

# CONSTRAINTS AND PRIORITIES IN AGRICULTURE FROM THE TECHNOLOGICAL PERSPECTIVE IN LATINAMERICA AND THE CARIBBEAN<sup>1</sup>

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## 1. Introduction

This document has been prepared on information drawn from several sources, including documents and fora and workshops held in different parts of Latin America and the Caribbean (LAC) to address the problems and priorities of the region regarding agriculture and the rural milieu, from the perspective of technological development and in the context of the work carried out under FORAGRO.

## 2. General Context

Primary agriculture contributes approximately 8% to the Gross Domestic Product of Latin America and the Caribbean (LAC). Under an expanded concept of this sector, including its linkages with industry, this contribution, on average, accounts for 20% of the total value of the economy. However, despite the relative decrease in agriculture's contribution to the region's economy, its economic importance remains unchallenged. The aggregated indexes of agricultural production in the Region show an improvement in the last decade, with annual growth agricultural GDP of between 2 and 3%. Nevertheless, in terms of production of basic foods, LAC is caught in a situation where there is a relative balance between production and population growth, with a danger that this (per capita) growth may turn negative without warning, as happened in past decades.

The challenges and opportunities offered by the new world political and economic order are great, but the scenarios that emerge for overall economic growth and for the Region's agriculture, especially in the tropical areas, are of great concern. In general terms, the Region is unlikely to attain higher average growth in GDP, as projected at the beginning, at least not in the short term. But most worrying of all, it will not emerge from poverty unless it adopts a development model that incorporates a new vision of the rural setting and of agriculture itself, with a substantial capitalization of human resources, positively confronting the competitive pressure in a context of trade liberalization. Specifically, we suggest that it is not viable to begin a process of sustainable development without strengthening **the agricultural sector and promoting its growth.**

Based on the above, and on the consensus of hemispheric meetings with top government authorities of the agricultural sector, (for example in the context of the Ministerial Meeting organized by IICA in Bahia, Brasil 2000 and Punta Cana Dominican Republic, IDB's Agri-food Strategy and the meetings of FORAGRO itself), we can say that as we begin the third millennium, agriculture in LAC is the basic motor that will drive economic development. Its role is now conceived beyond that of supplying food, supporting processes of urbanization and industrialization, as happened with the development model of the period 1960-80. The new role contemplates four basic functions for this sector: contribution to economic growth; contribution to social development as provider of food at reduced prices; source of employment contributing to the relief of poverty; sustainable use of the Region's natural resources and environmental protection; for example, by increasing productivity, it is possible to reduce the pressure on the land.

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### 3. Situation of agricultural production and productivity in LAC

The aggregated agricultural production indexes in the Region showed an improvement during the nineties, but as mentioned previously, from the perspective of food production, it is necessary to take steps to prevent the sector's performance and per capita growth from turning negative, particularly in some regions of LAC at any moment, as happened in past decades. Below are some aspects to consider:

- The Region shows dynamism in its exports, but also in imports. Thus, in most cases, the growth in exports has barely been sufficient to pay for growing food imports. In per capita terms, the region today exports less agricultural value than it did 20 years ago. Certain sub-regions, such as the Caribbean, show negative balances in their agricultural trade balance, while some countries that are considered agricultural producers are joining the ranks of net food importers.
- Significant changes have occurred in the composition of production, with the substantial growth of products in the oil, fruit and vegetables complex and, to a lesser extent, meat products and their derivatives. At the same time, there has been decreased production of sorghum, cotton, cassava, potatoes, wheat and to a lesser extent, coffee, rice and beans. This situation has resulted in a major change in the production structure in the past 20 years, improving the market share of products with better commercial prospects and integration with the agro-industrial sector, and substantially reducing market share of basic staples.
- Changes in the production structure and the expansion differential in production have occurred mainly because of increases in area under cultivation, a total of 23 million hectares in 22 years. These conditions have led to a marked subregional specialization in agriculture, and in fact to a geographic concentration of capacities, which have yielded better results for the countries of the Southern Cone, compared with other sub-regions.
- There is an important impact of yields on foods and basic grains, where changes in production occur basically due to greater productivity. However, the Region has reduced its cultivated areas by nearly 2.5 million hectares. In terms of fruits, particularly tropical fruits, the situation is exactly opposite to that of animal feed and staple grains. Production has increased, in essence, because a greater area is under cultivation, and the effect of increased yields has been very limited. Despite the above, the region has substantially increased its share of international trade in fruits.
- One issue that unfortunately remains relevant, especially in some countries, is urban and rural poverty. There are more than 200 million poor people, of whom nearly 35% live in rural areas. One important fact is that in most of the countries located in the tropical belt (Andean and Central Regions, Northern Brazil, Southern Mexico and some parts of the Caribbean) the proportion of people who live from agriculture is above 50%, in contrast with those with temperate ecosystems. In other words, poverty persists in the Region and is concentrated in the tropical and subtropical areas.
- Despite its strategic wealth in natural resources, such as biodiversity - the Region contains five centers of origin and diversity of species and crops of major economic importance to the world – it is suffering the consequences of an accelerated deterioration in its ecological capital. Three major reasons for this are: a development model that excludes rural dwellers and producers who live in fragile zones; the use of technologies and development of productive systems that are not environmentally-friendly and are based on a notion that the supply of resources is inexhaustible and an excessive transfer of agricultural and rural resources to the rest of the economy. This has

meant that the agricultural frontier, in terms of land, cannot be expanded. For example, there are 11 countries in LAC that may no longer have productive soils in the next 25 years.

#### **4. Agriculture from the perspective of technology**

- The technological gap with the world's leading countries is widening with respect to many crops. Regional research has responded to a political and economic model that prioritized the contribution of agriculture to the food supply and to facilitate the development of other sectors.
- Although significant efforts have been invested in technology development, these have proven to be inadequate compared with the results achieved in other continents at a time of economic and commercial liberalization. This highlights the region's lack of competitiveness in many food items, except for the grains and oils complex in the Southern Cone, among other cases.
- In recent decades, research in many countries of the tropical belt did not give priority to investment in tropical crops such as fruits, because it was given a low priority in the prevailing economic model, for the reasons stated. According to studies carried out by IICA with support from the IDB, in the early nineties barely 14% of total investments in the NARIs were assigned to the category of fruits, compared with nearly 70 % to staples food.
- The above shows that in the past the Region, with some exceptions, has focused more on products with comparative disadvantages, especially in predominantly tropical countries. By contrast, countries with temperate ecosystems, have been able to take better advantage of these priorities, which are later seen to coincide with comparative advantages. Meanwhile, the supply of available foreign technology, has certainly coincided more with the temperate countries.
- Products with comparative advantages that require technology reinforcement in the region already have major competitors, not only in developed temperate countries but also in other developing countries. If the region fails to strengthen its production structure and adapt knowledge and apply it to the market, and does not influence the priorities of international agricultural research, it may fall into a strategic error in the immediate future.
- Investment in public research has increased in few countries but in general has declined alarmingly and there has been a de-capitalization of specialized human resources, particularly in the national institutions of the countries where, paradoxically, agriculture is an important economic factor. The average public research intensity of the Region is less than 0.5% of the AgrGDP.

#### **5. Synthesis of agricultural problems from a technological perspective**

- The above shows that LAC is in a process of “disengagement” from knowledge and the technology development, at least for tropical agriculture, at a crucial point in the development of sources of competitiveness. In fact, growth was based in good part on the availability of natural resources, incorrectly assumed to be plentiful.
- In the past, public research institutions concentrated their efforts on primary production, placing less emphasis on other value added activities in the productive chain. Research in tropical countries focused more on traditional food crops that offer fewer competitive advantages in national and international trade, neglecting products such as fruits and vegetables, where the region enjoys clear advantages.

- The challenge is to reposition agriculture, not only within LAC, but also globally, and develop strategies to avoid continuing with inefficient production on the first link of the chain, despite the opportunities, but with little horizontal expansion based on an increasing the area under cultivation.
- The agricultural scenarios of LAC are not homogeneous. Those in the temperate zones of the north and south differ from the scenarios of the high mountain plains or those of the wet and dry tropical lowlands and medium-elevation hillsides, such as those in Central America, the Andean countries and some Caribbean nations.
- Consequently, it is not possible to speak of absolute regional priorities, given the region's diversity. In the case of agriculture in temperate ecosystems, the situation of technological engagement is better than in the tropical areas. This is the case with soybean and wheat, where the results of other areas have been used, including the recent import of transgenics such as "RR soybean". The differentiation of technological strategies is a matter that must be resolved.
- Another aspect is the challenge facing countries with respect to environmental problems, which often appear to be separated from the issue of natural resources. The Region's technology development system has adopted these environmental problems as a priority and this has represented another disengagement from technology. Degradation takes place within an economic context where producers faces high interest rates, high inflation, the need to expand or intensify production, and where the need to conserve natural resources is not fully incorporated within the technology strategy and the investment required for this purpose.
- With regard to food security, this is a mainly urban problem with political repercussions, though it is also associated with efficiency in the production and distribution of food. At the same time, a large proportion of the region's small producers farm lands with less productive potential, and therefore the production strategy is not efficient. Therefore poverty as a subject for research has not been attractive, politically speaking. If we analyze the indirect effects (reduction of food costs, employment) of technology, the panorama is clearer; but when it comes to the direct effects, the matter is more difficult, even though there are several examples of the fact that technology does have direct effects in combating rural poverty. What is certain is that in terms of reducing poverty, the direct and indirect effects are important. This has not been fully incorporated in the Region's research agendas.

Under this general panorama, the institutional response to technology has occurred in a context of major disparities between stated priorities and what happens in practice, something that is reflected in the institutional reality.

## **6. Regional Priorities under FORAGRO**

The participants of the Third Meeting of FORAGRO in Brasilia 2002 declared their intention to continue to identify and implement research priorities that will make it possible to tap the opportunities of the new world economic order, reduce rural poverty and conserve natural resources. Also to ensure that the development of knowledge via agricultural technology innovations is placed high on the agendas of policy makers in the countries, and of hemispheric integration efforts. An important effort has to be made to optimize agricultural technology systems in the Americas, so that greater use is made of them and they have a bigger socioeconomic impact. They also drew attention to the need for both the public and private sectors to invest more, given the chronically low level of investment in science and technology in most of the countries and the to support the modernization of education, based on new knowledge and technologies, but also respecting traditional practices,

incorporating the new technological paradigms and taking all farmers into consideration, especially small-scale ones. Also to work to ensure that science and technology figure more prominently on the economic integration agenda, strengthening cooperation between research and development institutions and programs.

FORAGRO consider the following topics, presented in random order, to be the most relevant in terms of hemispheric cooperation and to “influence”, using this term in the most sane context, the priorities and agendas of the international systems of agricultural research:

- Water resources (sound use, conservation, quality and availability)
- Genetic resources (conservation, characterization and use)
- Sustainable management of natural resources (soil and biodiversity)
- Promotion and development of agribusinesses
- Technologies using agroecological principles
- Incorporation of small-scale agriculture into agrifood chains
- Clean production (as a prerequisite for market opening, consumer demand and harmonization with nature)
- Development and use of new agricultural technologies (biotechnology and precision agriculture)
- Integrated pest management and integrated crop and livestock management
- Information systems and human resources training
- Climate change

FORAGRO is promoting the institutional strengthening of the regional cooperation system made by FORAGRO itself, FONTAGRO, the PROCIs (Subregional Fora and Cooperative Programs on R&D: PROCINORTE, SICTA, PROCIANDINO, PROCITROPICOS, PROCICARIBE, PROCISUR), CATIE, CARDI and other networks as strategic mechanisms in strengthening regional cooperation. FORAGRO is aimed to promote strategic alliances with the international and regional centers in areas of research that are a priority for, and have an impact on, the Americas. Recently, the Executive Committee of FORAGRO has approved the Plan of Action of the Forum for 2003-2004. The details can be consulted in the FORAGRO web page mentioned below.

## 7. Selected references

(For more information and papers on research priorities in LAC of several authors of the Subregions of LAC consult FORAGRO web page [www.iica.int/foragro](http://www.iica.int/foragro) Prioridades Regionales and INFOTEC web page [www.infotec.ws](http://www.infotec.ws))

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