detailed explanation of the methodology used to carry out the simulations, refer to Annex A in the Model of multipliers and simulations.

for products on the part of the leading importers or by any other factor that produces a 10% growth in exports of agriculture and agrifood.

Table 6 shows that this impact generates an initial boost to the economy, ranging from $95 million in Venezuela to nearly $11,600 million in the United States. This amount varies according to structure and value of each country's exports. If we consider the effect that this shock will have on the economy, taking into account the fact that the agricultural sector has strong production chains and is very closely linked to the rest of the economy, we find the total impact on the economy ranges from 0.23% growth for Venezuela to 2.72% for Uruguay. In other words, the total impact of the initial shock, which is traditionally used to measure the effects on the agricultural sector, is multiplied by 2.6 times for Canada and by up to 5.7 times for Argentina.

The simulation also makes it possible to predict the effects on the generation of household or family income. In this case, the increase ranges from 0.20% in Venezuela to 2.52% in Uruguay, a pattern very similar to that for the overall effect on the economy. One obvious result, which is also consistent with what we have discussed so far, is that the factor of production that benefits most in all the countries is land, showing increases of more than 4% in the case of Uruguay and Canada.

TABLE 6

Effect of a 10% increase in agriculture and agrifood exports by country, as a percentage of growth by item

	Argentina	Brazil	Canada	Chile	Colombia	USA	Mexico	Peru	Uruguay	Venezuela
Initial injection into	1,480	1,978	5,332	655	522	11,585	1,833	278	229	95
the economy*	0.27%	0.13%	0.48%	0.48%	0.31%	0.08%	0.27%	0.26%	0.74%	0.06%
Total effect										
on the economy	1.55%	0.71%	1.26%	0.02	1.19%	0.34%	0.86%	0.94%	2.72%	0.23%
Total effect/										
Initial injection	5.7	5.4	2.6	3.4	3.9	4.2	3.2	3.7	3.7	3.7
Effect on										
household income	1.51%	0.67%	1.13%	1.48%	1.17%	0.31%	0.83%	0.95%	2.52%	0.20%
Factor payments										
Land	2.99%	1.54%	4.60%	3.61%	3.09%	2.13%	1.86%	1.92%	4.06%	0.57%
Unskilled Labor	1.55%	0.64%	1.22%	1.65%	1.26%	0.32%	0.93%	0.93%	2.76%	0.24%
Skilled labor	1.22%	0.52%	1.00%	1.13%	0.86%	0.27%	0.60%	0.57%	2.18%	0.18%
Capital	1.46%	0.71%	1.07%	1.37%	1.07%	0.32%	0.79%	0.97%	2.36%	0.19%
Natural Resources	1.07%	0.76%	1.11%	2.19%	0.65%	0.34%	0.45%	1.09%	3.70%	0.08%

Note: * Datum in US$ million and as growth rate.
Source: IICA with data from the Annexes.

A common denominator in all the countries studied is that the increase in unskilled labor remuneration is greater than for skilled labor. This difference is greatest in Peru, where the increase in unskilled labor remuneration is almost double that for skilled labor.

Furthermore, it is interesting to note that the increase in capital profits follows a similar pattern to that of labor, since this increase is situated between the growth rate for skilled and unskilled labor in the majority of the countries, except for Brazil and Peru, where the increase in capital profits is greater than unskilled labor remuneration.

Impact of a change in investment in the aggregate of agriculture and agrifood

This simulation considers the effects of increased investment in agriculture and agrifood for all the countries (illustrated in Table 7). The increase amounts to US$ 100 million and is distributed between the primary, food, and agroindustry subsectors, in line with the SAM structure. This increase represents nearly 50% of the sum invested in the sector in 1997. More detailed calculations showing how this simulation was carried out are included in Annex E.

As shown in this table, the initial boost to the economy resulting from an infusion of investment in agriculture varies from country to country. The sum of $100 million generates an impact ranging from 0.01% in the United States up to 3.22% for Uruguay. The overall effect on the economy of these countries depends on their structure and on the value of their agricultural investments. Given the strong linkages that exist with the rest of the economy, the effect of this capital injection is multiplied by 2.5 times in the case of Canada up to 5.5 times in Argentina.

TABLE 7									
Effect of a US$100 million increase in investment by country, as a percentage of growth by item									
	Argentina	Brazil	Canada	Chile	Colombia	USA	Mexico	Peru	Uruguay	Venezuela
Initial injection into the economy	0.18%	0.07%	0.09%	0.73%	0.59%	0.01%	0.15%	0.93%	3.22%	0.66%
Total effect on the economy	1.00%	0.34%	0.23%	2.41%	2.24%	0.03%	0.48%	3.37%	11.74%	2.42%
Total effect/ Initial injection	5.5	5.2	2.5	3.3	3.8	3.8	3.2	3.6	3.6	3.6
Effect on household income	1.02%	0.34%	0.21%	2.24%	2.17%	0.02%	0.49%	3.56%	11.78%	2.14%
Factor payments										
Land	1.07%	0.87%	0.36%	5.56%	5.38%	0.03%	1.75%	7.03%	27.82%	6.42%
Unskilled Labor	0.80%	0.32%	0.23%	2.50%	2.35%	0.03%	0.62%	3.46%	13.39%	2.61%
Skilled labor	0.94%	0.26%	0.20%	1.69%	1.64%	0.02%	0.32%	2.11%	9.34%	1.87%
Capital	0.76%	0.36%	0.19%	2.07%	2.01%	0.02%	0.42%	3.66%	10.34%	1.97%
Natural Resources	1.02%	0.39%	0.13%	3.36%	1.22%	0.02%	0.32%	4.00%	24.66%	0.84%

Source: IICA with data from the Annexes

With regard to the generation of household incomes, the pattern is virtually the same as the overall effect on the economy, ranging from nearly 0.03% in the United States to around 11.8% for Uruguay.

An analysis of the effects on factors of production remuneration reveals that the biggest increase in all the countries is for land, with very significant percentages in the case of Uruguay where land rents increase by almost 30%.

Similarly, the results of the simulation reveal a greater increase in payments made to unskilled labor vis à vis skilled labor, except in the case of Argentina. It is interesting to note that in Argentina, Chile, Peru, and Uruguay there is a major impact on natural resource remunerations, with very significant percentages that are almost as high as land rents, ranging from 3% in Argentina to 25% in Uruguay.

Simulations in Key Agricultural Sectors

In order to identify and analyze key agricultural sectors in the economies of the Americas, an initial comparison was made of the percentage of the gross output of each economy represented by a particular sector, selecting the sectors with high percentages. These sectors were then analyzed by simulating exogenous impacts to the SAM multipliers model. Thus, dozens of simulations were performed on the most important sectors. This chapter describes the simulations with the most significant effects, particularly on incomes, helping to pinpoint key agricultural sectors.

Increase in coffee exports

A 10% increase in external demand for coffee from Brazil, Colombia, Peru, and Costa Rica has a very different impact on each country. This impact generates an initial boost to the economy ranging, in absolute terms, from $41 million in case of Costa Rica and Peru to nearly $275 for Brazil; in percentage terms, it varies from 0.02% for Brazil to 0.19% for Costa Rica. It is also evident that this sector has greatest importance for Costa Rica and Colombia, see Table 8.

The overall effect on growth of the economy goes from 0.05% for Peru to 0.60% for Costa Rica. With respect to the initial injection, we can see that this impact is multiplied by 1.4 times in Peru and by 4 times in Colombia. At the same time, income generation increases by nearly 0.10% in Brazil and Peru, and by around 0.6% for Costa Rica and Colombia. The growth in factor of production remunerations would also be much higher for these last two countries.

In the case of Costa Rica, an initial infusion of nearly $42 million generates $63 million in private income, which is distributed as follows: $35 million in capital profits, $19 million in rural labor remuneration and $9 million to urban labor (see Annex F). Table 8 shows that payments to rural labor increase by 0.75%, almost three times the increase shown by urban labor remunerations (0,28%) and higher than the increase in capital profits (0.63%).

TABLE 8				
Effect of a 10% increase in coffee exports by country, as a percentage of growth by item				
	Brazil	**Colombia**	**Peru**	**Costa Rica**
Initial injection into the economy*	275	226	41	42
	0.02%	0.13%	0.04%	0.19%
Total effect on the economy	0.08%	0.53%	0.05%	0.60%
Total effect/ Initial injection	3.4	4.0	1.4	3.2
Effect on household income	0.08%	0.57%	0.06%	0.56%
Factor payments				
Rural Labor	-	-	-	0.74%
Urban Labor	-	-	-	0.28%
Capital	0.10%	0.53%	0.03%	0.63%
Land	0.38%	2.04%	0.55%	-
Unskilled Labor	0.07%	0.63%	0.13%	-
Skilled labor	0.04%	0.29%	0.01%	-
Natural Resources	0.07%	0.22%	0.01%	-

Note: * Datum in US$ million and as growth rate.
The data for coffee exports was taken from the FAO (for Costa Rica, the datum of the SAM was used).
Source: IICA with data from the Annexes.

The results for Costa Rica confirm the importance of coffee, in quantitative terms, for the well-being and development of the country's rural communities.

With respect to factor payments in the other three countries, it is clear that land is the factor showing the most significant increase, as much as 2.04% in the case of Colombia. Moreover, as expected in a purely agricultural sector, unskilled labor benefits more than skilled labor. Another striking result is that in Colombia and Peru the increase in factor payments to labor is greater than for capital.

Increase in exports of fruits, vegetables and nuts.

A simulation was carried out for Argentina, Chile, Colombia, Mexico, Uruguay and Costa Rica. Table 9 shows that a 10% growth in exports of fruits and vegetables brings an initial injection of less than 0.10% in the economies (for Costa Rica the figure is 0.48%). The overall effect on the economy of the selected countries is multiplied by around three times for Argentina, Chile, Colombia, Mexico, and Uruguay. For Costa Rica the initial impact is increased by about twofold.

Once again, in is interesting to note the impact on private income, which is nearly 0.10% in these countries. However, the figures for Costa Rica and Chile are 1.05% and 0.30% respectively.

If factor of production remunerations are analyzed, the results are very similar to those shown in the previous simulations: land benefits most (increasing by 1.56% for Chile) and unskilled labor benefits more than skilled labor.

TABLE 9						
Effect of a 10% increase in vegetable. fruit and nut exports by country. as a percentage of growth by item						
	Argentina	**Chile**	**Colombia**	**Mexico**	**Uruguay**	**Costa Rica**
Initial injection intothe economy*	82	112	52	207	7	106
	0.02%	0.08%	0.03%	0.03%	0.02%	0.48%
Total effect on the economy	0.08%	0.27%	0.12%	0.11%	0.09%	1.05%
Total effect/ Initial injection	5.4	3.3	3.9	3.5	4.2	2.2
Effect on household income	0.09%	0.30%	0.13%	0.13%	0.09%	1.05%
Factor payments						
Rural Labor	-	-	-	-	-	1.26%
Urban Labor	-	-	-	-	-	0.64%
Capital	0.08%	0.26%	0.12%	0.10%	0.08%	1.18%
Land	0.27%	1.56%	0.45%	0.67%	0.25%	
Unskilled Labor	0.09%	0.36%	0.14%	0.18%	0.10%	
Skilled labor	0.07%	0.14%	0.06%	0.07%	0.07%	
Natural Resources	0.05%	0.13%	0.05%	0.06%	0.05%	

Note: * Datum in US$ million and as growth rate.
Source: IICA with data from the Annexes.

The simulation for Costa Rica reveals that the increase in rural household incomes (1,26%) is double that of urban households (0.64%), once again underscoring the importance of agriculture for rural communities.

Increase in exports of wheat, corn and oils

This simulation was carried out for Uruguay and Argentina. Table 10 shows that for both economies, the overall effect of increased wheat exports is nearly five times greater than the initial effect (injection). The impact on household incomes is also greater in Argentina than in Uruguay.

It is interesting to note that for Argentina, the effect on the economy, on household incomes and on factor payments of a 10% increase in exports of corn, barley, oats and other grains, is practically equal to that generated by an identical growth in wheat exports.

Increase in exports of oilseeds and oleaginous crops

The simulation carried for the oilseeds and oleaginous crops sector in Brazil, Canada, Uruguay and the United States reveals that a similar impact is to be expected in all the countries; a 10% growth in exports produces an increase of between 0.03 and 0.05% in the countries' total output. Households benefit from income increases ranging from 0.03 to 0.05%. However, factor of production remunerations stemming from increased output are not the same for all countries. For example, in Canada and the United States, the percentages are higher for land rents (0.71% and 0.50% respectively). This suggests that land is a more limiting factor

TABLE 10 Effect of a 10% increase in wheat and corn exports by country, as a percentage of growth by item			
	Uruguay (wheat)	**Argentina (wheat)**	**Argentina (corn**)**
Initial injection into the economy*	4	149	141
	0.01%	0.03%	0.03%
Total effect on the economy	0.06%	0.15%	0.14%
Total effect/ Initial injection	4.3	5.6	5.4
Effect on household income	0.06%	0.17%	0.16%
Factor payments			
Capital	0.06%	0.16%	0.14%
Land	0.18%	0.46%	0.47%
Unskilled Labor	0.07%	0.16%	0.15%
Skilled labor	0.05%	0.14%	0.13%
Natural Resources	0.04%	0.11%	0.09%

Note: * Datum in US$ x million and as growth rate.
   ** Includes corn, barley, oats and others.
Source: IICA with data from the Annexes.

in both of the North American countries than in Brazil and Uruguay, in the case of a possible increase in exports (see Table 11).

With respect to factor of production payments, very similar results are evident for the wheat-corn simulations and the oilseeds simulations, despite the fact that these were conducted for different countries. In the three cases described, we find two related results. Firstly, as is to be expected, land payments increase more in relation to other factor of production remunerations. Secondly, the benefits for unskilled labor are slightly greater than

TABLE 11 Effect of a 10% increase in oilseed exports by country, as a percentage of growth by item				
	Brazil	**Canada**	**Uruguay**	**USA**
Initial injection into the economy*	159	134	4	778
	0.01%	0.01%	0.01%	0.01%
Total effect on the economy	0.04%	0.03%	0.05%	0.03%
Total effect/ Initial injection	4.1	2.8	4.1	4.8
Effect on household income	0.05%	0.04%	0.05%	0.03%
Factor payments				
Capital	0.05%	0.04%	0.05%	0.03%
Land	0.22%	0.71%	0.14%	0.50%
Unskilled Labor	0.04%	0.03%	0.06%	0.03%
Skilled labor	0.02%	0.02%	0.04%	0.02%
Natural Resources	0.04%	0.02%	0.03%	0.03%

Note: * Datum in US$ million and as growth rate.
Source: IICA with data from the Annexes.

for skilled labor, though in all three cases the difference between skilled and unskilled labor is not as marked as in the cases of coffee and fruits and vegetables.

Simulations in Key Agroindustrial Sectors

In order to identify and analyze key agroindustrial sectors in the economies of the Americas, the same procedure was followed with the agroindustrial sectors. This section describes the simulations with the most significant effects.

Increase in exports of textiles and clothing manufactures

Four countries were analyzed in the light of a hypothetical 10% increase in external demand for textiles and clothing: Colombia, Mexico, Uruguay, and Costa Rica. This growth in exports generates an overall effect in the economies of Colombia, Mexico and Uruguay that is three times the initial injection. For example, an initial injection of 0.19% in the Uruguayan economy (resulting from a 10% growth in textiles and clothing exports) increases domestic output by 0.31%. In case of Costa Rica, an initial injection of 0.26% increases national output by 0.37%. (See Table 12).

The impact of increased textile and clothing exports on household incomes ranges from a 0.14% growth in Colombia to 0.67% in Uruguay. As expected, the pattern is very similar to the overall effect on the economy.

Meanwhile, the impact on factor of production payments for Colombia, Mexico, and Uruguay varies for each country. In Colombia, on the one hand, the greatest increase is seen in unskilled

TABLE 12			
Effect of a 10% increase in exports of manufactures of textiles and wearing apparel by country, as a percentage of growth by item			
	Colombia	Mexico	Uruguay	Costa Rica
Initial injection into the economy*	75	746	59	57
	0.04%	0.11%	0.19%	0.26%
Total effect on the economy	0.17%	0.34%	0.69%	0.46%
Total effect/ Initial injection	3.9	3.0	3.7	1.8
Effect on household income	0.14%	0.31%	0.67%	0.37%
Factor payments				
Rural Labor	-	-	-	0.44%
Urban Labor	-	-	-	0.39%
Capital	0.15%	0.33%	0.69%	0.33%
Land	0.12%	0.29%	0.78%	-
Unskilled Labor	0.16%	0.30%	0.64%	-
Skilled labor	0.10%	0.21%	0.57%	-
Natural Resources	0.06%	0.18%	0.39%	-

Note: * Datum in US$ million and as growth rate.
Source: IICA with data from the Annexes.

labor (0.16%), while in Mexico, it is capital (0.33%), and in Uruguay it is land (0.78%). However, a common element in all three countries is the greater increase in payments to unskilled labor in relation to skilled labor.

The unique characteristics of Costa Rica's SAM make it possible to study the patterns of income distribution. This reveals that of the $43 million generated by this shock for household incomes, around $18 million goes to capital profits, $12.5 to rural labor and $11.5 million to urban labor, see Annex F. In terms of growth, rural income grows by 0.44% while urban income grows by 0.39%, as shown in Table 12.

In this case, the performance of rural and urban incomes is very similar, contrasting with the situation in primary agricultural sectors, such as coffee and fruits and vegetables where, as we have already seen, the difference in the distribution of household incomes is more marked and favors rural incomes.

Increase in the exports of timber and paper manufactures

The simulation included Canada, Chile and Mexico. In this case we find that an increase in exports of wood-based products represents an initial injection ranging from 0.14% in Mexico to 0.42% in Canada. For these three countries the overall effect on the economy resulting from the initial boost is multiplied by about three times. The impact on incomes is practically the same as the total effect on the economy. (See Table 13).

Table 14 shows a simulation performed for exports of manufactured paper products for Canada and Chile, where the initial impact on the economy as a whole is multiplied almost threefold. In this simulation, both the economy and incomes grow by nearly 0.40% in Canada and by around 0.20% in Chile, respectively.

TABLE 13 Effect of a 10% increase in exports of manufactures of wood by country, as a percentage of growth by item				TABLE 14 Effect of a 10% increase in exports of manufactures of paper and paper products by country, as a percentage of growth by category		
	Canada	Chile	Mexico		Canada	Chile
Initial injection into the economy*	1,585	77	273	Initial injection into the economy*	1,617	104
	0.14%	0.06%	0.04%		0.15%	0.08%
Total effect on the economy	0.42%	0.19%	0.14%	Total effect on the economy	0.41%	0.24%
Total effect/ Initial injection	3.0	3.4	3.4	Total effect/ Initial injection	2.8	3.1
Effect on household income	0.39%	0.19%	0.14%	Effect on household income	0.40%	0.23%
Factor payments				Factor payments		
Capital	0.34%	0.22%	0.16%	Capital	0.42%	0.25%
Land	0.22%	0.13%	0.12%	Land	0.21%	0.15%
Unskilled Labor	0.46%	0.17%	0.12%	Unskilled Labor	0.40%	0.21%
Skilled labor	0.33%	0.12%	0.08%	Skilled labor	0.38%	0.15%
Natural Resources	0.50%	0.12%	0.12%	Natural Resources	0.27%	0.11%

Note: * Datum in US$ million and as growth rate.
Source: IICA with data from the Annexes.

With regard to factor payments, in the case of wood and paper products it is interesting to note that unskilled labor benefits more than skilled labor. This is the same result obtained in all the cases analyzed in this document.

At the same time, the results of the simulation conducted with manufactured paper products show that payments to capital is the factor of production with the greatest increase, whereas in the case of the wood (Canada is the exception), the increase is greatest for natural resources.

The results obtained on hypothetical changes, both in the general sectors and in key agricultural and agroindustrial sectors, show that in order to improve the well-being of communities it is essential to provide incentives, investment and support for the agricultural sector of the economies of the Americas.

4. Conclusions

The study has clearly demonstrated the importance of the value added of the agricultural production chain to the domestic economies of all the countries in the Americas, thus correcting the traditional skewed view of agriculture's contribution and its potential for economic development. The study validated the methodology in 11 countries and highlighted the role of agriculture as a supplier of inputs, a generator of value added and foreign exchange earnings, and an important factor in the redistribution of income.

When analyzing agriculture's true contribution to our countries' economic development, the analytical framework of SAM multipliers makes it possible to factor in considerations related to the generation and use of income, since it provides policymakers with indicators of the effects on labor, capital, land, and household incomes. This information is important when negotiating development strategies, since it makes it possible to identify sectors that not only have a significant multiplier effect on production, but that can also have important effects on the distribution of the income and the value added generated.

The application of these methods to measure agriculture's true contribution to the economy gives us a better understanding of its importance to development. This, in turn, makes it possible to improve decisions regarding investments and policy-making for agriculture, so that they contribute more effectively to development and poverty reduction.

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GLOSSARY

PRODUCTION

Gross Domestic Product (GDP) is the market value of the final goods and services produced in a country during a given period of time. The ***Primary Sector or Agricultural GDP*** is defined as the production of agriculture, forestry, and fisheries. ***Agriculture and agrifood Ag GDP*** includes the primary, food and agroindustrial subsectors.

Disposable National Income measures the country's disposable income for final consumption and net savings. ***Value added*** is understood as the value of payments made to the factors of production, generated by a productive process. ***Full-Employment Output*** measures the output of the economy when unemployment is at its natural or normal rate.

DEMAND

Gross output is the total sum of value of goods and services produced in a country during a given period of time: including inputs and final goods and services. The concept of gross output is sometimes confused with Gross Domestic Product (GDP). The difference between both is that to estimate the GDP is the value of inputs used in the production is subtracted from gross output.

Intermediate Demand consists of the value of the production of goods and services of a given sector that is demanded as input by other sectors of the economy. ***Investment*** is defined as expenditure on equipment and infrastructure that is used repeatedly or continuously to produce goods and services, as well as the stock of business inventories.

Private Consumption or final consumption by households consists of consumer goods or services acquired by individual households, either by purchasing them or through social security transfers received in kind. ***Government Consumption*** is the value of spending on consumer goods or services by government departments or institutions. ***Imports*** of goods and services consist of purchases, exchanges (barter), gifts or donations of goods and services by residents from non-residents. ***Exports*** of goods and services consist of sales, exchanges, gifts or donations of goods and services by residents to non-residents.

Consumption of Intermediate Inputs is the value of goods and services consumed as input by a production process, i.e. it includes the goods and/or services that are transformed or are consumed in the productive process. Indirect business taxes are obtained by subtracting the

subsidies granted by the government from the total of the taxes that the government receives from production.[26]

SOCIAL ACCOUNTING MATRIXES

An *Input-output Matrix (IOM)* basically describes the existing structural interdependence between the various sectors or industries, and for this reason it mainly considers the total of real intermediate transactions in the economy.

A *Social Accounting Matrix (SAM)* is a database that consistently represents, in matrix format, all flows of goods, services and income between all agents of the economy within a period of reference. A *SAM* presents the structural characteristics of the economy in an explicit and detailed manner.

Walrasian Equilibrium is a balance in which supply is equal to demand for each and every one of the markets in the economy. A *Computable General Equilibrium (CGE) Model* based on the *SAM* presupposes a *General or Walrasian Equilibrium*. The *CGE models* use non-linear programming to solve a system of behavioral equations and to find a vector of equilibrium prices. This model could dynamically simulate the effects of policies on the economic system.

Endogenous Variables are variations that are determined only by the relationships within the model, while *Exogenous Variables* are those that vary due to external changes of the model. *Comparative Static* is the study of how economic variables respond to changes in the environment. The idea is to compare the current situation with the one that would be created when all possible adjustments have been made, i.e. comparing one situation of equilibrium with another.

LINKAGES AND MULTIPLIERS

In relation to *backward linkages*, the analysis is based on the premise that in order to produce more in a given sector, it is necessary to purchase inputs from other sectors, This is known as direct input requirements. But in order to supply these inputs, the different sectors of the economy must also use inputs from other activities, and so the process is repeated, creating a long chain of what are termed indirect input requirements. The aim is to calculate the total of input requirements, both direct and indirect. This process also generates changes in factor of production payments, in national income and in its distribution.

Forward linkages occur when the output of a given sector is or may be utilized as input by several or many of the other sectors of the economy. As capacity increases in a sector with strong forward linkages, the supply of inputs for other sectors will increase. Or, viewed from another perspective, these linkages indicate to the extent to which demand in other sectors of the

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26. The importance of the use of this accounting framework was discussed by Pyatt (1991).

economy sectors should be expanded in order to absorb an additional unit produced in a given sector, for example, agriculture.

Multipliers are a series of measures that describe the relationships inherent to the SAM based on technical calculations. Thus, we have the multiplier for demand (backward linkages), and the multiplier for a uniform expansion of supply (forward linkages).

OTHERS TECHNICAL DEFINITIONS

A *Function of Production* is defined as the relationship between the quantity of factors used to produce a product, and the amount of that product that is produced. *Relative Price* is defined as the price of a product compared with other prices of the economy. *Marginal Propensity to Consume* is the proportion of additional income spent by an economic agent (households) instead of saving. *Average Propensity to Consume* is the average percentage of consumption by an economic agent instead of saving. *Elasticity of Substitution* measures the extent to which a variation in the level of supply and demand for a product responds to a variation in its price. *Income Elasticity* measures the extent to which the level of demand for a product responds to variations in the income of consumers.

ANNEXES

ANNEX A
Methodology

METHODOLOGY

Social Accounting Matrix

A Social Accounting Matrix (SAM) is a database that represents, consistently and in a matrix format, all the flows of goods, services, and income among all the agents in an economy during a given reference period (Ferri and Uriel, 2000). As an analytical tool, SAMs have become the best instrument available for studying the characteristics of economic development processes, and key aspects and questions related to them (Alarcon, in Adamson *et al.*, 1999).

These matrixes were developed in the mid-1970s to provide an information system that could be used to analyze employment opportunities and income distribution (Pyatt and Thorbecke, 1976). Initially, they were constructed to evaluate economic policies in developing countries (Pyatt and Round, 1985) but they are now also used in developed countries, as an instrument for analyzing fiscal, trade and other policies.[27] They are an extension of the input-output model developed by Wassily Leontief in the 1930s, which includes, besides the structure of production, data on income distribution and the demand from institutions.

The first distinctive feature of a SAM is the definition of an exhaustive and mutually exclusive set of socioeconomic groups linked to the productive sphere (in respect of both income and expenditure). The main reason why a SAM is used in this study is that it emphasizes real, intermediate economic relationships. The system of national accounts, on the other hand, describes the end results of the economy. Thus, the growth of different branches of activity generates income for the different households according to the production factors they possess. The resources of these households spend on consumption also create demand for goods from the different production sectors of the economy. Of course, the database also considers the income and expenditure of other institutional sectors (the government, firms, and the rest of the

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27. To present economic transactions in a matrix format, three conditions must be met: 1) all the matrix's rows and columns are defined symmetrically, with each account, defined by a row and a column of the matrix, used to record the transactions of a given agent; 2) each transaction is entered in a single cell of the matrix, using the accounting concept of double entry and showing that the expenditure of one agent is the income of another; and, 3) for each of the accounts in the matrix, the sum of each row (income) is the same as the sum of each column (expenditure).

world). Therefore, it complements the primary income of households with the different redistributive mechanisms that exist in the economy. In other words, a SAM is used to explain the structural interdependence among the sectors of a given economy, emphasizing the relationships established among the agents of production, and the relationships between these agents and the users of the finished products (Astori, 1990).

Thus, a SAM provides information about the entire economic structure of an economy. It can be used to ascertain a country' gross domestic product or value added, as well as the contribution that each economy activity and factor of production makes to the value added. It is also possible to obtain information about per capita income, income distribution among households, and the source of income (be it local or external); the economy's dependence on other countries; the weight of national and international remittances in the population's income; and other matters of interest. In other words, a SAM is not a set of isolated data, but a comprehensive and integrated analytical system (Adamson *et al.*, 1999). SAMs have not only been used to describe these structural relationships, however; they can also be used to plan their future evolution.

Schematically speaking, a SAM is a squared matrix[28] in which each sector or account has its own row and column. Expenditures are listed in the columns and income in the rows. As each account must balance, the totals for the row and the column are the same.

The way in which production sectors are disaggregated within a SAM will depend, firstly, on the objectives sought, and, secondly, on the quantity and quality of the available information that exists. This second point is the biggest limiting factor in analyses carried out using such instruments.

Another advantage of this instrument is that, through extensions, information can be incorporated about the use of natural resources and pollution processes, as well as social indicators, by means of a module of basic needs and another of social indicators (Adamson *et al.*, 1999).

In short, the main reasons why SAMs are very interesting to use are (Alarcon, in Adamson *et al.*, 1999):

1. Their comprehensiveness: they reflect the total circular flow of the entire economy.
2. Their consistency: they obey the Walrasian rule of general equilibrium; for all accounts, the total for the rows is identical to the total for the columns.
3. Their transparency: they make it possible to objectively establish the socioeconomic structural relationships of the economy studied.
4. Their flexibility: they can be used to develop Computable General Equilibrium Models (CGE)[28] or to extend them, including demographic data or social and environmental indicators, or both. Thus, relevant additional modules can be introduced.

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28. These can be used to simulate the integral effects of different policies (e.g., economic, social and environmental policies). They are based on a series of equations that characterize the performance of the economic sectors described in the accounts of a SAM, where the expected performance of these sectors, the restrictions of the system and the conditions needed for equilibrium should be spelt out.

In a SAM, there are six kinds of accounts: activities, commodities, factors, institutions (households, firms and government), capital, and the rest of the world. Table 1 shows the basic structure of a SAM.

TABLE 1. BASIC STRUCTURE OF A SAM

	Activities	Commodities	Factors	Private	Government	Capital	Rest of the World	Total
Activities		Gross Output					Exports	Total value production
Commodities	Intermediate Consumption			Private Consumption	Government Consumption	Private and Public Investment		Domestic Aggregate Demand
Factors	Salaries + capital earnings							Factors Remuneration
Private			Income, labor and capital		Transfers		Foreign Transfers	Private Income
Government	Indirect Taxes	Tariffs	Social Security Contributions	Direct Taxes			Foreign Transfers	Gov. Income
Capital				Private Savings	Government Savings		Foreign Savings	Total Savings
Rest of the World		Imports		Payment Interest & Other	Payment Interest & Other			Income from RoW
Total	Total Value of Production	Aggregate Supply	Remune-ration Factors	Private Expenditure	Government Expenditure	Total Investment	Payments to RoW	

The commodities accounts can be seen as the domestic market for products (intermediate consumption). These accounts purchase (column) imported and domestic products, paying indirect taxes and tariffs (subsidies) on imports. The income (row) is derived from the sales, in the domestic market, of intermediate products to the activities, final consumption of goods by families, government consumption, investment and export demand.

The factors accounts include capital and labor. They receive (row) payments from the sale of their services to the activities, in the form of wages and capital earns. These are distributed (column) to the households as labor income or dividends (net factor income) and undistributed corporate profits after paying taxes.

The institutions account includes households, firms and the government, usually with the households disaggregated into different socioeconomic groups. Household income includes the net factor income described previously and transfers from other households, the government, the firms, or the external sector. Household expenditure is made up of consumption and income taxes, with residual savings transferred to the capital account. The firms receive retained

earnings and dividends gained abroad, spend on taxes and transfers, and the residual saving is included in the capital account. The government account makes outlays to purchase products, in addition to the transfers to different institutions, and what is left (savings/deficits) is entered in the capital account. On the income side, the government receives the different taxes and transfers from the external sector (net borrowing).

The capital account is identified independently, and contains the savings of institutions and the external sector. This provides the financing for capital formation and changes in the inventory (investment).

The last account is used to record the transactions that take place between the domestic economy and the rest of the world. The economy receives income from the external sector as payment for exports, and pays for imports. Likewise, a net payment is received from abroad for some factors, and the debt is serviced.

Relationships and characteristics inherent in a SAM

It is possible to distinguish between two types of measures in the relationships and characteristics inherent in a SAM. On the one hand, there are those based on the direct calculation of ratios, which include the "technical coefficients of production" (Leontief coefficients), meaning the ratios between the purchases that sector j makes from sector i, and the total production of j. Another series of measures on the subject are the linkages of demand (supply), meaning the percentage of purchases (sales) of each activity to the rest of the economy with regard to the total intermediate purchases (sales) of the economy; and the Chenry and Watanabe coefficients, which measure the strength of forward and backward linkages among the branches of activity, calculated as the proportion of a sector's purchases and intermediate sales with respect to the sector's total purchases and sales.

There is also a series of descriptive measures of the relationships inherent in the SAM called multipliers which are extensions to the Input-Output multipliers methodology. In Input-output models, there are two types of multipliers: backward and forward multipliers. Backward multipliers are computed using the Leontief Inverse Matrix (LIM) that uses an input-output coefficients matrix. Meanwhile; forward multipliers are computed using a LIM that uses a supply coefficients matrix[29]. SAM multipliers extent the calculation of the backward multipliers to include value added and income distribution in what is referred to as the matrix of SAM coefficients (Adelman and Robinson, 1986). The inverse of this matrix of SAM coefficients yields the multipliers of an external injection for sector j-th under the column j-th. This vector of multiplier present the own multiplier in the j-th raw which measure the additional demand generated on the j-th sector. The other multipliers of the vector measures the capacity of the different sectors for transmitting throughout the production structure a unit increase in the final demand of activity j;

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29. A matrix of supply coefficients is obtained by dividing the row of intermediate inputs supply by the total supply of a sector and; the input-output coefficient matrix is obtained by dividing the row of intermediate inputs by the total of each column.

The first type of measures described help to obtain an approximation of the importance of each activity in the economic system as a whole, since they measure simply the direct contribution of the given industry to the total production of each sector, and of the economy. The second type of measures calculate the importance of each production activity in the economy, considering not only their direct contribution to production, but also their indirect contribution (which results from being the "supplier" of "suppliers" of other production activities), included in the LIM coefficients.

SAMs are also a complete database that can be used to develop different models, which in turn make it possible to conduct analyses of the impact of changes in policy and variables that are regarded as exogenous (international prices, foreign investment, exports). Build upon mathematical formulations, a SAM-based model shows the flows that exist among all the components of an economy, as well as those that occur between it and its environment (i.e. with its surroundings). These models, then, should reproduce the original data of the SAM according to the functional relationships that it contains (calibration of the model). Once the calibration has been carried out, it will be possible to use the model to simulate the effects that different policy scenarios would have on the economic structure of the country in question (e.g., a trade negotiation package). In practice, such effects are evaluated by comparing the initial data (the original SAM or the data of the model that reproduce it) with the results of the simulation exercise performed using the model.

Multiplier and simulation model

The valuable statistical data that SAMs provide, and the accounting relationships derived from them, make it possible to study in greater depth, without the need for complicated modeling, the consequences that a variation in any of the accounts have on production, the use of factors, and the distribution of income, in a way analogous to the input-output analysis credited to Leontief.

Models of this kind are known as linear multiplier models. The methodology used to break down the multipliers is based on the guidelines provided by Pyatt and Round (1979), Defourny and Thorbecke (1994), Sadoulet and Janvry (1995), Ferri and Uriel (2000), Adamson et al. (1999), and others.

Estimates of such models are useful for exploring the impact that various changes in exogenous variables have on an economy, e.g., on the local supply, income, income distribution among households, investment, the structure of the expenditure of institutions and capital outflows.

Linear multiplier models are based on the following assumptions: idle production capacity, fixed prices, linear production functions and fixed proportion (means that the elasticities of substitution are nil, and production factors are perfect complements), average and marginal and propensities to consume are equal, income elasticities are unitary).

The first step in constructing multiplier models is to divide the SAM accounts into two groups:

1. Endogenous. These accounts usually include the factors of production, households and firms, and production activities.

2. Exogenous. These accounts contain the government, capital, and the rest of the world. They are used to enter the data for the change that we wish to model and analyze.

The selection of the accounts that make up each group is crucial, since it determines the type of experiments with economic policies that can be formulated.

Once the accounts have been grouped together, the next step is to standardize the SAM, by dividing the amount in each cell by the corresponding column total. The resulting matrix contains the average propensity to expenditure of all the accounts (technical coefficients), represented by the letter S.

The elements of the S matrix are in the form:

$$s_{ij} = \frac{m_{ij}}{\sum_{i=1}^{n} m_{ij}}$$

where m_{ij} are the elements of the SAM and n is the number of rows in the SAM.

All the payments from exogenous to endogenous accounts are recorded in matrix X. This is constructed by eliminating the columns of the endogenous accounts and the rows of the exogenous accounts from the SAM. X is known as the matrix of exogenous injections.

The result of the elimination of the rows and columns of the exogenous accounts of S is the matrix of endogenous propensities A.

Matrix K is comprised of sub-matrixes A_{ij}. The accounts of matrix A are in subgroups: the accounts of activities are located in the first row; the accounts of production factors in the second; and household accounts in the third.[30] Thus, elements i and j of sub-matrix A represent the average propensity to consume of the endogenous accounts of subgroup i with respect to those of subgroup k, and the A_{ij} record the average propensity to consume of the endogenous accounts of the i-th subgroup with respect to itself.

The SAM multiplier matrix is represented as M, and, just like the Leontief input-output multipliers, is the result of the matrix operation:

$$M = (I - A)^{-1}$$

where M is a squared matrix that contains the total effects of the exogenous changes on the endogenous accounts.

The result of the multiplying matrix M by the vector of exogenous injections yields vector y. This vector contains the total income of the endogenous accounts:

$$y = M X = (I - A)^{-1} X$$

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30. This depends on the characteristics of the SAM utilized.

When a change is introduced into the transfers of the exogenous accounts to the endogenous ones, matrix X is modified, which in turn also affects the income of the endogenous accounts (represented by vector y). The total impact caused by an exogenous change in the endogenous accounts is obtained by resolving the operation:

$$y_m = M X_m,$$

where y_m is the modified vector of the total income of the endogenous accounts and x_m is the modified vector of exogenous injections.

This operation not only records the total effect of the exogenous change on production, but also makes it possible to evaluate the total impact on the structure of income and expenditure of all the institutions in the economy.

M is known as the *ex-post* multiplier matrix. It contains the information that records all the multiplier effects of any exogenous induction introduced into the system. In other words, it indicates to what extent an exogenous injection into the system affects the total income of the endogenous accounts. This multiplier can be analyzed in more detail by disaggregating it.

The total impacts contained in M can be disaggregated into three types of effects, by means of a multiplicative process.[31] This breakdown shows the iterative process and the relationships of the circular flow of the economy - that is, the flow between the distribution of income (factorial and personal) and production, resulting from an exogenous injection of expenditure into the system (Alarcon, in Adamson *et al.*, 1999). The disaggregated effects are threefold:

i) Intra-group effect. Only reflects the change in the accounts that belong to the group in which the modification was originally made.

ii) Extra-group or crossed effect. Shows the impact of the accounts of groups other than the one where the exogenous change occurred.

iii) Inter-group or circular effect. Records the variation in the group that presented the initial change, after having passed through and affected the other groups of accounts.

For example, if exports of a given product increase, a derive demand for inputs of other industries used in the production process of the original product is generated. This reaction is the intra-group effect. It also leads to a greater use of the factors of production, increasing the income of the institutions that own the factors concerned. These movements are the extra-group effect, since the initial change alters the accounts of the groups, except for the one that initially underwent the change. Finally, a higher level of household income modifies the households' original consumption pattern, affecting the production sectors. This is the inter-group effect, since the accounts where the exogenous change occurred react to the adjustments to the new situation of all the other groups of accounts.

As seen, the SAM presents the structural characteristics of the economy in an explicit and detailed way. It is a static instrument, however. To overcome this limitation and dynamically simulate the effects of policies on the economic system, CGE models are developed afterwards.

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31. Proposed by Pyatt and Roe in 1977. There is also an additive disaggregation, which can be studied in Stone (1981) or Adamson *et al.* (1999).

EXCEL can be used for multiplier models and simulation exercises, to estimate the impact of exogenous changes, although the GAMS (General Algebraic Modeling System) software is suggested as an alternative, because it is more expeditious for formulating simulations and obtaining results.

As stated earlier, the accounting principles used in SAMs make them very flexible. Elements that the researcher is interested in can be incorporated, such as natural resources and their valuation.

The simulations for analyzing impact can also be based on the knowledge of the influences external to the economy studied. An example of this is the analysis of impact of a change in the flow of remittances on the economy of the households. If the use to which households put the remittances is known, alternative forms of investment can be proposed, so that the economy and the households obtain a greater benefit from such external flows.

Limitations of Multiplier Models

The multisectoral models based on SAMs are superior to input-output models, to partial equilibrium models, and to another type of model based on systems of expenditures. This is because, since a SAM is used to construct them, they include all the components of an economy and its interrelationships, and they are general, not partial, equilibrium models. Unlike input-output models (that do not take into consideration the aspects of income distribution) and models based on expenditure systems (that do not include production), multiplier models incorporate them into a single model.

Nevertheless, SAM-based models are linear; they have limitations because of the assumptions made in them concerning prices, resources, and technology, as well as the propensities to consume of the institutions. The first two assumptions are related, since SAM-based models can be interpreted as fixed-price models - that is, that the multipliers calculated assume that exogenous changes do not affect prices. This assumption is equivalent to proposing that the economy is not using its resources to the full, nor has technological restrictions. Alternatively, by assuming fixed coefficients in the supply and using fixed average propensities to consume, relative prices are irrelevant in this type of model. The existence of fixed proportions means that no substitution is possible among inputs, factors, goods, and services. On the supply side, this means that even when relative prices change, the input mix will not change for producing more of the product in question in response to an increase in demand.

The assumption that resources are fully utilized can be avoided, however, by introducing restrictions in the supply of some of the activities of the economy.

The third and final limitation of SAM-based multiplier models is the assumption that the average propensities to consume of the households are unitary. This limitation can be avoided if marginal (rather than average) shares are incorporated into the component of the share to expenditure of the SAM, before calculating M.

Nonetheless, multiplier models continue to be fixed-price. One alternative, which considers relative prices and the effect of changes in them on the decisions of the economic agents, are computable general equilibrium models (CGE), which also use SAMs as their database

ANNEX B
Social Accounting Matrixes by Country

TABLE 1B
Argentina: SAM for 1997, US$ millions

ACCOUNTS	ACTIVITIES Food	Primary	Agro Industry	Natural Resources	Rest Economy	COMMODITIES Food	Primary	Agro Industry	Natural Resources	Rest Economy	FACTORS Land	Unskilled Labor	Skilled Labor	Capital	Natural Resources	PRIVATE	GOVERNMENT	CAPITAL ACCOUNT	REST OF WORLD	TOTAL
ACTIVITIES																				
Food						77,495														77,495
Primary							48,241													48,241
Agroindustry								61,157												61,157
Natural Resources									8,459											8,459
Rest Economy										351,640										351,640
COMMODITIES																				
Food	11,818	1,183	1,104		3,879											63,046	223		7,823	78,848
Primary	25,512	4,656	2,391	20	922											9,234	54	1,370	6,016	49,034
Agroindustry	1,538	339	22,635	45	7,035											29,148	1,018	591	2,198	64,503
Natural Resources	43	0	108	44	6,550														2,226	8,975
Rest Economy	9,343	4,417	9,080	888	117,182											157,547	8,984	63,343	11,810	369,250
FACTORS																				
Land	10,056																			10,056
Unskilled Labor	8,890	17,193	10,283	1,752	77,199															115,303
Skilled Labor	1,918	477	1,966	434	35,772															40,483
Capital	18,640	9,784	12,917	3,551	102,456															147,328
Natural Resources		206		1,729																1,935
PRIVATE												10,056	115,303	40,483	147,328	1,935				315,105
GOVERNMENT	98	10	98	63	847											66,139				66,991
CAPITAL ACCOUNT																	56,712		8,612	65,324
REST OF WORLD										31,653										37,460
TOTAL	77,495	48,241	61,157	8,459	351,640	1,151	78,848	49,034	64,503	8,975	389,250	10,056	115,303	40,483	147,328	1,935	315,105	66,991	65,324	37,461	1,931,438

TABLE 3B
Canada: SAM for 1997, US$ millions

ACCOUNTS	ACTIVITIES Food	Primary	Agro Industry	Natural Resources	Rest Economy	COMMODITIES Food	Primary	Agro Industry	Natural Resources	Rest Economy	FACTORS Land	Unskilled Labor	Skilled Labor	Capital	Natural Resources	PRIVATE	GOVERNMENT	CAPITAL ACCOUNT	REST OF WORLD	TOTAL
ACTIVITIES																				
Food						48,207														48,207
Primary							41,998													41,998
Agroindustry								90,970												90,970
Natural Resources									38,998											38,998
Rest Economy										888,073										888,073
COMMODITIES																				
Food	8,404	2,396	138	16	6,635											30,983	1,339		8,107	58,330
Primary	13,318	7,682	8,703	1	1,518											4,564	1,035		9,599	46,250
Agroindustry	2,288	342	22,076	174	20,130											20,298	6,759	1,989	35,617	109,570
Natural Resources	158	73	374	358	23,912											425	333		20,283	45,916
Rest Economy	9,421	14,085	23,983	18,507	336,409											279,288	114,480	113,082	161,183	1,070,428
FACTORS																				
Land		2,002																		2,002
Unskilled Labor	6,467	7,377	18,330	2,351	194,119															229,644
Skilled Labor	1,433	684	5,502	881	82,998															91,397
Capital	7,211	6,470	9,821	7,277	183,286															214,064
Natural Resources		1,294		6,789																8,083
PRIVATE											2,002	229,644	91,397	214,064	8,083					545,170
GOVERNMENT	431	(349)	1,044	2,884	39,077											209,882	128,525		(13,843)	252,471
CAPITAL ACCOUNT																				114,981
REST OF WORLD						9,113	4,382	18,599	8,917	192,355										221,246
TOTAL	48,207	41,998	90,970	38,998	888,073	58,330	46,250	109,570	45,916	1,070,428	2,002	229,644	91,397	214,064	8,083	546,170	252,471	114,081	221,246	4,118,759

Source: IICA with data from GTAP 5.0

TABLE 4B
Chile: SAM for 1997, US$ millions

ACCOUNTS	Act: Food	Act: Primary	Act: Agro Industry	Act: Natural Resources	Act: Rest Economy	Com: Food	Com: Primary	Com: Agro Industry	Com: Natural Resources	Com: Rest Economy	Fac: Land	Fac: Unskilled Labor	Fac: Skilled Labor	Fac: Capital	Fac: Natural Resources	PRIVATE	GOVERNMENT	CAPITAL ACCOUNT	REST OF WORLD	TOTAL
ACTIVITIES																				
Food						16,414														16,414
Primary							11,894													11,894
Agroindustry								10,560												10,560
Natural Resources									5,343											5,343
Rest Economy										92,715										92,715
COMMODITIES																				
Food	2,556	537	128		1,181											9,742	12	556	2,792	17,582
Primary	5,451	1,607	2,695	2	307											2,117		610	1,060	12,329
Agroindustry	432	118	16	35	2,114											4,685		798	2,094	12,530
Natural Resources	29	189	687	827	3,460											1		153	2,492	6,996
Rest Economy	3,968	2,314	3,753	1,882	34,384											29,934	7,675	17,130	10,743	110,401
FACTORS																				
Land		1,558																		1,558
Unskilled Labor	1,287	2,357	1,174	671	12,727															18,675
Skilled Labor	246	48	197	111	6,972															7,576
Capital	2,357	2,044	2,222	1,687	29,561															37,823
Natural Resources		412		387																800
PRIVATE											1,558	18,675	7,576	37,823						64,432
GOVERNMENT	9	227	142	22	2,098										800	20,853				23,440
CAPITAL ACCOUNT																	15,753		3,491	19,234
REST OF WORLD					17,687	1,106	445	2,349	1,652											23,281
TOTAL	16,414	11,894	10,560	5,343	92,715	17,582	12,329	12,530	6,996	110,401	1,558	18,675	7,576	37,823	800	64,432	23,440	19,234	23,281	495,680

Source: RCA with data from GTAP 5.0

TABLE 5B
Colombia: SAM for 1997, US$ millions

ACCOUNTS	ACTIVITIES					COMMODITIES					FACTORS					PRIVATE	GOVERNMENT	CAPITAL ACCOUNT	REST OF WORLD	TOTAL
	Food	Primary	Agro Industry	Natural Resources	Rest Economy	Food	Primary	Agro Industry	Natural Resources	Rest Economy	Land	Unskilled Labor	Skilled Labor	Capital	Natural Resources					
ACTIVITIES																				
Food						20,999														20,999
Primary							15,988													15,988
Agroindustry								10,221												10,221
Natural Resources									6,309											6,309
Rest Economy										116,907										115,907
COMMODITIES																				
Food	2,191	874	309	0	1,663											16,078		·	966	22,040
Primary	6,904	783	339	·	84											4,863	·	347	3,147	16,897
Agroindustry	472	139	2,274	16	2,076											5,374	·	191	1,146	11,996
Natural Resources	57	1	81	1	2,650											2	·	·	3,465	6,306
Rest Economy	6,038	3,109	4,415	2,130	42,308											36,202	15,585	15,193	6,063	131,941
FACTORS																				
Land	·	2,853	·	·	·															2,853
Unskilled Labor	2,030	5,086	1,284	630	23,597															32,657
Skilled Labor	384	67	202	107	13,210															13,949
Capital	2,817	2,703	1,281	1,844	27,761															36,406
Natural Resources	·	159	·	1,412	·															1,571
PRIVATE												2,853	32,657	13,949	36,406	1,571				87,415
GOVERNMENT	199	44	147	98	1,870	1,072	946	1,448	47	16,034						24,906			3,094	27,221
CAPITAL ACCOUNT																87,415	11,637			15,681
REST OF WORLD																	27,221			19,548
TOTAL	20,999	15,988	10,221	6,309	115,908	22,040	16,897	11,996	6,306	131,941	2,853	32,657	13,949	36,406	1,571	87,415	27,221	15,681	19,548	591,964

Source: IICA with data from GTAP 5.0

TABLE 6B
United States of America: SAM for 1997, US$ millions

ACCOUNTS	ACTIVITIES					COMMODITIES						FACTORS						PRIVATE	GOVERNMENT	CAPITAL ACCOUNT	REST OF WORLD	TOTAL
	Food	Primary	Agro Industry	Natural Resources	Rest Economy	Food	Primary	Agro Industry	Natural Resources	Rest Economy		Land	Unskilled Labor	Skilled Labor	Capital	Natural Resources						
ACTIVITIES																						
Food						566,231																566,231
Primary							265,080															265,080
Agro Industry								700,891														700,891
Natural Resources									115,628													115,628
Rest Economy										12,711,763												12,711,763
COMMODITIES																						
Food	95,690	21,857	1,895	0	96,515													342,644	10,004		30,674	598,250
Primary	134,396	34,186	12,493	1	18,299													37,324	1,498	10	35,178	265,573
Agro Industry	18,527	4,004	201,832	370	249,319													250,807	19,763	40,024	49,988	635,634
Natural Resources	107	44	538	2,072	178,005													97	9	77	6,404	185,743
Rest Economy	128,913	96,054	198,713	46,428	4,878,341													4,864,264	1,170,694	1,358,257	750,534	13,502,380
FACTORS																						
Land		27,433																				27,433
Unskilled Labor	57,658	34,186	130,636	15,802	2,626,969																	2,867,461
Skilled Labor	18,846	2,789	50,079	5,813	1,958,485																	2,035,685
Capital	101,287	37,568	104,657	22,951	2,707,885																	2,974,338
Natural Resources		1,311		23,192																		24,503
PRIVATE													27,433	2,867,461	2,035,685	2,974,338	24,503					7,929,420
GOVERNMENT	(99)	(3,046)	(1)		(4)													2,434,283				2,425,134
CAPITAL ACCOUNT																			1,222,976		175,382	1,398,348
REST OF WORLD						32,019	20,493	134,933	70,116	790,620								7,929,420	2,425,134	1,398,348	1,048,189	
TOTAL	566,231	265,091	700,891	115,628	12,711,764	598,250	265,573	635,634	185,742	13,502,380		27,433	2,867,461	2,035,685	2,974,338	24,503						50,477,895

Source: IICA with data from GTAP 5.0

TABLE 7B
Mexico: SAM for 1997, US$ millions

ACCOUNTS	ACTIVITIES Food	Primary	Agro Industry	Natural Resources	Rest Economy	COMMODITIES Food	Primary	Agro Industry	Natural Resources	Rest Economy	FACTORS Land	Unskilled Labor	Skilled Labor	Capital	Natural Resources	PRIVATE	GOVERNMENT	CAPITAL ACCOUNT	REST OF WORLD	TOTAL
ACTIVITIES																				
Food						64,222														64,222
Primary							48,946													48,946
Agro Industry								50,577												50,577
Natural Resources									25,046											25,046
Rest Economy										485,310										485,310
COMMODITIES																				
Food	8,607	2,138	968	0	2,348											51,385	96	82	2,904	64,466
Primary	23,380	5,380	2,678	0	671											17,402	182	672	3,660	53,087
Agro Industry	1,813	368	10,988	41	12,009											22,205	1,034	388	11,740	63,218
Natural Resources	10	38	29	664	14,094											10	2	55	11,045	26,256
Rest Economy	10,384	6,154	13,563	3,682	171,317											170,852	32,342	77,548	85,902	571,753
FACTORS																				
Land		8,889														8,889				8,889
Unskilled Labor	2,746	15,142	4,376	1,280	55,440											78,103				78,103
Skilled Labor	564	296	744	665	28,948											30,103				30,103
Capital	15,981	10,308	14,848	13,138	166,388											220,575				220,575
Natural Resources				646	5,978											6,922				6,922
PRIVATE												8,889	78,103	30,103	220,575	6,922				345,231
GOVERNMENT	1,175	(127)	2,517	189	34,782											63,367		88,629		121,994
CAPITAL ACCOUNT																	88,629		(9,483)	78,746
REST OF WORLD						4,894	4,740	9,641	610	88,543										105,796
TOTAL	64,222	48,946	50,577	25,046	485,310	64,466	53,087	63,218	25,955	571,753	8,889	78,103	30,103	220,575	6,922	345,231	121,994	78,746	105,796	2,451,982

Source: ICA with data from GTAP 5.0

TABLE 8B
Peru: SAM for 1997, US$ millions

ACCOUNTS	ACTIVITIES Food	Primary	Agro Industry	Natural Resources	Rest Economy	COMMODITIES Food	Primary	Agro Industry	Natural Resources	Rest Economy	FACTORS Land	Unskilled Labor	Skilled Labor	Capital	Natural Resources	PRIVATE	GOVERNMENT	CAPITAL ACCOUNT	REST OF WORLD	TOTAL
ACTIVITIES																				
Food						12,760														12,760
Primary							9,340													9,340
Agroindustry								11,494												11,494
Natural Resources									2,514											2,514
Rest Economy										71,457										71,457
COMMODITIES																				
Food	1,407	567	38	4	2,134											7,941			1,544	13,634
Primary	3,638	594	498	3	398											4,320	0		561	9,931
Agroindustry	315	57	2,518	12	1,280											7,047	7	78	662	12,151
Natural Resources	0	6	1	2	1,995											0		151	1,195	3,207
Rest Economy	1,413	1,001	1,301	1,009	25,117											21,826	7,459	15,631	3,813	78,189
FACTORS																				
Land		1,546																		1,565
Unskilled Labor	301	2,951	454	305	7,846															11,566
Skilled Labor	63	43	65	50	5,086															5,676
Capital	6,019	1,754	6,496	535	24,810															38,617
Natural Resources		270		299																549
PRIVATE											1,565	11,566	5,676	38,617	549					56,119
GOVERNMENT	615	941	130	296	2,160											17,159				20,683
CAPITAL ACCOUNT																	13,118		2,742	15,960
REST OF WORLD						874	591	657	662	7,712										10,535
TOTAL	12,761	9,340	11,495	2,514	71,457	13,634	9,931	12,151	3,206	78,189	1,565	11,566	5,676	38,617	549	56,119	20,683	15,960	10,535	360,022

Source: RCA with data from GTAP 5.0

TABLE 9B
Uruguay: SAM for 1997, US$ millions

ACCOUNTS	ACTIVITIES Food	Primary	Agro Industry	Natural Resources	Rest Economy	COMMODITIES Food	Primary	Agro Industry	Natural Resources	Rest Economy	FACTORS Land	Unskilled Labor	Skilled Labor	Capital	Natural Resources	PRIVATE	GOVERNMENT	CAPITAL ACCOUNT	REST OF WORLD	TOTAL
ACTIVITIES																				
Food						4,470														4,470
Primary							3,355													3,355
Agro Industry								2,413												2,413
Natural Resources									86											86
Rest Economy										20,732										20,732
COMMODITIES																				
Food	479	50	66	-	265											2,890	182	-	885	4,909
Primary	1,390	241	237	-	344											716	198	27	304	3,513
Agro Industry	153	15	743	-	345											767	147	15	888	3,083
Natural Resources	1	-	-	-	243											-	16	16	8	285
Rest Economy	1,141	696	569	33	7,045											8,942	2,048	2,114	2,032	24,780
FACTORS																				
Land		553																		553
Unskilled Labor	431	961	272	18	2,916															4,598
Skilled Labor	80	19	47	3	1,195															1,344
Capital	731	543	469	24	7,596															9,322
Natural Resources		31		6	-															37
PRIVATE												553	4,598	1,344	9,322	37				15,945
GOVERNMENT	67	86	48	3	783										37	2,529			1,180	3,536
CAPITAL ACCOUNT																	978			2,158
REST OF WORLD						438	157	670	179	4,058										5,508
TOTAL	4,470	3,355	2,414	86	20,732	4,909	3,513	3,083	285	24,780	553	4,598	1,344	9,322	37	15,945	3,536	2,158	5,504	110,504

TABLE 10B
Venezuela: SAM for 1997, US$ millions

ACCOUNTS	ACTIVITIES					COMMODITIES					FACTORS					PRIVATE	GOVERNMENT	CAPITAL ACCOUNT	REST OF WORLD	TOTAL
	Food	Primary	Agro Industry	Natural Resources	Rest Economy	Food	Primary	Agro Industry	Natural Resources	Rest Economy	Land	Unskilled Labor	Skilled Labor	Capital	Natural Resources					
ACTIVITIES																				
Food						14,035														14,035
Primary							8,370													8,370
Agroindustry								8,309												8,309
Natural Resources									19,338											19,338
Rest Economy										99,973										99,973
COMMODITIES																				
Food	2,179	644	109	180	2,238											9,017			431	15,283
Primary	3,485	703	412	102	378											3,670			168	9,231
Agroindustry	354	38	2,588	190	1,908											4,551			319	10,434
Natural Resources	36	7	22	280	7,260											9		14	11,802	19,432
Rest Economy	4,391	1,283	3,383	4,148	34,534											38,636	5,211	13,640	10,738	116,064
FACTORS																				
Land		1,464																		1,464
Unskilled Labor	1,191	2,832	1,081	1,316	15,380												121	443		21,479
Skilled Labor	226	44	180	296	7,746												12	274		8,495
Capital	2,339	1,568	1,016	7,583	30,083												103	364		42,856
Natural Resources		158		4,808														14		5,054
PRIVATE											1,464	21,479	8,495	42,856	5,054					78,341
GOVERNMENT	5	19	17	3	477											22,468			(2,786)	22,678
CAPITAL ACCOUNT																	17,531			14,743
REST OF WORLD						1,266	681	1,826	90	16,891										20,686
TOTAL	14,035	8,370	8,309	19,338	99,973	15,283	9,231	10,434	19,432	116,064	1,464	21,479	8,495	42,856	5,054	79,341	22,979	14,743	20,687	539,842

TABLE 11B
Costa Rica: SAM for 1997, US$ millions

Accounts	ACTIVITIES Food	Primary	Agroindustry	Rest Economy	COMMODITIES Food	Primary	Agroindustry	Rest Economy	FACTORS R Labor	U Labor	Capital	Indirect Business Tax	Distribution Margin
ACTIVITIES													
Food					585,842			275					
Primary						582,394							
Agroindustry						251	500,096	823					
Rest Economy							1,202	3,462,680					
COMMODITIES													
Food	71,293	45,283	57,148	123,801									
Primary	268,730	26,547	20,826	15,606									
Agroindustry	38,276	21,759	104,921	88,022									
Rest Economy	41,005	140,908	140,499	1,211,986									
FACTORS													
R Labor	31,931	134,006	50,787	387,516									
U Labor	29,904	14,950	55,124	840,835									
Capital	102,558	191,220	65,163	944,353									
Indirect Business Tax	4,421	7,724	6,449	52,215	139,270	47,956	124,688	(311,903)					
Distribution Margin													
PRIMARY INCOME RECIPIENT													
Wage earner Household									596,207	447,219	330,049		
Other Employed Household									153,435	156,013	445,472		
Other Household									1,668	1,770	15,827		
Firms											511,947		
Government					22,393	(571)	66,861	176,282				70,809	
INCOME SECONDARY DISTRIBUTION													
Wage earner Household													
Other Employed Household													
Other Household													
Firms													
Government													
INCOME USE													
Households													
Firms													
Government													
CAPITAL ACCOUNT													
FOREIGN					188,921	31,478	164,373	945,732	2,037				
TOTAL	588,118	582,394	500,918	3,464,133	936,436	661,406	857,199	4,273,689	743,366	605,002	1,303,294	70,809	

(continue)

TABLE 11B (Cont'd)
Uruguay: SAM for 1997, US$ millions

Accounts	PRIMARY INCOME RECIPIENT					INCOME SECONDARY DISTRIBUTION					INCOME USE			CAPITAL ACCOUNT	FOREIGN	TOTAL
	Wage earner Household	Other Employed Household	Other Household	Firms	Government	Wage earner Household	Other Employed Household	Other Household	Firms	Government	Households	Firms	Government			
ACTIVITIES																
Food																586,118
Primary																582,394
Agroindustry																500,918
Rest Economy																3,464,133
COMMODITIES																
Food											464,073			(5,410)	180,449	936,436
Primary											65,173			12,372	252,154	681,408
Agroindustry											389,875			12,904	223,442	857,199
Rest Economy											1,269,784		390,087	519,774	559,868	4,273,889
FACTORS																
R Labor															763	605,002
U Labor															2,553	743,396
Capital																1,303,294
Indirect Business Tax																70,609
Distribution Margin																
PRIMARY INCOME RECIPIENT																
Wage earner Household	1,363,476															1,363,475
Other Employed Household		754,919														754,919
Other Household			19,285													19,285
Firms				482,756											39,815	551,761
Government					335,673											335,673
INCOME SECONDARY DISTRIBUTION																
Wage earner Househ	1,363,476														6,470	1,369,945
Other Employed Household		754,919													8,855	763,774
Other Household			19,285												18,732	38,017
Firms				452,798											43	452,798
Government					335,673										10,370	348,043
INCOME USE																
Households						1,369,945	763,774	24,377			(10,788)					2,158,097
Firms									452,798							452,798
Government								13,639		344,404						344,404
CAPITAL ACCOUNT																
FOREIGN				99,006				1,639		348,043	(10,788)	452,798	(45,682)	(143,311)		1,303,514
TOTAL	1,363,475	754,919	19,285	551,761	335,673	1,369,945	763,774	38,017	452,798	348,043	2,158,097	452,798	344,404	396,328	1,303,514	25,236,789

Source: IICA. Based on data from the SAM of Costa Rica for 1997(IICA)
For Costa Rica SAM in set extension (115 X 115 sectors), please see (IICA, 2004) or the web site: www.iica.int

ANNEX C
Disaggregation of Gross Output for
Costa Rica, by Destination and Cost

TABLE IC
Costa Rica: Use made of the gross output by sector, millions of colones, 1997

	Intermediate Consumption	Private Consumption	Investment	Government Consumption	Exports	Imports + Distribution margin	Taxes	Gross Output
Banana	28.8	4.7			576.2	31.6	39.8	538.4
Coffee beans	353.8							356.7
Sugar Cane	82.6		2.9					95.0
Cocoa Beans and Toast	7.5		12.5					2.2
Staple grains	152.1	23.2	2.2		0.2	5.1	0.5	84.9
Unprocessed tobacco	0.1				0.1	92.8	0.1	3.9
Livestock	473.3	72.2	(37.9)		0.3	17.1	0.0	490.7
Forestry and Fishing	147.6	35.3			14.8	85.2	(1.7)	114.3
Other Agricultural Products	178.9	144.5	73.5		487.6	109.5	(41.5)	816.5
TOTAL PRIMARY AGRICULTURE	1,494.7	279.9	53.1		1,093.0	341.2	(2.9)	2,892.8
Meat and Dairy Products	206.2	933.6	(24.5)		57.5	360.0	8.9	805.9
Fish, crustaceous and others sea products	87.4	69.3	(0.5)		159.7	111.5	5.3	219.1
Vegetable and Animal Oils and Fats	61.5	183.7	(12.3)		50.3	102.0	1.3	180.0
Green Coffee	46.4	34.2	18.4		419.0	5.1	9.3	503.5
Milling, excluding coffee processing	162.9	274.2	(3.4)		10.4	160.4	9.8	274.0
Bakery Products	11.7	157.6	(1.1)		19.6	50.4	27.5	110.1
Sugar	60.8	98.6	0.5		51.2	75.1	(1.5)	137.6
Beverages	638.1	221.7	(0.3)		7.4	545.2	35.6	286.1
TOTAL FOOD INDUSTRY	1,277.1	1,993.3	(22.3)		775.1	1,409.7	96.2	2,516.3
Other Manufactured Products	254.5	563.8	(15.3)		205.8	361.4	109.9	557.5
Tobacco (cigarettes)	16.7	93.8	0.6		2.4	36.7	2.6	74.0
Textiles and garments	190.5	474.9	16.2		572.7	310.7	86.2	668.4
Textiles and garments	39.5	56.8	(1.5)		70.5	65.2	12.4	69.6
Timber and Furniture	89.0	65.9	16.6		49.7	95.8	11.5	114.0
Paper and Printing	478.8	311.7	36.8		58.6	371.7	64.6	449.7
TOTAL AGROINDUSTRY	1,078.0	1,566.7	58.4		969.7	1,241.6	287.2	2,183.2
TOTAL AGRICULTURE AND AGRIFOOD	3,770.6	3,861.9	86.3		2,817.8	2,992.3	390.8	7,172.0
Chemicals	1,355.4	702.3	0.1		205.9	1,437.2	190.0	697.4
Oil refining (gasoline, diesel, etc.)	507.0	170.8	0.3		19.5	553.6	21.9	122.2
Tire	90.2	144.5	52.8		24.6	187.8	34.5	69.8
Rubber and Plastic Products	332.2	182.4	28.4		104.8	226.5	32.1	390.1
Glass and Ceramic Products	53.0	38.1	14.2		46.1	69.0	8.9	75.4
Clay products for construction	496.7	37.3	24.0		14.5	326.7	14.0	201.9
Base metals	435.4	103.8	63.2		102.5	372.4	25.7	326.9
Electrical Goods	306.0	240.8	384.7		374.9	669.7	67.9	568.9
Transportation Equipment	91.7	891.5	572.9		77.2	1,063.8	200.7	138.9
Other Manufacture	47.9	114.8	139.1		363.3	198.1	4.8	461.9
Construction	29.1		669.2				4.1	914.3
Financial Services and Insurance	1,118.0	138.2	43.6		109.1	160.8	0.2	1,247.9
Trade, Restaurants and Hotels	110.5	379.0			506.9	(2,617.8)	3.4	3,612.7
Transportation, Storage and Communications	630.0	662.7			386.4	38.9	7.4	1,824.7
Social, Communal and Personal Services	358.9	976.3		1,056.2	62.9	4.1	4.4	2,445.8
Electricity	243.4	213.0					34.1	422.3
Real State Service	215.0	650.7			0.1	1.6	104.1	780.1
Public Administration Services		7.8		619.3				627.2
TOTAL REST ECONOMY	6,980.5	5,463.8	2,222.5	1,675.5	2,494.7	2,722.4	767.2	14,877.5
TOTAL	10,270.3	9,316.7	2,317.6	1,675.5	5,222.5	5,714.7	1,157.5	22,049.5

Source: IICA. Based on data from the SAM of Costa Rica for 1997(IICA)

TABLE XX
Costa Rica: Use made of the gross output in percentages by sector, 1997

	Intermediate Consumption	Private Consumption	Investment	Government Consumption	Exports	Imports + Distribution margin	Taxes	Gross Output
								100.0%

TABLE 3C
Costa Rica: Cost of the gross output by sector, millions of colones, 1997

	Intermediate Inputs	Skilled Labor	Unskilled Labor	Indirect Business Tax	Capital	TOTAL
Banana	256.0	24.5	121.3	5.1	101.4	538.4
Coffee beans	32.6	2.8	148.3	4.4	150.6	358.5
Sugar Cane	32.6	1.5	34.4	1.8	24.6	95.0
Cocoa Beans and Toast	0.1	-	1.6	0.0	0.5	2.2
Staple grains	48.4	4.3	30.6	1.5	(0.0)	84.9
Unprocessed tobacco	1.9	2.1	-	0.0	(0.2)	3.9
Livestock	243.6	3.1	86.2	10.0	147.6	490.4
Forestry and Fishing	33.4	8.6	13.5	1.2	57.6	114.3
Other Agricultural Products	308.8	17.4	141.7	9.0	339.1	815.8
TOTAL PRIMARY AGRICULTURE	1,057.2	64.2	575.6	33.2	821.2	2,601.6
Meat and Dairy Products	603.5	32.8	39.1	7.5	123.1	806.0
Fish, crustaceous and others sea products	140.9	17.5	7.0	1.1	63.4	219.9
Vegetable and Animal Oils and Fats	107.5	10.2	13.8	1.4	47.3	160.0
Green Coffee	410.4	6.4	18.4	2.7	85.8	503.5
Milling, excluding coffee processing	224.8	4.8	13.3	1.2	30.3	274.0
Bakery Products	81.0	19.8	11.7	1.7	16.1	110.3
Sugar	109.5	3.7	19.5	1.2	3.8	137.6
Beverage	134.9	33.8	14.6	2.2	100.8	286.1
TOTAL FOOD INDUSTRY	1,782.4	129.4	137.1	19.0	449.6	2,517.5
Other Manufactures Products	343.2	35.5	44.2	8.3	129.0	559.3
Tobacco (cigarettes)	54.1	10.9	-	0.6	8.6	74.1
Textiles and garments	592.4	103.7	116.6	13.6	39.8	866.2
Textiles and garments	81.0	12.1	11.6	1.3	3.7	99.7
Timber and Furniture	62.9	16.4	20.8	1.8	12.3	114.0
Paper and Printing	275.5	58.2	25.0	4.2	86.5	449.3
TOTAL AGROINDUSTRY	1,399.0	236.8	218.1	27.7	279.9	2,151.6
TOTAL AGRICULTURE AND AGRIFOOD	4,138.6	430.4	930.9	79.9	1,541.7	7,170.5
Chemicals	399.9	40.7	51.3	5.9	138.3	633.1
Oil refining (gasoline, diesel, etc.)	107.2	18.0	0.4	1.1	(3.7)	123.0
Tires	55.5	10.1	3.5	2.5	18.2	89.8
Rubber and Plastic Products	275.4	49.2	27.8	5.1	41.7	399.1
Glass and Ceramic Products	45.5	8.4	8.8	1.5	13.2	75.4
Clay products for construction	130.8	17.0	25.0	1.9	27.9	202.6
Base metals	233.0	17.0	27.1	6.4	44.6	328.0
Electrical Goods	401.3	86.5	58.1	7.8	36.3	568.9
Transportation Equipment	95.2	32.7	7.0	1.7	12.5	139.0
Other Manufacture	341.4	57.7	30.9	4.9	29.7	464.6
Construction	491.2	148.3	186.7	10.8	78.5	914.3
Financial Services and Insurance	308.8	298.2	87.7	27.1	447.8	1,157.0
Trade, Restaurants and Hotels	1,363.5	595.0	398.6	56.1	1,252.8	3,063.8
Transportation, Storage and Communications	813.1	173.9	129.3	17.7	663.8	1,827.8
Social, Communal and Personal Services	640.3	855.3	429.4	27.9	522.2	2,475.2
Electricity	115.5	52.2	38.1	9.5	203.2	418.8
Real State Service	151.3	27.5	14.3	34.1	503.0	730.2
Public Administration Services	226.1	299.7	144.5	3.0	(4.7)	669.6
TOTAL REST ECONOMY	6,191.7	2,783.5	1,694.4	224.3	4,098.1	14,979.0
TOTAL	10,370.3	3,151.9	2,696.3	304.1	5,897.9	22,049.5

Source: IICA. Based on data from the SAM of Costa Rica for 1997(IICA)

TABLE 4C
Costa Rica: Cost of the gross output in percentages by sector, 1997

	Intermediate Inputs	Skilled Labor	Unskilled Labor	Indirect Business Tax	Capital	TOTAL
Banana	53.1%	4.8%	22.5%	1.0%	18.6%	100.0%
Coffee beans	14.8%	0.7%	41.0%	1.2%	42.2%	100.0%
Sugar Cane	34.3%	1.8%	36.2%	1.9%	25.9%	100.0%
Cocoa Beans and Toast	3.4%	0.0%	72.5%	0.2%	24.0%	100.0%
Staple grains	57.1%	5.1%	36.1%	1.8%	0.0%	100.0%
Unprocessed tobacco	46.2%	55.1%	0.0%	1.1%	-4.4%	100.0%
Livestock	49.7%	0.6%	17.6%	2.0%	30.1%	100.0%
Forestry and Fishing	29.2%	7.5%	11.6%	1.0%	50.4%	100.0%
Other Agricultural Products	37.8%	2.1%	17.4%	1.1%	41.6%	100.0%
TOTAL PRIMARY AGRICULTURE	40.3%	2.6%	23.0%	1.3%	32.6%	100.0%
Meat and Dairy Products	74.9%	4.1%	4.9%	0.9%	15.3%	100.0%
Fish, crustaceous and others sea products	64.1%	8.0%	3.2%	0.5%	24.3%	100.0%
Vegetable and Animal Oils and Fats	59.7%	5.8%	7.5%	0.8%	26.3%	100.0%
Green Coffee	81.5%	1.3%	3.8%	0.5%	13.0%	100.0%
Milling, excluding coffee processing	82.0%	1.7%	4.9%	0.4%	11.1%	100.0%
Bakery Products	55.3%	17.9%	10.8%	1.6%	14.6%	100.0%
Sugar	79.5%	2.7%	14.1%	0.9%	2.8%	100.0%
Beverages	47.2%	11.7%	5.1%	0.8%	35.2%	100.0%
TOTAL FOOD INDUSTRY	71.2%	5.1%	6.4%	0.8%	17.5%	100.0%
Other Manufactured Products	61.5%	6.4%	7.9%	1.1%	23.1%	100.0%
Tobacco (cigarettes)	72.9%	14.8%	0.0%	0.8%	11.6%	100.0%
Textiles and garments	68.4%	12.0%	13.5%	1.6%	4.6%	100.0%
Textiles and garments	68.0%	13.5%	13.0%	1.4%	4.1%	100.0%
Timber and Furniture	55.1%	14.4%	18.3%	1.4%	10.8%	100.0%
Paper and Printing	61.3%	12.9%	5.6%	0.9%	19.2%	100.0%
TOTAL AGROINDUSTRY	64.6%	11.0%	10.1%	1.3%	13.0%	100.0%
TOTAL AGRICULTURE AND AGRIFOOD	58.4%	6.0%	13.0%	1.1%	21.5%	100.0%
Chemicals	62.7%	6.4%	8.1%	0.9%	21.8%	100.0%
Oil refining (gasoline, diesel, etc.)	87.2%	14.6%	0.3%	0.9%	-3.0%	100.0%
Tire	61.6%	11.2%	3.9%	2.6%	20.3%	100.0%
Rubber and Plastic Products	69.0%	12.3%	7.0%	1.3%	10.4%	100.0%
Glass and Ceramic Products	60.3%	11.4%	8.8%	1.9%	17.5%	100.0%
Clay products for construction	64.6%	8.4%	12.3%	0.9%	13.8%	100.0%
Base metals	71.0%	5.2%	8.3%	1.9%	13.6%	100.0%
Electrical Goods	70.6%	11.5%	10.2%	1.3%	6.4%	100.0%
Transportation Equipment	61.2%	23.5%	5.0%	1.2%	9.0%	100.0%
Other Manufactures	73.5%	12.4%	6.7%	1.1%	6.4%	100.0%
Construction	53.7%	16.0%	20.4%	1.2%	8.7%	100.0%
Financial Services and Insurance	28.7%	24.7%	7.8%	2.3%	38.7%	100.0%
Trade, Restaurants and Hotels	37.2%	16.2%	10.8%	1.5%	34.2%	100.0%
Transportation, Storage and Communications	44.5%	9.5%	7.1%	1.0%	38.0%	100.0%
Social, Communal and Personal Services	25.9%	34.6%	17.3%	1.1%	21.1%	100.0%
Electricity	27.6%	12.5%	9.1%	2.3%	48.6%	100.0%
Real State Services	20.7%	3.8%	2.0%	4.7%	68.9%	100.0%
Public Administration Services	33.8%	44.8%	21.8%	0.5%	-0.7%	100.0%
TOTAL REST ECONOMY	41.8%	18.5%	11.2%	1.8%	27.2%	100.0%
TOTAL	47.0%	14.4%	11.5%	1.4%	25.4%	100.0%

Source: IICA. Based on data from the SAM of Costa Rica for 1997 (IICA)

ANNEX D
SAM Multipliers by Country

Table 1D
Argentina: SAM Multipliers for 1997

	Food	Primary	Agroindustry	Natural Resources	Rest Economy
ACTIVITIES					
Food	1.880	0.738	0.706	0.710	0.703
Primary	0.808	1.505	0.447	0.394	0.389
Agroindustry	0.584	0.566	2.074	0.563	0.576
Natural Resources	0.049	0.048	0.052	1.053	0.070
Rest Economy	2.691	2.637	2.713	2.644	3.871
TOTAL ACTIVITIES	6.013	5.495	5.364	5.364	5.608
COMMODITIES					
Food	0.893	0.749	0.719	0.720	0.713
Primary	0.821	0.514	0.454	0.400	0.395
Agroindustry	0.616	0.597	1.133	0.594	0.607
Natural Resources	0.052	0.051	0.055	0.056	0.074
Rest Economy	2.833	2.874	2.857	2.882	3.129
TOTAL COMMODITIES	5.316	4.785	5.318	4.863	4.919
FACTORS					
Land	0.188	0.314	0.083	0.082	0.081
Unskilled Labor	1.203	1.305	1.195	1.115	1.180
Skilled Labor	0.349	0.321	0.365	0.361	0.436
Capital	1.544	1.390	1.511	1.582	1.526
Natural Resources	0.014	0.016	0.012	0.217	0.016
TOTAL FACTORS	3.278	3.347	3.176	3.356	3.240
HOUSEHOLDS INCOME	3.278	3.347	3.176	3.356	3.240

Source: IICA with data from GTAP 5.0

*Households income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

Table 2D
Brasil: SAM Multipliers for 1997

	Food	Primary	Agroindustry	Natural Resources	Rest Economy
ACTIVITIES					
Food	1.648	0.458	0.418	0.406	0.426
Primary	0.894	1.526	0.400	0.341	0.361
Agroindustry	0.417	0.381	1.845	0.395	0.416
Natural Resources	0.059	0.056	0.055	1.104	0.073
Rest Economy	2.812	2.605	2.808	3.008	3.932
TOTAL ACTIVITIES	5.830	5.025	5.527	5.254	5.208
COMMODITIES					
Food	0.654	0.462	0.422	0.410	0.430
Primary	0.901	0.529	0.403	0.343	0.364
Agroindustry	0.427	0.391	0.867	0.405	0.427
Natural Resources	0.081	0.057	0.057	0.107	0.075
Rest Economy	2.892	2.679	2.888	3.094	3.016
TOTAL COMMODITIES	4.904	4.118	4.637	4.358	4.311
FACTORS					
Land	0.083	0.142	0.037	0.032	0.034
Unskilled Labor	0.820	0.777	0.841	0.779	0.859
Skilled Labor	0.323	0.289	0.335	0.341	0.420
Capital	1.267	1.316	1.245	1.200	1.213
Natural Resources	0.012	0.015	0.008	0.144	0.011
TOTAL FACTORS	2.505	2.539	2.468	2.495	2.537
HOUSEHOLDS INCOME	2.505	2.539	2.468	2.495	2.537

Source: IICA with data from GTAP 5.0

*Households income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

Table 3D
Canada: SAM Multipliers for 1997

	Food	Primary	Agroindustry	Natural Resources	Rest Economy
ACTIVITIES					
Food	1.280	0.163	0.099	0.089	0.100
Primary	0.407	1.274	0.184	0.051	0.058
Agroindustry	0.150	0.109	1.344	0.096	0.117
Natural Resources	0.037	0.038	0.038	1.044	0.058
Rest Economy	1.365	1.492	1.390	1.488	2.436
TOTAL ACTIVITIES	3.238	3.076	3.056	2.767	2.769
COMMODITIES					
Food	0.331	0.193	0.118	0.105	0.118
Primary	0.449	0.302	0.203	0.056	0.064
Agroindustry	0.180	0.131	0.415	0.115	0.141
Natural Resources	0.044	0.045	0.045	0.051	0.068
Rest Economy	1.645	1.798	1.675	1.793	1.731
TOTAL COMMODITIES	2.649	2.469	2.456	2.121	2.122
FACTORS					
Land	0.019	0.061	0.009	0.002	0.003
Unskilled Labor	0.572	0.597	0.637	0.429	0.584
Skilled Labor	0.180	0.170	0.218	0.171	0.240
Capital	0.555	0.547	0.482	0.533	0.550
Natural Resources	0.019	0.046	0.012	0.183	0.012
TOTAL FACTORS	1.346	1.421	1.358	1.316	1.388
HOUSEHOLDS INCOME	1.346	1.421	1.358	1.318	1.388

Source: IICA with data from GTAP 5.0
*Households income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

Table 4D
Chile: SAM Multipliers for 1997

	Food	Primary	Agroindustry	Natural Resources	Rest Economy
ACTIVITIES					
Food	1.499	0.374	0.304	0.308	0.320
Primary	0.682	1.369	0.219	0.191	0.198
Agroindustry	0.206	0.187	1.422	0.179	0.194
Natural Resources	0.061	0.066	0.056	1.152	0.085
Rest Economy	1.568	1.471	1.605	1.584	2.599
TOTAL ACTIVITIES	3.995	3.466	3.606	3.413	3.396
COMMODITIES					
Food	0.532	0.399	0.325	0.329	0.341
Primary	0.886	0.383	0.227	0.198	0.205
Agroindustry	0.252	0.229	0.516	0.219	0.238
Natural Resources	0.080	0.066	0.073	0.199	0.112
Rest Economy	1.867	1.752	1.911	1.886	1.904
TOTAL COMMODITIES	3.417	2.848	3.053	2.630	2.800
FACTORS					
Land	0.087	0.179	0.029	0.025	0.026
Unskilled Labor	0.519	0.587	0.461	0.451	0.461
Skilled Labor	0.148	0.127	0.154	0.152	0.206
Capital	0.885	0.817	0.909	0.982	0.976
Natural Resources	0.027	0.052	0.012	0.090	0.013
TOTAL FACTORS	1.667	1.762	1.564	1.701	1.682
HOUSEHOLDS INCOME	1.667	1.762	1.564	1.701	1.682

Source: IICA with data from GTAP 5.0
*Households income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

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Table 5D
Colombia: SAM Multipliers for 1997

	Food	Primary	Agroindustry	Natural Resources	Rest Economy
ACTIVITIES					
Food	1.579	0.545	0.456	0.467	0.475
Primary	0.637	1.361	0.306	0.295	0.291
Agroindustry	0.218	0.208	1.425	0.198	0.212
Natural Resources	0.049	0.045	0.060	1.047	0.071
Rest Economy	1.976	1.853	2.099	1.964	2.991
TOTAL ACTIVITIES	4.460	4.012	4.346	3.981	4.040
COMMODITIES					
Food	0.609	0.573	0.479	0.491	0.499
Primary	0.675	0.383	0.327	0.302	0.309
Agroindustry	0.249	0.237	0.488	0.226	0.242
Natural Resources	0.050	0.045	0.060	0.048	0.071
Rest Economy	2.250	2.110	2.390	2.236	2.267
TOTAL COMMODITIES	3.832	3.347	3.741	3.302	3.388
FACTORS					
Land	0.114	0.244	0.055	0.051	0.052
Unskilled Labor	0.793	0.896	0.756	0.668	0.783
Skilled Labor	0.261	0.231	0.278	0.255	0.356
Capital	0.836	0.798	0.814	0.918	0.878
Natural Resources	0.018	0.024	0.017	0.241	0.019
TOTAL FACTORS	2.022	2.194	1.920	2.133	2.098
HOUSEHOLDS INCOME	2.022	2.184	1.920	2.133	2.088

Source: IICA with data from GTAP 5.0
*Households income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

Table 6D
United States of America: SAM Multipliers for 1997

	Food	Primary	Agroindustry	Natural Resources	Rest Economy
ACTIVITIES					
Food	1.344	0.262	0.145	0.148	0.156
Primary	0.381	1.296	0.084	0.080	0.084
Agroindustry	0.205	0.186	1.467	0.160	0.178
Natural Resources	0.026	0.029	0.025	1.037	0.035
Rest Economy	2.937	3.116	2.812	2.966	3.956
TOTAL ACTIVITIES	4.894	4.879	4.534	4.372	4.392
COMMODITIES					
Food	0.364	0.277	0.154	0.156	0.165
Primary	0.410	0.308	0.091	0.085	0.089
Agroindustry	0.245	0.222	0.557	0.191	0.213
Natural Resources	0.042	0.046	0.041	0.080	0.056
Rest Economy	3.120	3.310	2.966	3.151	3.142
TOTAL COMMODITIES	4.181	4.163	3.829	3.623	3.645
FACTORS					
Land	0.039	0.133	0.009	0.006	0.007
Unskilled Labor	0.840	0.885	0.885	0.808	0.681
Skilled Labor	0.517	0.517	0.545	0.526	0.630
Capital	0.960	0.927	0.861	0.897	0.914
Natural Resources	0.007	0.012	0.005	0.208	0.007
TOTAL FACTORS	2.364	2.475	2.306	2.446	2.439
HOUSEHOLDS INCOME	2.364	2.475	2.306	2.446	2.439

Source: IICA with data from GTAP 5.0
*Households income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

Table 7D
Mexico: SAM Multipliers for 1997

	Food	Primary	Agroindustry	Natural Resources	Rest Economy
ACTIVITIES					
Food	1.476	0.400	0.220	0.251	0.206
Primary	0.648	1.272	0.277	0.245	0.215
Agroindustry	0.201	0.194	1.384	0.195	0.192
Natural Resource	0.047	0.048	0.048	1.096	0.078
Rest Economy	1.657	1.576	1.578	1.598	2.645
TOTAL ACTIVITIES	3.928	3.663	3.666	3.469	3.436
COMMODITIES					
Food	0.607	0.427	0.341	0.374	0.327
Primary	0.710	0.408	0.304	0.269	0.226
Agroindustry	0.239	0.231	0.457	0.224	0.228
Natural Resource	0.048	0.049	0.049	0.098	0.080
Rest Economy	1.836	1.860	1.860	1.871	1.939
TOTAL COMMODITIES	3.359	2.978	3.010	2.827	2.800
FACTORS					
Land	0.117	0.247	0.050	0.044	0.039
Unskilled Labor	0.461	0.641	0.402	0.347	0.403
Skilled Labor	0.111	0.106	0.117	0.112	0.162
Capital	1.119	1.009	1.109	1.295	1.125
Natural Resource	0.019	0.029	0.015	0.256	0.021
TOTAL FACTORS	1.827	2.033	1.693	2.054	1.749
HOUSEHOLDS INCOME	1.927	2.033	1.693	2.054	1.749

Source: IICA with data from GTAP 5.0
*Households income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

Table 8D
Peru: SAM Multipliers for 1997

	Food	Primary	Agroindustry	Natural Resources	Rest Economy
ACTIVITIES					
Food	1.460	0.445	0.368	0.338	0.400
Primary	0.566	1.371	0.347	0.256	0.294
Agroindustry	0.377	0.369	1.628	0.327	0.376
Natural Resource	0.033	0.034	0.033	1.037	0.060
Rest Economy	1.442	1.525	1.491	1.642	2.707
TOTAL ACTIVITIES	3.938	3.744	3.885	3.600	3.837
COMMODITIES					
Food	0.524	0.475	0.415	0.362	0.427
Primary	0.634	0.395	0.369	0.273	0.313
Agroindustry	0.398	0.390	0.664	0.346	0.398
Natural Resource	0.042	0.044	0.042	0.047	0.076
Rest Economy	1.596	1.690	1.652	1.819	1.891
TOTAL COMMODITIES	3.195	2.993	3.142	2.846	3.106
FACTORS					
Land	0.100	0.230	0.058	0.043	0.049
Unskilled Labor	0.382	0.587	0.340	0.400	0.413
Skilled Labor	0.128	0.132	0.131	0.155	0.221
Capital	1.419	1.178	1.663	1.157	1.378
Natural Resource	0.021	0.044	0.014	0.131	0.016
TOTAL FACTORS	2.048	2.171	2.207	1.885	2.076
HOUSEHOLDS INCOME	2.048	2.171	2.207	1.885	2.076

Source: IICA with data from GTAP 5.0
*Households income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

Table 9D
Uruguay: SAM Multipliers for 1997

	Food	Primary	Agroindustry	Natural Resources	Rest Economy
ACTIVITIES					
Food	1.523	0.456	0.422	0.429	0.434
Primary	0.626	1.370	0.400	0.296	0.303
Agroindustry	0.193	0.167	1.462	0.159	0.174
Natural Resources	0.008	0.008	0.007	1.006	0.012
Rest Economy	2.038	2.045	1.906	2.112	3.051
TOTAL ACTIVITIES	4.398	4.046	4.197	3.996	3.973
COMMODITIES					
Food	0.574	0.500	0.463	0.471	0.477
Primary	0.656	0.387	0.419	0.299	0.317
Agroindustry	0.246	0.214	0.590	0.204	0.222
Natural Resources	0.024	0.024	0.022	0.025	0.036
Rest Economy	2.437	2.446	2.279	2.526	2.452
TOTAL COMMODITIES	3.937	3.571	3.774	3.526	3.504
FACTORS					
Land	0.103	0.228	0.066	0.047	0.050
Unskilled Labor	0.634	0.740	0.589	0.649	0.579
Skilled Labor	0.152	0.137	0.148	0.169	0.189
Capital	1.133	1.077	1.094	1.199	1.272
Natural Resources	0.008	0.013	0.004	0.072	0.004
TOTAL FACTORS	2.030	2.195	1.901	2.136	2.093
HOUSEHOLDS INCOME	2.030	2.195	1.901	2.136	2.093

Source: IICA with data from GTAP 5.0
*Households Income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

Table 10D
Venezuela: SAM Multipliers for 1997

	Food	Primary	Agroindustry	Natural Resources	Rest Economy
ACTIVITIES					
Food	1.461	0.393	0.305	0.327	0.334
Primary	0.464	1.299	0.233	0.197	0.194
Agroindustry	0.212	0.190	1.500	0.198	0.206
Natural Resources	0.146	0.133	0.150	1.151	0.218
Rest Economy	1.919	1.771	1.984	1.826	2.948
TOTAL ACTIVITIES	4.221	3.776	4.171	3.700	3.900
COMMODITIES					
Food	0.523	0.426	0.331	0.356	0.363
Primary	0.512	0.318	0.257	0.217	0.214
Agroindustry	0.251	0.225	0.592	0.235	0.244
Natural Resources	0.146	0.133	0.151	0.151	0.219
Rest Economy		2.071	2.319	2.135	2.277
TOTAL COMMODITIES	1.432	3.175	3.660	3.094	3.317
FACTORS					
Land	0.081	0.224	0.040	0.034	0.034
Unskilled Labor	0.598	0.726	0.595	0.471	0.580
Skilled Labor	0.182	0.157	0.193	0.170	0.242
Capital	0.986	0.917	0.924	1.134	1.080
Natural Resources	0.046	0.058	0.042	0.295	0.059
TOTAL FACTORS	1.895	2.081	1.795	2.104	2.005
HOUSEHOLDS INCOME	1.890	2.081	1.795	2.104	2.005

Source: IICA with data from GTAP 5.0
*Households Income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

TABLE 11D
Costa Rica: SAM Multipliers for 1997

	Food	Primary	Agroindustry	Rest economy
ACTIVITIES				
Food	1.29	0.24	0.28	0.19
Primary	0.45	1.15	0.19	0.11
Agroindustry	0.18	0.16	1.27	0.15
Rest economy	0.81	0.90	0.90	1.99
TOTAL ACTIVITIES	2.72	2.46	2.64	2.44
COMMODITIES				
Food	1.31	0.32	0.25	0.29
Primary	0.38	1.14	0.13	0.11
Agroindustry	0.20	0.23	1.27	0.22
Rest economy	0.71	1.01	0.71	2.13
TOTAL COMMODITIES	2.60	2.70	2.37	2.76
URBAN LABOR				
Self-employed	0.03	0.03	0.05	0.04
Employer	0.02	0.02	0.02	0.03
Public Sector	0.04	0.05	0.05	0.11
Firms	0.14	0.16	0.20	0.16
Domestic help	0.00	0.00	0.00	0.00
TOTAL URBAN LABOR	0.24	0.27	0.32	0.34

(continues)

TABLE 11D (Cont'd)
Costa Rica: SAM Multipliers for 1997

	Food	Primary	Agroindustry	Rest economy
RURAL LABOR				
Self-employed	0.07	0.13	0.05	0.04
Employer	0.04	0.07	0.03	0.02
Public Sector	0.02	0.02	0.02	0.04
Firms	0.17	0.21	0.16	0.13
Domestic help	0.00	0.00	0.00	0.00
TOTAL RURAL LABOR	**0.30**	**0.43**	**0.25**	**0.23**
HOUSEHOLDS INCOME				
Wage earner household	0.56	0.63	0.59	0.61
Other employee household	0.37	0.45	0.32	0.32
Other household	0.01	0.01	0.01	0.01
Firms	0.26	0.26	0.22	0.24
Government	0.12	0.13	0.14	0.13
TOTAL HOUSEHOLDS INCOME	**1.33**	**1.48**	**1.28**	**1.31**

Source: IICA. Based on data from SAM of Costa Rica for 1997 (IICA)
*Households income is the same that family income
For Costa Rica's SAM in all extension (115 X 115 sectors), please see (IICA, 2004) or contact the web site: www.iica.int.

ANNEX E
Results of the Simulation of a Shock in Exports and in Investment by Country

Table 1E
Argentina: Effect of a 10% increase in agriculture and agrifood exports (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial Injection into the Economy				0.27%
ACTIVITIES				
Food	77,465.0	0.0	1,922.1	2.48%
Primary	48,240.5	0.0	1,441.6	2.99%
Agroindustry	61,156.8	0.0	1,144.3	1.87%
Natural Resource	8,459.2	0.0	71.3	0.84%
Rest Economy	351,639.9	0.0	3,879.4	1.10%
TOTAL ACTIVITIES	546,991.2	0.0	8,458.7	1.55%
COMMODITIES				
Food	78,645.8	762.3	1,950.6	2.48%
Primary	49,034.1	501.6	1,465.3	2.99%
Agroindustry	64,502.9	216.6	1,207.0	1.87%
Natural Resource	8,976.4	0.0	75.7	0.84%
Rest Economy	383,293.0	0.0	4,228.7	1.10%
TOTAL COMMODITIES	584,452.2	1480.4	8,927.1	1.53%
FACTORS				
Land	10,055.5	0.0	300.5	2.99%
Unskilled Labor	115,302.8	0.0	1,792.9	1.55%
Skilled Labor	40,483.4	0.0	495.5	1.22%
Capital	147,328.0	0.0	2,156.1	1.46%
Natural Resource	1,935.2	0.0	20.7	1.07%
TOTAL FACTORS	315,104.9	0.0	4,765.7	1.51%
HOUSEHOLDS INCOME	315,104.9	0.0	4,765.7	1.51%

Source: IICA with data from GTAP 5.0
*Households income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

Table 2E
Argentina: Effect of a US$1000 million increase in investment, (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial Injection into the Economy				0.18%
ACTIVITIES				
Food	77,465.0	0.0	709.9	0.92%
Primary	48,240.5	0.0	1,162.2	2.41%
Agroindustry	61,156.6	0.0	982.0	1.61%
Natural Resource	8,459.2	0.0	47.6	0.56%
Rest Economy	351,639.9	0.0	2,587.5	0.74%
TOTAL ACTIVITIES	546,991.2	0.0	5,489.3	1.00%
COMMODITIES				
Food	78,645.8	0.0	720.5	0.92%
Primary	49,034.1	998.6	1,181.3	2.41%
Agroindustry	64,502.9	301.4	1,035.8	1.61%
Natural Resource	8,976.4	0.0	50.5	0.56%
Rest Economy	383,293.0	0.0	2,820.4	0.74%
TOTAL COMMODITIES	584,452.2	1,000.0	5,808.6	0.99%
FACTORS				
Land	10,055.5	0.0	242.3	2.41%
Unskilled Labor	115,302.8	0.0	1,238.4	1.07%
Skilled Labor	40,483.4	0.0	325.1	0.80%
Capital	147,328.0	0.0	1,387.3	0.94%
Natural Resource	1,935.2	0.0	14.7	0.76%
TOTAL FACTORS	315,104.9	0.0	3,207.8	1.02%
HOUSEHOLDS INCOME	315,104.9	0.0	3,207.8	1.02%

Source: IICA with data from GTAP 5.0
*Households income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

Table 3E
Brazil: Effect of a 10% increase in agriculture and agrifood exports (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial injection into the Economy				0.13%
ACTIVITIES				
Food	128,585.5	0.0	1,712.1	1.33%
Primary	112,977.3	0.0	1,744.9	1.54%
Agroindustry	130,395.2	0.0	1,785.4	1.37%
Natural Resources	19,071.1	0.0	110.6	0.58%
Rest Economy	1,113,112.5	0.0	5,368.2	0.48%
TOTAL ACTIVITIES	1,504,141.6	0.0	10,721.2	0.71%
COMMODITIES				
Food	132,147.1	717.6	1,727.4	1.31%
Primary	116,661.9	548.3	1,757.2	1.51%
Agroindustry	135,535.7	712.3	1,831.2	1.35%
Natural Resources	24,639.9	0.0	113.6	0.46%
Rest Economy	1,185,493.0	0.0	5,520.9	0.47%
TOTAL COMMODITIES	1,594,477.6	1978.2	10,950.3	0.69%
FACTORS				
Land	10,546.1	0.0	162.9	1.54%
Unskilled Labor	246,673.5	0.0	1,591.0	0.64%
Skilled Labor	119,414.4	0.0	620.0	0.52%
Capital	350,281.8	0.0	2,482.0	0.71%
Natural Resources	3,007.4	0.0	22.8	0.76%
TOTAL FACTORS	729,923.2	0.0	4,878.6	0.67%
HOUSEHOLDS INCOME*	729,923.2	0.0	4,878.6	0.67%

Source: IICA with data from GTAP 5.0
*Households Income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

Table 4E
Brazil: Effect of a US$1000 million increase in investment, (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial injection into the Economy				0.07%
ACTIVITIES				
Food	128,585.5	0.0	432.8	0.34%
Primary	112,977.3	0.0	985.5	0.87%
Agroindustry	130,395.2	0.0	1,047.4	0.80%
Natural Resources	19,071.1	0.0	54.6	0.29%
Rest Economy	1,113,112.5	0.0	2,657.8	0.24%
TOTAL ACTIVITIES	1,504,141.6	0.0	5,178.1	0.34%
COMMODITIES				
Food	132,147.1	0.0	436.6	0.33%
Primary	116,661.9	529.1	992.4	0.85%
Agroindustry	135,535.7	470.9	1,074.3	0.79%
Natural Resources	24,639.9	0.0	56.1	0.23%
Rest Economy	1,185,493.0	0.0	2,733.4	0.23%
TOTAL COMMODITIES	1,594,477.6	1,000.0	5,292.8	0.33%
FACTORS				
Land	10,546.1	0.0	92.0	0.87%
Unskilled Labor	246,673.5	0.0	794.7	0.32%
Skilled Labor	119,414.4	0.0	305.9	0.26%
Capital	350,281.8	0.0	1,263.0	0.36%
Natural Resources	3,007.4	0.0	11.9	0.39%
TOTAL FACTORS	729,923.2	0.0	2,467.4	0.34%
HOUSEHOLDS INCOME*	729,923.2	0.0	2,467.4	0.34%

Source: IICA with data from GTAP 5.0
*Households Income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

Table 5E
Canada: Effect of a 10% increase in agriculture and agrifood exports (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial injection into the Economy				0.48%
ACTIVITIES				
Food	49,206.9	0.0	1,310.8	2.66%
Primary	41,987.7	0.0	1,933.0	4.80%
Agroindustry	90,970.4	0.0	4,172.1	4.59%
Natural Resource	38,966.3	0.0	171.4	0.44%
Rest Economy	888,073.3	0.0	6,342.6	0.71%
TOTAL ACTIVITIES	1,109,236.6	0.0	13,930.0	1.26%
COMMODITIES				
Food	58,319.8	810.7	1,553.5	2.66%
Primary	48,249.5	959.9	2,129.2	4.80%
Agroindustry	109,569.6	3661.7	5,025.1	4.59%
Natural Resource	45,915.6	0.0	201.9	0.44%
Rest Economy	1,070,428.4	0.0	7,645.0	0.71%
TOTAL COMMODITIES	1,330,482.7	5332.3	16,554.7	1.24%
FACTORS				
Land	2,002.3	0.0	92.2	4.60%
Unskilled Labor	229,643.9	0.0	2,795.2	1.22%
Skilled Labor	91,397.2	0.0	915.4	1.00%
Capital	214,064.1	0.0	2,281.4	1.07%
Natural Resource	8,062.9	0.0	89.3	1.11%
TOTAL FACTORS	545,170.4	0.0	6,173.4	1.13%
HOUSEHOLDS INCOME*	545,170.4	0.0	6,173.4	1.13%

Source: IICA with data from GTAP 5.0
*Households income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

Table 6E
Canada: Effect of a US$1000 million increase in investment, (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial injection into the Economy				0.09%
ACTIVITIES				
Food	49,206.9	0.0	82.4	0.17%
Primary	41,987.7	0.0	153.0	0.36%
Agroindustry	90,970.4	0.0	1,115.7	1.23%
Natural Resource	38,966.3	0.0	31.7	0.08%
Rest Economy	888,073.3	0.0	1,153.8	0.13%
TOTAL ACTIVITIES	1,109,236.6	0.0	2,536.6	0.23%
COMMODITIES				
Food	58,319.6	0.0	97.6	0.17%
Primary	46,249.5	0.3	166.6	0.36%
Agroindustry	109,569.6	999.7	1,343.8	1.23%
Natural Resource	45,915.6	0.0	37.4	0.08%
Rest Economy	1,070,428.4	0.0	1,390.8	0.13%
TOTAL COMMODITIES	1,330,482.7	1,000.0	3,036.1	0.23%
FACTORS				
Land	2,002.3	0.0	7.3	0.36%
Unskilled Labor	229,643.9	0.0	528.9	0.23%
Skilled Labor	91,397.2	0.0	180.7	0.20%
Capital	214,064.1	0.0	400.1	0.19%
Natural Resource	8,062.9	0.0	10.2	0.13%
TOTAL FACTORS	545,170.4	0.0	1,127.2	0.21%
HOUSEHOLDS INCOME*	545,170.4	0.0	1,127.2	0.21%

Source: IICA with data from GTAP 5.0
*Households income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

Table 8E
Chile: Effect of a US$1000 million increase in investment, (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial Injection into the Economy				0.73%
ACTIVITIES				
Food	16,414.1	0.0	612.2	3.73%
Primary	11,883.5	0.0	661.0	5.56%
Agroindustry	10,560.4	0.0	578.8	5.48%
Natural Resources	5,342.8	0.0	54.4	1.02%
Rest Economy	92,714.8	0.0	1,389.4	1.50%
TOTAL ACTIVITIES	136,915.6	0.0	3,295.8	2.41%
COMMODITIES				
Food	17,521.8	284.6	653.5	3.73%
Primary	12,328.5	312.6	685.7	5.56%
Agroindustry	12,929.7	402.8	708.7	5.48%
Natural Resources	6,996.0	0.0	71.2	1.02%
Rest Economy	110,401.4	0.0	1,654.5	1.50%
TOTAL COMMODITIES	160,177.4	1,000.0	3,773.6	2.36%
FACTORS				
Land	1,558.1	0.0	86.7	5.56%
Unskilled Labor	18,675.4	0.0	466.9	2.50%
Skilled Labor	7,575.6	0.0	128.3	1.69%
Capital	37,822.8	0.0	781.3	2.07%
Natural Resources	799.6	0.0	26.9	3.36%
TOTAL FACTORS	66,431.5	0.0	1,490.1	2.24%
HOUSEHOLDS INCOME*	66,431.5	0.0	1,490.1	2.24%

Source: IICA with data from GTAP 5.0
*Households Income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

Table 7E
Chile: Effect of a 10% increase in agriculture and agrifood exports (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial Injection into the Economy				0.48%
ACTIVITIES				
Food	16,414.1	0.0	503.8	3.07%
Primary	11,883.5	0.0	429.5	3.61%
Agroindustry	10,560.4	0.0	326.8	3.09%
Natural Resources	5,342.8	0.0	36.0	0.67%
Rest Economy	92,714.8	0.0	920.0	0.99%
TOTAL ACTIVITIES	136,915.6	0.0	2,216.1	1.62%
COMMODITIES				
Food	17,521.8	279.2	537.8	3.07%
Primary	12,328.5	166.0	445.6	3.61%
Agroindustry	12,929.7	209.4	400.2	3.09%
Natural Resources	6,996.0	0.0	47.1	0.67%
Rest Economy	110,401.4	0.0	1,095.5	0.99%
TOTAL COMMODITIES	160,177.4	654.6	2,526.2	1.58%
FACTORS				
Land	1,558.1	0.0	56.3	3.61%
Unskilled Labor	18,675.4	0.0	308.6	1.65%
Skilled Labor	7,575.6	0.0	85.4	1.13%
Capital	37,822.8	0.0	517.8	1.37%
Natural Resources	799.6	0.0	17.5	2.19%
TOTAL FACTORS	66,431.5	0.0	985.5	1.46%
HOUSEHOLDS INCOME*	66,431.5	0.0	985.5	1.48%

Source: IICA with data from GTAP 5.0
*Households Income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

Table 10E
Colombia: Effect of a US$1000 million increase in investment, (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial Injection Into the Economy				0.59%
ACTIVITIES				
Food	20,968.5	0.0	465.5	2.22%
Primary	15,887.8	0.0	854.6	5.38%
Agroindustry	10,221.4	0.0	642.0	6.29%
Natural Resource	6,208.5	0.0	46.5	0.75%
Rest Economy	115,806.5	0.0	1,786.9	1.54%
TOTAL ACTIVITIES	169,092.7	0.0	3,795.5	2.24%
COMMODITIES				
Food	22,040.3	0.0	489.3	2.22%
Primary	16,836.9	576.3	905.6	5.38%
Agroindustry	11,667.7	423.7	732.9	6.29%
Natural Resource	6,255.9	0.0	46.9	0.75%
Rest Economy	131,841.0	0.0	2,034.3	1.54%
TOTAL COMMODITIES	188,641.8	1,000.0	4,209.0	2.23%
FACTORS				
Land	2,853.1	0.0	153.5	5.38%
Unskilled Labor	32,836.9	0.0	767.7	2.35%
Skilled Labor	13,948.7	0.0	229.0	1.64%
Capital	36,405.7	0.0	731.0	2.01%
Natural Resources	1,570.5	0.0	19.1	1.22%
TOTAL FACTORS	87,414.9	0.0	1,900.2	2.17%
HOUSEHOLDS INCOME	87,414.9	0.0	1,900.2	2.17%

Source: IICA with data from GTAP 5.0
*Households Income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

Table 9E
Colombia: Effect of a 10% increase in agriculture and agrifood exports (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial Injection Into the Economy				0.31%
ACTIVITIES				
Food	20,968.5	0.0	346.6	1.65%
Primary	15,887.8	0.0	491.1	3.09%
Agroindustry	10,221.4	0.0	224.0	2.19%
Natural Resource	6,208.5	0.0	23.6	0.38%
Rest Economy	115,806.5	0.0	934.9	0.81%
TOTAL ACTIVITIES	169,092.7	0.0	2,020.2	1.19%
COMMODITIES				
Food	22,040.3	92.5	364.3	1.65%
Primary	16,836.9	314.7	520.4	3.09%
Agroindustry	11,667.7	114.8	255.7	2.19%
Natural Resource	6,255.9	0.0	23.8	0.38%
Rest Economy	131,841.0	0.0	1,084.4	0.81%
TOTAL COMMODITIES	188,641.8	521.8	2,228.5	1.18%
FACTORS				
Land	2,853.1	0.0	88.2	3.09%
Unskilled Labor	32,836.9	0.0	411.7	1.26%
Skilled Labor	13,948.7	0.0	119.5	0.86%
Capital	36,405.7	0.0	389.4	1.07%
Natural Resources	1,570.5	0.0	10.3	0.65%
TOTAL FACTORS	87,414.9	0.0	1,019.1	1.17%
HOUSEHOLDS INCOME	87,414.9	0.0	1,019.1	1.17%

Source: IICA with data from GTAP 5.0
*Households Income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

Table 11E
United States of America: Effect of a 10% increase in agriculture and agrifood exports (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial Injection into the Economy				0.08%
ACTIVITIES				
Food	556,231.2	0.0	5,363.1	0.96%
Primary	265,090.2	0.0	5,657.8	2.13%
Agroindustry	700,891.0	0.0	7,355.5	1.05%
Natural Resources	115,627.8	0.0	276.0	0.24%
Rest Economy	12,711,763.0	0.0	30,482.1	0.24%
TOTAL ACTIVITIES	14,349,603.2	0.0	49,134.5	0.34%
COMMODITIES				
Food	588,249.7	3067.4	5,671.8	0.96%
Primary	285,573.0	3517.8	6,095.0	2.13%
Agroindustry	835,823.9	4999.8	8,771.6	1.05%
Natural Resources	185,743.3	0.0	443.3	0.24%
Rest Economy	13,502,383.1	0.0	32,377.9	0.24%
TOTAL COMMODITIES	15,397,773.0	11585.0	53,359.7	0.35%
FACTORS				
Land	27,432.6	0.0	585.5	2.13%
Unskilled Labor	2,867,461.2	0.0	9,038.6	0.32%
Skilled Labor	2,035,685.4	0.0	5,473.7	0.27%
Capital	2,974,337.5	0.0	9,424.7	0.32%
Natural Resources	24,502.8	0.0	83.3	0.34%
TOTAL FACTORS	7,929,419.5	0.0	24,605.8	0.31%
HOUSEHOLDS INCOME*	7,929,419.5	0.0	24,605.8	0.31%

Source: IICA with data from GTAP 5.0
*Households Income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

Table 12E
United States of America: Effect of a US$1000 million increase in investment, (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial Injection into the Economy				0.01%
ACTIVITIES				
Food	556,231.2	0.0	121.8	0.02%
Primary	265,090.2	0.0	71.0	0.03%
Agroindustry	700,891.0	0.0	1,230.2	0.18%
Natural Resources	115,627.8	0.0	21.2	0.02%
Rest Economy	12,711,763.0	0.0	2,357.8	0.02%
TOTAL ACTIVITIES	14,349,603.2	0.0	3,802.1	0.03%
COMMODITIES				
Food	588,249.7	0.0	128.9	0.02%
Primary	285,573.0	0.3	76.5	0.03%
Agroindustry	835,823.9	999.7	1,467.0	0.18%
Natural Resources	185,743.3	0.0	34.1	0.02%
Rest Economy	13,502,383.1	0.0	2,504.5	0.02%
TOTAL COMMODITIES	15,397,773.0	1,000.0	4,211.0	0.03%
FACTORS				
Land	27,432.6	0.0	7.4	0.03%
Unskilled Labor	2,867,461.2	0.0	742.1	0.03%
Skilled Labor	2,035,685.4	0.0	457.0	0.02%
Capital	2,974,337.5	0.0	722.4	0.02%
Natural Resources	24,502.8	0.0	4.6	0.02%
TOTAL FACTORS	7,929,419.5	0.0	1,933.6	0.02%
HOUSEHOLDS INCOME*	7,929,419.5	0.0	1,933.6	0.02%

Source: IICA with data from GTAP 5.0
*Households Income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

Table 13E
Mexico: Effect of a 10% increase in agriculture and agrifood exports (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial Injection into the Economy				0.27%
ACTIVITIES				
Food	64,221.8	0.0	855.0	1.33%
Primary	48,947.7	0.0	909.2	1.86%
Agroindustry	50,577.3	0.0	1,484.3	2.93%
Natural Resource	25,645.6	0.0	75.8	0.30%
Rest Economy	485,210.3	0.0	2,510.9	0.52%
TOTAL ACTIVITIES	674,602.7	0.0	5,835.1	0.86%
COMMODITIES				
Food	68,485.4	293.4	911.7	1.33%
Primary	53,667.5	366.0	997.3	1.86%
Agroindustry	60,217.8	1174.0	1,767.3	2.93%
Natural Resource	26,256.2	0.0	77.6	0.30%
Rest Economy	571,753.2	0.0	2,958.7	0.52%
TOTAL COMMODITIES	780,400.1	1833.3	6,712.5	0.86%
FACTORS				
Land	8,828.7	0.0	184.0	1.86%
Unskilled Labor	79,103.0	0.0	737.3	0.93%
Skilled Labor	30,102.8	0.0	181.2	0.60%
Capital	220,574.9	0.0	1,738.1	0.79%
Natural Resources	6,621.6	0.0	29.6	0.45%
TOTAL FACTORS	345,231.0	0.0	2,850.3	0.83%
HOUSEHOLDS INCOME*	345,231.0	0.0	2,850.3	0.83%

Source: IICA with data from GTAP 5.0
*Households Income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

Table 14E
Mexico: Effect of a US$1000 million increase in investment, (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial Injection into the Economy				0.15%
ACTIVITIES				
Food	64,221.8	0.0	405.5	0.63%
Primary	48,947.7	0.0	858.6	1.75%
Agroindustry	50,577.3	0.0	512.8	1.01%
Natural Resource	25,645.6	0.0	42.4	0.17%
Rest Economy	485,210.3	0.0	1,401.7	0.29%
TOTAL ACTIVITIES	674,602.7	0.0	3,220.9	0.48%
COMMODITIES				
Food	68,485.4	71.8	432.4	0.63%
Primary	53,667.5	588.2	941.7	1.75%
Agroindustry	60,217.8	340.0	610.5	1.01%
Natural Resource	26,256.2	0.0	43.4	0.17%
Rest Economy	571,753.2	0.0	1,651.7	0.29%
TOTAL COMMODITIES	780,400.1	1,000.0	3,679.7	0.47%
FACTORS				
Land	8,828.7	0.0	154.9	1.75%
Unskilled Labor	79,103.0	0.0	489.8	0.62%
Skilled Labor	30,102.8	0.0	97.8	0.32%
Capital	220,574.9	0.0	933.0	0.42%
Natural Resources	6,621.6	0.0	21.2	0.32%
TOTAL FACTORS	345,231.0	0.0	1,696.6	0.49%
HOUSEHOLDS INCOME*	345,231.0	0.0	1,696.6	0.49%

Source: IICA with data from GTAP 5.0
*Households Income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

Table 15E
Peru: Effect of a 10% increase in agriculture and agrifood exports (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial Injection into the Economy				0.26%
ACTIVITIES				
Food	12,760.4	0.0	263.4	2.06%
Primary	9,339.8	0.0	179.5	1.92%
Agroindustry	11,494.3	0.0	178.5	1.55%
Natural Resources	2,514.1	0.0	8.6	0.34%
Rest Economy	71,456.7	0.0	383.5	0.54%
TOTAL ACTIVITIES	107,565.3	0.0	1,013.6	0.94%
COMMODITIES				
Food	13,634.4	154.4	281.5	2.06%
Primary	9,930.7	55.1	190.9	1.92%
Agroindustry	12,151.1	68.2	188.7	1.55%
Natural Resources	3,207.3	0.0	11.0	0.34%
Rest Economy	79,168.7	0.0	424.9	0.54%
TOTAL COMMODITIES	118,092.2	277.6	1,096.9	0.93%
FACTORS				
Land	1,565.4	0.0	30.1	1.92%
Unskilled Labor	11,566.3	0.0	107.6	0.93%
Skilled Labor	5,876.4	0.0	33.5	0.57%
Capital	38,616.7	0.0	373.2	0.97%
Natural Resources	588.6	0.0	6.2	1.09%
TOTAL FACTORS	58,193.4	0.0	550.6	0.95%
HOUSEHOLDS INCOME	58,193.4	0.0	550.6	0.95%

Source: IICA with data from GTAP 5.0
*Households income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

Table 16E
Peru: Effect of a US$1000 million increase in investment, (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial Injection into the Economy				0.93%
ACTIVITIES				
Food	12,760.4	0.0	384.7	3.01%
Primary	9,339.8	0.0	656.9	7.03%
Agroindustry	11,494.3	0.0	1,132.6	9.85%
Natural Resources	2,514.1	0.0	31.7	1.26%
Rest Economy	71,456.7	0.0	1,418.6	1.99%
TOTAL ACTIVITIES	107,565.3	0.0	3,624.4	3.37%
COMMODITIES				
Food	13,634.4	0.0	411.0	3.01%
Primary	9,930.7	341.5	698.4	7.03%
Agroindustry	12,151.1	658.5	1,197.3	9.85%
Natural Resources	3,207.3	0.0	40.4	1.26%
Rest Economy	79,168.7	0.0	1,571.7	1.99%
TOTAL COMMODITIES	118,092.2	1,000.0	3,918.8	3.32%
FACTORS				
Land	1,565.4	0.0	110.1	7.03%
Unskilled Labor	11,566.3	0.0	400.5	3.46%
Skilled Labor	5,876.4	0.0	124.1	2.11%
Capital	38,616.7	0.0	1,414.3	3.66%
Natural Resources	588.6	0.0	22.7	4.00%
TOTAL FACTORS	58,193.4	0.0	2,071.8	3.56%
HOUSEHOLDS INCOME	58,193.4	0.0	2,071.8	3.56%

Source: IICA with data from GTAP 5.0
*Households income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

Table 18E
Uruguay: Effect of a US$1000 million increase in investment, (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial Injection into the Economy				3.22%
ACTIVITIES				
Food	4,470.4	0.0	395.8	8.85%
Primary	3,355.3	0.0	933.3	27.82%
Agroindustry	2,413.4	0.0	531.0	22.00%
Natural Resource	86.2	0.0	6.8	7.91%
Rest Economy	20,731.9	0.0	1,779.6	8.58%
TOTAL ACTIVITIES	31,057.2	0.0	3,646.5	11.74%
COMMODITIES				
Food	4,908.7	0.0	434.6	8.85%
Primary	3,512.9	623.0	977.1	27.81%
Agroindustry	3,083.1	377.0	678.3	22.00%
Natural Resource	266.0	0.0	21.0	7.85%
Rest Economy	24,790.4	0.0	2,126.0	8.58%
TOTAL COMMODITIES	36,561.1	1,000.0	4,238.9	11.59%
FACTORS				
Land	553.4	0.0	153.9	27.82%
Unskilled Labor	4,588.2	0.0	614.3	13.39%
Skilled Labor	1,343.7	0.0	125.5	9.34%
Capital	9,322.3	0.0	963.9	10.34%
Natural Resources	37.2	0.0	9.2	24.66%
TOTAL FACTORS	15,844.8	0.0	1,866.9	11.78%
HOUSEHOLDS INCOME*	15,844.8	0.0	1,866.9	11.78%

Source: IICA with data from GTAP 5.0
*Households income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

Table 17E
Uruguay: Effect of a 10% increase in agriculture and agrifood exports (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial Injection into the Economy				0.74%
ACTIVITIES				
Food	4,470.4	0.0	184.7	4.13%
Primary	3,355.3	0.0	136.4	4.07%
Agroindustry	2,413.4	0.0	126.3	5.23%
Natural Resource	86.2	0.0	1.5	1.77%
Rest Economy	20,731.9	0.0	396.3	1.91%
TOTAL ACTIVITIES	31,057.2	0.0	844.3	2.72%
COMMODITIES				
Food	4,908.7	99.5	202.8	4.13%
Primary	3,512.9	39.4	142.8	4.06%
Agroindustry	3,083.1	89.6	161.4	5.23%
Natural Resource	266.0	0.0	4.7	1.76%
Rest Economy	24,790.4	0.0	472.7	1.91%
TOTAL COMMODITIES	36,561.1	228.5	934.4	2.69%
FACTORS				
Land	553.4	0.0	22.5	4.06%
Unskilled Labor	4,588.2	0.0	126.6	2.76%
Skilled Labor	1,343.7	0.0	29.4	2.18%
Capital	9,322.3	0.0	220.0	2.36%
Natural Resources	37.2	0.0	1.4	3.70%
TOTAL FACTORS	15,844.8	0.0	399.8	2.52%
HOUSEHOLDS INCOME*	15,844.8	0.0	399.8	2.52%

Source: IICA with data from GTAP 5.0
*Households income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

Table 19E
Venezuela: Effect of a 10% increase in agriculture and agrifood exports (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial Injection into the Economy				0.08%
ACTIVITIES				
Food	14,034.8	0.0	73.8	0.53%
Primary	8,369.6	0.0	47.5	0.57%
Agroindustry	8,807.6	0.0	52.2	0.59%
Natural Resources	19,337.8	0.0	12.2	0.06%
Rest Economy	99,973.3	0.0	160.9	0.16%
TOTAL ACTIVITIES	150,523.1	0.0	346.6	0.23%
COMMODITIES				
Food	15,262.7	43.1	80.3	0.53%
Primary	9,230.7	19.6	52.4	0.57%
Agroindustry	10,434.0	31.9	61.8	0.59%
Natural Resources	19,428.5	0.0	12.2	0.06%
Rest Economy	116,864.1	0.0	188.1	0.16%
TOTAL COMMODITIES	171,220.0	94.6	394.8	0.23%
FACTORS				
Land	1,453.7	0.0	8.3	0.57%
Unskilled Labor	21,479.0	0.0	52.6	0.24%
Skilled Labor	8,495.1	0.0	15.2	0.18%
Capital	42,858.9	0.0	80.2	0.19%
Natural Resources	5,054.3	0.0	4.0	0.08%
TOTAL FACTORS	79,341.0	0.0	160.2	0.20%
HOUSEHOLDS INCOME*	79,341.0	0.0	160.2	0.20%

Source: IICA with data from GTAP 5.0
*Households income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

Table 20E
Venezuela: Effect of a US$1000 million increase in investment, (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial Injection into the Economy				0.66%
ACTIVITIES				
Food	14,034.8	0.0	735.0	5.24%
Primary	8,369.6	0.0	537.3	6.42%
Agroindustry	8,807.6	0.0	549.7	6.24%
Natural Resources	19,337.8	0.0	128.1	0.66%
Rest Economy	99,973.3	0.0	1,694.2	1.69%
TOTAL ACTIVITIES	150,523.1	0.0	3,644.3	2.42%
COMMODITIES				
Food	15,262.7	409.8	799.3	5.24%
Primary	9,230.7	253.5	592.6	6.42%
Agroindustry	10,434.0	336.7	651.2	6.24%
Natural Resources	19,428.5	0.0	128.7	0.66%
Rest Economy	116,864.1	0.0	1,980.4	1.69%
TOTAL COMMODITIES	171,220.0	1,000.0	4,152.2	2.43%
FACTORS				
Land	1,453.7	0.0	93.3	6.42%
Unskilled Labor	21,479.0	0.0	560.9	2.61%
Skilled Labor	8,495.1	0.0	159.2	1.87%
Capital	42,858.9	0.0	845.0	1.97%
Natural Resources	5,054.3	0.0	42.4	0.84%
TOTAL FACTORS	79,341.0	0.0	1,700.9	2.14%
HOUSEHOLDS INCOME*	79,341.0	0.0	1,700.9	2.14%

Source: IICA with data from GTAP 5.0
*Households income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

ANNEX F
Results of an Increase in the Exports of Key
Agricultural and Agroindustrial Sectors

Table 1F
Brazil: Effect of a 10% increase in coffee exports (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial injection into the economy				0.02%
ACTIVITIES				
Food	90,953.9	0.0	359.5	0.40%
Primary	152,418.7	0.0	113.3	0.07%
Agroindustry	128,585.7	0.0	106.0	0.08%
Natural Resources	22,319.0	0.0	13.3	0.06%
Rest Economy	1,109,864.4	0.0	545.7	0.05%
TOTAL ACTIVITIES	1,504,141.7	0.0	1,138.8	0.08%
COMMODITIES				
Food	93,687.7	274.8	368.1	0.39%
Primary	158,504.4	0.0	117.5	0.07%
Agroindustry	132,144.9	0.0	110.9	0.08%
Natural Resources	27,900.9	0.0	17.5	0.06%
Rest Economy	1,182,226.9	0.0	583.1	0.05%
TOTAL COMMODITIES	1,594,464.8	274.8	1,197.2	0.08%
FACTORS				
Land	10,546.0	0.0	40.0	0.38%
Unskilled Labor	246,673.7	0.0	170.9	0.07%
Skilled Labor	119,414.1	0.0	46.2	0.04%
Capital	350,282.0	0.0	338.8	0.10%
Natural Resources	3,007.5	0.0	2.2	0.07%
TOTAL FACTORS	729,923.3	0.0	598.1	0.08%
HOUSEHOLDS INCOME*	729,923.3	0.0	598.1	0.08%

Source: IICA with data from GTAP 5.0
*Households Income is the same that family income and is taken to the sector Private of the SAM based on GTAP.
The data for coffee exports was taken from the FAO

Table 2F
Colombia: Effect of a 10% increase in coffee exports (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial injection into the economy				0.13%
ACTIVITIES				
Food	12,024.3	0.0	275.5	2.29%
Primary	14,084.6	0.0	70.4	0.50%
Agroindustry	20,968.4	0.0	119.6	0.57%
Natural Resources	6,995.7	0.0	15.5	0.22%
Rest Economy	115,019.6	0.0	422.2	0.37%
TOTAL ACTIVITIES	169,062.6	0.0	903.1	0.53%
COMMODITIES				
Food	12,855.5	226.2	283.0	2.20%
Primary	15,642.6	0.0	77.8	0.50%
Agroindustry	22,037.0	0.0	125.8	0.57%
Natural Resources	7,043.6	0.0	15.6	0.22%
Rest Economy	131,046.5	0.0	474.9	0.36%
TOTAL COMMODITIES	169,625.2	226.2	977.0	0.52%
FACTORS				
Land	2,853.1	0.0	58.3	2.04%
Unskilled Labor	32,636.9	0.0	206.4	0.63%
Skilled Labor	13,948.4	0.0	40.2	0.29%
Capital	36,405.7	0.0	191.5	0.53%
Natural Resources	1,570.5	0.0	3.4	0.22%
TOTAL FACTORS	87,414.6	0.0	499.9	0.57%
HOUSEHOLDS INCOME*	87,414.6	0.0	499.9	0.57%

Source: IICA with data from GTAP 5.0
*Households Income is the same that family income and is taken to the sector Private of the SAM based on GTAP.
The data for coffee exports was taken from the FAO

Table 3F
Peru: Effect of a 10% increase in coffee exports (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial injection into the economy				0.04%
ACTIVITIES				
Food	8,180.0	0.0	42.8	0.52%
Primary	12,654.3	0.0	0.9	0.01%
Agroindustry	12,760.6	0.0	3.3	0.03%
Natural Resources	2,567.0	0.0	0.2	0.01%
Rest Economy	71,403.6	0.0	8.3	0.01%
TOTAL ACTIVITIES	**107,565.5**	**0.0**	**55.5**	**0.05%**
COMMODITIES				
Food	8,689.6	41.0	43.3	0.50%
Primary	13,387.3	0.0	1.0	0.01%
Agroindustry	13,633.2	0.0	3.5	0.03%
Natural Resources	3,260.0	0.0	0.3	0.01%
Rest Economy	79,110.1	0.0	10.3	0.01%
TOTAL COMMODITIES	**118,080.2**	**41.0**	**58.4**	**0.05%**
FACTORS				
Land	1,565.4	0.0	8.6	0.55%
Unskilled Labor	11,586.2	0.0	15.0	0.13%
Skilled Labor	5,876.4	0.0	0.6	0.01%
Capital	38,616.7	0.0	12.5	0.03%
Natural Resources	568.7	0.0	0.0	0.01%
TOTAL FACTORS	**58,193.4**	**0.0**	**36.7**	**0.06%**
HOUSEHOLDS INCOME*	**58,193.4**	**0.0**	**36.7**	**0.06%**

Source: IICA with data from GTAP 5.0
*Households income is the same that family income and is taken to the sector Private of the SAM based on GTAP.
The data for coffee exports was taken from the FAO

Table 4F
Costa Rica: Effect of a 10% increase in coffee exports (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial injection into the economy				0.19%
ACTIVITIES				
Food	2,789.9	0.0	50.0	1.79%
Primary	2,501.7	0.0	33.4	1.34%
Agroindustry	1,879.5	0.0	7.0	0.37%
Rest Economy	14,880.3	0.0	42.1	0.28%
TOTAL ACTIVITIES	**22,051.4**	**0.0**	**132.4**	**0.60%**
COMMODITIES				
Food	4,184.5	41.9	57.6	1.38%
Primary	2,841.1	0.0	34.3	1.21%
Agroindustry	3,520.1	0.0	12.1	0.34%
Rest Economy	18,358.6	0.0	55.0	0.30%
TOTAL COMMODITIES	**28,904.3**	**41.9**	**159.0**	**0.55%**
FACTORS				
Rural Labor	2,598.8	0.0	19.3	0.74%
Urban Labor	3,193.2	0.0	8.9	0.28%
Capital	5,598.3	0.0	35.3	0.63%
TOTAL FACTORS	**11,390.3**	**0.0**	**63.5**	**0.56%**
DISTRIBUTION				
Wage earner Household	5,856.9	0.0	27.7	0.47%
Other Employed Household	3,242.8	0.0	21.5	0.66%
Other Household	82.8	0.0	0.5	0.62%
Firms	2,370.1	0.0	13.9	0.60%
Government	1,441.9	0.0	6.2	0.43%

Source: IICA. Based on data from the SAM of Costa Rica for 1997 (IICA)

Table 5F
Argentina: Effect of a 10% increase in vegetable, fruit and nut exports (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial injection into the economy				0.02%
ACTIVITIES				
Food	30,522.7	0.0	104.6	0.34%
Primary	78,874.5	0.0	61.4	0.08%
Agroindustry	77,494.9	0.0	61.5	0.08%
Natural Resources	11,665.2	0.0	5.7	0.05%
Rest Economy	348,434.3	0.0	214.2	0.06%
TOTAL ACTIVITIES	546,991.6	0.0	447.4	0.08%
COMMODITIES				
Food	31,299.0	82.4	106.2	0.34%
Primary	82,294.4	0.0	64.0	0.08%
Agroindustry	78,643.9	0.0	62.4	0.08%
Natural Resource	12,187.2	0.0	6.0	0.05%
Rest Economy	380,071.4	0.0	230.9	0.05%
TOTAL COMMODITIES	584,435.9	82.4	469.5	0.08%
FACTORS				
Land	10,055.6	0.0	28.8	0.27%
Unskilled Labor	115,303.2	0.0	103.5	0.08%
Skilled Labor	40,483.2	0.0	29.8	0.07%
Capital	147,327.8	0.0	124.0	0.08%
Natural Resource	1,935.3	0.0	1.0	0.05%
TOTAL FACTORS	315,105.1	0.0	285.1	0.08%
HOUSEHOLDS INCOME*	315,105.1	0.0	285.1	0.09%

Source: IICA with data from GTAP 5.0
*Households income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

Table 6F
Chile: Effect of a 10% increase in vegetable, fruit and nut exports (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial injection into the economy				0.09%
ACTIVITIES				
Food	9,679.4	0.0	143.2	1.48%
Primary	12,764.6	0.0	26.2	0.21%
Agroindustry	16,414.1	0.0	36.6	0.22%
Natural Resource	5,705.1	0.0	5.2	0.09%
Rest Economy	92,352.4	0.0	165.1	0.18%
TOTAL ACTIVITIES	136,915.6	0.0	376.4	0.27%
COMMODITIES				
Food	10,062.1	112.4	145.8	1.45%
Primary	15,191.7	0.0	31.4	0.21%
Agroindustry	17,520.0	0.0	39.2	0.22%
Natural Resource	7,358.7	0.0	8.5	0.11%
Rest Economy	110,031.2	0.0	193.0	0.18%
TOTAL COMMODITIES	160,163.7	112.4	417.9	0.26%
FACTORS				
Land	1,558.0	0.0	24.3	1.56%
Unskilled Labor	18,675.1	0.0	66.5	0.36%
Skilled Labor	7,575.5	0.0	10.8	0.14%
Capital	37,822.5	0.0	98.9	0.26%
Natural Resource	799.5	0.0	1.0	0.13%
TOTAL FACTORS	66,430.6	0.0	199.5	0.30%
HOUSEHOLDS INCOME*	66,430.6	0.0	199.5	0.30%

Source: IICA with data from GTAP 5.0
*Households income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

Table 7F
Colombia: Effect of a 10% increase in vegetable, fruit and nut exportsexports (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial injection into the economy				0.03%
ACTIVITIES				
Food	12,024.3	0.0	61.9	0.52%
Primary	14,084.6	0.0	15.8	0.11%
Agroindustry	20,968.4	0.0	27.2	0.13%
Natural Resources	6,995.7	0.0	3.5	0.05%
Rest Economy	115,019.6	0.0	94.9	0.08%
TOTAL ACTIVITIES	169,092.6	0.0	203.4	0.12%
COMMODITIES				
Food	12,855.5	52.3	65.3	0.51%
Primary	15,642.6	0.0	17.5	0.11%
Agroindustry	22,037.0	0.0	28.7	0.13%
Natural Resources	7,043.6	0.0	3.5	0.05%
Rest Economy	131,046.5	0.0	106.6	0.08%
TOTAL COMMODITIES	188,625.2	52.3	221.5	0.12%
FACTORS				
Land	2,853.1	0.0	12.8	0.45%
Unskilled Labor	32,636.9	0.0	46.1	0.14%
Skilled Labor	13,948.4	0.0	9.0	0.06%
Capital	36,405.7	0.0	42.8	0.12%
Natural Resources	1,570.5	0.0	0.8	0.05%
TOTAL FACTORS	87,414.6	0.0	111.5	0.13%
HOUSEHOLDS INCOME	87,414.6	0.0	111.5	0.13%

Source: IICA with data from GTAP 5.0
**Households Income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

Table 8F
México: Effect of a 10% increase in vegetable, fruit and nut exports exports (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial injection into the economy				0.03%
ACTIVITIES				
Food	34,072.7	0.0	238.6	0.70%
Primary	65,452.1	0.0	58.3	0.09%
Agroindustry	64,221.7	0.0	77.2	0.12%
Natural Resources	26,521.1	0.0	12.9	0.05%
Rest Economy	484,334.9	0.0	330.1	0.07%
TOTAL ACTIVITIES	674,602.5	0.0	717.2	0.11%
COMMODITIES				
Food	37,998.4	207.2	248.5	0.65%
Primary	75,901.5	0.0	66.9	0.09%
Agroindustry	68,483.9	0.0	82.4	0.12%
Natural Resources	27,140.3	0.0	13.2	0.05%
Rest Economy	570,864.7	0.0	371.2	0.07%
TOTAL COMMODITIES	780,388.8	207.2	782.2	0.10%
FACTORS				
Land	8,828.7	0.0	59.2	0.67%
Unskilled Labor	79,102.9	0.0	140.3	0.18%
Skilled Labor	30,102.7	0.0	20.2	0.07%
Capital	220,575.1	0.0	223.8	0.10%
Natural Resources	6,621.5	0.0	3.7	0.06%
TOTAL FACTORS	345,230.9	0.0	447.3	0.13%
HOUSEHOLDS INCOME	345,230.9	0.0	447.3	0.13%

Source: IICA with data from GTAP 5.0
**Households Income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

Table 10F
Costa Rica: Effect of a 10% increase in
vegetable, fruit and nut exports exports (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial injection into the economy				0.46%
ACTIVITIES				
Food	2,517.7	0.0	17.4	0.68%
Primary	2,501.7	0.0	109.3	4.37%
Agroindustry	2,151.7	0.0	17.6	0.82%
Rest Economy	14,880.3	0.0	87.2	0.59%
TOTAL ACTIVITIES	22,051.4	0.0	231.5	1.05%
COMMODITIES				
Food	4,022.5	0.0	29.4	0.73%
Primary	2,841.1	106.4	122.8	4.32%
Agroindustry	3,682.1	0.0	31.7	0.86%
Rest Economy	18,358.6	0.0	125.3	0.68%
TOTAL COMMODITIES	28,904.3	106.4	309.1	1.07%
FACTORS				
Rural Labor	2,598.8	0.0	32.8	1.26%
Urban Labor	3,193.2	0.0	20.6	0.64%
Capital	5,598.3	0.0	66.0	1.18%
TOTAL FACTORS	11,390.3	0.0	119.3	1.05%
DISTRIBUTION				
Wage earner Household	5,856.9	0.0	59.3	1.01%
Other Employed Household	3,242.8	0.0	33.1	1.02%
Other Household	82.8	0.0	0.9	1.14%
Firms	2,370.1	0.0	25.9	1.09%
Government	1,441.9	0.0	14.1	0.98%

Source: IICA. Based on data from the SAM of Costa Rica for 1997 (IICA)

Table 9F
Uruguay: Effect of a 10% increase in
vegetable, fruit and nut exports exports (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial injection into the economy				0.02%
ACTIVITIES				
Food	2,275.2	0.0	8.9	0.39%
Primary	3,493.5	0.0	1.8	0.05%
Agroindustry	4,470.3	0.0	2.9	0.07%
Natural Resource	265.5	0.0	0.1	0.04%
Rest Economy	20,552.5	0.0	13.8	0.07%
TOTAL ACTIVITIES	31,057.0	0.0	27.5	0.09%
COMMODITIES				
Food	2,383.0	6.6	9.4	0.39%
Primary	4,200.7	0.0	2.1	0.05%
Agroindustry	4,907.9	0.0	3.3	0.07%
Natural Resource	444.9	0.0	0.2	0.05%
Rest Economy	24,603.8	0.0	15.9	0.06%
TOTAL COMMODITIES	36,560.3	6.6	30.8	0.09%
FACTORS				
Land	553.5	0.0	1.4	0.25%
Unskilled Labor	4,588.6	0.0	4.5	0.10%
Skilled Labor	1,344.1	0.0	1.0	0.07%
Capital	9,322.2	0.0	7.6	0.08%
Natural Resources	37.1	0.0	0.0	0.05%
TOTAL FACTORS	15,845.5	0.0	14.6	0.09%
HOUSEHOLDS INCOME*	15,845.5	0.0	14.6	0.09%

Source: IICA with data from GTAP 5.0
*Households income is the same that family income and is taken to the sector Private
of the SAM based on GTAP.

Table 11F
Argentina: Effect of a 10% increase in wheat exports (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial injection into the economy				0.03%
ACTIVITIES				
Food	30,522.7	0.0	201.1	0.66%
Primary	78,874.5	0.0	112.1	0.14%
Agroindustry	77,494.9	0.0	112.5	0.15%
Natural Resources	11,065.2	0.0	12.0	0.10%
Rest Economy	348,434.3	0.0	401.4	0.12%
TOTAL ACTIVITIES	546,691.8	0.0	839.1	0.15%
COMMODITIES				
Food	31,299.0	149.0	202.1	0.65%
Primary	82,264.4	0.0	116.9	0.14%
Agroindustry	78,643.9	0.0	114.2	0.15%
Natural Resource	12,187.2	0.0	12.4	0.10%
Rest Economy	380,071.4	0.0	432.0	0.11%
TOTAL COMMODITIES	584,435.9	149.0	877.8	0.15%
FACTORS				
Land	10,055.6	0.0	46.6	0.46%
Unskilled Labor	115,303.2	0.0	187.3	0.16%
Skilled Labor	40,483.2	0.0	56.2	0.14%
Capital	147,327.8	0.0	229.2	0.16%
Natural Resource	1,935.3	0.0	2.2	0.11%
TOTAL FACTORS	315,105.1	0.0	521.5	0.17%
HOUSEHOLDS INCOME*	315,105.1	0.0	521.5	0.17%

Source: IICA with data from GTAP 5.0
*Households income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

Table 12F
Uruguay: Effect of a 10% increase in wheat exports (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial injection into the economy				0.01%
ACTIVITIES				
Food	2,275.2	0.0	5.4	0.24%
Primary	3,493.5	0.0	1.2	0.03%
Agroindustry	4,470.3	0.0	2.1	0.05%
Natural Resources	265.5	0.0	0.1	0.03%
Rest Economy	20,552.5	0.0	9.5	0.05%
TOTAL ACTIVITIES	31,057.0	0.0	18.2	0.09%
COMMODITIES				
Food	2,393.0	4.3	5.5	0.23%
Primary	4,200.7	0.0	1.4	0.03%
Agroindustry	4,907.9	0.0	2.3	0.05%
Natural Resources	444.9	0.0	0.2	0.04%
Rest Economy	24,603.8	0.0	10.9	0.04%
TOTAL COMMODITIES	36,550.3	4.3	20.3	0.06%
FACTORS				
Land	553.5	0.0	1.0	0.18%
Unskilled Labor	4,588.6	0.0	3.2	0.07%
Skilled Labor	1,344.1	0.0	0.7	0.05%
Capital	9,322.2	0.0	5.3	0.06%
Natural Resources	37.1	0.0	0.0	0.04%
TOTAL FACTORS	15,845.5	0.0	10.2	0.06%
HOUSEHOLDS INCOME*	15,845.5	0.0	10.2	0.06%

Source: IICA with data from GTAP 5.0
*Households income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

TABLE 13F
Argentina: Effect of a 10% increase in corn, barley and oats exports (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial injection into the economy				0.03%
ACTIVITIES				
Food	30,522.7	0.0	183.9	0.60%
Primary	78,874.5	0.0	104.2	0.13%
Agroindustry	77,494.9	0.0	105.4	0.14%
Natural Resources	11,066.2	0.0	10.3	0.09%
Rest Economy	348,434.3	0.0	359.6	0.10%
TOTAL ACTIVITIES	546,991.6	0.0	763.4	0.14%
COMMODITIES				
Food	31,299.0	141.5	187.7	0.60%
Primary	82,264.4	0.0	108.5	0.13%
Agroindustry	78,643.9	0.0	107.0	0.14%
Natural Resources	12,187.2	0.0	10.7	0.09%
Rest Economy	380,071.4	0.0	387.0	0.10%
TOTAL COMMODITIES	584,435.9	141.5	801.1	0.14%
FACTORS				
Land	10,055.6	0.0	47.3	0.47%
Unskilled Labor	115,303.2	0.0	178.3	0.15%
Skilled Labor	40,483.2	0.0	50.8	0.13%
Capital	147,327.8	0.0	212.2	0.14%
Natural Resources	1,935.3	0.0	1.8	0.09%
TOTAL FACTORS	315,106.1	0.0	490.4	0.16%
HOUSEHOLDS INCOME*	315,105.1	0.0	490.4	0.16%

Source: IICA with data from GTAP 5.0
*Households income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

Table 14F
Brazil: Effect of a 10% increase in oilseed exports (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial injection into the economy				0.01%
ACTIVITIES				
Food	90,953.9	0.0	213.2	0.23%
Primary	152,418.7	0.0	63.4	0.04%
Agroindustry	128,585.7	0.0	60.5	0.05%
Natural Resources	22,319.0	0.0	7.2	0.03%
Rest Economy	1,109,864.4	0.0	301.9	0.03%
TOTAL ACTIVITIES	1,504,141.7	0.0	646.1	0.04%
COMMODITIES				
Food	93,687.7	159.0	222.3	0.24%
Primary	158,504.4	0.0	65.8	0.04%
Agroindustry	132,144.9	0.0	62.1	0.05%
Natural Resources	27,900.9	0.0	9.4	0.03%
Rest Economy	1,182,226.9	0.0	322.5	0.03%
TOTAL COMMODITIES	1,594,464.8	159.0	682.1	0.04%
FACTORS				
Land	10,546.0	0.0	23.2	0.22%
Unskilled Labor	246,673.7	0.0	96.5	0.04%
Skilled Labor	119,414.1	0.0	25.8	0.02%
Capital	350,282.0	0.0	191.7	0.05%
Natural Resources	3,007.5	0.0	1.2	0.04%
TOTAL FACTORS	729,923.3	0.0	338.4	0.05%
HOUSEHOLDS INCOME*	729,923.3	0.0	338.4	0.05%

Source: IICA with data from GTAP 5.0
*Households income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

Table 15F
Canada: Effect of a 10% increase in oilseed exports (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial injection into the economy				0.01%
ACTIVITIES				
Food	33,145.4	0.0	137.5	0.41%
Primary	99,812.8	0.0	16.8	0.02%
Agroindustry	49,207.0	0.0	14.5	0.03%
Natural Resources	46,640.2	0.0	7.3	0.02%
Rest Economy	880,431.4	0.0	193.5	0.02%
TOTAL ACTIVITIES	1,109,236.8	0.0	369.6	0.03%
COMMODITIES				
Food	36,956.9	133.7	146.7	0.40%
Primary	118,859.1	0.0	20.6	0.02%
Agroindustry	58,319.0	0.0	17.2	0.03%
Natural Resources	53,586.5	0.0	8.8	0.02%
Rest Economy	1,062,753.7	0.0	222.1	0.02%
TOTAL COMMODITIES	1,330,475.2	133.7	415.4	0.03%
FACTORS				
Land	2,002.5	0.0	14.3	0.71%
Unskilled Labor	229,644.4	0.0	78.0	0.03%
Skilled Labor	91,396.9	0.0	21.2	0.02%
Capital	214,064.3	0.0	90.6	0.04%
Natural Resources	8,063.0	0.0	1.5	0.02%
TOTAL FACTORS	545,171.1	0.0	205.6	0.04%
HOUSEHOLDS INCOME*	545,171.1	0.0	205.6	0.04%

Source: IICA with data from GTAP 5.0
*Households income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

Table 16F
Uruguay: Effect of a 10% increase in oilseed exports (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial injection into the economy				0.01%
ACTIVITIES				
Food	2,275.2	0.0	4.6	0.20%
Primary	3,493.5	0.0	1.0	0.03%
Agroindustry	4,470.3	0.0	1.6	0.04%
Natural Resource	265.5	0.0	0.1	0.02%
Rest Economy	20,552.5	0.0	7.6	0.04%
TOTAL ACTIVITIES	31,057.0	0.0	14.9	0.06%
COMMODITIES				
Food	2,393.0	3.7	4.8	0.20%
Primary	4,200.7	0.0	1.1	0.03%
Agroindustry	4,807.9	0.0	1.8	0.04%
Natural Resource	444.9	0.0	0.1	0.03%
Rest Economy	24,603.8	0.0	8.9	0.04%
TOTAL COMMODITIES	36,560.3	3.7	16.6	0.05%
FACTORS				
Land	553.5	0.0	0.8	0.14%
Unskilled Labor	4,588.6	0.0	2.6	0.06%
Skilled Labor	1,344.1	0.0	0.6	0.04%
Capital	9,322.2	0.0	4.3	0.05%
Natural Resource	37.1	0.0	0.0	0.03%
TOTAL FACTORS	15,845.5	0.0	8.2	0.05%
HOUSEHOLDS INCOME*	15,845.5	0.0	8.2	0.05%

Source: IICA with data from GTAP 5.0
*Households income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

Table 17F
United States of America: Effect of a 10% increase in oilseed exports (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial injection into the economy				0.01%
ACTIVITIES				
Food	207,909.9	0.0	868.3	0.42%
Primary	758,071.4	0.0	139.0	0.02%
Agroindustry	556,230.9	0.0	131.4	0.02%
Natural Resources	165,292.5	0.0	53.3	0.03%
Rest Economy	12,641,097.7	0.0	2,526.2	0.02%
TOTAL ACTIVITIES	14,348,602.4	0.0	3,718.2	0.06%
COMMODITIES				
Food	226,994.9	777.6	892.2	0.39%
Primary	994,366.4	0.0	166.6	0.02%
Agroindustry	588,248.3	0.0	139.0	0.02%
Natural Resources	256,546.0	0.0	74.0	0.03%
Rest Economy	13,431,573.8	0.0	2,638.1	0.02%
TOTAL COMMODITIES	15,397,761.4	777.6	3,910.0	0.03%
FACTORS				
Land	27,432.4	0.0	136.7	0.50%
Unskilled Labor	2,867,461.2	0.0	721.2	0.03%
Skilled Labor	2,035,685.6	0.0	412.2	0.02%
Capital	2,974,337.5	0.0	818.9	0.03%
Natural Resources	24,502.8	0.0	6.7	0.03%
TOTAL FACTORS	7,929,419.5	0.0	2,095.7	0.03%
HOUSEHOLDS INCOME*	7,929,419.5	0.0	2,095.7	0.03%

Source: IICA with data from GTAP 5.0
*Households income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

Table 18F
Colombia: Effect of a 10% increase in exports of manufactures of textiles (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial injection into the economy				0.04%
ACTIVITIES				
Food	12,024.3	0.0	13.6	0.11%
Primary	14,084.6	0.0	101.3	0.72%
Agroindustry	20,968.4	0.0	29.3	0.14%
Natural Resources	6,995.7	0.0	4.7	0.07%
Rest Economy	115,019.6	0.0	139.0	0.12%
TOTAL ACTIVITIES	169,092.8	0.0	287.8	0.17%
COMMODITIES				
Food	12,855.5	0.0	15.0	0.12%
Primary	15,642.6	74.6	116.0	0.74%
Agroindustry	22,037.0	0.0	30.8	0.14%
Natural Resources	7,043.6	0.0	4.7	0.07%
Rest Economy	131,046.5	0.0	155.9	0.12%
TOTAL COMMODITIES	188,625.2	74.6	322.4	0.17%
FACTORS				
Land	2,853.1	0.0	3.4	0.12%
Unskilled Labor	32,636.9	0.0	52.3	0.16%
Skilled Labor	13,948.4	0.0	14.0	0.10%
Capital	36,405.7	0.0	54.7	0.15%
Natural Resources	1,570.5	0.0	1.0	0.06%
TOTAL FACTORS	87,414.6	0.0	125.4	0.14%
HOUSEHOLDS INCOME*	87,414.6	0.0	125.4	0.14%

Source: IICA with data from GTAP 5.0
*Households income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

Table 19F
Mexico: Effect of a 10% increase in exports of manufactures of textiles (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial injection into the economy				0.11%
ACTIVITIES				
Food	34,072.7	0.0	91.6	0.27%
Primary	65,452.1	0.0	919.6	1.40%
Agroindustry	64,221.7	0.0	189.3	0.29%
Natural Resources	26,521.1	0.0	42.9	0.16%
Rest Economy	484,334.9	0.0	1,024.7	0.21%
TOTAL ACTIVITIES	674,602.5	0.0	2,268.0	0.34%
COMMODITIES				
Food	37,998.4	0.0	102.9	0.27%
Primary	75,901.5	746.4	1,101.9	1.45%
Agroindustry	68,483.9	0.0	202.3	0.30%
Natural Resources	27,140.3	0.0	44.1	0.16%
Rest Economy	570,864.7	0.0	1,161.6	0.20%
TOTAL COMMODITIES	780,388.8	746.4	2,612.8	0.33%
FACTORS				
Land	8,828.7	0.0	25.9	0.29%
Unskilled Labor	79,102.9	0.0	235.4	0.30%
Skilled Labor	30,102.7	0.0	63.3	0.21%
Capital	220,575.1	0.0	731.7	0.33%
Natural Resources	6,621.5	0.0	12.0	0.18%
TOTAL FACTORS	345,230.9	0.0	1,068.3	0.31%
HOUSEHOLDS INCOME*	345,230.9	0.0	1,068.3	0.31%

Source: IICA with data from GTAP 5.0
*Households income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

Table 20F
Uruguay: Effect of a 10% increase in exports of manufactures of textiles (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial injection into the economy				0.19%
ACTIVITIES				
Food	2,275.2	0.0	9.2	0.40%
Primary	3,493.5	0.0	82.7	2.37%
Agroindustry	4,470.3	0.0	22.0	0.49%
Natural Resource	265.5	0.0	0.8	0.31%
Rest Economy	20,552.5	0.0	100.9	0.49%
TOTAL ACTIVITIES	31,057.0	0.0	215.6	0.65%
COMMODITIES				
Food	2,383.0	0.0	9.8	0.41%
Primary	4,200.7	59.1	100.1	2.39%
Agroindustry	4,907.9	0.0	24.6	0.50%
Natural Resource	444.9	0.0	1.7	0.38%
Rest Economy	24,603.8	0.0	115.5	0.47%
TOTAL COMMODITIES	36,650.3	59.1	251.6	0.69%
FACTORS				
Land	553.5	0.0	4.3	0.78%
Unskilled Labor	4,588.6	0.0	29.2	0.64%
Skilled Labor	1,344.1	0.0	7.7	0.57%
Capital	9,322.2	0.0	64.5	0.69%
Natural Resources	37.1	0.0	0.1	0.39%
TOTAL FACTORS	15,845.5	0.0	106.9	0.67%
HOUSEHOLDS INCOME*	15,845.5	0.0	105.9	0.67%

Source: IICA with data from GTAP 5.0
*Households income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

Table 21F
Costa Rica: Effect of a 10% increase in exports of manufactures of textiles (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial injection into the economy				0.26%
ACTIVITIES				
Food	2,517.7	0.0	6.7	0.27%
Primary	2,501.7	0.0	5.6	0.22%
Agroindustry	2,151.7	0.0	46.9	2.27%
Rest Economy	14,880.3	0.0	39.9	0.27%
TOTAL ACTIVITIES	22,051.4	0.0	101.1	0.46%
COMMODITIES				
Food	4,022.5	0.0	11.5	0.29%
Primary	2,641.1	0.0	6.4	0.22%
Agroindustry	3,682.1	57.3	73.5	2.00%
Rest Economy	18,358.6	0.0	58.3	0.32%
TOTAL COMMODITIES	28,904.3	57.3	149.6	0.52%
FACTORS				
Rural Labor	2,598.8	0.0	11.5	0.44%
Urban Labor	3,193.2	0.0	12.5	0.39%
Capital	5,586.3	0.0	18.4	0.33%
TOTAL FACTORS	11,380.3	0.0	42.4	0.37%
DISTRIBUTION				
Wage earner Household	5,856.9	0.0	23.2	0.40%
Other Employed Household	3,242.8	0.0	11.6	0.36%
Other Household	82.8	0.0	0.3	0.35%
Firms	2,370.1	0.0	7.2	0.31%
Government	1,441.9	0.0	9.8	0.68%

Source: IICA. Based on data from the SAM of Costa Rica for 1997 (IICA)

Table 22F
Canada: Effect of a 10% increase in
exports of manufactures of wood (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial injection into the economy				0.14%
ACTIVITIES				
Food	33,145.4	0.0	479.6	1.45%
Primary	99,812.8	0.0	1,801.6	1.80%
Agroindustry	49,207.0	0.0	157.5	0.32%
Natural Resources	46,640.2	0.0	68.8	0.15%
Rest Economy	880,431.4	0.0	2,193.0	0.25%
TOTAL ACTIVITIES	1,109,236.8	0.0	4,700.5	0.42%
COMMODITIES				
Food	36,956.9	0.0	502.2	1.36%
Primary	118,859.1	1584.9	2,052.1	1.73%
Agroindustry	58,319.0	0.0	186.1	0.32%
Natural Resources	53,586.5	0.0	80.4	0.15%
Rest Economy	1,062,753.7	0.0	2,498.5	0.24%
TOTAL COMMODITIES	1,330,475.2	1,584.9	5,319.3	0.40%
FACTORS				
Land	2,002.5	0.0	4.3	0.22%
Unskilled Labor	229,644.4	0.0	1,061.2	0.46%
Skilled Labor	91,396.9	0.0	297.1	0.33%
Capital	214,064.3	0.0	729.6	0.34%
Natural Resources	8,063.0	0.0	40.4	0.50%
TOTAL FACTORS	545,171.1	0.0	2,132.6	0.39%
HOUSEHOLDS INCOME*	545,171.1	0.0	2,132.6	0.39%

Source: IICA with data from GTAP 5.0
*Households income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

Table 23F
Chile: Effect of a 10% increase in
exports of manufactures of wood (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial injection into the economy				0.06%
ACTIVITIES				
Food	9,679.4	0.0	16.7	0.17%
Primary	12,764.6	0.0	97.9	0.77%
Agroindustry	16,414.1	0.0	23.6	0.14%
Natural Resources	5,705.1	0.0	1.9	0.03%
Rest Economy	92,352.4	0.0	121.4	0.13%
TOTAL ACTIVITIES	136,915.6	0.0	261.4	0.19%
COMMODITIES				
Food	10,062.1	0.0	17.2	0.17%
Primary	15,191.7	77.4	108.1	0.71%
Agroindustry	17,520.0	0.0	25.2	0.14%
Natural Resources	7,358.7	0.0	5.0	0.07%
Rest Economy	110,031.2	0.0	138.8	0.13%
TOTAL COMMODITIES	160,163.7	77.4	294.3	0.18%
FACTORS				
Land	1,558.0	0.0	2.0	0.13%
Unskilled Labor	18,675.1	0.0	32.2	0.17%
Skilled Labor	7,575.5	0.0	8.8	0.12%
Capital	37,822.5	0.0	82.9	0.22%
Natural Resources	799.5	0.0	1.0	0.12%
TOTAL FACTORS	66,430.6	0.0	126.9	0.19%
HOUSEHOLDS INCOME*	66,430.6	0.0	126.9	0.19%

Source: IICA with data from GTAP 5.0
*Households income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

TABLE 24F

Mexico: Effect of a 10% increase in exports of manufactures of wood (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial injection into the economy				0.04%
ACTIVITIES				
Food	34,072.7	0.0	66.0	0.25%
Primary	65,452.1	0.0	348.7	0.53%
Agroindustry	64,221.7	0.0	83.7	0.13%
Natural Resources	26,521.1	0.0	15.5	0.06%
Rest Economy	484,334.9	0.0	398.8	0.09%
TOTAL ACTIVITIES	674,602.5	0.0	932.8	0.14%
COMMODITIES				
Food	37,998.4	0.0	91.6	0.24%
Primary	75,901.5	273.1	394.5	0.52%
Agroindustry	68,493.9	0.0	89.3	0.13%
Natural Resources	27,140.3	0.0	15.9	0.06%
Rest Economy	570,864.7	0.0	446.2	0.09%
TOTAL COMMODITIES	780,398.8	273.1	1,037.4	0.13%
FACTORS				
Land	8,828.7	0.0	10.7	0.12%
Unskilled Labor	79,102.9	0.0	98.9	0.12%
Skilled Labor	30,102.7	0.0	25.1	0.08%
Capital	220,575.1	0.0	344.0	0.16%
Natural Resources	6,621.5	0.0	7.8	0.12%
TOTAL FACTORS	345,230.9	0.0	484.6	0.14%
HOUSEHOLDS INCOME*	345,230.9	0.0	484.6	0.14%

Source: IICA with data from GTAP 5.0

*Households income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

Table 25F
Canada: Effect of a 10% increase in exports of manufactures of paper and paper products (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial injection into the economy				0.15%
ACTIVITIES				
Food	33,145.4	0.0	156.4	0.47%
Primary	99,812.8	0.0	1,978.4	1.98%
Agroindustry	49,207.0	0.0	158.1	0.32%
Natural Resources	46,640.2	0.0	82.9	0.18%
Rest Economy	880,431.4	0.0	2,168.2	0.25%
TOTAL ACTIVITIES	1,109,236.8	0.0	4,544.1	0.41%
COMMODITIES				
Food	36,956.9	0.0	169.1	0.46%
Primary	118,859.1	1617.4	2,255.0	1.90%
Agroindustry	58,319.0	0.0	187.0	0.32%
Natural Resources	53,586.5	0.0	96.8	0.18%
Rest Economy	1,062,753.7	0.0	2,460.3	0.23%
TOTAL COMMODITIES	1,330,475.2	1,617.4	5,168.3	0.39%
FACTORS				
Land	2,002.5	0.0	4.3	0.21%
Unskilled Labor	229,844.4	0.0	915.0	0.40%
Skilled Labor	91,396.9	0.0	350.5	0.38%
Capital	214,084.3	0.0	902.4	0.42%
Natural Resources	8,063.0	0.0	21.7	0.27%
TOTAL FACTORS	545,171.1	0.0	2,194.0	0.40%
HOUSEHOLDS INCOME*	545,171.1	0.0	2,194.0	0.40%

Source: IICA with data from GTAP 5.0
*Households income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

Table 26F
Chile: Effect of a 10% increase in exports of manufactures of paper and paper products (US$ millions)

	SAM Value	Shock 10%	Change US$ million	Growth rate
Initial injection into the economy				0.08%
ACTIVITIES				
Food	9,679.4	0.0	15.6	0.16%
Primary	12,764.6	0.0	127.0	1.00%
Agroindustry	16,414.1	0.0	27.8	0.17%
Natural Resources	5,705.1	0.0	2.9	0.05%
Rest Economy	92,352.4	0.0	150.8	0.16%
TOTAL ACTIVITIES	136,915.6	0.0	324.2	0.24%
COMMODITIES				
Food	10,062.1	0.0	16.2	0.16%
Primary	15,191.7	104.0	149.0	0.98%
Agroindustry	17,520.0	0.0	29.8	0.17%
Natural Resources	7,358.7	0.0	6.6	0.09%
Rest Economy	110,031.2	0.0	174.3	0.16%
TOTAL COMMODITIES	160,163.7	104.0	375.8	0.23%
FACTORS				
Land	1,558.0	0.0	2.4	0.15%
Unskilled Labor	18,675.1	0.0	38.6	0.21%
Skilled Labor	7,575.5	0.0	11.5	0.15%
Capital	37,822.5	0.0	96.4	0.25%
Natural Resources	799.5	0.0	0.9	0.11%
TOTAL FACTORS	66,430.6	0.0	149.8	0.23%
HOUSEHOLDS INCOME*	66,430.6	0.0	149.8	0.23%

Source: IICA with data from GTAP 5.0
*Households income is the same that family income and is taken to the sector Private of the SAM based on GTAP.

FECHA DE DEVOLUCION			

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