

Agricultural production in Latin America and the Caribbean: International organizations and regional programs

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IICA was founded as an institution for agricultural research and graduate training in tropical agriculture. In response to changing needs in the hemisphere, the Institute gradually evolved into an agency for technical cooperation and institutional strengthening in the field of agriculture. These changes were officially recognized through the ratification of a new Convention on December 8, 1980. The Institute's purposes under the new Convention are to encourage, promote and support cooperation among the 29 Member States, to bring about agricultural development and rural well-being.

With its broader and more flexible mandate and a new structure to facilitate direct participation by the Member States in activities of the Inter-American Board of Agriculture and the Executive Committee, the Institute now has a geographic reach that allows it to respond to needs for technical cooperation in all of its Member States.

The contributions provided by the Member States and the ties IICA maintains with its twelve observer countries and numerous international organizations provide the Institute with channels to direct its human and financial resources in support of agricultural development throughout the Americas.

The 1987-1991 Medium Term Plan, the policy document that sets IICA's priorities, stresses the reactivation of the agricultural sector as the key to economic growth. In support of this policy, the Institute is placing special emphasis on the support and promotion of actions to modernize agricultural technology and strengthen the processes of regional and subregional integration.

In order to attain these goals, the Institute is concentrating its actions on the following five programs: Agrarian Policy Analysis and Planning; Technology Generation and Transfer; Organization and Management for Rural Development; Marketing and Agroindustry; and Animal Health and Plant Protection.

These fields of action reflect the needs and priorities established by the Member States and delimit the areas in which IICA concentrates its efforts and technical capacity. They are the focus of IICA's human and financial resource allocations and shape its relationship with other international organizations.



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AGRICULTURAL PRODUCTION IN LATIN AMERICA AND THE CARIBBEAN: INTERNATIONAL ORGANIZATIONS AND REGIONAL PROGRAMS¹

Martín E. Piñeiro²

INTRODUCTION

The economic picture in the 1980s has not been a bright one for the developing world. The external debt in most countries of Latin America and the Caribbean has worsened due to deteriorating conditions in international markets, especially for temperate zone agricultural products. Faced with these conditions in the international economy, developing countries require new strategies and a joint approach to international policy and to economic and technological policies.

This paper will provide a brief, general picture of three interrelated topics. Sections 2 and 3 show that in Latin America, given today's international context, agricultural production is an important alternative for reactivating the economy. However, due to conditions in the international marketplace, agricultural production cannot be expanded unless economic

and technological policies are adopted in full recognition of real market conditions and are adapted to fit them. Section 4 gives general guidelines on modern technology needs in the agricultural sector and shows how these needs shape research priorities and the organization of institutions in this sector. Finally, section 5 examines the role of international organizations and regional programs and the need to develop a new style of international cooperation.

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ECONOMIC REACTIVATION THROUGH AGRICULTURE

Today, Latin American countries face an unprecedented economic challenge.

As an example, GDP growth rates for the period from 1980 to 1985 are the lowest of the past three decades. Agricultural production has experienced zero growth per capita in the 1980s (see Table 1), and in cases such as livestock, growth has been negative.

International trade is another problem area. Latin America and the Caribbean as a whole have gradually lost their footing in the world agricultural commodities market.

The mean annual growth rate of imports has shrunk from 20.1 percent from 1975 to 1980, to 5.5 percent from 1980 to 1982. This reduction is the outcome of foreign debt repayment programs, which in many cases held back the purchase of inputs, materials and equipment needed for general development in the region. The clearest symptom of this situation is that, in recent years, the private capital outflows from the region have exceeded the inflow of external resources of various kinds.

TABLE No. 1

Latin America: Growth indicators (Growth rates 1960-1985, percent)

	60-70	70-80	80-85
Total	5.5	6.0	0.8
Agriculture	3.5	3.7	2.4
Agriculture per capita	0.9	1.2	0.0
Production			
- Crops	3.0	3.5	2.5
Livestock	4.4	4.3	-0.3
Foodstuffs	4.0	3.8	1.7
 Foodstuffs per capita 	1.4	1.3	-0.7
 Subsistence crops 	3.8	1.4	8.0
Export crops	2.4	5.5	3.1

Source: IDB, 1986 Report.

This picture of crisis is colored by the following problems:

- The countries are increasingly unable to generate internal savings with which to sustain long term economic growth. Thus, investment in key sectors has been limited, a situation which has been exacerbated in recent years by ever-growing external indebtedness.
- The countries face increasing difficulty in obtaining foreign exchange through export due to limitations associated with protectionist trends, greater competition from developed countries, and a substantial surplus of many products.
- Efforts to reactivate national industries have been set back by high investment demands and the presence of trade barriers to protect industrial production in developed countries.
- Little of the available technology has been adopted, despite the emergence of new needs of producers (to improve profitability) and domestic and foreign consumers (market saturation and the lack of new options, new products and new technologies to increase competitiveness and profitability).

The agricultural sector in Latin American is emerging as one of the best alternatives available to the countries for reawakening economic growth under these conditions. There are two reasons for this. In the first place, agricultural production in Latin America has comparative advantages over that of other countries of the world, due to the abundance of natural resources (land, water, forests). In the second place, capital investment needs for livestock production per unit of output are less than those of other sectors of the economy, particularly industry.

Uncultivated fertile land is no longer easily available, and there are clear signs that the expansion of the agricultural frontier is losing importance as a source of growth. Nevertheless, the process is not fully complete, and to date has allowed the region to expand production at a cost lower than that in other parts of the world with fewer natural resources (IDB, 1986 report).

While new lands continue to be opened, modernization of agriculture and of the overall economy has tended to push the labor force into urban activities. As a result, there is a relative shortage of agricultural labor, and productivity gains are increasingly necessary¹

This argument suggests that reactivation is more feasible in the agricultural sector than in other areas of the economy. Furthermore, if economic policy conditions are favorable and the technological innovation process is adequate, agriculture could have an important multiplier effect on the rest of the economy. The following impacts would be felt:

- a) Lower relative prices for foods and raw materials on the national and international markets would make it possible to increase overall demand in the economy as a whole.
- b) The generation of a major economic surplus would reinforce domestic savings and capital formation for investment in other sectors of the economy.
- c) New products or new uses of known products would be introduced, and the demand would grow for processed goods with higher added value.

PRESENT-DAY CONDITIONS OF THE DEMAND FOR AGRICULTURAL COMMODITIES

We have argued that under present conditions of external indebtedness and capital restriction, the agricultural sector is reemerging as an economic activity in a favorable position to promote overall economic growth. This situation, however, is subject to the restraints of domestic and world market demand.

These restraints on the demand side and their effects on the market and prices of agricultural products have a vital impact on the nature of agricultural development. Consequently, they hold major implications for the magnitude and qualitative characteristics of technological innovation in the agricultural sector.

The primary sector, and particularly in agriculture, has traditionally been the cornerstone of economic development in Latin America, Production was expanded by making use of the comparative advantages of extensive land resources. Ecological conditions were ideal for producing temperate zone crops and well suited to the cultivation of tropical crops not produced in industrial countries. Latin America therefore emerged as a major supplier of agricultural goods to feed economic development and a growing demand in industrial countries. The region contains barely 7.5 percent of the world's population, but from 1965 to 1970, it generated nearly 75 percent of the world's total exports of foodstuffs. beverages and tobacco. From 1975 to 1979, this percentage had fallen to nearly 15 percent (United Nations, 1979-1980 Statistical Yearbook).

The expanding potential of international trade, with its cyclical trends and often deteriorating terms of trade, went hand in hand with a domestic market which grew quickly and steadily. This was due in part to rapid population growth in Latin America, fed by waves of migration from Europe and a high birth rate. The population from 1960 to 1980 grew from 209 million to 342 million people (IDB, 1985 Report).

This population growth proceeded parallel to a rapid trend toward urbanization and, in some countries, industrial development, especially as of the 1950s. For example, from 1960 to 1980, the continent's urban population grew from 100 million to 228 million inhabitants (IDB, 1980-1981 Report).

The simultaneous processes of population growth and urbanization steadily pushed up overall domestic demand for agricultural products and brought about major changes in the structure of demand. A quick glance at today's market for most agricultural products reveals highly unfavorable conditions.

The international marketplace has undergone substantial changes as the supply from developing countries has expanded, especially from Asia and the industrialized countries. The focal point of this expansion has been the increasing importance of technological

¹ In general, the region has increased its use of capital through modern inputs and machinery, thus replacing labor in production.

innovation and its capacity to realign comparative advantages which, in an earlier age, depended on natural resource endowments. At the same time, industrial countries have been able to maintain their productive capacity and share of international trade by adopting policies for production and export subsidies. The new world market conditions have driven down international prices, introduced elements of uncertainty and brought on heavier and more complex competition than in the past.

The deteriorating international market conditions in recent years have coincided with stagnating domestic demand caused by general economic decline in most countries of the region.

As a result, while GDP from 1960 to 1980 rose at an annual average rate of three percent, over the last five years, growth has been less than one percent, and the slide was particularly severe from 1981 to 1983 (IDB, 1981 to 1986 Reports). Moreover, in many countries where conditions are particularly harsh, per capita income among the poorest population groups has dropped sharply as the stagnation of real wages coincided with rising unemployment,

The cause of this decline has been the general slump in recent years experienced by the industrial sector, which had maintained the demand for agriculturally based raw materials. The industrial sector from 1960 to 1980 sustained overall average annual growth rates of nearly seven percent, but as of 1980, growth has been negative in most years.

This situation has tightly constricted the real demand for agricultural production and visibly increased malnutrition among poorer population groups. Thus, the world has witnessed the close causal relationship between stagnating overall economic activity and the loss of purchasing power and lower levels of nutrition for wage laborers.

This causal relationship is of major importance for designing food production policies and their concomitant technological patterns. For many years, the central concern of public agricultural sector authorities and the international community has been to increase production. One of the central arguments for

this approach was the preoccupation with food security and with improving nutrition for the growing urban population.

Today we have seen that production growth must go hand in hand with increased purchasing power by low income groups. This, in turn, is heavily dependent on food prices.

We have asserted that the agricultural sector offers perhaps the best promise of economic renewal because of the wealth of natural resources on this continent, low investment needs, and its potential impact as a mechanism for reactivating the overall economy. We have also shown, however, that the sector must play its role in a context of low demand in world markets, due to changes in the patterns of international trade, and in domestic markets due to declines in production, income and wages. In conclusion, a new strategy is needed for production and technology, and it must allow the agricultural sector to play its role fully.

TECHNOLOGICAL INNOVATION UNDER NEW CONDITIONS OF PRODUCTION

The previous section argued that profound changes taking place in the international economic context, especially the shrinking demand for agricultural commodities, have far-reaching implications for the design of technological strategies in Latin America.

This paper will not give an exhaustive analysis of the characteristics that such a strategy should possess. However, we would like to draw attention to three items which appear especially important: a) a policy that would ensure an adequate supply of agricultural inputs of industrial origin; b) access to state-of-the-art technology, such as biogenetics; and c) the development of new products based on agriculture.

The importance of technological inputs

The agricultural production growth experienced in the industrialized world and many developing countries is a direct outcome of technological innovation in recent decades. The impact has been particularly strong in the area of production and factor productivity, especially in traditional temperate zone crops. This technological development was based essentially on improved varieties and farming practices, and, in recent decades, on the rapid incorporation of fertilizers and agrochemicals for taking full advantage of the greater productive capacity of new crop lines and hybrids (see Piñeiro, 1985 for a description of this process).

The widespread use being made of agrochemicals today reveals that agricultural production has grown increasingly dependent on technological innovations generated and produced by certain industrial sectors. For example, in the United States, half the gross income of the agricultural sector is used for acquiring industrially based inputs (Freebairn et. al., 1982:39).

The technological pattern adopted in Latin America is less intensive in its use of industrial inputs, but the introduction of these materials, especially in certain regions and for certain production lines, has acquired momentum in recent years. For example, at the beginning of the 1960s, 10.5 kilos of fertilizer were used per hectare, while by the early 1980s, the figure had grown to 35.6 kilos per hectare (IDB, 1986 Report: 108). The swift spread of improved varieties and hybrids of such crops as wheat. corn, sugar cane, and soy beans is similarly well known and widely documented, and the impact on factor productivity has been considerable. The importance of this technological innovation process resides in the fact that, despite its higher capital demands, it has reduced unit production costs and consequently increased competitiveness in international markets for those countries which have more quickly and efficiently incorporated technical change.

These technological inputs are produced by industry. Thus emerges one of the greatest technological difficulties and one of the most serious dilemmas for economic policy in the countries of Latin America, especially those with voluminous agricultural exports.

It is evident that technological innovation in agricultural production, and the resulting ability to compete in international markets, depend on an adequate supply of technological inputs of industrial origin, standing on the frontier of human knowledge, and available at costs comparable to those charged in major competing countries. Does this mean that all our countries should initiate policies to develop and protect industries which will produce technological inputs for agriculture?

This question cannot be answered without recalling that many countries in Latin America, especially those which began to undergo a major industrialization process several decades ago, have developed industrial sectors which produce or could produce most of the industrial inputs needed for agricultural production. However, many of these industries are not internationally competitive, partly because of the generalized tariff protections under which they were developed.

Local production of inputs is subject to various handicaps. A high degree of technological complexity is required for developing certain inputs, and economies of scale for most of them can be realized only at extremely high volumes. Therefore, local production cannot easily maintain the technological and economic competitiveness required. Furthermore, evidence shows that the importance of scientific knowledge protected by patents in some sectors has led to the emergence of industries with strong international ties, operating in a situation of virtual monopoly (Vaitsos, 1974).

It is therefore necessary to conduct a careful, case-by-case examination of the situation confronting industries which produce agricultural inputs and the potential capability of each country to develop a supply of advanced technological inputs under conditions of economic competitiveness. In many instances, despite balance of payment difficulties, it would be necessary to concentrate first on mechanisms for importing inputs under adequate controls and reinsurance, so as to guarantee a stable and continuous supply. Otherwise, the agricultural sector will increasingly fall short of its productive potential and find itself hard-pressed to maintain adequate levels of international competitiveness.

A second necessary stage will be for the region to begin acquiring greater production capacity for needed materials. This process will have to follow conditions and guidelines clearly designed to strengthen, rather than weaken, the competitiveness of our agricultural production. Collective production endeavors need to be included as a part of the strategy adopted, for such an approach will down the barriers imposed by the small size of markets and the inadequacy of financial and technological resources available to our countries individually. Cooperation will also help us build the foundations of a major technological effort, as is required to give momentum to this endeavor and tap its full benefits.

Access to state-of-the-art technology

A second important issue is the development of mechanisms for providing access to new developments, such as biotechnology, that will usher in a new phase of technological innovation qualitatively different from earlier phases. The incorporation of this technology will have a heavy impact on the ability to generate lower-cost foodstuffs for the region, and will help improve the competitiveness of exports of both traditional products and new lines. This cannot be done unless research organizations are restructured and modernized.

The products of this new revolution are already appearing on the market. They can improve the unit production of beef, genetically alter the resistance of plants to pests or diseases, increase the efficiency of research management through computer and electronic innovations, replace conventional inputs such as chemical fertilizers, insecticides and fungicides with other, more efficient biological products; in short, bring about unexpected reductions in the time that must elapse between research and the delivery of final results to the farmers. ¹

Many of these technological innovations are being developed by the private sector and are heavily dependent on highly complex basic sciences. This fact poses new and difficult challenges for the formulation of scientific and technical policies and for the organization of research and technology generation systems in the agricultural sector of our countries.

The development of new products based on agriculture

One of the most visible of recent technological developments is that processes for transforming agricultural products into other items in greater demand are now economically feasible. An example of these technological innovations is the generation of fructose or fuel alcohol based on corn starch or sugar cane. The economic impact that these processes have had on primary production of both products is already well known.

The possibilities for this type of technological development are growing fast and are introducing a new situation which the countries of the region cannot overlook. This wave of technological innovation underscores the growing interdependence between the agricultural sector and the industrial sector and the importance of technological innovation in determining the productive capacity of agriculture.

These arguments serve to reaffirm the validity of three important postulates. The first is the need to design and implement clear scientific and technological policies that will allow the countries of the region to take part in the rapid technological currents which are sweeping the developed world. This will require careful analysis of priorities for research, resources and organizations to be created. It also demands a tremendous effort to train the human resources necessary for this phase of our development. In the second place, closer ties need to be forged between agricultural research organizations strongly influenced by a tradition of agronomic investigation, and scientific research and technological development underway in certain industrial sectors. In the future, these areas may be definitive in shaping the productive and technological capacity for agricultural production.

¹ Work today has centered on genetic manipulation of plants, bioconversion, and the production of metabolites useful in producing monoclonal antibodies. For example, it is feasible to manipulate proteins in such crops as potatoes, introduce genes for protein in cassava, manipulate tolerance to salinity, extract useful compounds such as pigments, drugs and insecticides, produce monoclonal antobodies to detect virus infections, and, in short, develop a whole range of modern innovations that should be adopted by research systems.

Finally, our countries face increasing difficulty in realizing economies of scale and handling the technological complexity of innovation processes. This hampers the implementation of an independent technological policy. Under such circumstances, it is important and strategically necessary to promote regional cooperation as an instrument for technological and productive development in Latin America.

International organizations and regional programs must play a major role in this area.

INTERNATIONAL ORGANIZATIONS AND REGIONAL PROGRAMS

Introduction

Multinational organizations and programs came into being with particular strength after World War Two. This was a time of vigorous, productive international relations, when industrial countries victorious in the war were concerned about the possibility of new international conflicts. They launched a period in which common interests and a view of an interrelated world received special attention.

The United Nations was created in 1945, along with its system of specialized technical organizations, and the OAS appeared in 1948. This was followed by the establishment of other organizations obeying a wide range of technical mandates and with considerable geographic coverage. IICA, the organization we represent, was created in 1942, and thus predates the United Nations system. Its specific mandate was research and training for the American tropics. Under its latest Convention, which went into effect in 1980, the Institute has a mandate for cooperation in agriculture in Latin America and the Caribbean.

International technical organizations were originally based on a very simple, extremely attractive idea. The industrialized countries, partly as a result of their efforts during the war, had developed major technological and industrial potential that could be used for peaceful ends and as a tool for development.

The organizations were an efficient mechanism for implementing this technology transfer and facilitating the use of technology to solve development problems; at the same time, relatively less developed countries could establish their own institutions and train their own people.

Later, in the 1960s, even though the international programs had achieved striking success, their vision began to narrow. They had achieved a new awareness of the difficulties involved in transfering technology without a component of local adaptation. In the second place, developing countries themselves saw a need to create institutional mechanisms and train technical personnel, and thus embark on a more autonomous and self-sustained process of scientific and technical development as the cornerstone of economic development.

International programs were adapted to this new view, and greater emphasis was placed on institutional development and on programs for technical and scientific training. This second stage was especially visible in the agricultural sector, where institutional development and training programs acquired a new dimension in the 1960s and early 1970s. ¹

These programs were largely successful, and the efforts made by most of the countries on the continent led to rapid development of human resources and of public sector institutions committed to research and technology transfer. These efforts should continue, and international organizations have an important role to play. They must cooperate with the countries. adapting the institutions to on-going changes in each local context and to the emergence of new problems. However, organizations and regional programs have begun to develop a number of activities that reflect a new view of international cooperation and mark the beginning of a third stage in the evolution of technical cooperation.

This third stage recognizes that developing countries and their institutions have matured and that the top priority of international

¹ This shift is a typical example of the wisdom found in an ancient Chinese proverb which states that the second stage is the beginning, or stresses the effort to teach people how to fish instead of giving a fish to the hungry.

cooperation should be to carry out tasks which are of a such nature or scope as to lie beyond the purview of these institutions. The organizations should also help initiate complementary efforts among developing countries that share similar problems and visions.

It can be stated, in summary, that international programs, especially at the regional level, should emphasize the following essential functions of international cooperation in this third stage:

- a) International organizations should do those things for which they are best equipped (for which have a comparative advantage) and which they can do better than the countries and the national organizations. Examples include:
 - i. Because they are in a better position to generalize and enjoy access to a broader framework of institutional diversity (more situations under which to analyze a shared problem), they should generate new ideas on problems of regional scope and relevance.
 - ii. International organizations should provide support services to the countries and national organizations in areas where size or access often pose administrative contraints (technical and scientific or financial and administrative brokerage, information services).
- b) International organizations should facilitate horizontal cooperation and actions that would have a synergistic effect on national activities, promoting joint actions among countries and organizations in the region and from other regions.
- c) International organizations should bring together many diverse institutions for problem analysis and for seeking solutions through:
 - i. Joint discussion and meditation on development problems.
 - ii. Comparative analysis and sharing of experiences with certain problems and their solutions.

- d) International organizations should provide the region with a institutional memory for:
 - i. Analytical accumulation of information on the behavior of the particular environment targeted by the international organization (archives, data banks).
 - ii. Provision of mechanisms for security and continuity to counteract possible institutional instability in vital fields, such as genetic resources.

A new style of international cooperation

Multilateralism, which emerged after World War Two, acquired a considerable following in subsequent decades and strongly influenced international relations and the development of successful technical cooperation programs. Today, in the 1980s, it has entered a period of questioning and has lost the political support it received in the past from the industrialized world. By contrast, Latin America in the 1980s is characterized by a rediscovery of shared bonds and interests among the countries of the continent and a clear political will to support regional integration.

These political conditions provide the frame of reference for international organizations and regional programs and a mandate to encourage actions for complementary efforts and regional cooperation. The implementation of this mandate requires a new style for working in the field of international cooperation and gives renewed impetus to institutional growth and development in regional programs such as those we have discussed.

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