

INCAGRO: Developing a Market for Agricultural Innovation Services in Peru

John Preissing, Food and Agriculture Organization of the United Nations (FAO)

SYNOPSIS

The INCAGRO project seeks to establish a national agricultural science and technology system that is decentralized, pluralistic, demand-driven, and led by the private sector. The project achieves this objective by strengthening the market for agricultural innovation services, increasing strategic competencies in agricultural research for development, and promoting the institutionalization of policies, information, and the quality of innovation services. The most notable innovation of INCAGRO was the emergence of a demand-driven market for agricultural innovation services that was more extensive and inclusive than before. This achievement came about as a result of empowering clients to formulate, cofinance, regulate, implement, monitor, and evaluate extension services through the mechanisms and tools offered through two competitive funds. One fund increased the demand and supply of extension services through competitive bidding, and the other expanded the number and quality of extension providers. Another innovation of INCAGRO is that it provided effective national yet decentralized support through regional offices and a central headquarters. The potential long-term impact or sustainability of the model has not been established (more care is needed to document ex post impacts), but it is clear that with appropriate backstopping farmers can become authentic drivers of agricultural extension systems. The competitive grant funds owed their success to transparent policies and rigorous selection and monitoring. A small staff functioning as agricultural innovation brokers throughout Peru promoted efficiency and effectiveness within the agricultural innovation market. Organizational development is needed to work with underserved groups (and also larger groups of farmers to decrease administrative costs). The emphasis must shift to developing a more sustainable system based on private cost recovery, funding partners, and government support.

BASIC PROJECT DATA

The Innovation and Competitiveness Program for Peruvian Agriculture (INCAGRO, Innovación y Competitividad para el Agro Peruano) contributed to the development of a market for agricultural innovation services by paying close attention to how demand for such services is generated and how those services are supplied. INCAGRO has led to technical innovations that bolstered production and productivity and institutional innovations that fostered potentially sustainable models for delivering innovation services. INCAGRO's primary partner has been the Ministry of Agriculture and the national agriculture research and innovation institute (Instituto Nacional de Innovación Agraria) (financing details are shown in box 3.33).

Box 3.33 Sources of Support for the Innovation and Competitiveness Program for Peruvian Agriculture (INCAGRO)

The first phase of the INCAGRO research and extension program (November 1999–January 2005) was financed through a World Bank Adaptable Program Loan (US\$9.6 million), the Government of Peru (US\$1.44 million), and local counterparts (US\$2.78 million), for a total of US\$13.82 million. The second phase (October 2005–December 2010) was financed through a second Adaptable Program Loan (US\$25 million) in addition to US\$6 million from the Government of Peru and US\$12 million from local counterparts, for a total of US\$43 million. As of this writing, financing for a third phase remains under review by the Government of Peru and the World Bank.

Source: Author, based on INCAGRO project documents and World Bank 2005.

CONTEXT

Peru's public extension services grew considerably from the mid-1950s to the mid-1980s, but in the years that followed, a range of factors led to their decline. The number and range of services supplied by Peru's public extension system became financially unsustainable owing to government financial limitations, privatization trends, and the inhibiting presence of the Shining Path guerilla group (Ortiz 2006). The system was considered too top-down, too supply-driven in its focus on technology transfer, and too centralized. Although large-scale commercial producers could still obtain extension services, small and medium producers came to rely on sporadic support from NGOs. A common concern with the extension services supplied by NGOs was that those organizations were not well integrated with the AIS and its knowledge and information subsystem.

Because the provision of agricultural innovation services to Peru's small and medium-sized farmers was particularly weak, in 1999 the government signed a letter of intent with the World Bank to promote agricultural innovation through the Bank's Adaptable Loan Program in three phases: the establishment of the innovation system; scaling up the system; and a final consolidation phase (presently under discussion). A key feature of the resulting INCAGRO project is the use of competitive funding schemes to promote a market for agricultural innovation services.

DEVELOPING A MARKET FOR AGRICULTURAL INNOVATION SERVICES

INCAGRO's main objective is to establish a national agricultural science and technology system that is modern, decentralized, pluralistic, demand-driven, and led by the private sector. The project's three components are designed to achieve this objective by: (1) strengthening the market for agricultural innovation services; (2) increasing strategic competencies in agricultural research for development; and (3) promoting the institutionalization of policies, information, and the quality of innovation services.

Agricultural technology fund: Competitive grants to improve the demand and supply side of the market for agricultural innovation services

The Agricultural Technology Fund (Fondo de Tecnología Agraria, FTA) has financed projects developed by farmer organizations for support in agricultural extension. Project proposals are based on business plans and use standardized logframes. Independent, three-member panels of

agribusiness leaders rate the proposals and determine which projects will be funded. The panels may also recommend changes in the content or size of the proposed projects. The INCAGRO team receives guidance from the evaluation panels for adjusting proposals with the farmer organizations. The exercise of developing a business plan, submitting proposals for competitive review, negotiating with INCAGRO "innovation brokers," and the follow-up monitoring and evaluation data demonstrates, particularly to farmers, that a positive return can be made on the investment in agricultural innovation services.

Proposals range from using innovation services to improve agricultural production and productivity to using them to improve agricultural products and agroindustry. To date, extension service projects covering 40 annual crops, 26 perennial crops, 10 kinds of farm animals, 11 kinds of fish, and 18 agroprocessing efforts have been funded. Crops include basic food crops as well as export crops, some raised organically.

An important aspect of the FTA model is that farmers own the project. They contract extension providers to complete a specified number of activities. Farmer groups are required to make a financial contribution in cash, plus any in-kind contributions. The cash contribution ranges between 15 and 30 percent of the total costs for extension projects. Farmers must form legal entities to sign contracts and receive government support. To meet these requirements, participants must be willing to collaborate, handle considerable legal paperwork, and have the capacity to manage and implement their projects.

The FTA fund makes it possible for farmer groups to gain organizational and project development skills by contracting an "ally" (*aliado*), a private individual or a public or private agency, to assist in formulating the project proposal, developing the corresponding business plan, identifying the right extension supplier, and managing project implementation on behalf of the farmer group (box 3.34 provides an example from the project). An ally is a new but critical innovation in the development of a functioning market for extension services. (For more on this concept, see the discussion of innovation brokers in TN 4.)

Competitive funds have expanded the market for extension service providers through various means. Producer organizations have hired their own extensionists, contracted individual private extension providers, signed agreements with NGOs, and partnered with cooperatives for the provision of extension services. The FTA guidelines for project proposals support a more holistic approach to agricultural innovation by including collaborating entities in the project proposal, such as private input and marketing firms in the

Box 3.34 An Ally Broadens Farmers' Skills to Articulate and Meet Their Demand for Innovation Services

Through the Agricultural Technology Fund, three cacao cooperatives in Huánuco Region partnered with an ally to acquire technical assistance and training in a project to increase the productivity of cacao, obtain certification for organic cacao production, and increase the marketing of their organic cacao. CAFÉ PERÚ (Central de Organizaciones Productoras de Café y Cacao del Perú) served as the ally and implementing agency for the project. The cooperatives received market analysis and specific training in cooperative management and product promotion. Starting from zero in the project's first year, more than 1,200 producers had obtained organic certification by the end of year three. Over the same period, cacao productivity rose from 340 to 600 kilograms per hectare, and the cooperative markets some 1,500 tons of organic cacao. Although cacao prices have risen overall, the productivity increases and the switch to organic production enabled producers' returns to rise from US\$ 546 to US\$ 1,543 per hectare. The total project cost was US\$ 158,716 over the three years. INCAGRO staff, along with CAFÉ PERÚ, played an important role in brokering the arrangement between national and local partners.

Source: Author, INCAGRO (<http://www.incagro.gob.pe>).

value chain as well as public agencies. Together, these collaborators form a strategic alliance that is formalized in an Agreement of Participation. The agreement establishes the roles and responsibilities of each member of the alliance, their respective contributions to the project, and the final disposition of any items obtained as a result of the project. The idea is that a strong strategic alliance will raise the probability of success.

In addition to developing extension-based projects, farmer organizations can develop adaptive research projects to verify the technical and economic suitability of research findings in the local setting. The research is participatory, requiring the producer-clients to become involved in identifying problems or opportunities in their fields and contribute actively during all stages of the research. Producers can use the strategic alliance framework to include other actors in the value chain as part of the adaptive research

business plan and use the ally to assist them in implementing the adaptive research project. The research entity can be a public or private institution or an individual with specific competencies required for the project. In this case, the farmer organization must meet 5 percent of project costs.

**Strategic Services Development Fund:
Improving the supply side of the market
for agricultural innovation services**

The Strategic Services Development Fund (FDSE, Fondo para el Desarrollo de Servicios Estratégicos) uses competitive matching grants to promote basic and applied strategic research, focusing on genetic resources, biotechnologies, plant and animal protection, natural resource management, postharvest technologies, and conservation agriculture. It is a demand-driven system (box 3.35 provides examples). These strategic research areas were defined through national as well as decentralized workshops, with actors in the value chain for all of Peru's major agricultural products, and on the basis of in-depth studies.

Projects must involve strategic alliances of at least two major stakeholders in the research. A specific entity must make the proposal and lead the research; collaborating research organizations are encouraged and increase the competitiveness of a proposal. Funding is capped at US\$125,000 per project. Grant recipients must match this funding by 50 percent or more through actual or in-kind resources. National, independent, three-member panels comprised of researchers evaluate proposals for funding.

A second purpose of the FDSE—to improve the supply of agricultural extension services—has proven useful for developing service providers. Competitive grants are awarded to train extension providers to establish extension services; use specific extension methods; learn particular crop and livestock practices, laboratory procedures, and postharvest storage practices; write and analyze business plans; and conduct market analysis. One example of how these funds are used is the training given by the Lambayeque Institute for Agricultural Development to extension providers in how to price and market their services. Another example is the value chains and improvements in value chain training on small livestock in Arequipa by the Institute for Development of the Informal Sector–Arequipa (IDESI, Instituto de Desarrollo del Sector Informal). Extension training providers have included cooperatives with their own staff, universities, national and regional research institutes, and national and regional NGOs. While this training has been useful

Box 3.35 Using Competitive Grants to Fund Multiple, Synergistic Innovation Services for a New Oilseed Crop in Peru

Competitive grants awarded by the *Agricultural Technology Fund*^a and Strategic Services Development Fund^b for nine interrelated projects provided extension services for producers, adaptive research, and strategic research for the development of Sacha Inchi, a native Amazon oilseed plant with high levels of omega fatty acids. The projects involved actors all along the value chain, including the Ministry of Agriculture and Institute of Peruvian Amazon Research, rootstock providers, regional producers' associations, extension providers, and processing and marketing associations. Extension services were offered to community-based or regional producer organizations on improving and

standardizing production, making production of organic Sacha Inchi more competitive, and improving producers' agribusiness skills. These projects reached 450 producers directly. Adaptive research projects included testing and validating two technology packages, one for organic production methods and the other for production and processing methods; these projects had 220 direct and 670 indirect beneficiaries. The four in-depth strategic research projects focused on integrated pest management methods, the identification and improvement of genetic lines of Sacha Inchi, the generation of elite lines, and asexual propagation methods.

Source: Author, INCAGRO (<http://www.incagro.gob.pe>).

a. Fondo de Tecnología Agraria; b. FDSE = Fondo para el Desarrollo de Servicios Estratégicos.

for improving the quality of the extension services market, it represented just 10 percent of the projects. According to the World Bank (2009), this low percentage reflects the small number of providers, the weakness of current and potential training institutions, and a lack of communication between the potential providers and suppliers.

Monitoring, evaluation, and policy development to support a high-quality market for agricultural innovation services

A key activity under the third component of INCAGRO has been to develop an effective project monitoring and reporting system that is agile and robust. For each project, baseline information is collected as part of the business plan proposal required for submitting the requests for funds. During the life of each project, data are collected during the "critical path" steps. At the end of each project, a final financial and technical report is prepared by the project executor. INCAGRO has developed strong, web-based tools (spreadsheets and templates) to aid in this analysis. Data for all of the projects are compiled for analyses by region, crop, type of intervention, gender, and other critical features.¹

Periodic evaluations helped to improve how INCAGRO is implemented. For example, based on initial findings from the World Bank's Independent Evaluation Group, the competitive fund strategy was redesigned to ensure that disadvantaged groups would have greater access to the

competitive funding cycles and have greater success in winning rounds. Stratifying the funds and providing direct assistance to targeted low-income groups were key features of INCAGRO's second phase.

RESULTS AND INNOVATIONS

The most notable innovation of INCAGRO was the emergence of a demand-driven market for agricultural innovation services that was more extensive and inclusive than before. This achievement came about as a result of empowering clients to formulate, cofinance, regulate, implement, monitor, and evaluate extension services through the mechanisms and tools offered by the two competitive funds (J. Ramirez-Gaston, personal communication, April 19, 2010). The demand and supply of extension services was increased through the FTA competitive bidding process, while the number and quality of extension providers increased through the FSDE.

Another innovation of INCAGRO is that it provides effective national yet decentralized support through seven regional offices and a central headquarters. Approximately 60 consultants led or supported the overall project, with an average of four per regional office (this number has fluctuated over the life of the project, based on competitive funding and activity levels). All INCAGRO staff members are consultants rather than permanent government employees. To improve their integration into the ministry, most INCA-

GRO offices are located at stations of the national agricultural research service, unless they are quite distant from a city center.

The impact of the individual projects funded by the grants has been significant, but challenges remain in ensuring a sustainable market for agricultural innovation services. There is no evidence yet that effective, sustained demand for technical assistance services exists or that the capacity to pay for these services (through increased incomes) will suffice to maintain them. In fact, one institutional challenge to the continued market for agricultural extension is the plethora of providers from NGOs and other government projects (some also funded by the World Bank) which provide technical assistance gratis or without competitive funding. Indicators of sustainability are discussed in the benefits section below.

BENEFITS, IMPACT, AND EXPERIENCE TO DATE

Two recent evaluations assessed the impact of INCAGRO (World Bank 2009; Ministry of Agriculture 2009). These and the INCAGRO database provide information on the project's near-term benefits and outcomes, but they are not conclusive on the potential long-term impact or sustainability of the model. Over eight years of INCAGRO's implementation, thousands of farmers demanded and received extension support (table 3.10). Over half of the funds used in the competitive grant projects came from financing provided by farmers and service providers, though much was in the form of in-kind contributions.

The two evaluation studies, using nonrandomized samples due to data limitations, reached positive findings on the project's impact. The Ministry of Agriculture study estimated that 56 percent of producers were likely to adopt the technology innovations, productivity increased by 86

percent, 77 percent of participants were willing to partially pay for extension services, the number of extension and research providers grew by 23 percent, and the diversity and quality of services increased by 25 percent. The same study calculated an internal rate of return between 23 and 34 percent, higher than typical returns for agricultural development projects. The benefit-cost ratio was estimated at two to one, and net present value at US\$15 million (2009). Using a different sample, the World Bank study concluded that the economic rate of return for the FTA projects was 39 percent. The Bank's study also reports that Barrantes et al. (2004) calculated an average economic rate of return of 76 percent for a selected number of extension projects.

Based on these analyses, INCAGRO appears to have been a sound investment and successful project. Equity remains a concern, however: The greatest beneficiaries were medium-to large-scale producers rather than the most disadvantaged producers, including women. Strategies were adopted in the second phase to target more vulnerable groups with separate funding, more support, and training. The results of this effort are not clear, but it has led to a perception that costs per client have become higher. Finally, while it is possible to conclude with confidence that the competitive grant projects represented strong investments, INCAGRO itself must be judged against its broader goal of generating a sustainable model for an agricultural innovation market for extension services.

LESSONS LEARNED AND ISSUES FOR WIDER APPLICATION

Peru now has many new competitive funding schemes supporting agriculture, including at least two other schemes managed by the Ministry of Agriculture and others by science and technology and innovation units. In interviews, these funders credit INCAGRO for much of the success of competitive funding schemes, including their role in developing competitive funding strategies; in building the capacity of producer organizations to follow rigorous funding protocols and implement projects; preparing a cadre of professionals that now manage other funds; developing a pool of competent service providers; and creating competitive funding mechanisms and tools that were directly adopted by the new funding agencies. These are actually some of the strongest signs of INCAGRO's sustainability, if not as a program then as a concept. The long-term sustainability of individual extension service providers is not guaranteed through competitive funding schemes, but

Table 3.10 Measures of INCAGRO Project Output

Projects supported through grants	Outreach and funding
Funding cycles: 36	72,000 farmers reached
FTA extension projects:	580,000 indirectly affected
34% to indigenous groups*	16% indigenous population*
12% to women's groups*	5.5% women farmers reached
1,211 proposals	directly*
330 approved	US\$43.7 million expended
FDSE extension training:	53% from cofinancing
349 proposals	67% used strategic alliances
51 approved	

Sources: INCAGRO (<http://www.incagro.gob.pe>); Benites and Wiener 2008.

* Some of these beneficiaries may be indigenous women.

such schemes may represent a sustainable model for extension provision. Quite possibly, future markets for agricultural innovation services will include multiple competitive funding schemes that seek efficiency and responsiveness on the part of extension providers and effective demand from farmers. This model or market may grow, shrink, or change focus based on who funds it and on what producers demand of it.

In summary, major lessons and issues have emerged from INCAGRO. Farmers can become authentic drivers of agricultural extension systems, but initially they require professional backstopping (by “allies”). Transparent policies and rigorous selection and monitoring procedures are keys to the success of competitive grant funds. INCAGRO’s operating procedures, information systems, and communication strategies were essential. A small number of staff

functioning as agricultural innovation brokers throughout Peru served to promote efficiency and effectiveness within the agricultural innovation market. Further, by basing staff throughout the country, INCAGRO supported national decentralization goals. Smaller projects dominated the market for extension services, incurring higher administrative costs. Organizational development is needed to work with underserved and also larger groups of farmers to decrease administrative costs (IAP 2). While it is important to focus on establishing funding cycles and tools, eventually the emphasis must shift to developing a more sustainable system based on private cost recovery, funding partners, and ongoing government support. Finally, more deliberate care is needed to document ex post impacts, including the careful and limited use of control groups to reach clearer conclusions on INCAGRO’s impact.