



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*


COMUNICA
online

Inter-American Institute for Cooperation on Agriculture

Fourth Edition / 1st Year / Second Stage

October - December, 2005

ISSN 1814-0939



**Gender
Equity in
Micro and
Small Rural
Enterprises**



Inter-American Institute for Cooperation on Agriculture

Agriculture's true contribution to Ecuador's economy

The contribution of the expanded agricultural sector to the economy of this Andean nation is double what is reported in official statistics.

Joaquin Arias

Regional Specialist in Policies and Trade for the Andean Area, IICA

Silvana Vallejo,

Specialist in Policies, Trade and Agribusiness, IICA Ecuador

Rafael Trejos,

Coordinator, Directorate of Strategic Planning and Institutional Modernization, IICA



develop some 11 thousand years ago; at present, available technological sophistication has increased the variety of lifestyles enjoyed by more than 6 billion people.

Agriculture has become much more than farms and food; it is considered a strategic asset by most nations. More specifically, last year, the developed countries provided US\$311 billion in government subsidies to support their farmers. The systems related to agriculture, above all its interaction with the environment, industry, finance, trade and consumers, have become more complex, making it necessary to develop new policy tools and new paradigms with which to meet effectively the food security needs of the 21st century. Even though the knowledge economy and the industrial revolution have led to unprecedented growth and opportunity, food and nutrition continue to be the bread and butter that turn calories into capital.

As agriculture has developed, we have become accustomed to food's always being available. Even though 800 million poor people worldwide, and more than 200 million in Latin America and the Caribbean, face serious problems in obtaining enough food to meet their minimum requirements, the networks for the distribution of food are the most complex and developed markets in the world today. Yet, despite this unprecedented capability to provide high-quality, low-cost and safe foods anywhere in the world, most

Agriculture is our most important resource. It has undergone major technological changes, but still faces major challenges in contributing to the development of nations. The founding of civilizations has always been based on food production. The domestication of plants and animals made it possible for population centers to

800 million poor people worldwide, and more than 200 million in Latin America and the Caribbean, face serious problems in obtaining enough food to meet their minimum requirements

countries measure the performance of agriculture and its contribution to economic development on the basis of harvest data and sales of raw materials, mostly crops and livestock; in other words, only primary agriculture is considered.

All of the stages involved in processing food and manufacturing clothing (based on the use of fibers such as cotton) or furniture and paper (based on the use of timber trees), for example, are taken into account when generating industrial rather than agricultural statistics. The agroindustrial complex also includes machinery, financial markets, chemicals, pharmaceuticals, specialized services and, now, even essential resources for life such as water and air. All of these activities involve the extraction of primary resources from rural areas.

Food security in a globalized and interdependent world reappears as a key challenge for humanity, and agricultural development plays a key role in reducing poverty in most developing countries.

Given the challenges posed by the international context and the process of adapting national economies to this reality, countries must establish clear strategies for positioning their economic sectors, prioritize their resources and strengthen their competitive advantages, while at the same time promoting equity and sustainability with a view to improving the living conditions of their inhabitants and preserving their natural heritage.

It is necessary to find new ways of measuring agriculture's contribution to the economy, to better understand its importance and to improve decision making related to investment in agriculture, so that the sector can contribute more effectively to development and the alleviation of poverty.

The time has come to view agriculture from a different, more complex perspective and to recognize that the production systems related to agriculture, for example agroindustry, have become more intricate and complex and require food distribution networks that are more developed and dynamic.

Aware of this need, the Inter-American Institute for Cooperation on Agriculture (IICA) wishes to provide decision makers, policy makers and the public in general with technical analyses and methodologies which can be used in making decisions related to investing in, formulating policies for and allocating budget resources to agriculture on the basis of its relative importance, with a view to enabling agriculture to contribute more effectively to development and the alleviation of poverty.

To this end, IICA conducted a pioneering research project entitled *"More than food on the table: Agriculture's true contribution to the economy"* (IICA, 2004), which quantified the contribution of agriculture for 11 countries: Argentina, Brazil, Canada, Chile, Colombia, Costa Rica, Mexico, Peru, Uruguay, United States of America and Venezuela. The document showed that agriculture's contribution, measured in the traditional way, was underestimated. A study of several countries in Latin America conducted later by the World Bank¹ reinforced the argument that agriculture and rural life are more important than they are portrayed in official statistics.

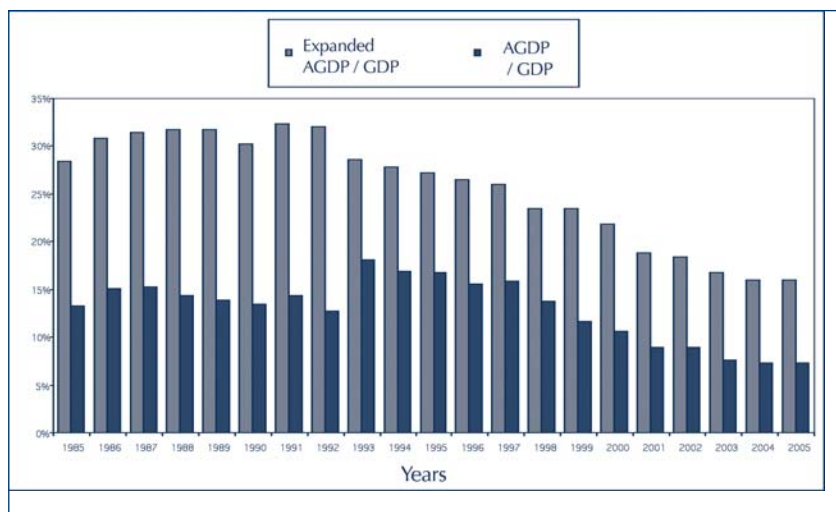
We are pleased to present the results of this analysis for Ecuador, a country whose economy relies heavily on agriculture according to several studies.²

¹ World Bank. 2005 "Beyond the City; the rural contribution to development." Washington, D.C.

² The methodology used to conduct the study for Ecuador differs from that applied by the World Bank in the aforementioned study, in order to avoid the possibility of overestimating the contribution of the expanded agricultural sector. Specifically, the proportion of value added of other sectors that can actually be attributed to the agricultural sector was calculated, using the coefficients from the Social Accounting Matrix for Ecuador. Adjustments were also made to take into account only domestic intermediate demand, in order to differentiate it from imported intermediate demand. In brief, the new indicator is the sum of the contribution of primary agriculture to GDP, plus the backward and forward linkages with the rest of the economy.

Figure 1

Ecuador: Historical trend of the contribution of the AGDP and the EAGDP to total GDP (percentages)



It is interesting to note that the greater the degree of diversification of the economic structure of the country, the greater the weight of food products and manufactures that transform inputs from primary agriculture.

For purposes of comparing the contribution of the Expanded AGDP in Ecuador with the countries mentioned earlier, the results of the Social Accounting

Matrix (SAM) for 1997 were taken into account. As shown in Table No. 1, all of the countries had this instrument in 1997.

1. The contribution of agriculture to Ecuador's economy

In the case of Ecuador, the average contribution of the agricultural sector between 1985 and 2005 was 12.96%; however, for expanded agriculture the average was above 25.96%. In other words, seen from a systemic perspective, agriculture's contribution is more than double. (See Figure 1.)

It is interesting to note that the greater the degree of diversification of the economic structure of the country, the greater the weight of food products and manufactures that transform inputs from primary agriculture. Noteworthy are the cases of the USA, Canada, Argentina and Brazil, where, when foods and manufactures derived from this sector are included, the contribution increases considerably.

In the case of Ecuador, the generation of value added increases the contribution of the sector 1.6 times, which is below the contribution recorded in other countries of the hemisphere, illustrating the limited transformation of products of primary agriculture in the country, as well as the potential for expansion.

Table No. 1
Agricultural Gross Domestic Product for several countries
(US\$ billions and percentages for 1997)

| Countries | GDP (1) | AGDP ¹ (2) | AGDP/ GDP (3) | GDP Expanded Agriculture ² (4) | GDP Expanded Agriculture/ GDP (5) | Ratio between GDP Expanded Agriculture and AGDP (6=4/2) |
|----------------|-------------|--------------------------|---------------------|--|---|--|
| Argentina | 326 | 14,9 | 4,60% | 104,9 | 32,20% | 7 |
| Brazil | 789,7 | 34 | 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 |
| Ecuador | 23,6 | 3,7 | 15,81% | 6,1 | 25,97% | 1,6 |
| 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 | 22 | 2,5 | 11,30% | 7,2 | 32,50% | 2,9 |

Sources: IICA, based on information from Central Bank of Ecuador, and Trejos, Segura and Vargas
1. Includes: agriculture, livestock farming, agroforestry and fisheries
2. Includes: primary sector plus foods and manufactures derived from this sector

In the case of Ecuador, an analysis of the destination of agricultural output reveals that agriculture is an important source of inputs for other production activities.

2. Linkages generated by agriculture in Ecuador

The results for Ecuador can be seen in Table No. 2. When forward and backward linkages were added to the contribution of the primary sector in 1993, the contribution of agriculture climbed from 17.6% to 23.2%; in 1997, it went from 13.6% to 18.4%. When the methodological adjustment mentioned above is made, the contribution of expanded agriculture is less, confirming the fact that to simply add up the value added of the sectors linked to agriculture leads to an overestimation.

As an economy grows and diversifies, the primary agricultural sector decreases in relative weight as a component of GDP, but generates strong linkages with the rest of the economy. Using the SAM, the existence of important linkages between agriculture and the rest of the economy can be shown. Using the new methodology, the contribution of expanded agriculture falls from 23.2% in 1993 to 18.4% in 1997; however, as will be shown later, this does not mean that agriculture declines in importance. Also, it is important to point out that agriculture's forward linkages (foods, agroindustry and exports) are stronger than its backward linkages (inputs, transportation, etc.).

In the case of Ecuador, an analysis of the destination of agricultural output reveals that agriculture is an important source of inputs for other production activities: 58% of primary agricultural output went to meet intermediate demand for agricultural products in 1993. In other words, 3/5 of agricultural output is used as inputs for other industries and/or sectors. Beginning in 1997, and most notably in 2001, there is a decline in intermediate consumption as a consequence of an increase in exports. As a result, their use as inputs in 1997 fell to 55.7% and in 2001 to 47.6%. This trend reflects a greater opening of the sector to external markets.

Likewise, it is important to estimate the role of agriculture's linkages in the generation and use of income. For Ecuador, this estimate was interesting in that it showed that the food and agroindustrial sectors report intermediate purchases of inputs equal to 70 cents for each dollar of production. If we compare this result with those obtained for the 11 countries of the Americas mentioned above, we see that intermediate purchases account for 47%, on average, of the costs of the primary agricultural sector for the countries included in the analysis. Ecuador generates stronger backward linkages for labor, capital and investment.

As for the absorption of labor (skilled and unskilled), agriculture absorbs more than any other sector. In 1993 and 1997, it absorbed 60% and 54%,

Table No. 2
Ecuador: Contribution of agriculture to Ecuador's economy

| Years | Value Added | Value of Forward Linkages | Value of Backward Linkages | Contribution EAGDP /GDP adjusted | Contribution EAGDP /GDP |
|-------------|-------------|---------------------------|----------------------------|----------------------------------|-------------------------|
| | (1) | (2) | (3) | (1) +(2) +(3) | |
| 1993 | 17,6% | 3,8% | 1,8% | 23,2% | 28,64% |
| 1997 | 13,6% | 3,3% | 1,6% | 18,4% | 25,97% |

Source: IICA, on basis of SAM for Ecuador 1993, 1997 and 2001

Note: 2001 has been excluded from table until results from Central Band can be verified

Preparation: IICA Office in Ecuador



respectively, mostly unskilled labor. It was also noted that the agricultural sector is restricted in terms of both capital and agricultural technology, in comparison with the indicators for other sectors. Of particular note is the natural resources sector, which shows high levels of modernization due, primarily, to the extraction of petroleum products.

In general, the results from all the countries show that the sector is linked to the income of the least skilled labor. In the expanded agricultural sector, the percentage of skilled labor climbs to 3.1% and the corresponding figure for unskilled labor falls to 15.5%. The link between agricultural production and unskilled labor is confirmed, as is the fact that the link to skilled labor is strengthened as the shift from primary to expanded agriculture takes place.

The analysis of agriculture's linkages, both via destination of agricultural output and costs of production, reveals the importance of agriculture in Ecuador, it being both a source of inputs for the rest of the industries, and a source of foreign exchange and value added. It is also argued that the incomes generated by agriculture stays in rural areas and plays a key role in the sustainability of rural livelihoods.

3. Is the contribution of agriculture to GDP, or the sector's importance declining?

It is well documented in the literature that economic development leads to a decline in agriculture's contribution to GDP. This can be seen in Figure No. 1, where agriculture's contribution according to official figures fell from 28.6% in 1993 to 7.35% in 2005. As a matter of fact, even in the expanded agricultural sector, its contribution dropped from 28.6% to 16.08% during the same years.

Even though calculations indicate that each year primary agriculture's share of GDP drops by 0.0752 percentage points, on average, for each 1% increase in per capita GDP, this does not mean that agriculture is declining in importance as a driving force for economic growth in Ecuador. A low or declining share does not indicate that the sector is playing a less important role in the economy; to the contrary, it may indicate greater generation of value added.

To visualize the impact of agriculture on the economy as a whole, the analysis was complemented with an econometric model for the measurement of elasticities. The results indicate that, in the short term, the rest of the economy is not expected to respond to changes in the GDP for primary agriculture. However, long-term elasticity (0.438%) indicates that the primary agriculture sector has a positive effect on the rest of the economy: a change in the GDP for primary agriculture of 1% would lead to an increase of 0.43% in the GDP of the rest of the economy. This elasticity is greater than the average for Latin America and the Caribbean, which, according to the World Bank, is 0.12%.

Also, no evidence was found of effects in the opposite direction; in other words, of changes in the rest of the economy on the primary agriculture sector.

4. Main Conclusions

- Agriculture in Ecuador is important not only because of its impact on national economic growth, but also because each dollar invested in the sector contributes to improving the incomes of the population. As a result, economic priority must be attached to the sector.
- The indicators contained in the study provide a foundation for ensuring that all efforts are focused on repositioning agriculture in the political arena, with a view to obtaining more of the State budget, and to designing support policies and instruments that are in keeping with the true importance of the sector in the development of the country. The con-

tribution of the agricultural sector is fundamental, since, seen from a systemic perspective, it is 23.2% of GDP, and not 9% as reported in official statistics.

- An analysis of the destination of agricultural output in Ecuador reveals that agriculture is an important source of inputs for other production activities. Three fifths of agricultural output is used as inputs for other industries and/or sectors. This generates important forward linkages.
- The study showed that for each dollar produced in agriculture, some 66 cents become value added.
- In general terms, it was determined that an increase of 1% in the AGDP generates an increase of 0.43% in the GDP of the rest of the economy, which is greater than the average generated in LAC (0.12%).
- As regards the absorption of labor (skilled and unskilled), the agricultural sector uses more labor than any other sector. In 1993, it used 60% and in 1997, 54%; most were unskilled labor.
- Based on the performance of agriculture in other countries of Latin America, there is great potential



to generate greater linkages between agriculture and the rest of the economy.

- Lastly, the challenge is to continue to improve the method used to calculate the contribution of agriculture to economic development, especially as regards preservation of the environment, alleviation of poverty, food security and sovereignty and as a source of new types of energy.

In summary, the measurement of the true contribution of agriculture to the economy through the use of better methods helps to understand its importance for development. This will lead to better decisions regarding investment in and the formulation of policies for agriculture and the allocation of budgetary resources in line with its relative importance, which will enable the sector to contribute more effectively to development and poverty alleviation.

The analysis of agriculture's linkages, both via destination of agricultural output and costs of production, reveals the importance of agriculture in Ecuador, it being both a source of inputs for the rest of the industries, and a source of foreign exchange and value added.