Cofinanced Public Extension in Nicaragua

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How effective is agricultural extension? Is it worth the vast sums governments spend to provide it, mostly as a free service, to farmers worldwide? Relatively few studies exist that measure and compare the benefits of extension activities against their costs. In the absence of such data, this pilot activity concentrated instead on demand. Would demand for extension services be high if they were no longer free? The existence of solid demand would presuppose some benefits from the service. Further, might charging for the service actually improve its quality and sustainability?

The pilot program in Nicaragua described here set out to test whether a truly demand-driven extension system aimed at farmers with small- and medium-size holdings could be developed. The principal mechanism was a contribution by the farmer paid as a bonus to the extensionist: the aim was to introduce incentives for providers to improve the service through rewards linked to the quality of their work and to establish direct accountability of extensionist to client. The outcomes showed that the cofinancing concept can be successful. The article describes the design, implementation, and results in the expectation that the lessons learned may be of interest elsewhere.

Governments have spent large sums providing agricultural extension as a free service to farmers—some US$6 billion worldwide in 1988 alone, according to estimates from the Food and Agriculture Organization (1990). Is expenditure on that scale justified by commensurate benefits?

Evidence does exist that extension has increased productivity and income (Birkhaeuser, Evenson, and Feder 1991; Bindlish and Evenson 1993; Bindlish, Evenson, and Gbetibouo 1993), but it is not clear that the investigated cases are typical. Evaluation of the cost-benefit relationships has been surprisingly thin. As Birkhaeuser, Evenson, and Feder (1991, p. 643) observe: "Given that an extension organization exists in almost every country and in view of the large volumes of public funds directed to extension, there is scope for much more..."
empirical work on this issue.” In the same vein, Purcell (1994, p. 10) notes (of World Bank–financed projects) that “quantification of the impact of extension investments in economic terms is normally not undertaken in either ex-ante or ex-post analysis.”

In the absence of data, unsatisfactory results are frequently assumed: “... the poor performance of many public extension programs...” (Umali 1996, p. 2), and “the public sector extension services in which developing countries often at the behest of donors have invested large sums are achieving only limited impact...” (Farrington 1994, p. 1). Nonetheless, there is a common conviction that, whether universally successful or not, extension is the only means available for increasing production “given the limits on land and irrigation and likely breakthroughs in technology, future increases are apt to... come from technological improvements derived from identifying, developing and applying more efficient practices” (Antholt 1994, p. 4).

Another way of deducing the value of extension services would be to find out whether farmers have expressed demand for them. Pressure from interest groups in the form of petitions or strikes when the service has been discontinued would be a fair indicator of demand (Guttman 1980; Rose-Ackerman and Evenson 1985). It is instructive, for example, that no strike took place in Nicaragua in December 1995 when the government announced a substantial cut in public expenditures that would affect the extension budget, whereas the concurrent announcement of a corresponding cut in financial support to universities was met with a very violent strike.

The farmers' lack of reaction suggests limited interest, even apathy toward the service and obviously therefore calls into question its impact on farmers' economic condition. Because failure to react to removal or reduction of extension is common to most extension services in the developing world, it is likely that the services provided often leave farmers’ indifferent to them.

An extension service should be designed to make the outcome of its actions advantageous to both the farmer and the extension institution. Without a stake in the outcome, the extensionist will make little effort: “The amount of effort... depends on the value of a reward and the probability of receiving the reward. The perceived effort and probability of actually getting a reward are, in turn, also influenced by the record of actual performance” according to the Porter and Lawler model of motivation (Koontz and Weihrich 1990, p. 326).

Accountability, which Kessides (1993, p. 17) defines as “the ability of service providers to serve the interests of users and other financiers,” also needs to be built into the design of the service. “Competitive markets meet this criterion of accountability in that the profit-oriented suppliers have an incentive to satisfy the demands of their customers” (Kessides 1993, p. 17). In standard extension organizations, these incentives are lacking. Data on performance are rarely col-
lected, so potential reward cannot be related to any record of performance, and public institutions in any case rarely offer performance-based incentives to their employees. Consequently, little effort is likely to be expended toward satisfying clients' needs.

This article describes the methodology applied in establishing and delivering a demand-driven, accountable, and possibly sustainable extension system. A pilot activity to test the system was carried out in Nicaragua in 1995 in the context of the Agricultural Technology and Land Management Project (ATLMP), financed by the World Bank and the Swiss government. The intention of the project was to make the extensionist accountable to the client through incentives directly related to the client's satisfaction with the service. A key mechanism is the client's power to influence the quality of the service through "exit" and "voice" (Hirschman 1970)—dissatisfied farmers will cease to be clients (exit) or demand a replacement of the service provider (voice). In this design the drop in the extensionist's income that would result from exit or the threatened decline that would result from voice may be expected to induce a corrective or recuperative action. Such mechanisms do not exist in a standard extension organization.

To put the account in context, the article first reports on extension experiences in countries other than Nicaragua in which farmers share in the cost of the service and goes on to provide some background on the extension service in Nicaragua as a whole. Subsequent sections discuss the methodology used in the pilot, the results and lessons learned, and authors' conclusions.

Cofinanced Public Extension in Various Countries

Farmers now share the costs of extension services to varying degrees in several industrial and developing countries, a shift in policy intended primarily to reduce costs (see "The Public and Private Sector in Agricultural Extension" by Dina Umali-Deininger in this issue, pp. 203 to 24).

Wilson (1991) reports on several models of cost sharing in Latin America. In Chile INDAP (the National Agricultural Development Institute) has contracted with consulting firms to provide extension services for a period limited to three to five years. In this plan farmers in higher income categories are required to pay 15 percent of the cost, financed by a credit provided by INDAP. In Mexico farmers at higher income levels are currently required to pay 15 percent of the cost of extension services, a share scheduled to increase gradually until it reaches 50 percent. In the Imbabura region of Ecuador, the extension agents purchase inputs and sharecrop with the farmers; the extensionist's share covers the interest on the loan for the purchase, the risk involved in the enterprise, and a payment for the services provided.
In Colombia responsibility for providing extension has been devolved to the municipalities, financed mainly by the central government with a share covered by the municipality (Garfield, Guadagni, and Moreau 1996). In Costa Rica a pilot project, planned to evaluate trade in extension vouchers, awards vouchers for extension services to farmers on the basis of the type of farm and level of technology; farmers may trade vouchers based on their needs (Ameur 1994). In Argentina groups of voluntarily formed and self-supporting neighboring farmers and ranchers organize to promote their common interests. Each group hires and pays for the services of an agricultural advisor (Garcia Tobar 1996). In China individual farmers or farmer associations contract with research institutions, universities, and individual scientists to provide technical assistance (Ameur 1994).

In Europe cost sharing is common. About three-quarters of the operating extension budget in France is collected at the farm level through direct payments, contributions of agricultural organizations, and other direct and indirect taxes on agricultural inputs and products (Ameur 1994). The U.K. extension agency, which remains partly government-funded, now charges for some services, originally offered free of charge, on a time-cost basis (Dancey 1993; Ingram 1992, pp. 51–58). The Dutch Extension Service began a privatization process in 1993 in which the share of the extension budget to be funded by the farmers increased from nothing in 1993 to 60 percent in 1996; in 1998 farmers are expected to cover 80 percent of the budget (Tacken 1996). Since 1990 extension in Queensland, Australia, has been project-based, with up to 30 percent of the budget funded by the clients. The cost-sharing formula for the cofinanced projects is set in negotiations; the government typically pays fixed costs such as salaries and equipment, while the farmers provide in-kind contributions such as the use of farm equipment, demonstration sites, and livestock (Coffey and Clark 1996).

Extension in Nicaragua

In 1994 agriculture accounted for about one-fourth of Nicaragua’s gross domestic product and employed about one-third of the labor force (Banco Central 1996). The total number of farmers was estimated at some 250,000 (Centro de Investigaciones 1988). Agricultural products, mainly coffee, sugar, and beef, account for as much as three-fourths of the country’s total exports.

Public agricultural extension in Nicaragua dates back to at least 1942, when the U.S. Department of Agriculture under cooperative agreements established two experimental stations in the country (Hernandez 1991). The extension service underwent numerous conceptual and organizational changes over the
years, but at all times remained highly dependent on external financing. Although public extension was funded through the public budget, the government's financial contribution was always limited. In 1996, for example, almost 60 percent of the basic extension budget was financed from external sources (of this, 80 percent was from a World Bank loan and the rest from Canada, Holland, Japan, Norway, Switzerland, and the European Community). Extension activity waxed and waned according to the fluctuations in foreign aid.

The Instituto Nicaragüense de Tecnología Agropecuaria (INTA) was created in 1993 as a semi-autonomous institution, primarily to remove it from political influences in staffing and to define it as a professional organization serving agriculture. It is divided geographically into five regions with its headquarters in Managua. The regions are all located in the west (Pacific) and center of the country where economic and agricultural activity have traditionally been concentrated.

In 1996 INTA employed some 160 extensionists throughout the country, serving some 21,500 farmers in its five regions (INTA 1996). Another 47 extensionists provided service to 5,400 farmers through a private technical assistance (PTA) program cofinanced by the government and contributions from the farmers, who are expected eventually to undertake most of the cost. In total, INTA's various programs reach about 27,000 farmers (about 11 percent of the country's total).

INTA's service is free, with the exception of the program described in this article and the one provided through five private firms in the PTA. Under the PTA program the farmers were to cover some 20 percent of the cost in the first year (1996), and their contribution was scheduled to rise to cover most of the costs of the service within five years. In 1997 no farmer was paying more than 30 percent of the cost. An estimate of the average cost of public extension provision in Nicaragua (based on the INTA budget for 1995) suggests a cost per farmer of $115 a year.

Extension is also provided to a very limited extent by other bodies such as UNICAFe, the coffee growers association; UNAG, an association of primarily small farmers; and numerous nongovernment organizations (NGOs). In December 1995 UNICAFe reported employing fifteen full-time extensionists, while APENN (a national NGO) employed three. UNAG employed only two technicians in 1994, but also fielded a larger number of promoters in their “Campesino a Campesino” (farmer-to-farmer) program. (The promoters have very limited training.) NGOs generally provide extension free of charge. UNAG's program requires the farmers to offer a meal to the visiting promoter. The UNICAFe program is financed through a charge on coffee exports and is in effect a tax on production. Extension services of all types reach only a small proportion of the farmers of the country.
Designing and Planning Cofinanced Public Extension in Nicaragua

In 1994 INTA's budgetary difficulties forced the agency to rethink its relationships with its clients and the way it provided extension services. In particular, the agency thought it necessary to create accountability in the service and to institute payments by farmers that would make it possible to reward extensionists who delivered good results.

The Concept

With those objectives in view, the ATLMP sponsors—the World Bank and the Swiss government—sought to develop a demand-driven extension system. The principal shortcomings of the existing extension service to be corrected were:

- Unclear objectives: extensionists did not have a clear sense of what they were expected to accomplish.
- Poorly motivated workers and management: there were no incentives to produce results.
- No accountability to clients.
- Little consumer interest in obtaining quality service.

The design of a delivery system for demand-driven extension services was based on the following assumptions:

- Extension is an economic input.
- Extension generates new income.
- Farmers, even if poor, will be willing to pay for an input whose expected value is greater than its cost.

The objective of extension in this concept is to help farmers who receive the service to increase incomes derived from agricultural activities by increasing yields, reducing losses in the field and after harvest, reducing costs, improving exploitation of available resources, and designing a better mix of products.

The principal mechanism proposed by the sponsors to achieve the objectives and correct the shortcomings was to charge for the service, on the rationale that payment serves the following purposes:

- Extension staff begin to regard farmers as clients to whom they are accountable.
- When their remuneration is linked to economic results, extensionists have a stake in the farmer's success.
- People are committed to a service they pay for; they are careless of a service they get free.
Promoting the Concept of Cofinancing

When payment for public extension service was first broached in February 1994, the Nicaraguan authorities and the leadership of the major agricultural associations rejected it as unworkable, unfair, and contrary to tradition. Implementing a payment system over such objections would clearly have been impossible, so a discourse with all the various interest groups was initiated to persuade them to withdraw their opposition. Project sponsors approached leading officials in the Ministry of Agriculture and Livestock, the board of directors of INTA, and the leaders of the major agricultural associations individually, in each case presenting the rationale for payment, accompanied by many examples related to the work of the institution being visited. Free discussion generally led to grudging acceptance and finally to agreement. Ultimately, this campaign was so successful that cofinanced public extension is now accepted by all sectors, including the associations of small farmers.

The next step was to determine the reactions of the principal players—the extensionists and the farmers—and to identify, understand, and deal with any reservations and qualms that they might have. Formal and informal discussions with extensionists and other staff in INTA extension districts revealed that extensionists lacked self-confidence and conviction about the effectiveness of extension and its impact on farmers' income. They doubted that any farmer would be willing to pay for it.

To help build confidence and to deepen their understanding of extension objectives and performance, extensionists were invited to participate in group discussions with INTA management and sponsors in their regions. Using actual cases suggested by the extensionists themselves, they were guided on how to identify benefits from their service and to calculate the value of the advice they had given to farmers. Directed questioning helped them think through a process and assign a value to their work. These discussions succeeded in increasing their confidence and reducing opposition to the concept.

At the same time, meetings were held with small groups of farmers throughout the country. Following the same format and process as the meetings with the extensionists, these discussions helped farmers identify some benefits of the extension that they had received and place an economic value on the service. At the conclusion of these meetings, they were asked if they would be willing to pay for a service that increased their income. Although none evinced enthusiasm, in all but one case the farmers agreed that they were. These discussions served several purposes simultaneously: they helped farmers to place an economic value on extension; they showed extensionists (who attended the meetings) that farmers would not reject the idea of payment; and they sent a message to farmers that payment for the service was being considered. These discus-
sions, which set the stage for implementation, were carried out intermittently
over several months before the concept was tested in the field.

Concurrently, INTA management, prodded by the sponsors to reflect on the
probable economic situation in which the institution would no longer have
access to external loans, generally acknowledged that the government could not
maintain funding at the current rate, and that payment by farmers for exten-
sion services might help to fill the gap.

The Field Test

The field test was carried out in 1995 in the postrera season (the second of
Nicaragua's two agricultural seasons: primera, which begins about May; and
postrera, which begins in August). The purpose of the field test was to find out
whether farmers would in practice pay for agricultural extension services—they
had accepted the concept in theory in the previous round, but no one was asked
to "put your money where your mouth is." The objects of the exercise were to
test farmers' reaction, to show that extension has economic value, to gain farmer
confidence by delivering on promises, and to establish the principle that the
service is not free. It was decided to test the principles on four farmer groups in
two regions.

In preparation for the test, a workshop was held with staff from the two
regions, Esteli and Matagalpa. After the concept was presented, virtually all
participants declared that it could never work. Although all had participated in
the earlier discussions, the threat of actual implementation on their own turf
again raised opposition. By the end of the day's discussion, however, there was
actual enthusiasm for the idea and a genuine willingness to test it. The turning
point was the clarification that the extensionists would retain all the money
received from the farmers.

Because farmers would join the program voluntarily, the concept would have
to be "sold" to them. They would have to be convinced that it was to their
benefit to pay for the service. The guiding principles for the test were voluntary
participation, no threats that existing services would be discontinued, negotia-
tion on services to be given and received, and negotiation on price and terms of
payment. Because only these four farmer groups would be paying, the package
offered for payment had to be superior to the package given free of charge to all
other farmers.

The workshop identified potentially interested groups, a short outline of
what they would be offered, and how much they would be asked to pay (table
1). All agreed that the farmers most open to such a program would be those
Table 1. Field Test, 1995: Payment Scale for Major Crops

<table>
<thead>
<tr>
<th>Crop</th>
<th>Payment scale (cordobas per manzana per month)*</th>
<th>Duration of season (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tomatoes</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>Beans</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Maize</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

a. At the time of the field test, US$1.00 = 7 cordobas, one manzana = 0.7 hectares.

Source: Data collected by INTA staff and processed by the authors.

who raised a cash crop, who had access to some credit, and whose yields could readily be increased by better farm management.

The prices set had to meet the following criteria: the sum had to be one to which a farmer would not be indifferent; and the total income expected (the sum of all payments) had to be a sum that would constitute an incentive to an extensionist. The prices were unrelated to either costs or benefits. Rather they were based on the sum paid monthly by low-income families for electricity. This was felt to be an indicator both of their ability to pay and of how much they would be willing to pay for a service promising some benefit.

Each region was permitted a great deal of latitude on the services offered and the rate charged. Cost recovery was not an objective either of the test or of the concept in general. Each region was free to propose any program within the scope that INTA thought to be attractive to the farmers, provided that the services offered did not go beyond those that extension traditionally provides. The essence of the package offered was greater frequency of visits of extensionists to farmer groups and included the right to a few visits to the plots of individual farmers. Extensionists would not offer advice on what crops to grow unless specifically requested, and not before gaining the confidence of the farmers by helping them to achieve better results than they traditionally obtained.

The selling process consisted of meetings with the farmer groups originally targeted, as well as others added later. The farmers accepted the idea of payment with relative ease. They generally claimed to have no access to credit, however, and maintained that without credit they would be unable to pay for the service; it soon became clear that they would not participate without being given access to credit. In Matagalpa the groups approached were also targeted by a local NGO dedicated to the export of nontraditional crops. This NGO offered intensive extension along with credit, land preparation, and marketing. The farmers rejected INTA's offer as inferior. No alternative groups were located in Matagalpa, probably because the INTA team felt weak in comparison with the "competition" and was demoralized by the failure of its first attempt.
In Esteli the farmers also conditioned their participation in the scheme on access to credit. INTA's regional director took the initiative of directing the funds for seed production, which he had available from another NGO, to groups of farmers that would agree to participate in the test. Two groups accepted the offer and entered into an agreement with INTA.

The agreement was basically between the farmers and the extensionist: INTA backed it. The farmers wanted a weekly visit to the group (rather than the customary biweekly visit) and asked for visits to individual fields on demand. Because the groups were centrally located and readily accessible, this request was easy to accommodate. INTA required the extensionist to devote some personal time to this service, including visits on Saturdays and Sundays.

Payment would be on the basis of the crop rates suggested above (see table 1), but only half the sum collected would go to the extensionist. The farmer groups had decided to use this opportunity to build up their own capital by retaining the other half in a fund. They also requested that payment be based only on some of their crops; they did not feel the need for advice on the farm as a unit. These changes were not desirable but were approved to get a field test of the system up and running.

A meeting to evaluate the experience was held by INTA managers and the sponsors at the end of the season to hear reports by the farmers and the extensionist. The farmers reported that the extensionist had visited even more than once a week. They also readily acknowledged that the test had been a success and that they were satisfied with the results. The most notable improvements were in tomatoes. They reported harvesting about 800 boxes of tomatoes per manzana instead of the 600 boxes they traditionally harvested, a difference they ascribed to extension. The extensionist, however, was not content with the return for his efforts. He had devoted a great deal of his own time to the test and had assumed that he would earn a higher sum than he ultimately did—the equivalent of about one week's salary for the three-month season (table 2). He acknowledged, however, that the field test was a preparatory phase and

<table>
<thead>
<tr>
<th>Crop</th>
<th>Area (manzanas)</th>
<th>Rate (c/robas/month)</th>
<th>Duration of season (months)</th>
<th>Total paid (c/robas)</th>
<th>Paid to extensionist (c/robas)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tomatoes</td>
<td>12</td>
<td>10</td>
<td>3</td>
<td>360</td>
<td>180</td>
</tr>
<tr>
<td>Beans</td>
<td>18</td>
<td>6</td>
<td>3</td>
<td>324</td>
<td>162</td>
</tr>
<tr>
<td>Maize</td>
<td>6</td>
<td>4</td>
<td>4</td>
<td>96</td>
<td>48</td>
</tr>
<tr>
<td>Total</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>780</td>
<td>390</td>
</tr>
</tbody>
</table>

n.a. Not applicable.

Source: Data collected by INTA staff and processed by the authors.

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showed promise for the future. He was also proud of the reputation he had gained among his clients and of his status among his peers.

The farmers were asked how they had arrived at the decision to pay the sum of 5 córdobas per manzana per month and whether they did not feel that a higher sum was justified. They replied that they were too poor to spend more on the service. Upon further questioning, they reported that the average price received was about 15 córdobas per box of tomatoes, giving a gross additional income of about 3,000 córdobas per manzana. They calculated their additional costs (mainly for boxes and transportation) at some 1,800 córdobas, leaving them with a net income of about 1,200 córdobas per manzana. They had earned this sum in return for an expenditure of about 15 córdobas per manzana (three months at 5 córdobas). When presented with this calculation, they were surprised at the extent of the economic benefit and agreed that it was far in excess of what they had paid.

In proving that the approach was feasible, albeit on a very small scale, the positive results of the test gave a strong impetus to the program. When it was announced that the trial would be expanded and a pilot carried out during the following season on a larger scale, extensionists throughout the country were eager to participate.

The Pilot

The pilot program was launched in the primera of 1996, after completion of the test, building on the lessons learned to apply the concept on a larger scale.

Strategy

Before broadening the scope, a strategy had to be developed for introducing cofinancing into forward planning for public extension as a whole. The plan defined three classes of service: free (traditional); participative (cofinanced, carried out by INTA's staff); and private (cofinanced, carried out by private consultant firms). The essence of the strategy was that future extension would end up in one of the two cofinanced modes after a process of transfer from free to cofinanced extension. Free extension was to be limited to a maximum period of two to three years, after which the farmer would either transfer to cofinanced extension or would cease to receive the service.

Free extension was to be viewed as a "free sample" to interest new clients in the service and would at any time in the future be only a small percentage of the total clientele. For current clients, free extension would also be phased out and the service either transferred to one of the cofinanced modes or discontinued,
but a decision as to the date was postponed until more experience with the concept could be gained.

**Tools**

Extensionists were trained to use tools developed for use in the pilot, principally the preparation of contracts, forward planning of both farm and extension activities, measurement of results, and monitoring of progress.

The *contract* formalizes the arrangement between a group of farmers and the extensionists: what services are to be provided at what price. The contract establishes the seller-buyer relationship between the extensionist and the farmer. It contains an outline of the services that a group of farmers might want and the price thought acceptable. It is meant to be revised after negotiation.

*Rapid analysis* of the farmers' resources and constraints, to be based on information about the fundamental features of the farm, gathered using a standard data collection form, is a tool for extensionists to use in planning and advising farmers.

*Farm planning* in this context does not imply a farm plan in the normal sense; rather, it is a means of setting objectives in order to create a "promise" on the part of the extensionist and an "expectation" on the part of the farmers, as well as a benchmark for measuring the success of the service. The form used places the "traditional" yield and the "promised" yield side by side.

*Plans for the extensionist's activities* must be relevant to the farm plans and not general to the extension service. On this basis the extensionist selects and plans the subjects to instruct in, the types of field demonstrations relevant to the farmer groups, and where and when to carry them out.

The farmers themselves must *measure results* because the extensionist cannot be present at all harvests and all times of production. Measurement by the farmer includes both products sold and those used in home consumption and must be continuous or intermittent, depending on the crop. Extensionists are advised to check regularly to see whether the forms are being filled in and whether the farmer has encountered any difficulties in this activity. After all harvesting is concluded, the farmer and extensionist should jointly estimate the value of increased yields, calculate and deduct any additional costs associated with the recommendations, and finally calculate the outcome.

An intense *program of support and monitoring* was prepared, to be carried out by the pilot promotion team and a person assigned to provide support in each region, selected because of his or her dynamism and enthusiasm for the program. This support person would maintain regular contacts with the extensionist and the groups. The promotion team would visit each region once a month, and the support persons from all regions would congregate once a month in a
different region, coinciding with one of the promotion team’s visits. The meetings would include sessions with the extensionists and with the farmer groups. In addition a workshop was programmed for the end of the season.

Results

Eighteen groups signed up to participate in the pilot by early 1996. Of these, seventeen remained and received extension services throughout the season (the eighteenth dropped out because of early flooding of its fields). Some individual farmers who had misinterpreted the payment for extension as meaning that it was a credit program, dropped out of the groups. Ultimately, 280 farmers were served. Several changes and adjustments occurred during the pilot. Many of the agreements changed after signing, partly because early losses of crops obliged the farmers to revise their original farm plans late in the season. Although such revisions may be common, their design and the provision of advice for the new plans constituted an important part of extension work. Another element of the original design, the rapid analysis form, was dropped because it proved so time consuming to complete.

A breakdown of the area grown by different crops and by farmer groups is shown in table 3; the results, reported in terms of yields and net benefits to farmers, are presented in tables 4 and 5; and sums payable to extensionists and the actual payments (by June 1996) appear in table 6.

Table 3 shows that more than 50 percent of the area was devoted to beans, a crop grown by ten of the seventeen farmer groups. The three major crops—beans, corn, and rice—covered 85 percent of the total area of the pilot.

Table 4 shows the data on basic crops reported by twelve of the seventeen groups. Four others specialized in cattle raising or, less commonly, in vegetables.

<table>
<thead>
<tr>
<th>Crop</th>
<th>Percentage of area</th>
<th>Number of groups with this crop</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beans</td>
<td></td>
<td>54</td>
</tr>
<tr>
<td>Corn</td>
<td></td>
<td>22</td>
</tr>
<tr>
<td>Rice</td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>Tomatoes</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Sesame</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Sorghum</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Other crops</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Livestock</td>
<td></td>
<td>n.a.</td>
</tr>
</tbody>
</table>

n.a. Not applicable.

Source: Data collected by INTA staff and processed by the authors.
### Table 4. Net Incremental Income by Regions and Crops

<table>
<thead>
<tr>
<th>Region/group</th>
<th>Number of farmers</th>
<th>Crop</th>
<th>Area (manzanas)</th>
<th>Yield (quintal/ha)</th>
<th>Farm incremental yield (quintal)</th>
<th>Price per unit of yield (c/box)</th>
<th>Gross incremental income (c/box)</th>
<th>Incremental production costs (c/box)</th>
<th>Net incremental income (c/box)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-1/Quetzalteg</td>
<td>23</td>
<td>Corn</td>
<td>6</td>
<td>20.0</td>
<td>10.0</td>
<td>-60.0</td>
<td>55</td>
<td>-3,300</td>
<td>-690</td>
</tr>
<tr>
<td>A-2/Masaya</td>
<td>27</td>
<td>Beans</td>
<td>27</td>
<td>9.0</td>
<td>10.0</td>
<td>27.0</td>
<td>220</td>
<td>5,940</td>
<td>4,430</td>
</tr>
<tr>
<td>A-2/Carazo</td>
<td>16</td>
<td>Beans</td>
<td>15</td>
<td>12.0</td>
<td>9.8</td>
<td>-33.0</td>
<td>500</td>
<td>-16,500</td>
<td>1,530</td>
</tr>
<tr>
<td>A-2/Ticuanote</td>
<td>16</td>
<td>Beans</td>
<td>18</td>
<td>9.0</td>
<td>13.9</td>
<td>88.2</td>
<td>250</td>
<td>22,050</td>
<td>3,714</td>
</tr>
<tr>
<td>A-2/Cardenes</td>
<td>19</td>
<td>Rice</td>
<td>26</td>
<td>64.0</td>
<td>68.9</td>
<td>127.4</td>
<td>140</td>
<td>17,836</td>
<td>11,401</td>
</tr>
<tr>
<td>B-3/Jalapa</td>
<td>24</td>
<td>Beans</td>
<td>24</td>
<td>8.0</td>
<td>6.0</td>
<td>-48.0</td>
<td>180</td>
<td>-8,640</td>
<td>2,760</td>
</tr>
<tr>
<td>B-3/Ocotal</td>
<td>25</td>
<td>Beans</td>
<td>4</td>
<td>6.5</td>
<td>10.0</td>
<td>14.0</td>
<td>150</td>
<td>2,100</td>
<td>137</td>
</tr>
<tr>
<td>B-3/Condega</td>
<td>22</td>
<td>Beans</td>
<td>15</td>
<td>8.0</td>
<td>3.0</td>
<td>-75.0</td>
<td>150</td>
<td>-11,250</td>
<td>3,375</td>
</tr>
<tr>
<td>B-5/Barro</td>
<td>31</td>
<td>Beans</td>
<td>21</td>
<td>12.0</td>
<td>8.6</td>
<td>-71.4</td>
<td>200</td>
<td>-14,280</td>
<td>5,607</td>
</tr>
<tr>
<td>B-5/Cebadilla</td>
<td>15</td>
<td>Beans</td>
<td>17</td>
<td>8.0</td>
<td>5.3</td>
<td>-45.9</td>
<td>200</td>
<td>-9,180</td>
<td>3,288</td>
</tr>
<tr>
<td>C-6/Boaco Viejo</td>
<td>16</td>
<td>Beans</td>
<td>12</td>
<td>15.0</td>
<td>19.1</td>
<td>-49.2</td>
<td>200</td>
<td>9,840</td>
<td>143</td>
</tr>
<tr>
<td>C-6/La Libertad</td>
<td>9</td>
<td>Corn</td>
<td>2</td>
<td>20.0</td>
<td>18.7</td>
<td>-2.6</td>
<td>80</td>
<td>-208</td>
<td>400</td>
</tr>
</tbody>
</table>

**Note:** Corn, beans, and rice only.

**Source:** Data collected by INTA staff and processed by the authors.
One group in Region C-6 did not provide information on its results. Of the sixteen groups reporting, eight recorded net gains and eight net losses. Three of the groups that had losses, reported increased income in one or more of the crops. Table 5 summarizes the results reported by all groups by region.

The quality of the data received from the fields was questionable. Some data on yields and income were inconsistent and had unexplained variations among farmers. For example, in some cases the yields and the net benefits with extension were reported to be lower than without this service. This would be a very unfortunate fact indeed, if true. But, because almost all farmers reported their satisfaction with the service and signed contracts for the following season, it could not have been true. The more likely conclusion is that farmers were not aboveboard, overestimating traditional yields and underreporting actual yields; they probably also inflated their traditional costs of production. The potential for such misreporting revealed a weakness in the reporting system as well as a professional weakness among the extensionists, who were themselves unfamiliar with traditional yields and unable to estimate visually the expected yields by observing the fields during the season.

Some data on drop in yields, however, were correct. On some farms a variety of beans was promoted that was not suitable to the prevailing conditions. Also, in some areas flooding and late planting because of heavy rains clearly affected the yields.

The farmers paid more than 60 percent of their fees within a reasonable time (June 1996, see table 6), indicating that they were willing and able to pay. Recovery might have been higher, but many extensionists were reluctant to collect, feeling uncomfortable with this activity. Most of the remaining farmers ultimately paid their outstanding balances, because all were informed that ful-

<table>
<thead>
<tr>
<th>Region</th>
<th>Number of farmers</th>
<th>Area of crops (manzana)</th>
<th>Number of livestock</th>
<th>Value of difference (c/rdobas)*</th>
<th>Incremental production costs (c/rdobas)*</th>
<th>Net incremental income (c/rdobas)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-1</td>
<td>55</td>
<td>21</td>
<td>95</td>
<td>-13,710</td>
<td>-170</td>
<td>-13,540</td>
</tr>
<tr>
<td>A-2</td>
<td>78</td>
<td>88</td>
<td>—</td>
<td>28,808</td>
<td>21,389</td>
<td>7,419</td>
</tr>
<tr>
<td>B-3</td>
<td>75</td>
<td>77</td>
<td>—</td>
<td>22,457</td>
<td>14,789</td>
<td>7,668</td>
</tr>
<tr>
<td>B-5</td>
<td>46</td>
<td>77</td>
<td>—</td>
<td>-38,488</td>
<td>16,062</td>
<td>-54,550</td>
</tr>
<tr>
<td>C-6</td>
<td>26</td>
<td>35</td>
<td>362</td>
<td>114,288</td>
<td>14,836</td>
<td>99,452</td>
</tr>
<tr>
<td>Total</td>
<td>280</td>
<td>298</td>
<td>457</td>
<td>113,355</td>
<td>66,906</td>
<td>46,449</td>
</tr>
</tbody>
</table>

a. Difference between previous season yields (primera 1995) and postera's 1995 yields, multiplied by market price.

b. Additional production costs in the postera 1995 compared with the situation before the test (i.e., primera 1995).

Source: Data collected by INTA staff and processed by the authors.
Table 6. Payments for Extension Services, Postrera 1995

<table>
<thead>
<tr>
<th>Region</th>
<th>Total agreed (cèrdobas)</th>
<th>Total paid by June 1996 (cèrdobas)</th>
<th>Percentage paid</th>
<th>Range of percentage paid by group</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-1</td>
<td>3,258</td>
<td>1,457</td>
<td>44.7</td>
<td>20.7-61.5</td>
</tr>
<tr>
<td>A-2</td>
<td>2,056</td>
<td>1,594</td>
<td>77.5</td>
<td>47.8-100.0</td>
</tr>
<tr>
<td>B-3</td>
<td>3,970</td>
<td>2,820</td>
<td>71.0</td>
<td>0.0-100.0</td>
</tr>
<tr>
<td>B-5</td>
<td>1,410</td>
<td>1,410</td>
<td>100.0</td>
<td>—</td>
</tr>
<tr>
<td>C-6</td>
<td>1,061</td>
<td>158</td>
<td>14.9</td>
<td>0.0-27.0</td>
</tr>
<tr>
<td>Total</td>
<td>11,755</td>
<td>7,439</td>
<td>63.3</td>
<td>—</td>
</tr>
</tbody>
</table>

— Not available.

Source: Data collected by INTA staff and processed by the authors.

filling their payment agreements was a condition for receiving the service in the following season.

Lessons Learned

Several preliminary lessons drawn from the pilot were applied in the subsequent season and may guide other countries interested in similar application of cofinanced extension.

The System Works

Farmers agreed to pay for the service, and most of them paid as agreed. They uniformly voiced their satisfaction in discussion with INTA staff and the pilot sponsors and voted with their feet by signing new contracts for the following season. The most common comment was that the extensionist was much more attentive and responsive to their needs than in the past. This had indeed been the primary objective of the concept.

The additional income extensionists earned in the course of the pilot instilled both a desire to seek out more clients and to serve existing clients better. A notable expression of this spirit was pressure by the extensionists to decrease the number of days devoted to training (which was reduced by management to a maximum of two days per month), whereas previously they had pleaded to be included in all training and workshops offered regardless of how this would affect their visits to the farmers.

The principal indicator of the success of the method is that all seventeen original groups have continued and by the postrera of 1996 (one year after the
testing of the pilot was initiated), the number had increased to 135 groups with 1,737 farmers.

The Process of Persuasion Is Critical

The sponsors proposed a concept that held high promise but that was also contrary to tradition and unpopular politically. Identifying the sources and reasons for the opposition, understanding the nature of the objections, resolving problems, and making allies of the opponents, all before any action was taken, were crucial steps to success. Actors at all levels, including farmers, participated in discussions and in developing the practical aspects and tools of the system. Many of their ideas were accepted and integrated, even when serious doubts existed about their viability or desirability, as long as they were not contrary to the basic principles. As long as the idea did no damage and could be corrected later, the support of the participants was considered to be paramount. Care was taken to ensure that the staff never felt that the concept was being imposed on them but rather that they were part of it.

It was also essential to avoid pushing too hard or too fast. Ideas are absorbed gradually, and even when understood intellectually, they are not truly assimilated until they become reality. Quantitative goals projected more than one season ahead appeared too outlandish and only indicated to INTA's staff and the farmers that the speaker did not have his feet on the ground. In the event, later goals were easily achieved and even surpassed.

The deep commitment and conviction of the sponsors and their perseverance was another element critical in the success. A high percentage of the time devoted to this pilot went into jawboning. Sponsors resisted the temptation to rush headlong into field testing, delaying implementation until the entire stage was properly set.

Start with a Comprehensive Strategy

From the outset the philosophy underlying the pilot was clearly articulated and concentrated on a small number of principles. Although the pilot was small, the sponsors and INTA management regarded it as a test of the methodology of the future, and consequently of interest to all—never as an activity affecting only a few staffers and a few clients. INTA management agreed to a strategy for full implementation of the concept, even while the pilot was little more than an idea. Thus the pilot was always part of the big picture and staff members knew where they were heading.

Staff at all levels participated in discussions on the whys and wherefores of the approach. No one was asked to do anything without first receiving explana-
tions of the logic behind it. Furthermore, detailed tools for all the major stages were developed and training given in them, even though the pilot was small. Many more staffers were trained than would actually participate in the pilot.

Key Issues

The pilot proved that the concept was feasible and accomplished its purposes. But the pilot also highlighted problems and issues that needed to be dealt with in order to refine the concept and make it more generally applicable.

Ability and willingness to take initiative and to adapt. Although informed that the typical contract was a model and had to be adapted to the specific agreement negotiated between the extensionist and the farmer group, virtually no extensionist modified a contract. More accustomed to following instructions than to adapting to the specific needs of their clients, they retained the original form down to “...visiting every other Thursday...,” not even changing the day. This is a big problem, with implications far beyond its manifestation in the issue of contract modification, and requires both better staff selection and training to make extensionists capable of showing more initiative.

Pricing policy, price of service, and timing of payment. The matter of pricing was approached pragmatically and allowed for many variations. The only firm requirement was that some payment be made for the service. There was never any intention to charge by cost of service. The sponsors had set out to test whether farmers would pay for extension, and whether this would make extensionists responsive to their clients, not whether the full cost could be recovered from the clients. It was felt that realistic prices could be defined only after sufficient experience had been gained, and any price set at the outset would be no more than a “bargaining price.” Payment was set by crop and area during the course of the growing season, because the growing season sets the cycle of farm expenditure and earning and the policy would therefore be explicable and acceptable to farmers; farmers never questioned this policy.

Payment was divided into two categories: by crop and time (payable throughout the season); and as a percentage of increased yield (payable at the end of the season). The payment as a percentage of incremental yields is problematical, because the greater the increase in yield, the greater the payment. The farmer then has good reason to withhold information on higher yields and, because the extensionist cannot be present at every harvest, a potential for misreporting is introduced. The sponsors agreed to include this form of payment despite reservations; in the event, this was probably partly responsible for the misreporting of yields.
Pricing the products also presented some problems. Many products are sold over a period of time during which prices vary; the farmer does not necessarily keep accurate track of the prices received nor of the quantities sold at each time—and is unlikely in any case to share this information with the extensionist. And how to deal with products stored and sold later? Those who sell immediately upon harvest receive a lower price than those who have invested in storage facilities and are able to hold on until the price rises. Should the extensionist share in the increased profit?

Having decided what to charge for the service, the question remained when the payment should be made. To offset the risk of default, the sponsors wanted payment to be made throughout the season, not only at the end. Initially there was some resistance to this, but ultimately more than half of the sums were paid during the season. It is expected that as both farmers and extensionists become more accustomed to the system, the bulk of the payments will be made during the season (with the exception, obviously, of the portion based on yield increases).

Measurement and reporting. The method of measurement applied in this pilot was oversimplified and inaccurate, but it did accomplish its main objectives. It made the farmers aware of the need to measure the value of the service, put pressure on the extensionists to perform, and served as an important exercise in analyzing information and trying to learn from the results. The method deliberately ignored the fact that, insofar as extension delivers a previously unfamiliar technology that increases yields and income, the flow of benefits continues for many years—in other words, that the actual value gained by the farmer is far in excess of the net benefit gained in one season. Only those benefits that could be measured easily and only improvements in the “cofinanced crops” themselves were measured. More complex, difficult-to-measure phenomena and benefits gained as a by-product in other activities were excluded. There is then a strong downward bias of the value. Farmers are reminded that the benefit is “at least such and such a sum.”

One weakness identified in the reporting system was that management was undemanding about the quality of the data, primarily because of inexperience in actually using the data in its decisionmaking. Extensionists were aware of this laxity and therefore tended to supply figures with little basis in fact. Strong action was taken to correct this. Cavalier reporting will probably be a problem in other places as well and should be dealt with early.

Professional qualifications. In the course of the pilot, the promotion team focused only on the method of delivery and on its management and organization. It was assumed that the extensionists were already equipped with know-
ledge on a range of agricultural technologies, farm problems, and their solutions, and had the necessary ability and experience to diagnose problems adequately and to suggest remedies. These assumptions were found to be only partially sound. Farmers expect the extensionists to be at a very high professional level. Extensionists cannot simply be conveyors of messages to farmers. They must be able to provide advice on more complex farm management issues. Farmers’ expectations are important both in evaluating the resources necessary to provide such a service and in calculating its cost. The service cannot work with poorly trained technicians.

As well as training in farm management and basic economic analysis, training for extensionists in elementary marketing skills to sell the service to potential clients was also found necessary. When establishing a new system, extensionists should be selected according to their training, experience, and proven abilities to analyze and diagnose. Well-trained people are likely to be available in any given country.

PARTICIPATION OF WOMEN. Women constituted some 21 percent of the clients in this pilot. (No special effort was made to target women.) Although INTA does not collect data on the number of women it serves under its regular program, indirect indicators show that the pilot served about the same number of women as the regular program. The potential impact on women in a demand-driven extension system is a subject that merits further study.

DISTRIBUTION OF INCOME AMONG SUPPORTING STAFF. The scope of the pilot was too small to apply all elements of a fully operational system. Distributing the small sums collected among the staff would have nullified the incentive effect; consequently, the entire payment remained with the extensionist. The long-range plan, however, is to distribute the income widely among the staff members who contribute to the effort, as more clients are added and income increases. The extensionists depend on subject-matter specialists for problem solution, on administrative staff for transport, and on others to enable them to provide a satisfactory service to their clients. A formula has been developed for distribution as income increased, to be applied in subsequent stages.

Conclusions

The sponsors of the pilot set out to test whether a truly demand-driven extension system aimed at farmers with small- and medium-size holdings could be developed. Central to the design was the principle of accountability of extensionist to client: the farmer would be charged for services received, and
the extensionist would benefit in direct relation to this payment. The incentive system thus introduced proved effective: by the end of the season, 60 percent of farmers had paid for the service, and all of the rest had agreed to pay their debts as a condition for receiving the service in the following season. The principal indicators of success are the repeat contracts with all participating groups, and the continuing expansion of the service (from 17 groups and 280 farmers in the 1995 pilot to 135 groups with 1,737 farmers in 1996). Critical to the project’s viability was the period of intense activity before field testing dedicated to persuading the various actors of the viability of the concept, identifying and analyzing opposition, and making necessary corrections and adaptations. Without this careful stage-setting, a cofinanced system would have had little chance of getting off the drawing board.

The success—albeit on a small scale—of the pilot shows promise that the concept could contribute to the sustainability of extension activities in general. Ideally, agricultural extension services should continue to be offered as long as there is demand for them, even after World Bank–financed project funding is terminated. Given the notorious unreliability of government funding, the only sound basis for sustainable operations is demand, in the form of willingness to pay, and the returns for supplying a service, in the form of payment. The test did not set out to discover whether a demand for extension exists at a market price, but the results do indicate that farmers will pay something for the service. In most European countries, farmers pay about half the cost of extension, with government covering the other half (Ameur 1994). Clearly the prospects for sustainability are much improved if farmers are willing to pay a 50 percent share.

In sum, the results of the pilot operation in Nicaragua suggest that cofinanced agricultural extension could contribute to the quality and sustainability of the service elsewhere. If the lessons learned are absorbed, the process described in the article could be followed to apply the concept successfully in a wide variety of situations in developing countries to the benefit of the farmers served by the extension service.

Notes

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References

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