

THE CAQUEZA PROJECT
ICA RURAL DEVELOPMENT PROJECT
FOR EASTERN CUNDINAMARCA, COLOMBIA

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I. PROJECT BACKGROUND

Cáqueza is one of six rural development projects initiated by the Colombian Agricultural Institute (ICA) in 1971. Its name is taken from the major municipality and market town which serves as the center for nine rural communities in the eastern portion of the Department of Cundinamarca, southeast of the capital of Bogotá. The project was conceived as an experimental program to reach small farmers, based upon studies of other projects with similar goals, and visits in 1970 by ICA central and regional staff to the Puebla Project in Mexico. The ICA commission to Puebla returned to Colombia convinced of the value of experimental plots conducted on small farmers' land to transfer technology and increase productivity. They were also convinced of the need to transcend productivity considerations and create an integral development approach which combined social and economic considerations. Both have been objectives of the Cáqueza Project.

ICA was given responsibility over all extension services of the Colombian Ministry of Agriculture in 1967. It performs basic agricultural research as well -- mostly at ICA Headquarters at Tibaitatá near Bogotá. ICA assistance to small farmers is coordinated with other Colombian government agencies which provide credit (the Caja Agraria), and land distribution and titles (INCORA, the Agrarian Reform Institute). The Cáqueza Project is directed by an ICA regional staff of 16 professionals and subprofessionals, assisted by research and evaluation support from the Canadian government's International Development Research Centre (IDRC), which has maintained two full-time professionals in Colombia since shortly after project initiation.

¹ The Spanish language abbreviation is PDROC, taken from *Proyecto de Desarrollo del Oriente de Cundinamarca*.

The project area embraces nine communities with 12,218 families farming 561,184 acres. A total of 976 farm families with land holdings of 5249 acres are considered to be the project participants.

II. LOCAL ENVIRONMENT

The nine communities forming the Cáqueza project are composed of mountain-side farms, ranging in altitude from 3,000 to 10,000 feet. To a visitor driving into Cáqueza, there does not appear to be one square acre of level land in the entire area. While 64.5 percent of all farms are below 12.4 acres in size, 42.3 percent of the total area is made up of farms with 74.1 or more acres -- suggesting a wide diversity between the many small farmers and the few very large land holders in the region. Average annual income in 1972 was estimated at \$645 per farm family with 7.5 members -- a per capita income of \$86.

Of the 976 farm families assisted by the project, 42 percent have five acres or less, while none of the participants have more than 7.4. This was a requirement when the project was initiated, since it was directed specifically at small farmers.

Colombia is one of the more developed countries in the Third World and both the ICA staff and the farmer participants in the project reflect this advancement. ICA is reported to have more than 150 PhD's trained abroad on its staff, and correspondingly larger numbers of well-educated and trained holders of lesser degrees. In addition, ICA operates a rural development school offering masters degrees as part of its Tibaitatá Headquarters. Farmers in Cáqueza were using large amounts of fertilizer on certain crops before the project was initiated. Credit is of great importance to small farmers, since, as will be shown, cash is not available for necessary inputs; thus, the maintenance of a good credit rating is considered essential. The Colombian government has made a good deal of credit available to small holders and there are private sources which almost all small farmers in the Cáqueza area draw upon.

Since the use of credit increases the risk of the farmer in years of bad harvest, repayment will be difficult and a subsistence income base may be threatened; credit is only used when absolutely necessary. However, credit is common among Cáqueza small farmers for potatoes, onions, tomatoes and other crops which require cash inputs. Farmers are very reluctant to use credit for corn, which can be grown without significant cash inputs. In addition, to minimize the possibility of loss, farmers will grow many different varieties of the same vegetable, e.g. beans, since some beans are resistant to frost, some to drought, some to rain, etc.

While 50 percent of the area's farmers have completed one to three years of primary education, estimates of functional literacy are much lower. Land titles are held by nearly 70 percent of all farmers, and those who rent land have reasonable security that their plots will be available in future crop cycles.

III. DYNAMICS: IDEA EVOLUTION AND PROJECT DESIGN

After the ICA commission returned from Puebla, a plan was developed which was to become the Cáqueza project. The area was chosen because of the large number of small farmers with low income levels. It moved ahead on three fronts: first, beginning in early 1971, the project staff began a campaign to unite leaders of the local municipalities (which correspond to districts or subcounties) in an attack on rural poverty. The project helped to organize municipal development councils, composed of farmers, clergy, businessmen and all local government leaders in an attempt to mobilize resources behind their new campaign. In addition, they attempted to work with small farmers' groups, or councils, as one lesson from Puebla was the success in working through small farm units, rather than with individual farmers. Although local non-farm resources have played a minor role in the project, the activity has continued, with school teachers, vocational teachers and many of the better educated citizens in the market towns of the region take part in some extension programs, meet with farmers on pre-arranged days and organize three-day workshops in an attempt to improve the transfer of technical knowledge to project participants.

The second effort of the project was straightforward extension services by full-time staff, offered on market days, at community fairs and in private homes. Wherever and whenever farmers congregated, demonstrations were organized and farmers persuaded to attend. In all, in the eight months between March and October 1971, the project staff estimated

they held nearly 200 meetings, with a total farm attendance of over 7000 persons, more than half of them males. The extensionists were offering the technological knowledge gained at the Tibaitatá research station, on improved seeds, planting densities, fertilizer use, weeding, insecticides, fungicides, etc. In addition, home economics and nutrition were discussed with rural women.

Interlocked with the promotion activity was the actual demonstration of improved techniques on land held by small farmers, inputs and technical assistance being supplied by the project. In 1971, 19 plots were conducted, seven 1196 square yard plots in corn and twelve 478 square yard plots in potatoes. No special incentives were required to obtain farmer cooperation. Results from the trials on small farmer land were good, but adoption rates were estimated to be low by project staff.

Although it was undertaken in 1972, the creation of baseline data on the project area can be considered as the third part of the evolution and design of the project. Baseline data were created by a survey of more than 600 farm families, and included very detailed demographic, social and economic studies. Some of the most useful information concerned the cropping associations¹ and the relative percentages of the farmers' land devoted to particular uses. Subsequent reevaluation of the income data obtained as a result of the farm surveys revealed that it was unreliable, due to farmers' reluctance to offer income and expense data to government representatives.

In summing up the evolution of the project, staff are inclined to talk and write about a decided lack of enthusiasm by small farmers for the technological knowledge being offered by the project. There were several reasons: previous INCORA attempts in the same area in the recent past had aroused farmers' fears that their land was to be confiscated by the government. INCORA apparently had attempted to institute a land consolidation scheme to end the fragmentation of plots scattered in many parts of the valley. This led to a good deal of initial resistance by farmers to cooperation with the ICA/Cáqueza staff.

Second, farmers in the area are highly independent, and often politicized. The use of organized groups for the dissemination of technical knowledge did not seem to be effective. Instead, natural leaders, from among the more progressive

¹ e.g. corn and beans, or potatoes and beans, grown together at the same time.

of the small farmers were identified and used to conduct local meetings, demonstration plots, and in general provide a transmission line between project staff and the rest of the small farmers. Third, technical recommendations, based upon the central research stations results, were only partially suited to the small farmers in the area. ICA hybrid corn grew well at some altitudes, but poorly at others. Both potatoes and corn were grown as single crops in the demonstration plots, and this method was encouraged by the ICA staff. However, local farmers had a long-established practice of intertwining both corn and potatoes with beans or some other legume, and were not especially interested in single-crop demonstrations. As a result of the first year's effort, the Caqueza staff reevaluated its methods, and reoriented the program for the 1972 cropping season.

IV. DYNAMICS: PROJECT IMPLEMENTATION

Adopting the Technology to the Region

The project was designed to be reiterative, so that project staff could learn from each year's interaction with the small farmer clients. Beginning in 1972 the staff attempted to adapt the technological recommendations being offered by ICA Headquarters in Tibaitat to the specific land and environment of farmers in Caqueza. There were 39 test plots that year, 15 in corn mixed with beans, 13 in potatoes and 11 in cash crop vegetables (onions, cabbages, tomatoes, lettuce, etc.). The tests utilized not only ICA hybrid seeds, but local varieties.

The results were clear: depending upon the altitude, the hybrid corn could produce more than 3.5 to 1 over traditional methods, while the simple use of the recommended package on local varieties could increase output more than 2.5 to 1. For potatoes and vegetables, it was found that the recommended fertilizer doses and planting densities, etc., were already being followed by the local farmers, or could be accepted without difficulty. Only for corn, the main staple, was there significant resistance to adoption of new methods. There were major problems in getting the farmers to accept high cash costs to pay for the recommended inputs on a crop which they could grow without those inputs, although at a greatly reduced yield per acre. This led to a series of special studies conducted by the IDRC advisors and ICA staff on the determinants of adaptive behavior among local small farmers in new corn technology.

These studies were conducted under the direction of the IDRC professionals (an agronomist, economist and anthropologist) with ICA staff members studying for advanced degrees at the ICA rural development graduate school, as well as with the ICA regional staff in Cáqueza. This combination produced significant research results on the perceptions, constraints and behavior changes of small farmers involved in development projects. A few of the more important conclusions were:

- small farmers in Cáqueza had cash availability constraints which eliminated the possibility of using their own funds for the cash inputs necessary for more productive agricultural technology;
- small farmers had access to credit, and nearly all drew upon credit sources: government (30 percent of farmers), commercial, and private individuals (59 percent of farmers);
- the real cost of credit was found to be much higher than stipulated interest rates when costs of loan administration, time spent in procuring the loan, hospitality and bribes offered to lenders and co-debtors were included; for government bank loans the stipulated annual interest rate of 13 percent rose to a real credit cost of 24 percent; and
- labor shortages during peak periods reflected the alternative costs of employment elsewhere, rather than full employment in the farm sector in Cáqueza; there were no major labor shortage constraints to adoption.

Investigating Constraints to Adoption

Using the constraints-to-adoption approach, the project began investigating corn producers' responses to the now-proven technology. Credit studies in 1972 determined that of those farmers who drew credit specifically for corn, 86 percent adopted the project's planting density recommendations (which involved no cash costs, but was a significant behavior change from the traditional method), but only 22 percent followed the expensive fertilizer dosage recommendations. This was rather conclusive evidence that Cáqueza small farmers, in the absence of credit or labor constraints, would not

follow proven recommendations on a crop which could be grown without incurring cash costs, even when net income increases of over 200 percent had been demonstrated.

With these data in hand, the project assumed three different tacks: first, it attempted to simplify the recommended input schedule, dropping fertilizer applications from three to two and then to one at the beginning of the planting cycle. Second, it attempted to improve extension techniques -- more farm visits, greater use of respected farmers to spread the word in their area of influence, greater use of leaders in the market towns to attempt to convince small farmers of the profitability of new techniques. While these new attacks on the problem made headway, they still failed to solve the problem. A second series of studies then attempted to focus on the particular constraints surrounding the use of cash inputs in the production of corn.

The project found that use of the recommended method increased cash costs from \$21 to \$142 or nearly six times. Since cash was not available to make these payments from the farmers' own savings, the credit costs of the recommended package (at the stipulated 13 percent) was \$21 -- equal to the total cash requirement of the traditional production method. Returns to cash as a factor of production dropped with the use of the recommended package.

The farmer's risk function was calculated as the expected value of the loss which might be incurred from adopting the recommended package, using both total production costs, and cash outlays alone. While calculated risks on the total investment more than doubled, the risk associated with cash inputs increased 15 times.¹ When he borrowed money for the recommended package, the farmer assumed a risk liability of \$21.46, a sum representing 23 percent of his per acre annual income. The farmer using traditional production methods incurs a risk equivalent of only \$1.32, which he can often raise from his own sources. The IDRC/Cáqueza Staff report concluded:

The above analysis suggests that resistance to acceptance of the recommended production methods lies in the high initial cash require-

¹ The risks involved are some combination of physical production risk -- the increased variance of yields as total yields increase -- and the problems of moving from the farmer's own financial resources to credit. We understand that the physical variance of the new corn technology in all cases (after the first year which selected out some hybrid corn seeds) gave greater yields than did traditional methods, that is, above 801.6 pounds per acre.

ment, the low returns to cash invested and the high risks related to the change.

Acceptable recommendations must apparently satisfy a set of requirements that are defined by the producers community. The lack of knowledge of researchers and planners of action programs about these conditions and their relation to the rural community, has probably been the overriding reason for the failure of new production technologies in the small farmers' community.¹

An Experimental Output-Sharing Scheme

The next step in the encouragement of corn adoption was a natural extension of the findings of the first three years' research. The IDRC advisors suggested and financially supported an experimental output-sharing program, initiated in the corn season of 1974, of two and a half acres each for 24 small farmers in Cáqueza. For a \$10 joining fee, the project would supply the farmer with technical assistance as well as all cash inputs required for the recommended package (valued at \$42.90 per acre), while the farmer furnished the land and all labor requirements (valued at \$41.30 per acre). The farmer takes the first 1760 pounds of output, after which the farmer and project shared the output equally. The plan was expected to return \$68 in cash equivalent to the farmer, a 185 percent increase over the return to traditional subsistence methods. In addition, risk is reduced, returns to cash are up. The plan was designed to work against the major identified constraints to the adoption of the recommended package.

Since harvest begins in late October and extends through December 1974, no reports on the final outcome of the plan are yet available. The project had not yet resolved problems over accurate measurement of farm output, and a concern for the farmer's reliability in delivering the entire output to be shared. In the traditional *compañía* system, cheating on creditors is an accepted method of readjusting the overly high interest rate, and if this system is extended to the

¹ H. G. Zandstra, *Two Corn Production Systems in the Cáqueza Project*, a paper prepared for the Agriculture, Food and Nutrition Science Field Staff Symposium of the International Development Research Centre (IDRC), Ottawa, November 18-21, 1974, page 9. Details of the expected loss function are included in this paper.

project, it will represent an unintentional subsidy to the farmer. At this time there is no final evaluation of this limited experiment.

However, long before the new corn season has begun, there have been numerous inquiries and requests by Cáqueza's small farmers to join the plan next year. If yields are as expected there will be a return to the plan (to the project) over and above costs, which could put it on a self-sustaining basis in the future for all expenses except technical extension services. As the new corn production method moves into its fourth and fifth years, farmers adopting the new techniques will become less dependent on the extension service.

Complementary Cáqueza Project Activities

While in-depth research and experimentation with corn production was ongoing, the Cáqueza project staff was conducting a variety of other programs with the small farmers.¹

By 1973 there was a clear realization that the perceptions of the farmer, his view of the constraints and profitability, must be a major input to changes in rural production behavior. To reflect this knowledge, several organizational changes were made in the Cáqueza project. The Investigations Division (agricultural and livestock) was combined with the Popularization Division (the extension service), and both were decentralized. The subprofessionals were moved from the market town of Cáqueza out into the nine municipalities, and given broad responsibility for four to six districts within each municipality. The project felt that the interaction with small farmers, the ability to communicate and be convincing, were more important attributes than specialized technical knowledge.

As one additional project activity, the Home Improvement Division, especially concerned with nutrition, health and child care, continued its training of wives of farmers. A study involving a U.S. Peace Corps volunteer separated those nutritional deficiencies which were correlated with income (protein and calories) from those which were not (calcium and vitamin A) and which could be dealt with through nutritional education programs.

¹ The Cáqueza staff have also assumed the role of extension agents in support of the Caja Agraria, the Colombian government's bank which lends to farmers. Project staff help prepare the farmer's loan papers, acting as an interface with bank officials. The staff estimates that each approved loan requires four visits to the individual farm by the ICA extensionist.

The Establishment of a Marketing Network

A farmers' consumers cooperative was formed as one outgrowth of the local municipal development councils, promoted by the project in 1971. The farmers felt that consumer goods were too expensive, and decided to organize a local cooperative. Since cooperatives in this part of Colombia have not been successful, project staff were less than enthusiastic, but finally agreed to support the farmers' requests. The raffle of a cow started the capitalization, and with this initial money purchases were made in bulk from Bogotá. This has grown, over time, to include agricultural input purchases.

The cooperative had 180 small farmer members in early 1974. More important than its size was the fact that it allowed an organized voice for small farmers, and provided a focus for a marketing scheme.

Project staff had been promoting the profitability of garden vegetable plots which required high cash inputs but yielded very high net income returns. When the staff recommended the planting of cabbages, many farmers complied the next season. When the price of cabbages fell below the labor cost of harvesting and transportation, the farmers dumped them onto the main highway as an explicit indication of the worth of the project's recommendations.

With major support and seed money from the IDRC advisors, the project then initiated a marketing scheme which was just beginning to take effect in 1974. Research established that in Cáqueza neither farmer nor trader had an advantage, since excess truck capacity and too many buyers reduced profits all around. The project set out to establish a marketing network with the other ICA clients around Bogotá, using a warehouse and purchasing arrangements with 20 of the city's independent stores. This effort had little farmer involvement, except in the demand for its operation.

Marketing is a very complex and specialized field in Colombia, necessarily involving many areas such as Cáqueza in order to insure a continual flow of garden vegetables to the major market in Bogotá. Grading and packaging are two of the most important aspects of the marketing plan, and these are done at the warehouse in Bogotá, not in Cáqueza.

V. PROJECT SUCCESS

The project has determined and then demonstrated, under small farmer conditions and constraints, that major net income increases of 50 percent are possible (from \$645 to \$963 for the average farm), and has offered the necessary extension services to spread knowledge of new techniques. Since potatoes presented an insurmountable problem to the Cáqueza staff (it is the lack of the highest quality potato seed which prevents greater income increases with this crop), and since garden vegetable production was increasing significantly (so long as marketing facilities could be assured), the major constraint to increased small farmer income was the continuing importance of the corn crops and low corn yields. The attack on corn productivity created an experimental crop-sharing program which seems to be a model which will work among small farmers.

The project had a budget of \$109,000 in 1974, and was augmented by both professional staff and operating funds from the IDRC. Over the course of a five-year program (1972-76) the project is scheduled to receive \$575,000 (again omitting the IDRC contribution). This is a significant amount for 976 farmers (\$590 per farm family), and can be justified only as an experimental research program design to improve all ICA research and extension methods. Seen in that context, the effort and expense at Cáqueza is a miniscule proportion of ICA's and Colombia's overall agriculture budget.

ICA has both extension and research responsibilities, and one part of the project involved determining how best to work with small farmers. The reiterative process began with the assumption that research results at ICA's headquarters at Tibaitatá near Bogotá were applicable to Cáqueza. It became clear this was not the case, and after long and difficult regional-versus-national headquarters battles, ICA Headquarters has instituted research on crop associations, and ordered the decentralization of the staff for all rural development projects along the lines developed in Cáqueza. Thus to the extent that the results of Cáqueza have improved the state of knowledge of the entire ICA organization, the project has been successful.

As concerns small farmers, if the 1972 adoption rates in corn technology as very conservative figures are applied to 1974, the \$12,400 in corn loans will bring in additional net income (over traditional techniques) of \$2781, which represents a 253 percent increase in net income per acre (for the adopters). Adding in the \$68 per acre increase in net income from the 20 farmers in the experimental crop-sharing

program, as well as an estimated 50 percent increase over pre-project area planted to garden vegetables, the project has generated an annual income increase of four percent taken over 976 farmers. This could be significantly increased if modern corn technology, the major component of the Cáqueza project, is widely adopted. The potential for income gains is greater than the actual benefits in 1974.

In other areas there have been some improvements, but they are hard to measure or quantify. The cooperative still relies upon projects' volume buying and pricing of consumer goods and agricultural inputs, as well as project marketing of garden vegetables. A great effort has been made to contact the small farmers in meetings, demonstrations, fairs, workshops, etc., by staff as well as by community and educational leaders. At the same time, resistance by Cáqueza's small farmers to formal organization has led to the use of informal leadership groups, and a great reliance upon contact between project staff and individual farm families. These are proven but high-cost methods of spreading modern agriculture technology.

VI. PROJECT LESSONS FOR DESIGN AND IMPLEMENTATION

The major lessons of this project are well-stated in the preface to the ICA-IDRC 1974 report:

Agricultural research at both the national and international level is strongly oriented towards technological change. Much of this research seeks to develop components of agricultural production systems or complete production systems which will increase food availability from improved agricultural production.

The experience of the Cáqueza project is that much of the technical effort invested into agricultural production research may not necessarily improve the well-being of the small farmer, unless the technical innovations are accompanied, at least in the first instance, by a comparable expenditure on activities to investigate the farmers' limitations to the incorporation of research results into their production systems.¹

¹ *The Cáqueza Project*, preface to four reports prepared by the ICA-IDRC interdisciplinary team for the Agriculture, Food and Nutrition Science Field Staff Symposium of the International Development Research Centre (IDRC) November 18-21, 1974. The authors of the paper were C.A. Zulberti, Ronald J. Duncan, Hubert G. Zandstra and Kenneth G. Swanberg.

In Cáqueza, the project staff had to learn to listen to the farmers; this was the first real step toward improved adoption rates for corn. But when the farmers reported that "credit" and "marketing" -- rather than technology and productivity -- were their main problems, this information did not automatically obviate difficulties. "Credit," it was learned, was the farmer's way of talking about a risk function involved in high cash inputs in a crop he can grow without cash requirements. The provision of more credit specifically for corn did not solve the problem. More "marketing" was not a solution; rather, too much marketing appeared to be responsible for the low price paid to farmers by middlemen. A marketing system which worked to capacity was one answer, but this required arrangements which could not be expected from small farmers themselves.

In 1974 the Cáqueza project represented one of the best researched and most responsive extension efforts seen by the DAI team. And yet, after four years of dedicated effort, there was still much to be accomplished. However, communications had been opened between project staff and small farmer, and the process established whereby each year's lessons were being translated into next year's project redesign. In the complex world of Colombian small farmers, this is probably the only way a project could interact with, and actually increase the well-being of small farmer participants in rural development.

Other lessons of the project concerned evaluation systems and the methods used to collect baseline data. The original 1972 survey data results gave a per capita income of \$50; this was revised to \$86 by utilizing expenditure data, and the project now estimates this figure is approximately 20 percent too low. In Colombia, survey methods which attempt to record wealth or income run into strong opposition from small holders who are suspicious of the purpose of the data collection. While the project has excellent data on net income potential from proven modern packages as well as books of statistics on meetings, demonstrations, extension contracts, etc., it has virtually no information on the number of adopters, the acreage changes as a result of adoption and total output and income increases as a result of project endeavors. The evaluation system has focused on the "why" questions, and there is no systematic attempt to answer the fundamental question of "how many" are receiving benefits or to attempt to quantify benefits other than those under controlled conditions in the project.

Finally, the project has demonstrated a need to take account of non-technological decisions of small farmers, building upon the constraints they face and the potential benefits they perceive. It has also launched an innovative

experiment which attempts to work directly against the reasons why farmers do not adopt new and "proven" agricultural methods and practices. However, it has yet to define, as the project staff most readily admit, an operationally proven solution which will take account of these constraints and which will have a broad-ranging and positive impact on large numbers of small farmers in rural Colombia.

Information Sources

A. Field

ICA Headquarters at Tibaitatá were visited four times in 1974. Discussions were held with the Cáqueza project director, who later became the overall director for Region I, which includes Cáqueza; Drs. Zandstra and Swanberg of the IDRC staff and Wallace Hawkins, the education advisor to ICA (supported by a grant from the Kellogg Foundation). Cáqueza was visited by two DAI staff on 7 and 8 May, and discussions were held with all project personnel, as well as with the U.S. Peace Corps volunteer working on the nutrition study.

B. Reports

A large number of research reports have been written on Cáqueza. Three of the most useful were:

- The afore-referenced ICA-IDRC Report to the Field Staff Symposium of IDRC held in November 1974;
- Luis Alfonso Chudt L. and Kenneth G. Swanberg, *Evaluation de Las Estructuras Institucionalizadas en los Proyectos de Desarrollo Rural, Bogotá*, October 11, 1974; and
- German Escobar Paez, *Proyecto de Desarrollo Rural del Oriente de Cundinamarca: Diagnostico Socio-Economico*, Bogotá, July 31, 1973 (the baseline socioeconomic study).

Data Adequacy

While the yields, net income, factor costs and returns, and other aspects of the benefits of the recommended technological packages, along with the risk calculations, have been elaborately documented by the project, the number of beneficiaries (adopters) had to be estimated.

I.C.A. RURAL DEVELOPMENT PILOT PROJECT FOR NORTHERN CAUCA

I. PROJECT BACKGROUND

The Colombian Agricultural Institute (ICA) is the agency responsible for Colombia's agricultural research and farm extension services. The successor to a series of research and extension institutions dating back to 1952, ICA was organized in 1969 as a semiautonomous entity. It employs some 5350 people, administers 25 research centers and experimental stations and operates 47 so-called "rural development agencies" -- essentially farm extension service offices.

In cooperation with the Caja Agraria, the nation's largest agricultural lending institution, ICA began in 1971 to organize pilot rural development projects in 20 selected areas of the country. Inspired by the Puebla Project in Mexico, which ICA representatives visited in 1970, the purposes of these rural development pilot projects were:

- to transfer adaptive agricultural research activities out of sophisticated experiment stations and into the fields of small farmers;
- to develop high-yield technological packages appropriate to small farmer production environments; and
- to organize these producers in local groups through which credit, technical assistance, and other services could be more efficiently channeled.

No less than \$7.8 million of a \$28 million Colombian Agricultural Sector Loan has been made available by AID to finance ICA's rural development program.

The first ICA rural development project was established in the Colombian highlands near Bogotá (see Cáqueza project write-up), the second in a middle-altitude valley of south central Colombia. This is the Northern Cauca Project, launched in March 1972. Headquartered in the small market town of

Santander de Quilichao (population circa 8000), the Cauca Project is directed at a small farm population of some 38,000 families whose land holdings range from one-half to 25 acres (0.2 to ten hectares), with an average of four acres (1.5 hectares). These producers are scattered over 11 rural districts and are clustered in an altitude zone of about 2500-4000 feet above sea level, where, because of river water availability and favorable rainfall patterns, most farmers can practice a double-cropping cycle.

Of the 38,000 farm units within the project's zone of influence, the project claims to directly or indirectly benefit 3100. Some 250-500 participants (the number varies per crop cycle) receive credit to finance cash crops with modern inputs following project recommendations. Most of these producers are organized in 14 base organizations.

The thrust of the project concerns applied agronomic research and education. From the beginning, ICA staff have tested improved crop varieties against traditional strains to determine which yield best under small farm production conditions. These so-called "regional tests" have involved such cash crops as yuca, beans, soybeans, corn, rice, sugar cane and vegetables. Additionally, fertilizer, fumigation and plant density trials on these crops have been conducted on demonstration plots. Both activities take place on the land of small farmers.

Where especially positive results are obtained, the project organizes "field days" (usually at harvest) to expose local farmers to the benefits of a newly-proven technology. This activity is supplemented by crop-specific courses presented to the membership of farmer base groups. Over the first 18 months of the project, ICA staff carried out 43 demonstration plots, 47 regional tests, 20 crop courses, 24 field days and 776 meetings with base group membership.

The ICA project is not restricted only to agriculture. It also provides the region's small farmers with assistance on livestock raising. To date assistance has included education and veterinary services relating to dairy cattle, pigs and poultry. Additionally, some 800 wives of small farmers, organized in 12 mothers' clubs, meet weekly with ICA paratechnical home economists for training in nutrition, health, child care, domestic arts and other subjects.

In all, the ICA project office in Santander de Quilichao employs a project staff of four professionals and 16 subprofessionals. In the first category are three agronomists (including the project director) and a veterinarian. Of the subprofessionals, 13 are agricultural technicians assigned to field supervision and promotion tasks on a district basis, and three are females with special training to work with rural

mothers' clubs. Most of the subprofessionals have completed primary and some secondary education. It is noteworthy that the Director of the Northern Cauca Project has served as the local farm extension agent in Santander de Quilichao since the late 1950's, and several of his agricultural technicians have served under him for a decade or more.

II. LOCAL ENVIRONMENT

The North Cauca region contains some of the best agricultural land in all of Colombia; it also contains some of the worst. In the first category are the wide, flat bottomlands of the Cauca Valley itself. These are abundantly supplied by river water and are perfectly suited for mechanization. Perhaps 70 percent of this superb agricultural real estate is controlled by large and medium farmers operating modern, commercial -- even agro-industrial -- rice and sugar cane haciendas or cattle ranches. These properties extend to the base of the Andean foothills at the northern end of the Cauca Valley, where Santander de Quilichao is located, and then as the landscape begins to pitch upward, one encounters much poorer and more heavily crowded farm land: that held by most of the region's small farmers.

About 60 percent of these producers are owner-operators, cultivating properties which on the average do not exceed five acres (two hectares). An additional 30 percent of farms are worked by renters and ten percent by squatters. The land of the small farmers is severely eroded in some areas, and hundreds of plots have been abandoned for this reason alone. Soils tend to be seriously depleted on most properties due to limited use of fertilizer and over-cultivation resulting from the progressive fragmentation of holdings.

The region's small farmers are commercially oriented, and perhaps as much as 90 percent of their production is destined for market sale. However, cash crop specialization is not common since farmers prefer to spread their risks by growing a wide variety of products, including tree crops such as plantains, coffee and citrus. They attempt to supplement their crop income with livestock enterprises on a small scale. Off-farm employment on lowland haciendas is widespread. Traditionally independent and self-reliant, the typical farmer is reluctant to solicit public agricultural credit with which to finance yield-increasing modern inputs. Consequently, cash crop yields are far below what they need to be to provide rural families with a means of escaping subsistence-level living standards.

Credit resistance by Northern Cauca's small farmers is not due to ignorance; 85 percent of rural adult males are able to read and write. Nor is it the result of restricted access to public credit sources; to the contrary, credit is available almost for the asking. In Santander is located a large office of the Caja Agraria, Colombia's oldest and largest agricultural lending institution. The Caja is fairly liberal in its credit policies and has few qualms about lending to small farmers. For example, it will lend not only to farmers with land titles but also to those without, including renters and squatters. To qualify for credit, renters must have contracts limited to no less than three years; squatters are required to have occupied their property for ten years.

Of course, the Caja's generosity ends abruptly when a client fails to repay his loan on time. The bank's interest rate of 13 percent per annum is automatically doubled on all loans delinquent by more than 30 days and doubled again at 60 days. Moreover, foreclosure proceedings begin at 6-12 months unless justifiable cause can be shown for inability to pay. This is not just an idle threat; many foreclosures have in fact been carried out.

It is worth mentioning that the Caja has also been in the farm supply business for decades. Indeed, much of its credit is provided in kind -- fertilizer, insecticides, seed, implements -- rather than cash. Combined with the demonstration effect created by the lowland haciendas, which at some time or another have employed most of the region's small farmers as wage laborers, the Caja has been instrumental in generalizing knowledge if not use of modern inputs throughout Northern Cauca. But given small farmer resistance to bank credit, many producers have no way of financing recommended input use levels and therefore fail to derive much benefit from them. This is perhaps the single most important problem which the staff of ICA must overcome if their pilot project is to succeed.

Unfortunately, the problem is getting worse rather than better. Between 1972 and late 1973 the price of Caja-distributed fertilizer (the cheapest supplier around) rose from \$7.60 to \$10.30 per 110-pound (50-kilo) bag and despite a temporary price freeze on existing stocks which was imposed in December 1973, the world energy crisis is sure to eventually force the price of this commodity much higher.

III. DYNAMICS: IDEA EVOLUTION AND PROJECT DESIGN

Like its counterpart rural development projects elsewhere in Colombia, the Northern Cauca project was the outgrowth of

a visit by ICA representatives in 1970 to Plan Puebla in Mexico. These representatives returned with the conviction that the Mexican project, innovative though it was, did not go far enough. Focused essentially on raising the corn crop yields and income of small farmers, it ignored the development of integral strategies for attacking other problems such as health, housing and nutritional inadequacies of the rural poor.

The Colombians vowed to be more ambitious; they began to talk about launching "multidisciplinary" and "multi-institutional" and "multi-crop" activities. Northern Cauca was selected as an appropriate region to convert these slogans into action for several reasons. First, the ICA farm extension agency in Santander de Quilichao was directed by a dynamic and respected agent, the kind of person that could be expected to "get results" quickly.

Second, due to its proximity to Cali, the project could draw upon a large number of public service institutions which might potentially be recruited for research and assistance activities directed at small farmers: universities, the Forest Service, the Federation of Coffee Growers, the Public Marketing Corporation, the regional offices of the Ministries of Housing and Health, etc. Third, the project region did face a terrible array of problems characteristic of many underdeveloped farming regions in Colombia, such that strategies and solutions proven effective in Northern Cauca might be replicated elsewhere.

Ostensibly for purposes of developing a project design which would innovatively cope with the region's priority problems, ICA staff undertook a socioeconomic survey based on a sample of 140 small families from five representative rural districts. Because it was conducted by agricultural professionals schooled in the methodologies of conventional farm extension, it is not surprising that the survey failed to generate a very novel strategy for assisting small farmers. In effect, project planners decided to continue basically with the services that the farm extension agency in Santander de Quilichao had been offering for many years: promotion of cash crop production using modern inputs, veterinary and educational attention to livestock raisers, and home economics training for rural women.

Indeed, the only innovations offered by the project were borrowed from Puebla: 1) project services would be directed exclusively at small farmers of 25 acres (ten hectares) or less, and 2) existing crop technologies developed on ICA experimental stations would be tested, under small farm conditions, against prevailing traditional technologies.

In other words, the project strategy was a conventional extension with a Puebla-style focus. It was more ambitious than Puebla only in that it did not restrict its research efforts to just one crop, and chose to scatter its energies over a broader range of activities. But in doing so, the Northern Cauca project sacrificed much of its potential usefulness as a pilot undertaking.

IV. DYNAMICS: PROJECT IMPLEMENTATION

Faithful to their slogan of encouraging "multi-institutional" approaches, Northern Cauca project staff attempted to recruit the cooperation of as many as 12 government and private service agencies in a joint enterprise to organize and assist small farmers. Representatives of these entities showed high initial interest in the project, and over a two-month period in early 1972 ICA arranged numerous meetings with small farmers in the rural districts; dozens of would-be change agents from Cali arrived to make glowing speeches about their plans for integral socioeconomic development of the farm population. Some 19 rural development base groups were organized in short order.

However, problems of maintaining their continuity quickly surfaced. In the first place, only two of the 12 cooperating agencies bothered to continue meeting with the base groups. Simultaneously, ICA was criticized for organizing base groups in the first place. Why organize *new* groups, the farmers complained, when they already belonged to old ones that had been active for years? Such groups, ICA discovered, were many: community action associations, civil defense groups, "friendship" credit and consumer clubs, burial societies, and sports clubs -- to name a few.

Faced with such institutional competition, ICA staff elected to drop their plan to work only with base groups they had organized, opting instead to work through existing entities wherever they were active and forming new groups where older ones were absent. However, there were no local objections to organizing mothers' clubs, of which nine were initially established.

ICA's next task was to recruit small farmers willing to volunteer part of their holdings for the establishment of regional tests and demonstration plots. When the project promised to pay all input costs of these experiments and allow their operators to keep all products harvested, many volunteers were found. The project was thus able to pick and choose among them, usually selecting those farmers located on roads who offered the highest potential "visibility."

As was the experience in Puebla, Northern Cauca project staff discovered that traditional crop strains used by small farmers performed equally or better than many of the more delicate hybrids imported from the experimental stations. With increased planting densities assisted by moderate to heavy fertilizer applications, yields on corn could be increased by 50-60 percent and those of yuca doubled. Bean and soybean yields demonstrated increases of 33 percent and 17 percent respectively. During the project's first crop cycle -- June to December -- regional tests were conducted on 40 small farms in all: ten for yuca, nine for beans, eight each for corn and soybeans, and five for vegetables. During this period 13 demonstration plots and 12 field days were conducted, together with 91 field meetings with farmers. Also four courses in vegetable growing and three in yuca were organized.

However, the project was pushed too quickly for its own good and managed to get the cart before the horse. For even as it was developing a set of suitable technological packages on small farm experimental plots, it launched a campaign to get small farmers to request credit for cash crop production (and animal purchases) before these packages had been proven. ICA staff, in dialogue with small farmers, helped them to prepare farm production plans and credit requests for Caja financing. The practices recommended were straightforward: fertilize, fertilize, fertilize. On this basis 521 farmers received cash crop loans for 2626 acres (1063 hectares) totalling \$145,200, mostly for growing corn, soybeans, and yuca. Yield increases on these crops matched those attained on the experimental plots.

Unfortunately, by harvest time in late 1972 market prices for these products had fallen sharply. Although all loans were repaid on time, most producers did little better than break even. Unlike the Puebla project, where the marketing problem had been solved by government price support to the promoted cash crop, Northern Cauca project staff had left small farmers to fend for themselves at harvest time. In the process, the potential income gains from increased productivity were lost, which only served to reinforce the small farmer's traditional reluctance to assume the risks of bank credit.

The consequences of having pushed too fast with too much were immediately felt during the first and second crop cycles of 1973. Project participation not only sagged but so too, apparently, did the energy of project staff. In 1973 the number of regional tests dropped to seven. In the first crop cycle there were 18 demonstration plots and nine field days; in the second cycle 12 and three respectively. The number of credit recipients supervised by ICA staff dropped by half: 225 in the first cycle and 232 in the second.

Yields on corn and soybeans were maintained. Yuca yields gained an additional 50 percent, but this outcome only affected 41 producers. No marketing services were organized, however, and even today this area of activity remains conspicuously neglected by the project.

The only areas of the project which seem to have maintained their initial momentum are those of livestock promotion and mothers' club activity. In the project's first crop cycle, nine courses on poultry and one each on pig and dairy cattle raising were held. Some 270 farmers attended, of which 59 received Caja Agraria loans totalling \$26,500 to finance the purchase of 99 dairy cows, 52 pigs and 2700 chickens. With respect to mothers' club activities, nine groups totalling 800 members held 820 meetings for courses on vegetable gardening, sewing and weaving. It is noteworthy that 17 women received Caja Agraria loans, 13 to purchase sewing machines, three for weaving looms and one to finance her vegetable garden.

In 1973, another nine livestock courses with 250 participants were organized in the first crop cycle; six courses had an attendance of 129 in the second. Animal loans totalling \$25,000 to 38 farmers in the first cycle and \$24,700 to 33 in the second were granted. During these periods the number of mothers' clubs was increased to 12. However, Caja loans to women were terminated, and with this impediment ICA home economists turned their efforts to non-income-generating projects: courses in nutrition, baby care, personal hygiene and first aid.

Unfortunately, at the time the project was visited no data were yet available on its 1974 performance. But it is likely that project activities have declined even further, in view of the high cost of modern inputs resulting from the world energy crisis. The energy crisis is bound to make ICA's technological packages, based as they are on intensified use of modern inputs, much less attractive to small farmers, especially in the absence of efforts to solve the marketing problem.

V. PROJECT SUCCESS

It is hardly appropriate to make a definitive judgment on the success of the Northern Cauca project on the basis of its performance during a brief 18-month period. However, the available evidence suggests that it has accomplished far less than it hoped to. By pledging themselves to exceed the accomplishments of Peubla, ICA staff in Santander de Quilichao

attempted a much broader range of activities than their Mexican counterparts, but delivered less in net benefits to small farmers.

ICA did overcome the resistance of many project participants to bank credit, but this victory proved ephemeral, mainly because one of the basic lessons of Puebla was ignored: namely, increased productivity is no automatic guarantee of increased income in the absence of marketing arrangements which offer the small farmer remunerative prices for the crops he sells. Moreover, despite the proliferation of ICA-supervised experimental plots on small farms, these efforts demonstrated little continuity after the first crop cycle in which they were attempted, and were sequenced inappropriately; consequently, credit promotion was launched prematurely.

It is tempting to conclude, from the available data, that the project was never truly committed to the idea of adaptive research on small farms in the first place, but went ahead with its regional trials for their symbolic value rather than because it was felt they would generate technological breakthroughs. Northern Cauca does claim substantial yield increases for those project participants who received crop loans to finance increased levels of fertilization, but project staff concedes its figures are based on field staff and small farmer estimates, not -- as in Puebla -- on careful yield sampling surveys at harvest time. In sum, the project has so far done very little to prove itself either as a pilot project or even as a model for conventional farm extension.

VI. LESSONS FOR DESIGN AND IMPLEMENTATION

Nonetheless, the project offers many useful lessons. First, the project demonstrates that organizing farmers in base groups is a fine idea if the client population lacks pre-existing institutional affiliations of its own; but where farmers have already organized themselves it is often wise to work through them rather than start from scratch with new institutions. ICA staff in Santander now admit that they can get far better mileage out of working with rural sport clubs than with any group they themselves have organized. When the project wants to drum up attendance for crop and livestock courses or field days, it often gets the word out fastest by sending its staff to attend or compete in local soccer matches in the rural districts.

A second lesson involves the questionable advisability of launching a new rural development project with veteran staff from conventional farm extension services. The Northern

Cauca pilot undertaking demonstrated an apparent lack of commitment to implementing those features of the project design which in any real sense could be considered "innovative." However, those activities which had been conducted for years were continued unchanged and apparently absorbed most of the energies of the staff.

The project also demonstrates that it is possible -- indeed quite easy -- to get immediate yield increases on small farms from the introduction of fertilizer. However, it is quite another matter to convert these increased yields into sustained income gains without facing up to the really hard questions of how to achieve remunerative price levels for the increased output generated. At the local level this may entail group storage and marketing arrangements. At the regional or national level it may entail the creation of price support policies, federal marketing agencies and other institutional infrastructure characterized by the requisite administrative agility and efficiency to establish staying power.

In brief, the challenge lies not in how to produce a discrete leap in cash crop productivity; it lies in assuming that such productivity, once achieved, can be sustained over time.

Other "negative" lessons of the project should be apparent and need only be summarized briefly here:

- the failure to address the marketing problem;
- premature credit promotion;
- lack of continuity in the adaptive research activities; and
- neglect of a reliable methodology, such as that used in Puebla, to collect yield data on the harvests of project credit recipients.

In general, the Northern Cauca project appears to be an undertaking which was designed and implemented with no clear commitment to get there. It appears to be an effort to make business-as-usual look like something more than it is or could ever become: namely, a pilot project.

Information Sources

A. Field

The Northern Cauca project was visited for two days by one DAI staff member in June, 1974, at which time the project director was not available, due to illness. However, extensive conversations were held with two project professionals, one field supervisor and one home economist. Two rural districts were visited, where conversations were conducted with the farmers of one base group and members of one mothers club.

B. Reports

The AID Agricultural Sector Loan Paper (Colombia: 514-L-064) was consulted for an overview of ICA rural development pilot projects in general; also a brief Northern Cauca project description by Ernesto Navia G., the project's director, in *Memorias (1er Seminario Internacional de Proyectos de Desarrollo Rural Regional, Sept. 10-19, 1972)*, published by ICA. Data on project activities were drawn from Northern Cauca's *Informe Estadístico*, compiled on a bi-annual (crop cycle) basis.

Data Adequacy

Numerical data on project activities and participant loans, yields, acreage, etc., are all taken from published documents or project files cited above.