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INSTITUTIONAL REFORM OF AGRICULTURAL RESEARCH AND EXTENSION IN LATIN AMERICA AND THE CARIBBEAN

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Background

The Latin America and Caribbean region (LAC) has been undergoing an evolutionary process in its agricultural research and extension systems in recent years. This transformation of agricultural innovation systems has been explained metaphorically as following the nature of an "intelligent living organism" that must learn and adapt to changes in its environment in order to be successful. What was once a linear process, driven by a top-down action plan where research and advisory services were dominated by government agencies, is slowly being transformed into a network of diverse stakeholders influencing the process of agricultural innovation. Traditionally, the unidirectional process of research and extension has been initiated by an agricultural agenda defined by the central government, for which the national agricultural research institutes (INIA for its Spanish acronym) were tasked with identifying strategies to address these priorities. The research was then implemented and finally its results disseminated to the farmers for adoption. The current incarnation of agricultural innovation systems have been typified by the engagement of a wider set of actors, including universities, farmers, input suppliers and other private sector interests, who offer their unique insights to feed the process of innovation in a practical and demand-driven manner. As such, the concept of "innovation" extends beyond the formal research and development (R&D) to more effectively incorporate learning through experience, which has proven more circular in nature, with the intention of more directly contributing to improved rural livelihoods. On the institutional side, these reforms have led to greater specialization, with policy formulation, financing and implementation being increasingly separated from one another.

The push towards institutional reform was stimulated by numerous external factors, forcing this evolutionary process (See Box 1). After a period of strong support in the 1960s and 1970s, public funding for research and extension activities in LAC began to wane in the 1980s and 1990s. The strained economic context for many countries required the search for more cost-effective and efficient strategies for producing, disseminating and applying new knowledge and information in agriculture. At the same time, the demand for innovation became all the more pressing, as increased global competition required improvements in agricultural productivity. Consequently, many countries in the region in recent years have sought to revitalize their agricultural research and extension systems through a series of

Box 1: Drivers of Reform

The 1990s was a period of significant transition for Latin America and the Caribbean (LAC). After leaving behind authoritarian rule, many LAC countries were embarking on a process of democratization and trade liberalization. These systemic changes resulted in dramatic repercussions in the development of agricultural research and extension systems in the region. Most notably, agricultural innovation systems were impacted by:

- Free trade and globalization, which increased competition and demanded producers to maximize their true comparative advantage;
- Fiscal restraints, due to economic crises, that reduced and demanded more efficient use of public resources;
- Greater role of the private sector in the provision of specialized services;
- Decentralization, with increased responsibilities and resources being devolved to the local level; and,
- Civic participation in decision-making processes at all levels.

These factors stimulated the reform process in the region to allow the agricultural sector to keep pace with the changing demands of its new environment.

institutional reforms, with particular attention given to the sustainability of funding for these services. Reflective of the drivers of reform, the focus has been on the following principles: i) diversification in execution and funding; ii) allocation of funding on a competitive basis; iii) demand-driven financing; iv) empowerment of local communities; and, v) increased private sector participation in implementation of the reform agenda.

A series of case studies from the LAC region, including Brazil, Chile, Colombia, Ecuador, Mexico, Peru and Venezuela, were conducted to review these institutional reform experiences in agriculture and distill lessons learned to further advance agricultural innovation systems in the region. The following summarizes some of the key trends in both agricultural research and extension based on the analysis of these varied country experiences.

Innovations in Agricultural Research

In recent years, competitive science and technology (S&T) funding schemes have transformed the traditional practice of lump-sum government grants for publicly-funded research into a more robust and demand-driven system. The competitive S&T funding schemes have improved the incentive structure of grants for potential grantees, thereby promoting the improved quality of research. The competitive funds for agricultural research have contributed significantly to: i) improved governance; ii) greater diversification of research suppliers; iii) improved client-orientation; and, iv) increased cross-institutional collaboration.

Improved Governance

New rules and norms have taken shape with the introduction of competitive funding schemes in agricultural research and technology transfer activities. Rather than the research priorities being defined almost solely by the national research agencies, the increased participation of other key stakeholders has expanded the decision-making role of private research entities in defining priorities. Researchers and research agencies also have had to adapt to the competitive grant process, and as a result, the quality of research proposals and the management of the resources have improved. This increased competition also has caused national agricultural research organizations to become more agile and results-oriented in order to effectively compete for these limited resources. The competitive funds also have increased the level of transparency and objectivity in the selection process, by requiring that all proposals be reviewed by external, technically competent reviewers, and the final selection is made public. Such processes, however, come with a price as they require a larger overhead to manage and monitor the grants systems.

Greater Diversification of Research Suppliers

Competitive funds allow for the expansion of the supply of researchers, which has resulted in a greater diversity of actors (from both the public and private sectors, including universities, non-governmental organizations (NGOs), producer organizations and other organized village-level communities including women's' groups) competing for these resources. By opening the pool of possible candidates, the awareness and competition for these grants has become more intense, creating greater specialization among institutions based on comparative advantage. As seen in Table 1, the INIAs have faced growing competition from other research institutions, mustering only about half or less of the competitive funding available.

Table 1: The Rise of New Partnerships in Research

Country	Percentage Share in the Distribution of Funding				
	INIA	Other public (research) agencies	Universities	NGOs	Others
Brazil	52	11	30	-	7
Chile	10	15	38	17	20
Colombia	43	4	9	21	23
Ecuador	38	-	37	11	14
Mexico (SAGARPA/ CONACYT)	23	23	53	-	2

Improved Client-Orientation and Participation

Many of the competitive S&T funds have incorporated increased participation of beneficiaries, namely farmers, including women farmers who are often underserved, and other producer organizations, in various aspects of agricultural research, especially in the identification of priorities and sources of financing. The greater attention given to the opinions and involvement of clients in research projects has contributed to a more responsive and pragmatic agenda to address key needs of the producers. In order to more effectively reach their target beneficiaries, many countries, including Brazil, Chile, and Mexico, have adopted more demand-driven approaches for their funding structures (See Table 2).

Increased Cross-Institutional Collaboration

Many competitive agricultural funding schemes have encouraged greater collaboration among research institutions by favoring joint proposals and innovative strategies for partnerships with other key stakeholders, such as farmer associations, NGOs, as well as relevant international counterparts.

Agricultural research systems have made strides in the right direction to be innovative and produce demand-driven research, but the need to keep pace with advancement in related sciences, such as information technology and communications, has lagged. The increased involvement of the private sector could facilitate this process, and consequently, requires particular attention.

Innovations in Agricultural Extension

The failures of agricultural extension services in the Latin America and Caribbean region during the 1980s resulted in dramatic changes in the nature of the extension business. The lack of active involvement of farmers, coupled with inefficiency, due to excessively bureaucratic procedures, poor planning and low capacity levels of human resources, yielded

limited returns. Consequently, the institutional reforms pursued in the region essentially dismantled existing structures, and rebuilt new models to support technology and knowledge diffusion among farmers.

Table 2: Bringing Farmers Closer to the Table

Country	Competitive Fund	Client Orientation and Participation
Brazil	PRODETAB	Innovation needs formulated and prioritized by the steering committee of the fund (mainly government officials) in consultation with stakeholders. Involvement of private sector in project development and implementation is an important selection criteria for funding. Special attention given to bias in allocation of resources towards richer and more dynamic parts of the country.
Chile	FIA	Consultations with farmers and other stakeholders have been conducted at the regional (instead of the national) level. A few small information offices have been opened to improve FIA's regional presence. Project selection remains centralized and in the hands of experts. Most projects selected involve farmer participation.
Mexico	PRODUCE	PRODUCE foundations have been established in all 32 states. Farmers are closely involved at all levels. Farmers have a majority vote on the boards and provide the chairman of the board of the foundations. Farmers are required to co-finance technology transfer projects, principally through in-kind contributions.

Decentralization

Common to the experience of most countries in LAC has been the trend towards decentralization, including that of agricultural extension services. By bringing advisory services closer to its clients, information is readily and easily accessible to farmers and be more tailored to their specific needs (See Box 2). However, the levels of decentralization vary widely from country to country. A single extension model does not work in all instances and for all countries, and the country context defines what works best.

Box 2: Civil Associations for Extension in Venezuela

Venezuela has introduced a new decentralized system of agricultural extension through the creation of locally managed Civil Associations for Extension (or ACEs for its Spanish acronym). The ACEs are legal entities comprised of representatives from the municipal governments as well as beneficiaries of the extension services. The responsibilities have gradually increased from participating in the preparation of the municipalities' annual extension plans, approving these plans, evaluating the performance of the implementing agencies, to finally selecting and directly contracting the implementing agencies. With their increased responsibility in extension activities, the ACEs have become more empowered and a valuable resource, as demonstrated by their discussions with high level officials in the Ministry of Agriculture and the National Rural Development Institute during national budgetary crises. Not only that, they have been able to access additional funding from other government programs.

Client-Orientation

In order to better meet the needs of farmers, extension services in recent years, have adopted a more demand-driven approach by incorporating farmers as active partners in identifying the priorities for advisory services. As such, extension services have extended beyond technical information on agricultural production to also include guidance on a wider range of issues, such as financial and economic concerns, among others. In fact, most countries have geared advisory services more towards market opportunities in response to greater trade liberalization. In Chile, for example, extension agencies offer each farmer assistance in developing a business plan to support the economic viability of their farm. Over the course of approximately four to five years, that farmer will receive continuous and intensive assistance to facilitate this transition.

Co-financing

Co-financing of extension services is becoming more commonplace in the LAC region, yet there are important distinctions that define what should be paid for and who should pay. For example, specific advice provided to individual clients would suggest that the service is a private good. At the same time, the adoption of environmentally-friendly technologies may be more in the common good, suggesting the need for public financing. The ability to pay also should distinguish the level of co-financing. Poor farmers may still receive advisory services for free, at a nominal fee or through in-kind contributions, while wealthier producers may be requested to pay a substantial portion, if not all, of the cost of the service. Through the Peruvian Agro-Innovation and Competitiveness project (INCAGRO), for example, the Government has sought to create or strengthen an agricultural advisory services market by paying up to 75 percent of project costs through competitive funds, while requiring the direct beneficiaries to pay or mobilize the remainder, thereby creating a culture of payment for demanded services. Payment, at least in part, by farmers to receive advisory services, will likely make services more client-oriented, and better identify demand and manage quality control of services.

Outsourcing

A characteristic of recent agricultural extension reforms in the LAC region has been the outsourcing of advisory services to NGOs, farmer organizations, private businesses, etc. Generally, public resources are used to fund competitive contracts of local service providers of extension services. This requires the transition from a highly centralized and integrated structure to a clear separation among the policy, priority setting, and implementation entities within the government. Venezuela has demonstrated a new model for decentralized and demand-driven extension services. The municipal ACE offices contract extension services, mainly from private firms and NGOs, which has increased the ability of beneficiaries to choose service providers that best meet their needs. Other countries have followed similar models with

increased private sector participation. Consultations with farmers as well as the use of market mechanisms have supported the definition of service priorities by users of advisory services. Outsourcing also demands considerable organizational and managerial capacity within the government. Clear and transparent procedures and regulations governing the bidding and selection process, as well as monitoring and evaluation of the contracts, are critical to successful outsourcing schemes.

Future Trends and Challenges

Trade Liberalization

The rise of free trade agreements in the region has stimulated greater demand for agricultural innovation. Agricultural research and extension services are increasingly shaped by market demands for improved quality, cleaner or more specialized (e.g. – organic, eco-friendly) production. Producers are more market-oriented, and consequently, are requiring the same of national innovation systems, and consequently, putting more demands on national innovation systems.

Fast Pace of Technology

Science and technology are rapidly evolving, particularly in the areas of telecommunications and biotechnology. New information and research quickly replace the knowledge of yesterday. As such, countries face increased pressure to stay on the cutting edge of innovation to remain competitive. The development of human capacity proves paramount to staying ahead of the curve.

Sources of Funding

Traditional funding sources for public research and extension systems have a continued and well-justifiable role to play to meet the needs of the rural poor. The competitive grant schemes, which have proven to be efficient funding instruments in the LAC region, need to be complemented with a sustained level of public funding, as they generate innovation of a public good nature. At the same time, there are various opportunities to explore alternative or additional sources of funding. For example, resources generated through the use of intellectual property rights, such as patents, trademarks, or plant breeders' rights, could be reinvested into the public research system. Not only that, as agriculture has demanded a broader range of innovations, resources from other sector ministries invested in innovation has impacted on agriculture. This, in turn, has resulted in greater integration of agriculture into the broader national S&T system.

Sustainability of Agricultural Institutional Reform

Conceptually, the sustainability of agricultural institutional reform has to be driven by a concerted effort by all stakeholders towards a demand-driven way of thinking about agricultural innovation systems. The agricultural institutional reforms discussed above are sustainable only when there is broad participation and investments from both the private and public sectors. The roles of the various stakeholders must be clear and concretely defined in order to secure their effective engagement.

Policy and Institutional Framework

Agricultural research and extension systems have had to adapt and modernize to confront the challenges of rapidly changing agricultural markets, and turn them into opportunities. To achieve institutional and technical innovations, concurrent and supportive modifications in the policy framework are needed in the national context. For example, countries must establish proactive policies to capture potential "spill-ins", in order to facilitate the adaptation of technology and information developed elsewhere in the world.

Amongst those challenges mentioned above and the lessons learned from two decades of reforms in agricultural research and extension is that institutional experimentation and change is a permanent fixture. The process of innovation has evolved from a linear to a circular approach, where the "feedback loop" encourages learning from various sources and through all stages of the process. To meet the overall challenges posed by these changes, new partnerships, rules and regulations, and new forms of innovation are required, and the adoption of an innovative system perspective is the way forward.

Notes

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