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Strengthening Cooperation in Agricultural Research in the Americas and the Role of FORAGRO

INTRODUCTION This document provides a summary of the context in which agriculture operates, primarily in Latin America and the Caribbean (LAC), from the technological perspective. It describes the principal objectives of the Forum for the Americas on Agricultural Research and Technology Development (FORAGRO), as well as its accomplishments through the first four months of 2001. It includes the principal aspects that have been dealt with in the Americas in building a vision and a shared agenda for research and technology development through the actions of FORAGRO. That shared vision, which is presented in this article, is primarily the result of the International Meeting of FORAGRO: Agriculture with Knowledge, held in Mexico in September 2000, and constitutes, in essence, the Declaration issued by the participants in said meeting.

I.. Problems and Challenges in a agriculture from the technological perspective

1. The context and the new visions

At the end of the 1990s, primary agriculture contributed approximately 8% of the gross domestic product (GDP) of LAC. Within the framework of an expanded concept of the sector, which includes its linkages with industry, it is estimated that this contribution, on average in different countries, is from 20% to 25% of the total value of their economies. This shows that the contribution to the economy of the region is still undeniable, even though there has been a relative reduction in its contribution. In the last decade, the aggregate indexes of agricultural production have improved, with annual increases in the agricultural GDP of between 2% and 3%. However, in LAC there is a relative balance between the increase in population and the growth of production, which carries with it the danger that, should any unforeseen situation arise, the growth (per capita) may become negative, as occurred in past decades.

In the new world political and economic order, great challenges and opportunities have arisen, but the levels of growth expected in the region for the economy in general and for agriculture in particular, especially in the countries of the tropics, are cause for concern. In general terms, the goal of reaching a substantial growth in the agricultural GDP, established at the end of the last millennium, was not achieved, despite of the growth obtained. The greatest worry is the fact that poverty will not be eliminated in the countries of LAC unless a development model is implemented that takes into consideration a new vision of the rural milieu and agriculture itself, calls for a major capitalization of human resources, and adopts a positive approach to the issue of competitiveness in the context of the liberalization of trade. Specifically, it is not viable to initiate a process of sustainable development if the agricultural sector has not been strengthened and its growth ensured, for which it is necessary to adopt and implement a renewed vision of agriculture.

The renewed vision and the role of agriculture in LAC

The renewed vision and the role of agriculture in LAC Today, it is evident that the agricultural sector is systemic in nature, making it necessary to introduce reforms and execute actions aimed at overcoming the traditional idea that the sector is limited to primary production. Therefore, the countries of the region have begun to act under a new approach, aimed at the

construction of a renewed vision of agriculture that takes into account three basic elements: **a) the rural spaces**, defined as the socio-political scenario in which relations among the different socioeconomic agents, agricultural production activities, the environment and the rest of society are articulated; **b) the agrifood trade chains,** in which the link of primary agricultural activities is articulated with the other components of the economic system: inputs (backward linkages), processing and the markets (forward linkages) and trade and consumption (lateral linkages); and **c) the interaction between production chains and rural spaces.** The implementation of this renewed vision involves the introduction, in the region, of **changes in production, trade, human beings and institutions** (IICA-MTP 1998-2002.)

Also, in different hemispheric forums in which the highest level authorities from the agricultural sector have participated, such as the ministerial forums organized by the Inter-American Institute for Cooperation on Agriculture (IICA) in Chile (1997) and Brazil (1999), the forum for launching the Agrifood Strategy of the Inter-American Development Bank (IDB), and the meetings held by FORAGRO itself, it has been proposed that, as the third millennium begins, agriculture is a driving force of economic development. It is believed that its role goes beyond the provision of foods, and that it can sustain processes of urbanization and industrialization, as occurred under the development model implemented between 1960 and 1980. Within the framework of this new role, the agricultural sector has four fundamental functions: a) to contribute to economic growth; b) to contribute to social development through the provision of foods at reduced prices and the generation of employment, thus helping to alleviate poverty; c) to promote the sustainable use of the natural resources in the region; and d) to contribute to environmental protection (for example, an increase in productivity can reduce pressure on the land).

New rurality

Another essential element of the new development model has been the construction of a new vision of the rural milieu based on the concept of "new rurality." This concept has been conceived in the Americas via a participatory and inclusive process carried out within the framework of an alliance for hemispheric cooperation involving IICA, IDB, the United Nations Food and Agriculture Organization (FAO), the Economic Commission for Latin America and the Caribbean (ECLAC), the International Fund for Agricultural Development (IFAD), governments, leaders and professionals. In the region, where efforts are under way to develop a new understanding of rurality, it is believed that urgent actions must be undertaken, both at the national and international levels, aimed at achieving sustainable rural development. This new vision makes it possible to view rurality from the perspective of territory, rural-urban interrelationships and the multiple options offered by the rural milieu, in both agricultural and non-agricultural activities, for the development of LAC. This approach provides many opportunities for contributing to development from the rural milieu and strengthening democracy, as has been pointed out by the heads of state and of government at the Summits of the Americas. This new vision takes into account the favorable change that has taken place in the international context, where priority is being attached to development in the rural milieu and to alleviating poverty. The basic strategies proposed for implementing the vision of the new rurality are aimed at, among other things, the reduction of poverty, comprehensive territorial planning, the development of social capital, the strengthening of the multi-sectoral economy, the promotion of participation and the promotion of competitiveness through innovation.

2. The situation in LAC from the perspective of agricultural production and productivity

In the 1990s, the aggregate indices of agricultural production in the region showed improvement, but, as mentioned above, as regards the production of staple grains, efforts are needed to ensure that the performance of the sector and its per capita growth do no become negative, as occurred in past decades.

Identified below are some aspects related to agricultural production in LAC, which are based on analyses of scenarios for agriculture conducted in IICA's Area of Science, Technology and Natural Resources, which have provided inputs for different FORAGRO documents:

- Exports are growing in the region, but imports are also. Thus, the growth in exports has barely been enough in the countries, on average, to offset greater imports of foods. In per capita terms, agricultural exports from the region have less value than 20 years ago. Some subregions, such as the Caribbean, have negative balances in their agricultural trade balances per capita, and some countries, in with agricultural has traditionally played a major role, became to be net food importing countries.
- Significant changes have taken place in the composition of production, with important growth in products from the oil-fruit-vegetable complex; smaller increases in meat and meat by-products; and reductions in the production of sorghum, cotton, cassava, potatoes, wheat, and to a lesser extent, coffee, rice and beans. This situation has led, over the last 20 years, to a significant change in the production structure; the participation of products that have better commercial alternatives and whose production is linked to the agroindustrial sector has increased and, in general, the participation of staple grains has been reduced substantially.
- The changes in the production structure, and the different degrees of expansion of the production of the different commodities, have been due primarily to an increase in the area under cultivation (23 millions hectares in 22 years). As a result, the subregions of LAC have specialized in the cultivation of specific agricultural crops. The countries of the Southern Cone have achieved the best results since the area under cultivation has been used to produce crops with greater competitive advantages than those of the other subregions.
- In the region there has been an important increase in the yields of the production of staple foods and grains, which is due basically to higher levels of productivity. However, the area under cultivation with such crops has been reduced in the region by some 2.5 million hectares. In the group of fruit crops, especially tropical fruits, the situation is opposite to that of foods and staple grains. The production of fruit has increased, in essence, due to an increase in the area under cultivation, and even though the increase in the indexes of productivity has been very small, the participation of the region in the international trade of fruit has increased significantly.
- One issue that continues to be regrettable, especially in some countries, is rural and urban poverty. There are some 200 million poor, of which some 35% are found in rural zones (ECLAC and IDB). It is important to point out that in most of the countries located in the tropics (Andean subregion, Central America, northern Brazil, southern Mexico and some Caribbean countries) the percentage of people whose livelihood depends on agriculture exceeds 50%, in contrast with the percentage of people in regions with temperate climates. In other words, poverty persists in the region and is concentrated in tropical and sub-tropical zones.
- Despite the strategic wealth of natural resources and biodiversity in the Americas, where there are five centers of origin and diversity of species and crops of great economic importance worldwide, the region is suffering the consequences of the accelerated deterioration of its ecological capital. Three of the most important reasons for this are: a) an exclusive model that confines the rural population and producers to fragile zones: b) the use of technological patterns and the development of production systems that are not environmentally friendly and were based on the belief that resources were limitless; and c) the practice of transferring large amounts of resources from agriculture and the rural milieu to the rest of the economy. This has meant that the agricultural frontier, in terms of land area, cannot be expanded. As a result, in the next 25 years, eleven countries in LAC could lose all their productive soil.

3. The situation in agriculture in LAC from the perspective of technology

The technological gap between the region and the leading countries in the world is widening for a considerable number of crops. In the region, research has gone hand in hand with a political and economic model that attached priority to agriculture's contribution in terms of food, as a means of facilitating development in other sectors.

- Efforts in LAC aimed at technology innovation have been important, but today, at a time of economic and trade opening, such efforts are insufficient compared with the results achieved on other continents, which reveals the limited competitiveness of the region in the production of foodstuffs, except in the Southern Cone in the grains and oils complex.
- In recent decades, in some countries of the tropics priority has not been attached to investments for research on tropical agricultural crops such as fruit, since in the prevailing economic model less importance has been given to these crops than to others. For example, according to studies conducted by IICA with support from the IDB, in the early 1990s, 14% of the total investment of the national agricultural research institutes (NARIs) was earmarked for fruits, while 70% was earmarked for foodstuffs.
- This shows that in the past, especially in the predominantly tropical countries of LAC, with some exceptions, priority has been given to investing in products with comparative disadvantages. In contrast, in the temperate countries of LAC, priority was attached to agricultural crops with comparative advantages, and the supply of technology from abroad was more suited to their needs.
- The products with comparative advantages and in need of technology in the region have important competitors, both developed countries with a temperate climate and developing countries. In the immediate future, LAC could commit a strategic error, if it does not reinforce its production structure, if it does not adapt and incorporate knowledge that will improve its position in the market, and if it does not exert influence in the establishment of priorities for international agricultural research.
- There is an alarming decline in the rates of growth of public investments in research, and specialized human resources are being lost, especially in the national institutions of countries where, paradoxically, agriculture constitutes an important economic factor. According to data from IICA's Area of Science, Technology and Natural Resources, total funding for the public research infrastructure in LAC declined by some 10%, in constant 1985 US$, between 1981-1985 (US$424 million) and 1992-1993 (US$384). It should be pointed out that in 1999 a substantial drop was reported in the regional budget for agricultural research, which went from some US$1 billion, at current 1997 prices, to some US$640 million. The Brazilian Agricultural Research Institute (EMBRAPA), the National Forestry, Agriculture and Livestock Research Institute (INIFAP) of Mexico, the National Agricultural Technology Institute (INTA) of Argentina and the Colombian Agricultural Research Corporation (CORPOICA) account for most of that budget, meaning that the investment in other countries is very low. In the last two decades, LAC has been the only region in the world which has presented negative rates of growth in the annual public investments in research.

4. . Summary of the problems of agriculture from the technological perspective

- The above leads to the conclusion that LAC is in not keeping pace with the development of knowledge and technologies, at least in agriculture in the tropics, in a critical period for the development of sources of competitiveness and one in which, in contrast, the growth of agriculture has been based, in large part, on the availability of natural resources, considered erroneously to be very abundant.
- • In the past, public research institutions concentrated their efforts on primary production, placing less emphasis on activities that add value in the other links of the production chain. In the tropical countries, more emphasis has been placed on research on traditional food crops with fewer competitive advantages in national and international trade, disregarding research on products such as fruits and vegetables, in which the region has clear competitive advantages.
- The challenge now is not only to reposition agriculture in LAC, but also globally, and to develop strategies to avoid the continued use of production systems in the primary link of the chain, even inefficiently, in the face of opportunities, but little chance of horizontal expansion on the basis of increases in surface area.
- The agricultural scenarios in LAC are not homogeneous. There are different scenarios for agriculture in the temperate zones of the north and south, for agriculture on the

high plains of the mountains and for agriculture in the humid and dry tropics and on hillsides, such as in Central America, the Andes and some Caribbean countries.

- Consequently, given the diverse characteristics of the region, absolute regional priorities cannot be established. More technology is available for the crops from temperate zones than for those from the tropics. This is the case of soy and wheat, in which the results obtained in other latitudes have been used; as a matter of fact, transagropegenic plants such as "soya RR" have even been imported. In the case of topical crops, with the exception of rice, in contrast, the region does not have a technological counterpart. This is a problem to be resolved, through the differentiation of technology strategies.
- Another aspect is the challenge facing the countries vis-‡-vis the environmental problem, which, to a large extent, appears to be separate from the topic of natural resources. The technological system of the region has not attached priority to this problem, which is another case of not keeping pace with the development of technology. The degradation of the environment is taking place in an economic context in which the producer faces high interest rates, high inflation, the need to intensify production; the priority of conserving natural resources has not been fully incorporated into the technological strategy and the investments required for this purpose.
- From the perspective of food security, this is primarily an urban problem, with political repercussions and associated with limited efficiency in the production and distribution of food. Also, a large percentage of small-scale producers work the land that is least productive and use production strategies that are not efficient. Thus, politically speaking, poverty as an objective of the topic of research has not been attractive. In analyzing the indirect effects of technology (reduction in the cost of foods, generation of employment), the panorama is clearer, but in the case of direct effects the issue is more difficult, even though there are several examples in which technology does have direct effects on the struggle against rural poverty. Nonetheless, both the direct and the indirect effects of technology are important in reducing aggregate poverty. This is not fully incorporated into the research agendas in the region.

In this panorama presented in general form, the technological institutional response is characterized by a lack of articulation among the priorities proposed, what is happening and what is reflected in the institutional reality.

II. COOPERACIÓN ENTRE INSTITUCIONES Y PAÍSES: EL SISTEMA REGIONAL PARA LA INVESTIGACIÓN AGROPECUARIA

The Americas are known for its wealth of agricultural research experiences, structures and mechanisms. The visionaries of agriculture in the 1950s and 1960s knew that an agricultural sector that did not incorporate technology could not survive in the new paradigm of "industrial production for the domestic market." As a result, the experimental stations later became the semi-autonomous agencies known as national agricultural research institutions (NARIs), whose purpose was to adopt and generate technologies capable of increasing the productivity of agriculture and the well-being of producers. Several of those institutes have also assumed responsibility for transferring said technology.

At the present time, the NARIs existing in most of countries play a predominant role in conducting research and transferring technology. In the beginning, in addition to generating new technologies, they adapted those that already existed in more developed countries, giving rise to the concept of "technology converter." Given the decline in public resources, and their limited capabilities as the only public institutions, the NARIs, considered for several years to be the only entities responsible for technological innovation, are currently undergoing important changes. Given the participation of new actors in research and development (R&D), the model based on the existence of a single institute has been gradually improved upon with the model of National Agricultural Research Systems (NARSs); some

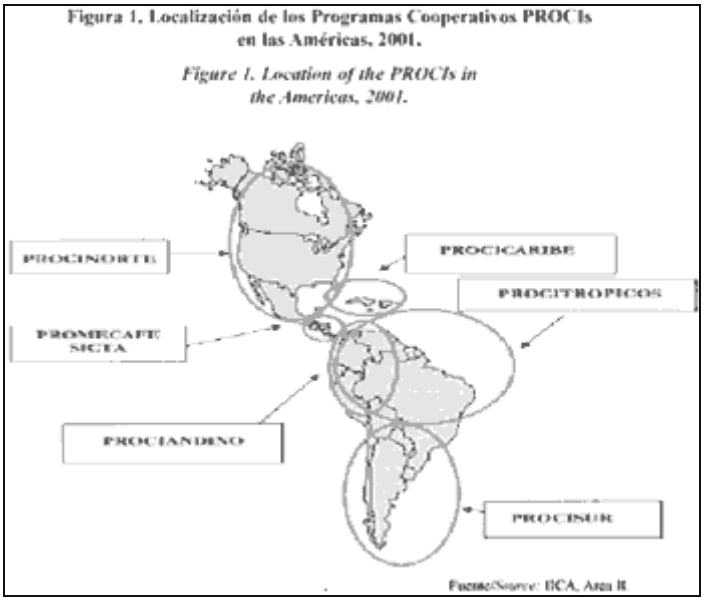
countries have even gone further, moving toward the configuration of National Technology Innovation Systems, in some cases with growing participation of the private sector.

The recognition of the existence of common problems and opportunities for the development of agricultural technology at the regional and subregional levels, on the one hand, and the impossibility of the smaller countries being able to develop their agricultural research programs fully, on the other, gave rise to the first initiatives calling for the exchange of knowledge and cooperative research. The earliest efforts in the field of cooperative research were the establishment of IICA in 1942 in Turrialba, Costa Rica, and its offshoot the Tropical Agriculture Research and Higher Education Center (CATIE), and the founding, in the 1970s, of the Caribbean Agricultural Research and Development Institute (CARDI), which operates as a subregional network in the countries of the Caribbean, including Belize and Guyana. Also, the Central American Cooperative Program for the Improvement of Crops and Animals (PCCMCA), the Regional Cooperative program for the Technological Development and Modernization of Coffee Cultivation in Central America, Dominican Republic and Jamaica (PROMECAFE) and the Cooperative Program for the Development of Agricultural Technology in the Southern Cone (PROCISUR), which date from the late 1970s and early 1980s, are the oldest mechanisms in LAC aimed at reciprocal cooperation for the exchange of information and the execution of regional research and non-formal training projects, among other activities.

The number of cooperative agricultural research program (PROCIs), in most of which the NARIs and in some cases private institutions participate, has grown notably. The topics these programs address have also increased, with research on natural resources, institutional development and agroindustry, among others, having been incorporated recently. Also, the actions of the PROCIs have shifted from the exchange of knowledge among the entities that participate in them to the execution of joint research activities.

Figura 1. Localización de los Programas Cooperativos PROCIs en las Américas, 2001.

Figure 1. Location of the PROCIs in the Americas, 2001.



Fuente/Source: IICA, Area II

The creation of PROMECAFE and PROCISUR was followed by other PROCIs: a) the Cooperative Agricultural Research and Technology Transfer Program for the Andean Subregion (PROCIANDINO), which covers the countries from Bolivia to Venezuela; b) the Cooperative Program on Research and Technology Transfer for the South American Tropics (PROCITROPICOS), which covers Brazil and the countries of the Amazon Basin; c) the Caribbean Agricultural Science and Technology System (PROCICARIBE), for the countries associated with CARDI, including the Dominican Republic, Suriname and Belize; d) the Cooperative Agricultural Research and Technology Transfer Program for the Northern Region (PROCINORTE), which covers Mexico, Canada and the United States of America, which was officially created in the declaration issued by the participating countries during a meeting of its Steering Committee held in September 2000 in Mexico; and e) the Central American System for Agricultural Technology (SICTA), for the countries of Central America and Panama. *Table 1* and Figure 1 show the geographic coverage, the subject matter and the institutions that make up these important cooperative mechanisms, whose impact has been very positive in promoting technical change in agriculture in the countries of the regions in which they operate. The internal rate of return derived from the evaluations of the impact of the different PROCIs has varied between 23% and 110%, which shows the benefits of investing in

them. Almost all the initiatives have had, during their stage of institutional formation, the support of IICA and the IDB.

Also deserving of attention are other consortia and specialized networks which have been established in LAC, such as: a) the Consortium for the Sustainable Development of the Andean Eco-region (CONDESAN); b) the International Network of Research Methodology in Production Systems (RIMISP); c) the Regional Cooperative Potato Program (PRECODEPA); d) the Regional Cooperative Program on Beans for Central America (PROFRIJOL); e) the Latin American Agricultural Conservation Network (RELACO); f) the Regional Maize Program coordinated by the International Maize and Wheat Improvement Center (CIMMYT); g) several networks sponsored by FAO, such as the Network for Technical Cooperation in Plant Biotechnology (REDBIO), and the international centers; and h) other product-specific networks, such as several cooperative programs in support of agricultural research (CRISPs), which are administered by universities in the United States of America and funded by the United States Agency for International Development (USAID), and the Regional Program to Upgrade Agricultural Research on Staple Grains in Central America (PRIAG), which concluded recently.

When referring to the institutional architecture for agricultural research in the region, four components are usually mentioned. Three of them have already been mentioned: the NARIs, the regional centers (CATIE and CARDI), and the subregional programs (the PROCIs and the specialized networks). The fourth component is the international centers of the Consultative Group on International Agricultural Research (CGIAR). Four of them (the CIMMYT, the International Center for Tropical Agriculture (CIAT), the International Potato Center (CIP) and the International Food Policy Research Institute (IFPRI)) are located in the Americas and form part of the principal global agricultural research network. They conduct important work in the development of technology, together with the scientists of the national programs. Other centers, for example, the International Service for National Agricultural Research (ISNAR), the International Plant Genetic Resources Institute (IPGRI), the International Livestock Research Institute (ILRI), the Center for International Forestry Research (CIFOR), and the International Center for Research in Agroforestry (ICRAF), have offices or carry out direct actions in several countries of LAC. The main emphasis of their research has been the genetic breeding of food crops, such as wheat, corn, rice, beans, potatoes, and cassava. More recently, they have carried out research on natural resources, conservation of genetic resources, agricultural policies and institutional strengthening.

This institutional panorama was enriched at the end of the 1990s with the implementation of two other regional mechanisms, FORAGRO and the Regional Agricultural Technology Fund (FONTAGRO), which attempt to fill in some of the gaps observed in the operation of the four components described above. In section IV of this article, information is provided on the first of these two.

The second mechanism, FONTAGRO, was established by the countries in the region with the sponsorship of the IDB, IICA, the International Development Research Center (IRDC) of Canada and the Rockefeller Foundation, as a competitive mechanism aimed at funding regional agricultural research projects of interest to two or more countries. In addition to sharing the principal characteristics common to other similar competitive mechanisms, FONTAGRO has three interesting particularities: a) the projects are funded with the dividends of an endowment fund (the goal is for this fund to have, by 2003, some US$200 million) so that the mechanism can become self-sustaining financially; b) it is not a new institution, but rather a cooperative program with no legal capacity whose operation is supported by the sponsoring organizations (principally IICA and the IDB); and c) the member countries can make their contributions to the capital fund of FONTAGRO, using agricultural loans from the IDB.

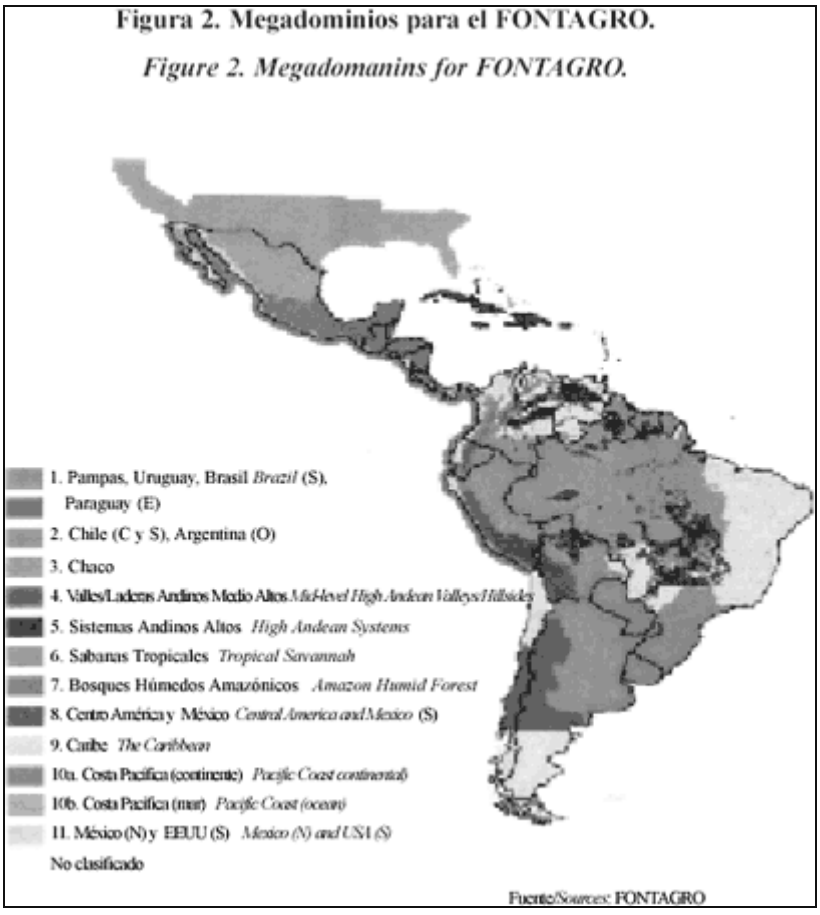
FONTAGRO, whose activities began in 1998, has issued calls for proposals on three occasions (1998, 1999 and 2001). In May 2001, it was executing twelve projects (valued at US$3 million) and another five were about to get under way. The framework document approved by the Steering Council of FONTAGRO for the execution of the projects submitted in the annual calls for proposals is the 1998-2002 Medium Term Plan, which is the first regional attempt to identify priorities and opportunities for research. The prioritization model developed by

FONTAGRO has two dimensions: one spatial, in which the region is divided into eleven mega-domains (Figure 2), and another technological, in which eleven families of technologies essential for LAC have been identified:

1. Genetic breeding
2. Optimization of use of inputs
3. Post-harvest handling and agroindustry
4. . New uses of agricultural products
5. Improvement of the management of agricultural enterprises
6. Integrated pest management.
7. Use and management of abiotic natural resources
8. Use and management of biotic natural resources
9. International environmental standards
10. Technologies for small-scale agriculture
11. \Policy design and institutional strengthening

Figura 2. Megadominios para el FONTAGRO.

Figure 2. Megadomanins for FONTAGRO.



The priorities for research represent opportunities and/or problems with broad spillover effects throughout the countries that figure in each mega-domain. Priorities for the region as a whole have also been identified, which correspond to opportunities and/or problems common to all the mega-domains. If you wish further information on the FONTAGRO 1998-2002 Medium Term Plan, visit http://www.fontagro.org.

Figure 3 shows the interactions of the four traditional components and the two new mechanisms described above, in support of state-of-the-art research, at both the country and regional and subregional levels. Even admitting that this organizational structure can and must be improved in terms of its components and its support mechanisms (recently created and still in the consolidation process), there is no doubt that this regional agricultural

research system constitutes a valuable platform for meeting the technological challenges of the region in the new millennium.

The challenge is how to make this institutional system more successful in promoting technical change, and to ensure that investment in regional agricultural research is, at the very least, sufficient to guarantee that the agricultural sector will be competitive and sustainable, and thereby help reduce rural poverty. This is an important issue, because current investment in research in LAC is insufficient, fact that can be demonstrated in two ways: a) investment is low compared with that of more developed countries and even some developing countries (such as India and China); and b) it is also low compared with the economic return on agricultural research.

III. FORAGRO

1.Background and conception

Faced with increasing globalization and interdependence in the last years of the twentieth century, and the process of institutional development and diversification that took place in the science and technology sector in the second half of the 1990s, the countries decided to strengthen hemispheric and global cooperation in the field of agricultural research and development. The First Consultative Meeting of the National Agricultural Research Systems of Latin America and the Caribbean was held in Bogota, Colombia, in February 1996. The purpose of this event was to discuss recent, successful regional cooperation efforts in the field of technology research and development (R&D) and technology transfer in the agricultural sector, and to find ways of strengthening regional cooperation of this kind. At that meeting it was proposed that the Regional Forum on Agricultural Research and Technology Development (FORAGRO) be created.

In October 1997, the Inter- American Board of Agriculture (IABA), comprising the ministers of agriculture of the countries of the Americas, approved Resolution No. 327, in which it expressed support for the creation of FORAGRO and asked IICA to set up its Technical Secretariat. In May 1998, a meeting of FORAGRO was held in Brasilia. The purpose of the meeting, which was attended by representatives of public and private research institutions, the PROCIs, universities, non-governmental organizations (NGOs), FONTAGRO and international centers, was to review the steps taken in setting up the Forum, report on the establishment of the Technical Secretariat by IICA and discuss the participantsí proposals vis-‡-vis the role of the Forum, the topics on which it would focus and operational considerations. There was strong support for both the initiative per se and the guidelines established for its operations. At the Brazil meeting, the meeting of the Executive Committee of FORAGRO held in San Jose, Costa Rica in 1999, and the Second Meeting of FORAGRO, held in Mexico in 2000, the countries recognized the importance of the Forum, praised the initial efforts to create it and defined its mission and role as a mechanism for the Americas.

The members of FORAGRO view it as an independent mechanism aimed basically at facilitating discussion and supporting the definition of an agricultural research and technology development agenda for the region, reflecting its needs, and taking into account the globalization process. A key role of the Forum is to impact the formulation of policies that will foster the development of technology for agriculture. The current concept of the Forum is based on the idea that, in a context of growing political and economic integration in the Americas and of globalization, it is increasingly necessary to share knowledge through networks. FORAGRO focuses on efforts to strengthen and implement hemispheric, integrated actions with the subregional mechanisms that exist for reciprocal cooperation on technological research (PROCIANDINO, PROCICARIBE, PROCISUR, PROCINORTE, PROCITROPICOS and the SICTA) and equivalent networks. It also complements the implementation of actions with FONTAGRO, an innovative institutional mechanism created to increase the financing of agricultural research in the region. The NARSs (NARIs), FORAGRO, the PROCIs and FONTAGRO, among others, are key members of the Regional Technology Research and Development System of the Americas (SIRIDET).

2. Mission, objectives and lines of action

The mission of FORAGRO is to facilitate dialogue, articulation and strategic alliances among the different members of the NARSs and the SIRIDET, and between them and the other stakeholders in the international agricultural research system, with a view to developing an agenda on technical issues and for influencing the formulation of policy, aimed at:

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- reassessing the importance of agriculture in LAC, adopting a renewed vision of the sector as a key component of economic development in the region.
- repositioning research and development on the political-economic agendas of the countries and the region, in order to influence the design and implementation of policies.
- supporting the definition of a regional R&D agenda, based on a shared, prospective vision of agriculture (regional priorities, strategies for collaboration, information, stakeholders).
- establishing a presence at the hemispheric level, adding value to national and subregional action, and influencing the definition of policies at the regional and international levels. FORAGRO is member of the Global Forum for Agricultural Research (GFAR).
- • supporting the development of an organic vision of the implicit regional research system (FONTAGRO, the PROCIs, the SICTA, other networks, regional centers like CARDI and CATIE, university research networks).
- facilitating homogeneous access by the countries to new knowledge and technologies developed both within the region and elsewhere.
- facilitating the organic participation LAC in the research systems of other regions of the world and in international ones.
- serving as an indicator and as a mechanism for channeling the needs of the region, influencing the establishment of priorities and the outputs of the international research system.
- supporting the efforts to consolidate an inter-American technology innovation system that will facilitate interaction among the institutional stakeholders involved in R&D and the implementation of joint actions designed to solve common problems.

During the initial phase of organizing FORAGRO, the stakeholders established the main lines of action, around which its specific activities have been organized. These lines of action are as follows:

Looking to the future: : prospective vision of the agricultural sector and the rural milieu, and its strategic role in the socioeconomic development of the Americas.

Regional R&D agenda: : identification of regional priorities, strategies for collaborative action, information and stakeholders, based on a shared, prospective vision of the sustainable development of agriculture.

Supply and exchange of information:efforts to foster the development of a hemispheric agricultural information system related to R&D.

Partnerships between the public and private sectors:: studies of successful cases where the public and private sectors worked together on technology innovation and integrated natural resource management, and the dissemination of information on such experiences.

Alliances and cooperation for R&D: support for cooperation programs and projects in areas that are a priority for the region, for reciprocal cooperation at the regional level.

Exchange of experiences: actions among the NARSs in the areas of strategic planning, policy formulation, the organization of technology innovation and the implementation and management of technology research and development processes.

Knowledge and society: appropriation of technology, intellectual property, the circulation of knowledge, and the implications of the new forms of knowledge and of the ways the private and public sectors are appropriating knowledge (intellectual property rights, IPR).

Agro-biodiversity and new biotechnologies: genetic resources for agriculture and agroindustry, and regional and subregional biosafety cooperation programs.

3. Progress made by FORAGRO

The results achieved so far by FORAGRO, by category and line of action, particularly under the Plan of Action from 1999 through the first half of 2001, are as follows:

Shared vision of agriculture and the regional research agenda (lines 1, 2 and 3)

- Development of a shared vision of FORAGRO itself, as a facilitator of dialogue and to establish inter-institutional linkages and development aspects related to both a technical and political agenda (meetings held in Bogota, Brasilia, Costa Rica and Mexico).
- Development of a shared vision of agriculture from the technological perspective. A total of 30 countries and 60 organizations took part in the Mexico 2000 Meeting ìAgriculture with Knowledge.î Eleven papers were presented and there were 200 participants. The Declaration of Mexico 2000 was issued, endorsed by all the participants.
- Dissemination of a number of studies and analyses designed to support the dialogue, which were prepared by the Technical Secretariat of FORAGRO, which is exercised by IICA:
    a. Agricultural production and technology innovation scenarios in LAC.
    b. Strategic considerations for orienting the implementation of agricultural research in LAC (with FONTAGRO).
    c. Institutional experiences and capabilities for agricultural R&D.
    d. The paradox involved in the financing of agricultural research in LAC.
    e. Agriculture and the rural milieu from the technological perspective: challenges and opportunities for the Americas.
    f. Shared vision of agriculture and the rural milieu: summary of proposals for the dialogue.
    g. Financing of technological innovation in agrifood chains: citric fruits, potatoes, dairy cattle and coffee (support for dissertations at National University, Heredia, Costa Rica).
- Technical and political presence. At the events described below presentations were made on the objectives and mission of FORAGRO, and declarations and messages were disseminated designed, in some cases, to reposition R&D; and, in others, to report on the impact of technology and the need to invest in R&D.
    a. Tenth Regular Meeting of the IABA (Brazil, 1999), Forum of Ministers of Agriculture. Remarks by President of FORAGRO: IICA 1998-2002 MTP.
    b. Meetings of Directors of FONTAGRO.
    c. "Science for Life," an international meeting of EMBRAPA.
    d. Meetings of the Global Forum on Agricultural Research (GFAR) held in Beijing, Washington and Dresden
    e. GFAR Meeting on Agricultural Information Systems.
    f. Meeting of the Latin American Parliament (PARLATINO), attended by delegates from parliamentary agriculture committees in Latin America.

Regional research agenda and exchange of experiences (lines 2 and 3)

IICA meetings on the articulation of FORAGRO/FONTAGRO/PROCIs, held in Lima (March 1999) and San Jose (February 7, 2001).

Brainstorming exercises aimed at identifying regional research priorities, held in San Jose, Costa Rica, in February 2001.

Consultation, in May 2001, on regional priorities. With the cooperation of GFAR, FONTAGRO, INIFAP, CIMMYT, CIAT, CIP. Emphasis was placed on leveling the identification of priorities in the subregions, particularly in Mesoamerica, the Humid Tropics, the Amazonian Tropics and the Andean Subregion. The other subregions have made progress in identifying regional priorities; the Caribbean and Southern Areas have completed their identification exercises.

Cooperation and technological integration (line 4)

- Creation of the Plantain and Banana Research and Development Network for Latin America and the Caribbean (MUSALAC), with the collaboration of the International Network for the Improvement of Banana and Plantain (INIBAP) and PROCINORTE (with IICAís Northern Regional Center).
- Support for the financing of regional research (links between the secretariats of FORAGRO and FONTAGRO, mutually beneficial synergies).
- Participation in the construction of the Shared Global Vision of the GFAR.
- Establishment of links and synergies between the secretariats of FORAGRO and the GFAR.

Appropriation of technologies, agro-biotechnologies and agro-biodiversity (lines 5 and 6)

During the short life of FORAGRO, the Forum has not promoted specific dialogues on these topics. However, IICA, through the Directorate of Area II (Science, Technology and Natural Resources), which exercises the Technical Secretariat of FORAGRO, has done some work on these issues, involving members of the Forum. The following publications have been produced:

a. Propiedad intelectual y las nuevas biotecnologías desde la perspectiva del comercio agrícola (Area II and Area I (Policies and Trade), 2000).
b. Investigación agrícola y propiedad intelectual en América del Sur (PROCITROPICOS, PROCISUR, PROCIANDINO, IICA's Southern Regional Center and the Directorate of IICA's Area II, 1999). A workshop was held on this publication, co-sponsored by the aforementioned mechanisms and units.
c. Algunas consideraciones para la gestión institucional sobre las nuevas biotecnologías: el caso de las plantas transgénicas en América Latina y el Caribe;
d. El impacto de las nuevas biotecnologías en el desarrollo sostenible de la agricultura de América Latina y el Caribe: el caso de las plantas transgénicas.

Development of a technical-scientific information system (line 7)

- Formulation of the conceptual and operating framework, formulation/ negotiation of the project with donors and agreement on the Scientific and Technological Information Network of the Agricultural Sector in the Americas (INFOTEC), with assistance from the GFAR.
- Meeting on information systems held in Rome and the establishment of links between the Global Electronic Forum on Agricultural Research (EGFAR) and INFOTEC.
- Meeting with the Web-based Information System for Agriculture Research for Development (WISARD), the EGFAR and the World Agriculture Information Centre (WAICENT).

- Implementation of the INFOTEC portal: http://www.infotec.ws.

Studies of successful cases related to public and private networks and alliances (line 8)

- Case studies on PRECODEPA, RELACO, PROMECAFE, PROCISUR, SIAGRO, FONTAGRO, DIRECT PLANTING SYSTEMS and COFUPRO (with assistance from the GFAR).
- Dissemination of information on FORAGRO and its products
- Publication of a brochure (English and Spanish).
- Establishment of the web site: http:// www.iica.int/FORAGRO.
- Publication of documents, electronic forums, press releases.

Consolidation of the Executive Committee and the Technical Secretariat (Resolution No. 327 of the IABA)

- The Technical Secretariat was set up at IICA, under the aegis of the Directorate of the Area of Science, Technology and Natural Resources.
- Contributions in the form of human resources, seed money and IICAís infrastructure (Headquarters, Regional Centers and Cooperation Agencies in the member countries).
- • Meetings of the Executive Committee of FORAGRO held in Brasilia (1998), Costa Rica (1999) and Mexico (2000).

Hemispheric Dialogue: Mexico 2000 Meeting "Agriculture with Knowlwdge" and the Resulting Declaration

At the first meeting of FORAGRO in the third millennium, the participants discussed the strategic importance of agriculture and the rural milieu for the development of the Americas and, in that light, the incorporation of knowledge, science and the technology within a framework of equity and the sustainability of natural resources, in order to ensure the well-being of the population. Specifically, the participants focused on the following:

a. The renewed role of agriculture and its strategic function, with emphasis on policies, institutions, capabilities and resources that can be tapped to incorporate knowledge and technological innovation.
b. The contents and elements of a shared vision of the challenges and opportunities for agriculture from the technological standpoint, and how to move forward to create an agenda for the Americas which will help strengthen agricultural research and technology development.

The meeting was divided into four sessions. Each of these included presentations by keynote speakers who dealt with the general aspects of the topics to be covered; distinguished panelists then addressed specific aspects of the presentations. The sessions and presentations were as follows:

Session 1: Agriculture with knowledge: "Towards a shared vision of agriculture and the rural milieu from the technological standpoint: challenges, opportunities and principles."

Session 2: Policies and institutions for technological innovation: "Management of institutional change for agricultural technology development"; "Institutional transformation for technological innovations: trends and changes"; "Institutional innovations in other continents."

Session 3: Partnerships and institutional strengthening for technological innovation: "Technological capabilities and trajectories in the Region and the World"; "From reciprocal cooperation to technology integration"; ìPartnerships for the development of international agricultural research in a globalized world."

Session 4: Financing technological innovation: "The new economy and investment in technology", "Financing of research and technological development in the Americas: methods and sources"; "Orientation and investments of the CGIAR and regional needs."

The meeting generated an intense dialogue and discussions on the above issues. The specific results are outlined in the proceedings of the meeting. The most important general agreement was the Declaration of Mexico 2000 ìAgriculture with Knowledge,î which is reproduced below and is also to be found at http://www.iica.int/foragro/Reunion/Declaracion.asp

ACHIEVEMENTS OF FORAGRO

Innovative, hemispheric mechanisms like FORAGRO take time to develop and consolidate. Despite the short time that has elapsed since its creation, at several international and Executive Committee meetings the Forumís members have described the achievements so far in the following terms:

The members have acknowledged the existence and role of FORAGRO as a forum and mechanism for dialogue on the challenges, needs and the actions required in agriculture from the technological perspective. This has been stated in resolutions adopted by the ministers of agriculture at the IABA meetings held in Chile (1997) and Brazil (1999), and in the Declaration of the Mexico 2000 Meeting "Agriculture with Knowledge", signed by representatives of national, regional and international, public and private institutions, universities, NGOs and producersí associations from 30 western-hemisphere countries.

a. A mechanism has been created that will make it possible to develop a shared vision of agriculture and arrive at a regional research agenda, with the participation of a number of public and private, national and regional stakeholders; for example, discussions on regional research priorities have taken place.
b. Efforts are now under way to identify and update regional research priorities via a participative process involving the national public and private members, the subregional collaborative mechanisms, the regional centers and the regional mechanisms, and interaction between them and the international agricultural research system and the international centers based in the Region mentioned in Section III.
c. The first steps have also been taken to develop a scientific and technological information system; the FORAGRO web site is part of this endeavor, with over 300 hits per month.
d. A vehicle has been provided for fostering debate about the financing of regional agricultural research, notably the case of FONTAGRO.
e. The members of the Forum have data, studies and documents that have served as the basis for discussions and been used as inputs for the argument that agriculture and agricultural R&D need to be repositioned.
f. Thanks to FORAGRO the issue of technology has formed part of, and provided input for, the discussions of the Regional Forum of Ministers of Agriculture, held during the meetings of the IABA.
g. The Forum has been involved, and represented the region, in the process of constructing the Global Research System being promoted

Neither FORAGRO nor any other continent-wide forum is represented officially in the CGIAR. However, the Forumís President and Technical Secretariat attended the Beijing Medium Term Meeting (1999) and the CGIARís International Centers Week (ICW) in Washington (2000). They were actively involved in the working groups, thus contributing to the discussion of global research initiatives that take into account the needs of the region. This development is recent, but nonetheless important. As part of its new strategy, the CGIAR assigned to the

regional fora a strategic role in support of its global agenda, because the Forum makes it easier to take the regional dimension into account when determining priorities at the global level.

Major steps are being taken to articulate actions among subregional mechanisms, regional centers, international centers and regional mechanisms, in order to reach agreement on regional research priorities in areas that are of strategic importance for the Americas (e.g., the competitiveness of the agricultural sector, efforts to combat rural and aggregate poverty, and the sustainable use of natural resources in the Americas). These priorities are being translated into research projects that will be implemented by partnerships or consortia of various institutional stakeholders with capabilities that complement those of the others. This is giving rise to a new approach to multinational scientific and technological research in the Americas. by the GFAR. FORAGRO has undoubtedly made greater progress than the forums on other continents, thanks to the institutional platform that exists in the Americas.