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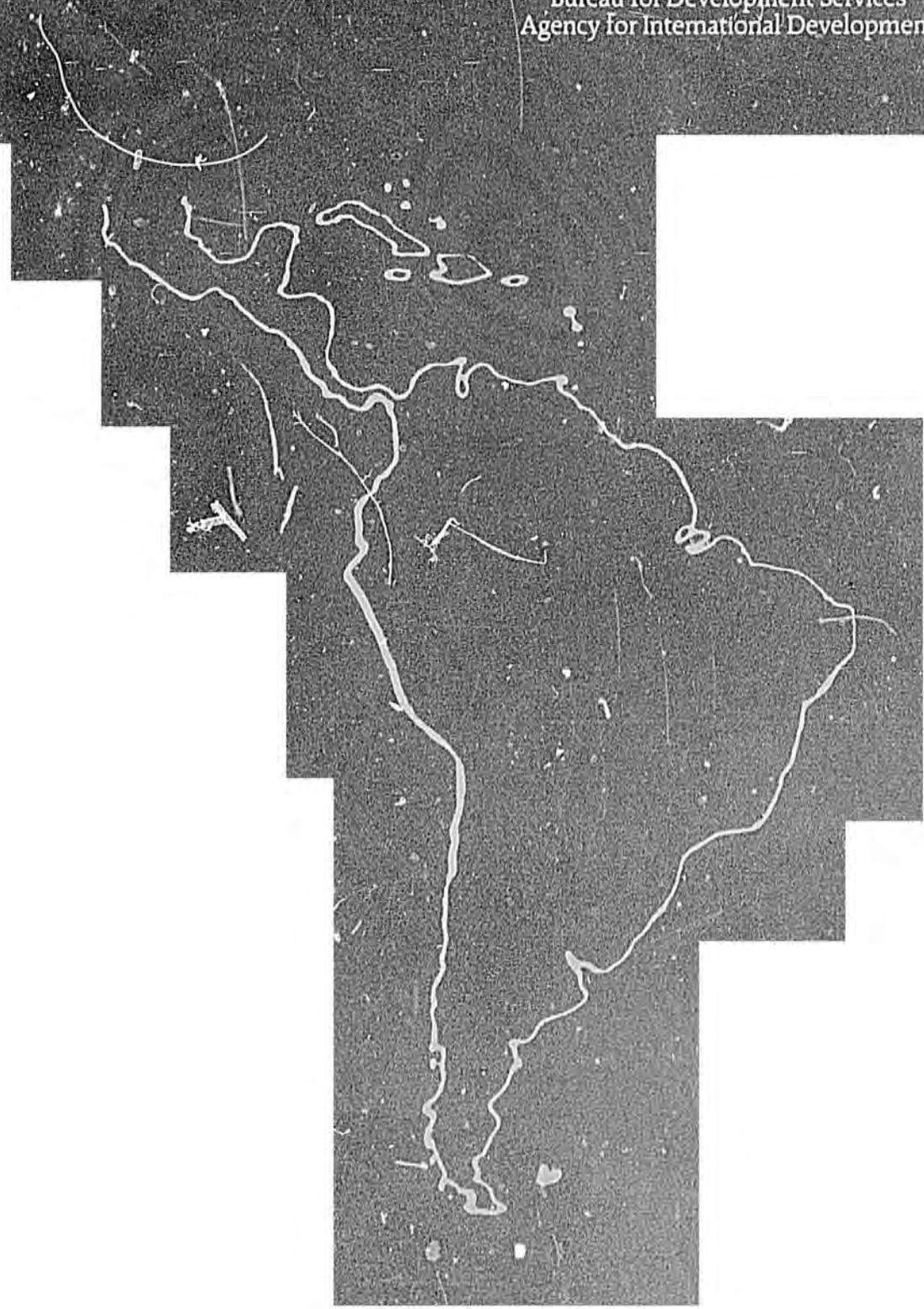
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Business Development with Small Farmer Participation: Evaluation of the Paragu y Rural Enterprise Project.

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For:
Office for International Cooperation and Development
United States Department of Agriculture
and
Division of Rural Enterprise and Employment
Bureau for Development Services
Agency for International Development



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EXECUTIVE SUMMARY

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I. Introduction

This evaluation is one of a series which will allow intercountry comparisons of projects in the area of rural enterprise and agribusiness development. Its principal purpose is to contribute to Agency understanding with regard to the planning, execution and impact evaluation of projects which are focused on small and medium agribusiness development.

II. Projection Background and History

The Paraguay Rural Enterprise Project was developed by the USAID Mission and the Central Bank of Paraguay in 1975-1976. Its purpose was to fund agribusiness development in activities which would remove constraints faced by small farmers in expanding their agricultural production and family incomes. Based on pre-project analysis it was found that small farmers lacked stable and remunerative prices for labor intensive, high value crops, access to intermediate technology, and off-farm employment opportunities. It was also found that there was a lack of long-term credit available for agribusiness investment and the banking community lacked the institutional experience and disposition to enter this area without encouragement. Therefore, the project established a rediscount mechanism between the Central Bank and local commercial banks in order to funnel long-term investment funds into those types of agribusiness activities which would remove constraints to small farmer development. The two major objectives of the project were to

increase the incomes of small farmers and establish an effective rediscount mechanism for agroindustrial financing between the Central Bank and local commercial banks.

Between the end of 1977 and the middle of 1980, about \$US 6.5 million were lent to 58 agribusiness firms, with AID and the commercial banks contributing about 40% each of the loan funds, and the Central Bank the balance. The loans tended to be either relatively small or quite large. Seventeen loans were for \$US 50,000 or less and twenty-two loans were for amounts between \$US 150,000 and \$US 200,000. The average loan size was almost \$US 110,000.

Loans financed the type of agribusiness activities which had been anticipated as priority areas: 15 loans in food storage facilities, 19 loans in farm input and services activities, and 22 loans in agricultural processing facilities. The geographic distribution of the loans was quite diverse, with many of the agribusinesses being located in small towns or rural areas.

The capital costs of direct employment in the firms themselves was of a medium level of capital intensity--about \$US 12,500 per job place. Based on borrower estimates, the project would have potentially impacted about 84,000 people or about 13,000 small farm operations.

Data show that the average borrower was a medium to small sized firm with an average of 8 employees making a substantial expansion of its operation. A rough estimate indicates that the average firm increased its capital stock from about \$US 103,750 before the loan to about \$US 321,250 after its investments. The firms

themselves financed a large portion of their total investments, an average of 48% of the total capital invested in the sub-projects.

The evaluation data of small farmers linked with agribusiness borrowers show such farms were poor by the standards of Paraguay. A profile of the average small farmer and his operation shows the following characteristics. His farm was about 15 hectares of which he cultivated 10 to 11 hectares. The average per capita income was about \$US 425--with an average family household of 6.5 individuals, the average farm household income was approximately \$US 2,763. The head of the household averaged three years of schooling, but 75% of his school aged children attended school on a regular basis. Fifty percent of the families used medical clinics or hospitals when they had sickness in the family, but they had to go 18 kilometers to get to them. Likewise, 95% of the households lacked both electricity and running water.

Farming practices were simple but not primitive. Ninety percent of the farmers received no technical assistance, although they did use insecticides and fertilizers on major cash crops. The majority had access to formal or informal credit. Animal power was often used for farm work, but almost no farmer had a tractor or other sophisticated, mechanized equipment.

To ensure that the benefits of the project flowed through to small farmers, the Central Bank and AID evolved a requirement that agribusiness borrowers do at least 50% of their business with small farmers. Processing firms, for example, had to purchase 50% of the value of agricultural raw materials they processed from

small farmers. The firms were required to provide lists of such small farmers with whom they would link when making loan applications. The evaluation found, however, that the firms and listed farmers in most cases did not form the anticipated linkages; either because small farmers chose to do business elsewhere or because the firm did not always follow through with the small farmer. This was to present problems for the evaluation team in measuring benefits to small farmers from the project.

III. Evaluation Objectives

Because of the limitation of funds for the analysis, the evaluation focused on the two principal objectives of the project. The first was to determine whether an effective financial mechanism for channeling long-term credit to agribusiness development was established. The second was to measure the degree to which the incomes of small farmers increased as a consequence of linking with agribusiness borrowers.

IV. Institutional Evaluation

A. Credit Facilities and Mechanisms

The project established a mechanism whereby commercial banks could rediscount with the Central Bank 60% of the value of loans they made to agribusiness entrepreneurs. The banks experienced two major problems in carrying this out: subproject selection and project evaluation.

Project selection turned out to involve a number of problems. The first was the verification that the subproject financed would have the desired impact

on small farmers. Initially, the Central Bank and commercial banks assumed that if an investment proposal was financially "bankable", it had the requisite impact on small farmers. This approach was in part understandable, since such institutions had constraints, objectives, and social orientations different from AID. Most of the people in these organizations were hardly aware of the existence of small farmers and did not at first fully understand the exact meaning of this objective. As a consequence, the two institutions were initially reluctant to adopt the necessary steps to ensure that this objective would be examined in the project selection process.

Another problem which arose was the criteria applied by the commercial banks to determine whether proposed projects were "bankable". The commercial banks tended to apply the type of analysis they customarily used for short term commercial loans, even though loan proposals were for long term investments. This involved relying heavily on collateral from the borrower rather than allocating the time and money necessary to carry out an adequate appraisal to determine the soundness of the proposals. The result was that loan analysis by the banks was inadequate and the Central Bank began to take over that function.

Because of the fast pace at which loans were initially approved and the apparent lack of attention to the potential impact on small farmers, AID decided to require that all loans be approved by a committee of itself, the Central Bank, consultants, and the commercial banks. This negated a system initially started where the Central Bank allowed the commercial

banks to make the decision regarding the bankability of subprojects and the Central Bank checked on the benefits to small farmers. AID's decision was a good one and would be a good mechanism to employ in the initial phases of similar projects. It permits all those of the institutions involved to form personal relationships with each other which are critical to the success of such projects, as well as allow AID to familiarize the other institutions with rediscounting procedures and AID criteria.

The application of the loan criteria also presented problems. Subprojects could be selected if they met one or more of the following criteria: the proposed subproject (a) contributed to the welfare of the small farmer, (b) eliminated a bottleneck to the development of agribusinesses which would benefit small farmers, and (c) created a substantial amount of direct employment, resulting in a new source of income for Paraguayan workers. These criteria proved to be too broad and confusing to exclude very many types of agribusiness activities, yet they represented an important objective of the project. Perhaps in future projects of this type the same objective might be accomplished by having a list of certain types of activities which are automatically excluded because of their obvious lack of potential linkages with small farmers, or by limiting agribusiness investment funding to geographic areas in which there are heavy concentrations of small farmers. Certainly, the requirement that potential borrowers provide lists of small farmers with whom they will link is not sufficient to forge the desired linkages nor is it a system that can be

easily monitored. In fact, no clear, low cost monitoring system was developed, indicative of the fact that there was no easy solution to this problem. It is also worth noting that other methods also present some trade-offs. The criterion of limiting project financing to geographic areas in which small farmers are concentrated, for example, would have the effect of encouraging small farmers to remain where they are rather than migrate to areas in the country where there might be greater long run opportunities for them.

The rediscounting mechanism proved to operate very efficiently for several reasons. First, the Central Bank staff was of a high caliber and performed their responsibilities well. Secondly, the banking institutions had prior experience in rediscounting with the Central Bank for other purposes. While this had been used as a tool for controlling the money supply, the banks adjusted well to using the mechanism for entirely different purposes.

B. Technical Assistance to Lending Institutions

The participating commercial banks needed technical assistance in loan application analysis rather than in dealing with the agribusiness borrowers themselves. As previously mentioned, the banks lacked experience and a commitment to carry out the type of analysis appropriate for long term loans. Nor did the banks anticipate that the loan volume would be sufficiently large to justify an investment of their own resources in developing expertise in this area. They did recognize, however, that many of the borrowers under the

program were not their traditional customers for whom they could just rely on collateral for security. Consequently, the banks often hired well qualified consultants to carry out the financial and technical analysis of project proposals.

The banks did not solve the problem, however, of loan follow-up. Consultants were not used for this purpose, and the banks were not willing to commit bank resources to make visits to project sites. Although the Central Bank eventually took over this responsibility, the problem was never satisfactorily resolved. Nor would it have been reasonable to expect the banks to make a long term commitment to institution building in this area when AID withdrew financial support to the project after three years.

C. Promotional Activities

Little promotion was necessary as there was a strong demand for the funds without extensive advertising. The Central Bank resisted recommendations by AID to advertise in the countryside, since this would have raised expectations far in excess of those which could be fulfilled with the limited funds available to the project. Several issues did arise, however, from their limited efforts. First, adequate promotion depends upon a clear set of criteria for sub-borrower selection, which this project lacked. Secondly, it is difficult to gauge private sector demand when social criteria such as those in this project are used. In such cases it will generally be important to closely monitor the project in the first stages to see if these criteria restrict the level of demand too greatly, so that

adjustments can be made, and be reflected in promotional activities.

D. Lending Institutions' Loan Review Requirements

Loan review requirements under the project suffered from a number of problems besides the inexperience of commercial banks in analyzing long term credit investments. The Central Bank increasingly took over from the commercial banks the function of financial and technical review of the subprojects because it felt its reputation depended upon the success of the project. AID increasingly took over from the Central Bank the function of reviewing the impact of loans on small farmers. Since these functions were far removed from the commercial banks themselves, the information required on application forms proved unsatisfactory to the Central Banks and AID. It probably would have been best for both of these institutions to have collaborated with the commercial banks to develop a uniform application form which provided information of interest to all of them, keeping the burden of paperwork to a manageable size and cost level.

E. Sub-Borrower Assistance Needs

Agribusiness borrowers proved to be of a sufficient size and sophistication to prepare feasibility studies and financial projections needed by the commercial banks for project approval. These skills were readily available in local consulting firms which agribusiness borrowers used. Consequently, none of the banks provided technical assistance in this area. The agri-

businesses also proved to know better the process technology than any other domestic sources, so no assistance was provided in this area either.

F. Interest Rate Structure

With regard to the Central Bank, it lent to commercial banks from its own funds and from AID funds for which it paid 2% interest. Lending at a 5% interest rate, the Central Bank had a 5% spread on its own money and a 3% spread on AID funds. This differential more than covered the administrative costs of the project to the Bank.

Based on the rates at which commercial banks were permitted to lend to sub-borrowers, they had a differential of about 8% on 60% of the funds they lent; the percentage of the loan that could be rediscounted to the Central Bank. On the rest of the loan amount the banks made nothing or lost a little. While the banks did not maintain sufficiently detailed records to determine profit rates on the loan funds alone, the bank officers generally felt their operations under the project were profitable. This was in part due to the relatively modest level of loan administration carried out by the commercial banks. As of the middle of 1981, there had been no defaults or serious threat of decapitalization.

G. Influence of Credit and Institutional Arrangements on the Rural Enterprise Project

The funds allocated to the project were disbursed rather rapidly for several reasons. First, the economy of Paraguay was experiencing strong growth in part because of an extremely

large dam project which was bringing into the country a considerable amount of money and the promise of large amounts of electricity in the future. Secondly, commercial banks were generally required to keep 45% of their portfolio in relatively unattractive loans by law. Under the project, subloans could count toward this requirement, while bearing a more attractive interest rate, and a larger amount could be rediscounted with the Central Bank.

The disbursement of loan funds was a prerequisite of success, but of course by no means a guarantee of it. While the next section measures the impact of the project on small farmers, some indirect indicators support the overall conclusion that the project did positively impact small farmers. First, all of the subprojects were in activities which were identified as important in relation to constraints faced by small farmers. A large number of the subprojects, for instance, tended to involve the processing of crops grown by small farmers. Also 43% of the projects were in two departments of the country which had the highest concentration of small farmers.

Equally important, the project seems to have proved the workability of the financial mechanism to funnel money toward agribusiness development. A cloud has been cast over this fundamental achievement of the project, however, because of a misunderstanding which has arisen. It has been the position of the Central Bank that AID had made at least an informal commitment to make a second loan under the project. AID, on the other hand, has taken the position that Paraguay is in a position to continue the project without AID's financial

assistance. The impasse has jeopardized the continuation of an institutional/financial mechanism which has proved to be rather successful.

Lastly, the project seems to have effectuated a number of attitudinal changes. Decision-makers in the capitol city who have historically dominated the country appeared to be more aware of small farmers and their capacity to contribute to the development of the country. Bankers became more aware of the entrepreneurial capacity and contribution of non-traditional clients. And most importantly, entrepreneurs who were not part of the social and business elites of the country saw that with proper organization and preparation they could become significant participants in their society and improve their own economic conditions.

V. Economic Impact Evaluation

A. Methodology

In order to understand the results of the economic impact evaluation it is necessary to have more than a cursory understanding of the methodology employed in the study. The methodology was designed to test several questions commonly raised when using statistical comparisons and the flow of benefits. Data were collected to compare small farmers who were linked with agroindustrial borrowers (participant farmers) with small farmers who were not (non-participant farmers), to see if there arose any income differences which could be reasonably attributed to the project. The list of small farmers which agribusinesses submitted with their loan applications were used to

randomly select participant farmers and criteria were established to select non-participant farmers in the same geographic areas as their participant counterparts. Data were collected for both participant and non-participant farmers for two agricultural cycles (July/August of 1979 and 1980). Three categories of activities were created for comparisons between participants and non-participants: (1) inputs and services (I&S), (2) processing (of agricultural goods), and (3) storage (facilities for agricultural goods).

The three categories were designed to permit the testing of several issues. First, it was hoped the results would show if some kinds of agribusiness activities impacted small farmers more than others, by comparing the three categories. Also, since the agribusinesses in one of the categories began their operations at a point in time different from the others, it was hoped that the results would show whether benefits were sustained for more than a year. The Processing category involved the measurement of "before" and "after" differences from project participation, while the I&S category involved measuring impacts on farmers linked with agribusinesses which had been carrying out their new or expanded functions over two successive agricultural cycles. The storage category fell in between the two others, with some of the agribusinesses under operation and linked with participant farmers in the first agricultural cycle.

The methodology was also designed to examine what is commonly called the "attribution issue". It is frequently argued that cross-sectional comparisons between persons participating in a

project with those not participating in a project are not valid because the participant people are often different from those not participating—in fact, this is evident from the fact that they get involved in the first place. It is asserted, for example, that participants are often more entrepreneurial than non-participants, and this causes much of the differences found in their incomes which is then incorrectly attributed to a project. This issue was addressed in the methodology by collecting data of the "before" and "after" situations for the Processing category to see if participants manifested any marked differences compared to non-participants before linking with agribusinesses.

It was anticipated that some of the farmers selected from the "participant lists" supplied by the agribusinesses might not in fact link with the firms, so the sample size was increased to 60% larger than otherwise would have been necessary for statistically reliable data. Even this rate, however, was not sufficient to compensate for the almost complete lack of linking found between agribusinesses and small farmers on their lists for the Processing and Storage categories in the second agricultural cycle, despite the assurances by the agribusinesses that the lists were reasonably accurate in terms of the farmers with whom they would be doing business. The result was that economic impact comparisons were possible for only the I&S category.

B. Economic Impact on I&S Category Farmers

For the purposes of comparison, a welfare measure of income was used

which included all of the costs of agricultural production normally included, except those of family labor and returns to capital. On the income side, in addition to sales of agricultural goods, the value of production consumed or stored on the farm and wages from off-farm employment were included. While this measurement did not indicate economic efficiency, it did measure family welfare, the principal concern of the project.

For both agricultural cycles the participant farms had superior incomes to those of non-participant farms—39% greater in the first period, and 35% in the second period.

C. Importance of Off-Farm Employment

Income to small farmers from off-farm employment was not large relative to their total income. In the first period it represented 5% of total income for participants and 4% of total income for non-participants. In the second period its incidence fell for both groups, but by a larger amount for the participants. It fell to only 1% of total household income for participants, a drop of 4% points, but by only 1% point for non-participant farms to 3% of total income. The larger drop by participant farms might have been due to linking with agribusiness firms opening more on-farm opportunities for participant farm households, so they shifted their labor allocation more to the farm operation from non-farm work.

D. Efficiency Measure of Income

When we impute a value to family labor and capital in the cost calculation

of farm production, we find that the incomes of participant farms was still significantly greater than non-participant farms, although this difference narrowed from the first to the second cycle. In the 1978/79 cycle participant farms had incomes 49% greater than non-participant farms, and this difference decreased to 30% in the 1979/80 period. This would suggest that the marginal efficiency of participant farms as they expanded their operations was less than that of non-participant farms, although we can see from the welfare measurement that efficiency can decrease while family welfare is maintained. The decrease in the differences in efficiency incomes could be due to participant farms increasing farm production on less productive land, and/or competitors of the agribusiness borrowers upgrading their own services with an impact on non-participant farm operations.

E. Impact of Project on Farm Production and Resource Productivity

Comparing participant and non-participant farms, we find that the percentage increase in the value of agricultural output that could be associated with participation in the project was 24% in 1978/79 and 31% in 1979/80. In examining the potential sources of this difference in increased output, four sources were analyzed: differences in crop mix, differences in prices, differences in yields, and intensification of land use. The data showed that the first three sources were only negligibly associated with project participation, while intensification of land use accounted for almost the whole difference.

The importance of intensification of land use was then broken into three subsources to examine their relative association with project participation. These subsources were the absolute size of the farm area cultivated, the percentage of the total farm cultivated, and increased interplanting and/or multiple cropping. In the first agricultural cycle all three subsources had some association with the project, with the percentage of the total farm cultivated being the most important. This perhaps was due to farmers in the first year of participation increasing their cultivated area because of the availability of inputs or services which made such an expansion feasible for them to carry out. In the second period there was a significant shift to an association with only the subsource of the absolute size of area cultivated. That is to say, in the second period participant farms increased their output relative to non-participant farms by moving into the cultivation of land which was not due to increasing the percentage of the total farm cultivated. This is borne out in data which shows that participant farmers expanded the total number of hectares they possessed and increased slightly the number of hectares they cultivated over the two periods. Non-participant farmers, on the other hand, increased the number of hectares they possessed but decreased the number of hectares they cultivated over the two periods.

All of these differences tend to support an aggregate picture of participant farmers rationally taking advantage of opportunities created by their linkages with agribusiness

borrowers. The opportunities of participation resulted in participant farmers decreasing their off-farm employment in order to expand their farm operation; in the first year by cultivating land not previously utilized and by expanding to newly purchased or rented land in the second year. Farm household size increased as family members returned to participate in the expanded operation. The consequence was that participant family welfare income increased relative to other farmers, which appears to have been accomplished by increasing more the size of the operation rather than by increasing its efficiency.

F. Attribution Issue

Overall, the data supported the validity of the comparison of the participant and non-participant farms. A comparison of net income of participant and non-participant farmers in the processing category in the 1978/1979 period show differences of 1%. Since the same procedures that were used to select participant and non-participant farms in the processing category were used in the I&S category, we can assume that non-project related income differences in the I&S category would have been about the same as the processing group prior to involvement in the project, i.e. approximately a 1% difference. This would mean that about 38% of the 39% of the income differences in the first year and 33% of the 34% of the differences in the second year of the I&S category were associated with the project.

Social profile data of participant and non-participant farm households were also employed to examine the

attribution issue. It is reasonable to assume that if participant farms were not comparable with non-participant farm households this would show up through differences in their social characteristics as well as their economic performance. Since the basic data were given previously in the profile of the small farmer (Project Background and History), it will only be mentioned here. The health profile showed mortality rates to be similar as well as access and use of health facilities when comparing participant and non-participant farms within categories. The education profile showed similar education levels, school attendance by children, and familiarity with both the Spanish and Guarani languages. The housing profile showed only one distinct difference which was in the size of homes of participants relative to non-participants in the I&S category. This could be attributable to several factors. First, the family size of the participant group was larger. Secondly, it is possible that extra income of the participant group was spent on improving their housing standards. While the amenities of their houses were not more than non-participants, the differences in the sizes of houses of participant farmers relative to non-participants did increase over the two year period, suggesting some association with the project.

Finally, we find the data on the use of technical assistance, credit, and land tenure to be very similar for participants and non-participants. All of these characteristics would suggest that there were probably no significant differences between participant and non-participant households to invalidate the use of cross-sectional comparisons.

VI. CONCLUSIONS

The analysis would suggest that the Rural Enterprise Project was a success in terms of achieving the objectives originally contemplated. An institutional/financial mechanism was established which funnelled long term credit to agribusiness development in activities identified as important to relieve production constraints faced by small farmers in Paraguay. Likewise, where it was possible to trace linkages between small farmers and participant agribusiness, we found that the farmers did better economically than their non-participant neighbors. The data supported the conclusion that these income differences were reasonably attributable to the Rural Enterprise Project.

The success of the institutional/financial mechanism can be attributed to a number of factors. First was the fact that the Central Bank and the commercial banks already had experience in rediscounting procedures among themselves. Secondly, the commercial banks could replace less productive loans which were previously required by the Central Bank with project subloans which were more profitable for them. They, therefore, had an economic incentive to participate quite apart from the interest that could be earned directly on project subloans. Thirdly, there was a strong loan demand for the project funds which was in large part due to a strong economic surge in the overall economy. Finally, an important factor appears to have been a high level of effort and performance on the part of Central Bank and USAID personnel involved in the project to work out

problems as they arose and to keep the project on track.

As with any project, there were problems and weaknesses. Probably one of the more obvious ones was the lack of adequate administration of loan applications and project monitoring by the commercial banks. This was seen in the lack of proper loan appraisal by commercial banks of subloan applications as well as inadequate follow-up after loan funds were disbursed. The manner in which this problem was worked out raises some questions. To some degree the burden of administration of loan appraisal was shifted to consultants and the Central Bank. While actual data were not available, it would appear that the commercial banks found the loan program a profitable one. One cannot help but ask, however, if this would have been the case if the commercial banks had borne the full costs of proper loan administration.

There is, however, a more fundamental question which this project raised in this regard. Did the project really make adequate provision for permanent institution building to happen in the commercial banking sector? There are fixed costs which a commercial bank must bear in building its capacity to make loans to clients with whom it has had little experience and in activities for which it has few expertise. The most number of loans any commercial bank made under the program was five. Given the limited number of loans probable under the program for any one commercial bank and the length of time for which funds would be available under the program, it was unreasonable to expect that commercial banks to make the com-

mitment to building their institutional capacity in long-term credit lending in the agribusiness area. It is not clear whether AID bears some responsibility to see that the program continues. It is clear, however, that the commercial banks were justified in being cautious about making institutional investments in reliance on a government/USAID funded program. The private sector in most developing country is generally suspicious of government subsidized programs. Private firms including banks are well aware from their own experience that investments based on such programs are very risky because of the abrupt manner in which they are often terminated. Consequently, as AID turns increasing to support private sector institution building, it will have to make long term commitments to such programs and accept the fact that it takes time before private sector investment will be induced as a consequence of them.

Another problem which caused considerable difficulties was the lack of an adequate definition of the social criteria which were to help achieve the social goals of the project. An acceptable monitoring system with regards to benefits flowing to small farmers was never developed. This was partly due to the lack of specific social criteria and also to the inherent difficulty of monitoring the flow of benefits of from agribusinesses to small farmers. In some respects this did not prove to be a great problem for this project, especially with regard to balancing the interests of small farmers with those of agribusinesses. The criteria did not seem to interfere with the profitability of the agribusinesses;

yet it appeared to have benefited substantially participant farmers. This can be attributed to both the economic conditions of the country and the impressive diligence shown by the personnel of the Central Bank and USAID involved in the project. In many respects it would appear that fine tuning the criteria in actual practice and keeping subloan activities focused on areas in which small farmers were constrained was done somewhat informally by the institutions involved. As a general rule, however, it would be preferable to formally fix requirements which limit loan funds to geographic locations where small farmers are concentrated if new lands are not available to them, and/or to the type of agribusiness activities which intensively involve activities in which small farmers are naturally linked. This was, in fact, what appears to have happened in this project and proved to be quite successful.

The institutional/financial analysis suggested a benefit that should perhaps be measured more directly and consciously in subsequent evaluations of similar projects. It would be important to see direct data collected regarding the type of attitude changes which were observed in this project. The change in attitude of the political and economic decision makers regarding non-traditional agribusiness investors and small farmers was an unanticipated but potentially fundamental benefit of the project. Its potential impact on sound economic and social development could be substantial and should be given more central attention in subsequent evaluations of this type.

The economic impact results were encouraging to some and discouraging to others involved in

the project. The data presented a consistent and rational picture which would suggest that participant farmers did benefit from the project--sufficiently to affect the way in which they operated their farms and to entice them to make long-term changes, such as expanding the size of their operations. Farm size expansion by participant farmers of the I&S category was not based on increasing the amount of land they rented either. In fact, between the two agricultural cycles they decreased the average amount of land they rented, although the average amount of land they "possessed" increased. In addition, we found household size of participant farms increase, off-farm employment decrease, area cultivated increase, and production increase; consistent trends with the hypothesis that the participant farmers were benefiting from their linkages with agribusiness borrowers.

The principal disappointment was that the data did not show a greater difference in the incomes between participant and non-participant farmers than found. The differences were significant, and for several reasons it is probably unrealistic to expect them to be greater, given the nature of the linkages between the firms and farmers. First, the nature of the agribusiness activities tended to spread benefits over a large group of farm households rather than concentrate them on a small number. Therefore, the benefits to any one farmer will be somewhat diluted because of this spread. Secondly, the expansion of farm input and farm services by some agribusinesses undoubtedly put pressure on their competitors to upgrade their

own services to non-participant farmers in the same geographic areas so that non-participant farmers would also indirectly benefit from the project. Also it is possible that there was a demonstration effect in which non-participant farmers began to be influenced by the benefits they saw accrue to participant farmers so that they too changed the way in which they carried out their own farm operations. These propositions are supported by the fact that non-participant farmers increased their incomes between the two agricultural cycles in the I&S category. These reasons would suggest that the project had an impact over a large number of farmers and to a degree greater than that indicated by the income differences found in the I&S category.

The lack of a relationship between the small farmer lists of the agribusinesses and the farmers with whom they did business presents

some problems. This does not mean that the agribusinesses in the processing and storage categories failed to link with small farmers. It is possible they linked and benefited farmers who were not on their lists. It does, however, point up the problem of monitoring the linkage requirement without field visits, which would be no small expense if done on a large scale.

More importantly, however, the economic impact analysis suggest that the model pursued in the project of benefiting small farmers through the development of agribusinesses which link with them is a viable one. While we do not know the profitability of the agribusinesses themselves, the unusually good repayment record would suggest the lack of profitability was not a problem. Likewise, the impact analysis found that small farmers did in fact benefit from the linkages formed with agribusinesses.

I. INTRODUCTION

This evaluation is one of a series which will allow intercountry comparisons of projects in the area of rural enterprise and agribusiness development. Its principal purpose is to contribute to Agency understanding with regard to the planning, execution and impact evaluation of projects which are focused on small and medium agribusiness development.¹ There is a wealth of experience in AID in this area which should be made available to those AID Missions which are turning with increasing interest to the development of rural industries and the private sector.

This evaluation was carried out through the mutual coordination and financial support of the Agribusiness Division of the Office of International Cooperation and Development of the United States Department of Agriculture, the Office of Agriculture of the Development Support Bureau, the Policy Planning and Evaluation Division of the Office of Development Programs of the Bureau for Latin America and the Caribbean, USAID/Asuncion, all of the Agency for International Development, and the Central Bank of Paraguay. The evaluation was carried out by Dr. Bryant Smith, with the assistance of Dr. Samuel R. Daines in survey design and the economic impact data analysis. Karl Hancock directed the data processing and statistical analysis. Jaques DeFay of the Pragma Corporation wrote section IV on the institutional analysis. Mention should be made of the superior level of cooperation and support given the evaluation team by USAID/Asuncion.

II. PROJECT BACKGROUND AND HISTORY

The Paraguay Rural Enterprises Project (526-0107/T-028) was originally developed by the USAID/Asuncion Mission and the Central Bank of Paraguay in 1975 and 1976. The fundamental objective of the project was to increase the net incomes of small farmers in that country through promoting the development of agro-industrial enterprises in the private sector. The assumption was that if the agribusinesses being funded were in activities which would alleviate bottlenecks which small farmers faced, then such farmers would be indirectly benefited.

In the analysis carried out in the project preparation phase, a variety of constraints faced at both the institutional level and farm level were identified as creating bottlenecks to agricultural production by small farmers. At the farm level, there was a lack of stable and remunerative prices for labor intensive, high value crops; the lack of processing and marketing facilities contributing to this situation. Also the technological level of production was low for farmers who generally lacked access to machinery and inputs suited for an intermediate level of mechanization most appropriate for their farm operations. In the areas in which new farms were being started, the so-called "colonies", there was a need for improved marketing and road access in order to permit higher levels of production for farmers moving into these areas. Finally, it was felt that there was a need for off-farm job opportunities to absorb labor during slack periods on the farm as well as for

rurally based individuals who had few employment opportunities in agricultural production itself, without migrating to the urban centers.

Agribusinesses that were seen as a key factor in alleviating these farm level constraints were storage facilities to serve marketing and distribution functions; food processing facilities to help stabilize and increase the market for labor-intensive, high value crops as well as contribute to off-farm employment opportunities; and farm input and service firms to help increase the technological level of farm operations.

At the institutional level, it was determined that the principal constraint to agribusiness development was the lack of the availability of long term credit. This was due to a variety of factors such as strong liquidity requirements, since most of the loanable funds of commercial banks are demand and sight deposits.

The project was designed to deal with these institutional and farm level constraints through the establishment of a loan fund which would provide long term credit to agribusinesses which could meet the special requirements of the program. The Central Bank of Paraguay set up a rediscount mechanism which funneled the loan funds through commercial banks which then on-lent funds to agroindustrial enterprises. It was hoped that this involvement of the commercial banks might result in long term benefits by interesting them in participating in loan programs to agribusinesses on a more permanent basis. Thus the establishment of an effective rediscount mechanism for agroindustrial loans between the Central Bank and the commercial banks was the most important insti-

tutional objective of the project.

Starting in November of 1977, subproject loans were made so that by the middle of 1980, approximately US\$ 6.5 million had been lent to 58 agribusiness firms, with AID and the commercial banks putting up about 40% each of the loan value and the Central Bank providing the balance. A total of 15 commercial banks participated in the program, making an average of almost four loans per bank. The range of the size of the loans made by the commercial banks to agribusiness firms can be seen from the following:

Loan Amount	No. Loans to
zero to \$ 50,000	17
\$ 50,001 to \$ 75,000	4
\$ 75,001 to \$100,000	8
\$100,000 to \$150,000	7
\$150,001 to \$200,000	22
	<u>58</u>

The chart shows that the lending patterns were somewhat lopsided. There were a large number of loans on both the lower range (17 loans under \$50,000) and on the higher range (22 loans between \$150,001 to \$200,000). The average loan size was almost \$110,000 and the median loan about \$95,000.

The loans also tended to be placed with firms engaged in the type of activities contemplated in the project preparation to overcome identified constraints. A total of 15 loans were firms involved in food storage, silos construction and cold storage. This was consistent with the objective of improving marketing opportunities for small farmers. Likewise, a variety of firms were financed which were engaged in producing inputs to

farm production or providing services to farmers. One firm, for example, was involved in the production of agricultural equipment of a relatively intermediate level of technology. Another was involved in maintaining roads in the "colonies" so that marketing could be carried on more efficiently in these relatively new agricultural areas. There were a total of 19 loans in the area of inputs and services. The area of processing of agricultural products had the largest number of loans, with a total of 22 firms borrowing money under the program. In addition, there were two additional loans for miscellaneous purposes.

The geographic distribution of the loans to agribusinesses was quite diverse. Loans were made to firms in 11 of 16 departments of the country, and no department had more than 22% of the total loan value. The evaluation team visited a number of agribusiness borrowers who were located in rather small towns in the middle of agricultural areas as well as firms located in the middle of production areas removed from any towns.

Based on the documentation presented by borrowers of the first 47 loans, it was estimated that these would create approximately 816 new job places at the agribusiness establishments themselves at an average investment per job place of about \$12,500. Estimates were also offered by borrowers regarding the breadth of the potential number of small farmers to benefit from their investments. Five firms estimated that an average of 277 small farm families would benefit from their investments and 36 borrowers estimated that an average of 1,450 individuals would be direct or indirect

beneficiaries of their agribusiness activities. If this average of individual beneficiaries were to be representative of the average of all of the firms, an estimated 84,100 persons could potentially benefit from the overall loan program. If we assumed an average family size of 6.5 (that found in the survey of this study), then potentially 12,900 small farm households could have benefited from the project. Of course, such figures submitted by potential borrowers seeking to meet loan requirements of benefitting small farmers must be accepted with some reservations, but they do represent a starting point from which to consider the issue. While evaluation resources did not permit a verification or repudiation of this data, it is noted that projects which were visited did reach a large number of small farms in their areas. In fact, many of the activities lent themselves to a broad reach--perhaps at the cost of not concentrating benefits on a group small enough to be significant.

While no direct data is available regarding the size of the participating agribusinesses, the data on the 47 original borrowers give some impressions. The firms on the average had 8.3 employees which they anticipated would increase to an average of 25.7 with the new investment. If we assume that the average capital costs per job place prior to the loan was roughly equivalent to the marginal rate, then the total capital per firm on the average would be about \$103,750 before the loan and about \$321,250 after. The firms supplied a large portion of the total capital of the investments that were financed by the loan program. On the average the total loan value to the agribusiness borrow-

er equalled 48% of the total investment made. While this percentage tended to fluctuate a great deal from firm to firm, the pattern was not different for firms obtaining large loans relative to those receiving loans for smaller amounts. In general, it would appear that the average agribusiness borrower was a medium sized firm involved in a business of a medium capital intensity, seeking investment funds to make a substantial expansion of his operation.

Turning to the small farmers who were meant to benefit from the project, the survey data of the evaluation gives a fairly detailed profile of them. The average small farmer possessed about 15 hectares of which he cultivated from 10 to 11 hectares. About three-fourths of them had relatively secure clear titles to their farms. When the value of farm produce consumed or saved on the farm is included with the value of the production sold, the average farm family had a per capita income of about US\$ 400 to \$450 per year. This generally consisted of a household of 6.5 individuals; so the average income of the farm household was approximately US\$ 2,763. The average farmer was literate and had completed the third grade of primary education, while 75% of his children between the ages of 7 and 18 years were attending school. A little more than half of them went to hospitals or health centers when there was sickness in the family, but such facilities were about 18 kilometers from their farms. The type of housing farm households had varied with the area of the country but 95% of them lacked both electricity and running water.

Farming practices were simple

but by no means primitive. Although 90% of the farmers received no technical assistance from government or private sources, most of them tended to use insecticides and fertilizer on their principal cash crops. Likewise, the average small farm surveyed had one ox and four cows, although almost no farm had a tractor. Also, there was a widespread use of credit among small farmers with a fourth of them obtaining loans from informal sources.

As the project progressed the Central Bank and AID struggled with the issue of how to ensure that small farmers would actually benefit from the agribusiness activities. Procedures evolved which required agroindustrial borrowers to supply lists of small farmers with whom they intended to link and then it was required that 50% of their raw agricultural inputs be obtained from them or other activities be carried out with these small farmers. Field trips were made to try and ascertain whether or not these farmers seemed to be benefiting from the agribusiness activities, and supervisory personnel of the project frequently discussed the effectiveness of this mechanism to effectuate the desired linkages. The evaluation of the project found that there was widespread noncompliance with this requirement, but not necessarily because of carelessness or bad faith on the part of the agribusinesses. The agribusiness firms themselves had no way of compelling small farmers to do business with them, even when such farmers might have previously expressed their willingness when approached by the firms in the preparation of loan applications and small farmer lists. In one case one of the agribusinesses had

technical problems and had to shut down its operation during the second agricultural cycle. This overall non-compliance, however, was to make verification of small farmer benefits from the project extremely difficult.

III. EVALUATION OBJECTIVES

An evaluation must focus on specific objectives which are consistent with the principal goals of the project and within the resources available for the review. If financial resources for project evaluation were unlimited a wide range of interesting and important issues could be examined and unexpected benefits from project activities could be given more central consideration. Given the scarcity of evaluation resources, however, this evaluation, proceeded on the somewhat unsatisfying but necessary requirement that the most fundamental objectives of the project determine the design and focus of the evaluation.

The evaluation focused on two major goals of the project. The first was to examine the institutional goal of establishing a financial mechanism which would effectively channel long term credit to agribusiness development. This section of the evaluation report examines the institutional/financial problems and practices which evolved over the life of the project, the manner in which problems were resolved, and the likelihood that the project helped establish a permanent or long term interest on the part of financial institutions of Paraguay in financing agribusiness investments.

The second section of the evaluation focuses on the economic impact of the project on the small farmer, the principal beneficiary

intended by the project. It seeks to measure the increase of incomes to small farmers which can be reasonable attributed to linkages forged with agribusiness borrowers.

Basic to this evaluation, as well as any evaluation, is the need to determine the degree to which project problems are attributive to flaws in the conceptual design of the project relative to inadequate implementation. Most projects which have serious problems probably suffer more from the lack of adequate attention to the "nuts and bolts" problems of implementation with its day-to-day follow-through requirements, rather than from unrealistic project design. This evaluation tries to keep these two problems separate in the analysis as well as in the recommendations.

IV. INSTITUTIONAL EVALUATION

The purpose of this section is to evaluate the influence of credit, institutional arrangements, and implementation had on the Paraguay Rural Enterprise Project. We shall approach that subject by addressing certain specific issues first, leaving until the end of the section the task of summarizing the relevance of these issues to the main purpose of the institutional evaluation.

A. Credit Facilities and Mechanisms

There are a number of institutional problems encountered in creating new credit facilities. A wide variety of credit mechanisms could be implemented such as a rediscount fund, branch bank lending, or ICI arrangements. It is, of course, beyond the scope of this evaluation to

analyze which of those alternative would have been best in the Paraguay Rural Enterprise Project. "What if" questions can generally be adequately answered only after considerable comparative analysis of similar projects utilizing different mechanisms. Therefore, our present evaluation will focus on the credit facilities utilized in the project itself.

The Rural Enterprise Project used the rediscount mechanism to channel funds from the Central Bank of Paraguay, through the commercial banks to agribusiness entrepreneurs. The \$2.5 million AID loan along with \$850,000 of Central Bank counterpart funds, formed a rediscount fund in the Central Bank. Commercial banks were allowed to rediscount 60% of the loans made to agribusiness entrepreneurs.

The principal institutions involved in the project were USAID/Paraguay, the Central Bank, and a number of commercial banks.

The institutional problems encountered during project execution all related to two major activities: subproject selection and project evaluation. The aspects of subproject selection that were particularly controversial were: the kinds of decisions that needed to be made, the institutions or the people responsible for the decisions, and the criteria that should guide these decisions.

At the beginning of project implementation, it was not clear what kinds of decisions each institution would have to make during project implementation. There were at least two important decisions: (1) Was the subproject presented by the agribusiness entrepreneur financially, institutionally, and technically viable, and (2) Would the

subproject have the desired impact on the small farmers?

The Central Bank and the commercial banks appeared at first to lump these two decisions together and assume that if the subproject passed the first test and was in the area of agribusiness, it would tend to have the desired impact on small farmers.

The first decision was one all banks must address when considering a loan application. It is essentially a commercial bank decision. The second decision was required only because of AID's objectives to benefit the small farmers. The difference between the two decisions was not always clear among Central Bank and commercial bank officials. These people came from a very different background, had different objectives, and faced different constraints than AID officials. When the AID Mission stated it wanted to relieve some of the constraints facing small farmers, most of the people in these organizations, who were hardly aware of the existence of small farmers did not at first fully understand the exact meaning of this objective. Therefore, not fully appreciating AID's motives, the two institutions were at first quite reluctant to adopt the necessary steps to ensure that the project's objectives would be reached. Initially, for example, Special Development Fund officials in the Central Bank were slow to hire an evaluation specialist to review loan applications to assure that each subproject would benefit small farmers.

The commercial banks had to decide whether the subprojects were "bankable". Unfortunately, at the beginning of the project, the banks continued to apply the type of analysis

required for short term commercial loans rather than allocate the time and money that is necessary to carry out an adequate appraisal of applications for long-term loans. As a result, the analysis they performed on subloans was often inadequate. The banks relied on good guaranty coverage and not on the viability of the subprojects. This problem, among others, caused the Central Bank to become much more interested in performing the analysis itself, and, thus, it began to ask applicants for considerably more information than was necessary to fulfill the commercial banks' own functions.

According to the project agreement, the Central Bank was allowed to approve or reject loans of less than \$200,000, although AID reserved the right to object within two weeks. In order to hasten the process of loan approval, however, it was informally agreed that the commercial banks would decide whether or not a subproject was financially, institutionally, and technically viable; whereas, the Central Bank would only check the subproject's potential for helping the small farmer.

This plan did not work very well, as a number of problems arose, principally because of the very rapid rate at which loan funds were being committed. AID became increasingly worried that the Central Bank was not sufficiently careful in assessing the loan's potential impact on the small farmer. AID's concern increased when it was discovered that a number of the subprojects approved were located in regions which did not have large numbers of small farmers. In addition, while conducting some field visits, AID officials discovered one or two cases where the impact of the subproject on

small farmers was at best unclear. As a result, near the end of 1978, AID officials decided to approve all loans directly in a committee consisting of representatives from AID, Central Bank, commercial banks, and consultants.

If anything, the initiative taken by AID to approve all loans in a committee should have come sooner. In the future, if such programs are to be developed in other countries with limited experience with rediscounting programs designed to help small farmers, it is suggested that the first few loans be approved by such committees involving all institutions engaged in the project. This forum is a good place to establish personal contacts among the people working in the operation of the project, which are crucial to the success of such projects.

The Central Bank was not content to let the commercial banks assume the entire responsibility for the analysis of financial, institutional, and technical viability of the operations. The Bank reasoned correctly that, although the commercial banks assumed the risk of foreclosure on each operation, the Central Bank had the final responsibility for the project. In fact, the Rural Enterprise Project was an initiative of the Central Bank and the Bank had invested its reputation in the possible success or failure of the project.

The criteria for selecting subprojects were confusing, and too general. Subprojects could be selected if they met one or more of the following criteria: (a) the proposed subproject contributed to the welfare of the small farmer, (b) the proposed subproject eliminated a bottleneck to the development of agribusinesses of

the type which would benefit small farmers, and (c) the proposed subproject created a substantial amount of direct employment resulting in a new source of income for Paraguayan workers. These categories were so broad as to include practically every possible subproject that could be presented. In addition, the definition of a small farmer was not initially clear. Finally it was agreed after several months that a poor farmer in the Central Zone was one who had less than 20 hectares, whereas a small farmer in the Colonies Zone was one who had less than 20 hectares under cultivation. Even then, however, there remained considerable room for judgment.

The matter of criteria deserves more attention. It is crucial for AID because it is how AID encourages the selection of projects which presumably will impact favorably on the small farmers. It is also a source of considerable disagreement because it is one of the most innovative aspects of the Rural Enterprise project. Based on the Paraguayan experience we would suggest that in the future AID use a different set of criteria which is perhaps less sector oriented and perhaps more geographically oriented.

One of the first things that could be done to improve the criteria is to use them as a means to exclude projects from the rediscount program rather than as a means to find desirable projects. In other words the criteria should list activities which are undesirable rather than the other way around. In practice, the activities which must be excluded are much fewer and much more specific.

Secondly, even where the criteria

make sense logically one must consider whether they can be enforced. The criteria proposed, for example, that the financial institutions involved select projects which benefited small farmers. As a result prospective agribusinesses were asked to provide a list of potential beneficiaries when they applied for a loan. These lists proved to be of very little value. The case of a firm that produces agricultural equipment and tools is illustrative of the inherent weakness of this requirement. The firm that produces agricultural equipment and tools is illustrative. The firm provides a list of his future customers, presumably small farmers] he has no choice since AID asks for the list and make it a condition of the loan. In fact there is no assurance that these people in the list will end up purchasing anything from this firm. They will make their purchasing decision only when the firm starts production and they will do so comparing prices and quality with other suppliers of these tools. The producer on the other hand must sell to whoever wants to purchase his goods. After all he is in business to make money and not necessarily to help small farmers. For him, helping a small farmer is a very incidental consequence of his activities.

The same weakness can be seen in the case of a silo operation. The small farmers in the area will sell their products to the silo only if they receive a good price. On the other hand the silo owner will look for business wherever he can get it. If the small farmer decides not to grow the type of product the silo owner was planning to store, because of world demand considerations, the silo owner has to find other clients.

This cases illustrate the difficulty of administering the types of criteria used in the Rural Enterprise project. On the theoretical side, such criteria can circumvent the price mechanisms as a tool for resource allocation. It is not at all clear how government officials will end up making better choices than the market forces, however, distorted such forces may be.

Finally, if one wants to help small farmers and knows where they are located, perhaps the use of funds should be limited to those areas where small farmers are concentrated. This approach would have its advantages, although there would also be some negative trade-offs. This criterion would encourage the small farmer to remain in these areas, although the best way to increase the small farmer's income might be to have him move to another richer region of the country. Also it might be difficult to limit the activities of the enterprises financed under this scheme to the areas targeted.

Project evaluation although closely related to project analysis, made entirely different demands on the institutions. AID repeatedly asked the Central Bank to appoint a project evaluator and the Central Bank delayed the appointment. Of course neither institution knew how to evaluate this project. As a matter of fact, it is still not clear how to evaluate some aspects of this type of rediscount project. The evaluation plan proposed in Annex I of the loan agreement was primarily a list of desirable end-products, without a clear explanation as to how they should be obtained. In general, this kind of evaluation activity should not be assigned solely to the institution that is in charge of implementing the project.

The institution tends to be staffed with people who are more oriented towards project implementation and usually have little interest in the type of analysis that is required in project evaluation. Likewise, the implementing institution is clearly interested in having the project look good and may not be unbiased. The implementing institution is however, in a good position to install an information gathering system and should be asked to do so, although first AID and the sponsoring institution should jointly design a plan. In practice, an evaluation plan for this type of rediscount project may be very costly and difficult to design, so lower cost second or third best indicators might have to be relied upon which are relatively more crude measurements of success.

Although the institutions had difficulty agreeing on the goals of the project, they had surprisingly few problems implementing the basic procedures of loan rediscounting. In fact, although the project funds were to be disbursed over a three year period, 38% of the funds were disbursed during the first six months. In part, this success can be explained because the idea of Central Bank discounting was not totally foreign to the Central Bank and the commercial banks. In fact, before the project, the Central Bank permitted the commercial banks to rediscount up to 20% of their loans. It used this policy basically as a tool for controlling the money supply available through the banking system. AID's objective was to generalize the use of the rediscounting mechanism as a tool to finance agribusiness projects which would impact favorably on the small farmer. This was a radical de-

parture from the kind of rediscounting to which the Central Bank and the commercial banks were accustomed, and as new idea had to be sold. The Central Bank took the lead in this respect and did a very commendable job.

Although the Bank deserved much of the credit for the project's success in making loans, the project designers must also be commended for having chosen the Central Bank as the main focus of the project instead of some other credit organization.

Surprisingly, these mechanical aspects of the project appear to have caused much concern during the project design phase, whereas few people imagined it would be difficult to reach agreement on the goals of the project. To AID's credit, the project was always viewed as a learning experience, and apparently anticipated that first phase would be followed by a second phase involving additional funding. When the Mission realized that the goals of the project were not being properly understood by the other two institutions, it required that all projects be approved directly by a committee. This exercise proved to be a very useful learning experience since all parties involved had the opportunity to clarify doubts they had about the project and see for themselves that AID was in fact serious about helping the small farmers.

B. Technical Assistance to Lending Institutions

The extent and type of technical assistance required by lending institutions in setting up and undertaking programs in small enterprises was almost non-existent because small enterprises were not generally

borrowers from those institutions under the project. The Paraguay Rural Enterprise Project was not directed to small enterprises; nor was there any limitation on the size of agribusinesses that could participate in the program. As a result, the banks had little difficulty dealing with these enterprises.

The need for technical assistance among the commercial banks arose because they were being asked to provide long-term credit to agribusiness instead of the short-term commercial loans with which they were familiar. The management of long-term credit required the commercial banks to install much more elaborate credit approval and credit follow up mechanisms.

The commercial banks traditionally offered short-term credit to their preferred customers with relatively little formal analysis, relying on the character of the individual and collateral offered. In fact, in Paraguay, many banks did not even require a complete description of the purpose of the loan. Once the short-term loan was approved, the bank traditionally did not conduct any follow up of the transaction.

The long-term credit offered under the Rural Enterprise Project differed significantly from the short-term credit offered by the banks. The Rural Enterprise credits tended to attract clients who were not the traditional clients of the commercial banks. In addition, since the credit repayments extended over several years, the banks had to become much more concerned about the enterprises' capacity to remain viable, and the quality of their management, in addition to the general purpose of the loan and the financial viability of the project. The financial

strength of borrowers measured in terms of the size and quality of the collateral offered became only one aspect of project analysis. These new concerns meant that loan approval became a much more demanding activity, and most commercial banks in Paraguay were not organized to undertake this type of analysis. To begin with, they did not have the personnel required, such as financial analysts expert in cash flow analysis and agroindustrial engineers able to judge the technical soundness of a project. In addition, the volume of business expected from a rediscount system did not usually justify the hiring of new professionals to work exclusively on long-term credit. As a result, the banks merely assigned one professional part time to long-term credits and contracted consultants to undertake most of the technical and financial analysis. One bank, as a result of its positive experience with the Rural Enterprise Project and because of its traditional emphasis on the agribusiness sector, has since hired several financial analysts and agroindustrial engineers to strengthen its long-term credit department. The banks which had no interest in opening a special section for long-term credit continued to rely primarily on consultants, of whom they have had no trouble finding qualified individuals.

The banks had much more difficulty using consultants to ensure follow up of the loans. Follow up can be costly since it may extend over a number of years. In addition, consultants who prepare feasibility studies, financial cash flows or technical evaluations may not be inclined to carry out loan follow up and

may not even be qualified to do so. Bank staff showed great reluctance to visit project sites because of the hardships involved (poor roads) and because of their natural preference to remain in Asuncion behind their desks. On occasion, also the per diem outside of Asuncion was not a sufficient incentive. In fact, most banks were quite content to have Central Bank employees carry out the loan follow up. The type of follow up carried out by personnel from the Central Bank, however, was primarily related to the small farmers criteria, so normal commercial bank monitoring was not carried out on any substantial scale.

In conclusion, loan follow up is still a problem. In general, the banks are still not inclined to incur the additional costs associated with follow up since the volume of business does not justify the extra cost. AID's decision to discontinue its financial support of the project after the first installment proved them right. If the project had continued at the same pace for several more years, many banks would have undoubtedly decided to install a special long-term credit section with full-time staff able to undertake project analysis and follow up. In the future, these banks will be more reluctant to increase their financial commitment in a similar project not knowing whether AID might withdraw its support of the project again, before adequate institution building has had sufficient time to take place.

C. Promotional Activities

The level of promotional activity necessary for credit institutions to attract sub-borrowers was perhaps somewhat unusual for an AID pro-

ject. The Central Bank and the commercial banks did not engage in much promotion aside from press releases and informal meetings arranged at the beginning of the project. The project funds were used so rapidly that no promotion was needed among the target group sub-borrowers. On numerous occasions the Mission objected to the lack of promotion in the countryside, in regions where most of the small farmers were located. Although such promotion might have been desirable if the project had received additional financial support, it was uncalled for then because it would have raised expectations far beyond what was possible with the funds available. Therefore, the Central Bank's decision to not carry out additional promotion was correct.

The kind of promotional activity appropriate in a project of this sort depends to a great degree on the selection criteria for sub-borrowers. Since the selection criteria were very loose there was very little promotion required. At the same time, however, it was necessary to take into account how the private sector was going to react to the social criteria of the project--not necessarily an easy thing to gauge. It would have been pointless, for example, to devise criteria so demanding that only a few firms would have been interested in participating in the program. In fact, the selection criteria devised were made very loose, in light of the poor experience in a similar project in Uruguay. In any project of this sort it will be necessary to monitor social criteria very closely at the beginning, in order to be able to adjust them quickly in response to the private sector's reactions. Likewise, such projects must be designed in such a

way that all parties realize beforehand that such modifications are likely and that mechanisms exist to implement the changes necessary in the project design.

D. Lending Institutions' Loan Review Requirements

An assessment of lending institutions' requirements for information on sub-borrowers such as personal data and feasibility studies raises the following issues:

(a) Do the requirements allow a thorough review of the loan purposes and make a satisfactory judgment about the feasibility of the enterprise to be financed?

(b) Do the requirements place too great a burden on potential sub-borrowers?, and

(c) Do the requirements inhibit target group members from borrowing?

From the start, the project designers were very aware of the dangers that a rediscounting system presented in terms of cumbersome procedures for project approval. Normally when an entrepreneur sought credit from a commercial bank, he only had to satisfy that particular bank. In the case of this rediscount system, the entrepreneur had to satisfy the requirements of the commercial bank, the Central Bank, and AID. As a result, the process could have taken triple the amount of time.

To hasten the process of project approval, AID allowed the Central Bank to approve loans for less than \$200,000, reserving for itself the right to object within two weeks.

In addition, the project placed the responsibility for project analysis on the commercial banks, since they were the

ones assuming the risks of the operation. According to this scheme, the Central Bank's role was to make sure that all subprojects adhered to the special criteria of contributing to the small farmer's welfare. In theory this system was reasonable. In practice, the following occurred.

The commercial banks, since they were unaccustomed to the type of analysis required for long-term credit approval, did not carry out a complete project analyses, involving a cash flow analysis and a technical review. They were content to protect themselves with large collateral requirements.

Although the commercial banks, in principle, assumed the risk for default, in fact the Central Bank could not avoid sharing some of the risks of the operation. The Rural Enterprise Project was a Central Bank initiative and the final responsibility for project success belonged to the Central Bank. The Bank, therefore, felt compelled to analyze the loan applications in some detail and it directly or indirectly asked for more information than was provided in the regular loan application form.

In addition, because Paraguay is a country where political allegiance, family ties, and friendships traditionally play an important role in every aspect of life, the Central Bank could not assign to the commercial banks complete responsibility for project approval. In fact, the normal procedure for loan application was to obtain the "no-objection" of the Central Bank informally before any documents were presented to the banks. After the first few months, the loan application system adopted appeared to provide enough information to allow a thorough review of some aspects of the

application. At the same time, sub-borrowers did not feel overburdened by the information requirements. Difficulties arose not because of the demand for information, but because of the analysis required in order to approve the loans. To determine whether the information presented in the loan application was sufficient or adequate to reach a correct decision, one would have to verify its veracity by conducting a field trip. No field trips were taken for that purpose, however, until more than half of the project funds had been committed. Near the end of the first year, AID assumed a more active part in the verification process, conducting various field trips and enforcing more strictly the selection criteria.

Neither AID nor the Central Bank, however, was happy with the application form. This form, included as an annex to this report, was divided into four sections. The first section dealt with the location of the subproject, the second section included financial data, the third section was a brief description of the project and fourth section listed the potential benefits to the small farmer. The Central Bank objected to the form because it felt the form did not contain enough information. Later on AID also objected to the form because it was not possible to determine from the form alone, the real impact of the projects on the small farmer. In addition, AID wanted a verification of the information on the form by visits to the project site.

Since the Central Bank felt compelled to review all aspects of the subproject, including aspects that presumably were the responsibility of the commercial banks such as finan-

cial and technical viability, it might have been best to design a general application form which would have included all the information required by the commercial banks, the Central Bank and AID. Then only a copy of that document would need to be sent to the Central Bank. Of course this procedure would have increased the risk of a long and costly approval process.

E. Sub-Borrower Assistance Needs

The business enterprises seeking loans under this project were not small firms. They had little difficulty providing the banks with the information which was requested from the lending institutions. There were, in fact consulting firms which could provide services and assistance sub-borrowers needed to qualify for subloans, such as the preparation of feasibility studies and the filling out of loan applications and financial projections. Consequently, there never developed a pressing need for lending institutions to provide such services themselves in order to maintain an active portfolio.

Technical assistance to sub-borrowers under the project was also very limited from outside sources. This was in part due to the fact that the sub-borrowers were generally firms with some experience in the activity in which they were investing, although there were some exceptions to this. It is doubtful, in practice, that the lending institutions or outside sources would have been better able to identify technical assistance sources in process technology than the sub-borrowers themselves.

F. Interest Rate Structure

An analysis of the impact of the interest rate structure of the financing arrangements raises several important issues for this type of project. Did the interest rates allowed fully cover the lending costs of the participating institutions, including the Central Bank? Did the lending institutions find themselves with a significant portion of their loans in default? And, finally, did the credit institutions experience serious decapitalization?

At the beginning of the Rural Enterprise Project, the commercial banks were allowed to charge 10% interest plus a 3% commission per year equivalent to 13% payable in advance every six months. In early 1980, the total permissible rate was increased to 14.5%.

Regarding the cost of the project to the Central Bank, this institution had two funds from which to make rediscounts: (1) US\$ 2.5 million loan from the US government which cost 2% per year for the first 10 years and 3% for the following 30 years; (2) \$500,000 which was the Central Bank's contribution to the Rural Enterprise Project, which bore no financial cost, other than an opportunity cost.

The Central Bank lent to the commercial banks at 5% payable in advance. Therefore it was left with at least a 3% rate on AID funds and a 5% rate on its own money. In the last 30 years of the program the differential on AID funds will be 2%. In fact these differentials were slightly higher since the Bank collected the interest in advance. In practice the Central Bank received approximately \$100,000 a year in interest income, the difference between the interest paid to AID

and the interest received from the commercial banks. This differential was more than enough to cover the administrative costs of the project. In 1978 for example, these administrative costs were less than US\$ 55,000. These costs however were paid from the \$350,000 allocation that the Central Bank had pledged for administrative cost at the beginning of the project. As a result the \$100,000 were kept as retained earnings.

The commercial banks received a differential of at least 8% on 60% of each loan made to the entrepreneurs since they were only allowed to rediscount 60% of each loan and charge 13% to the entrepreneurs. The cost of the remaining 40% of each loan oscillated between 14% and 16% which meant that the banks lost money on that portion of the loan. On the whole, however, the differential obtained from the loan operations seem to have been sufficient to cover their cost. Since the commercial banks accounting system did not segregate costs according to types of loan, it is not possible to ascertain exactly the administrative costs of the project. Bank managers believed, however, that these administrative costs were small and that the differential was more than adequate to cover them. This in part was due to the fact that there was relatively little administration of the loans being carried out by the banks so costs were relatively low. Since then, the commercial banks have accepted a lower 5% effective differential in a World Bank project.

As of now there are no loans in default and no serious threat of decapitalization. Since there is free convertibility between the dollar and the guarani there is no clause

obliging sub-borrowers to repay the loans in dollars.

G. Influence of Credit and Institutional Arrangements on the Impact of the Rural Enterprise Project

Let us now return to the main purpose of this section which is to evaluate the influence that credit and institutional arrangements and implementation had on the Paraguay Rural Enterprise Project beneficiaries.

The project's funds were fully disbursed by mid-1979, in half the time originally planned. The strong demand for these funds was due in part to the very favorable economic conditions which existed in Paraguay during this period. Because of an extremely large construction project, the Itaipu dam, a great deal of money came into the country from Brazil, a co-partner in the project.

Another reason which explains the project's success in using the funds allocated to it is the strong incentive provided to the commercial banks. In Paraguay, the commercial banks were required to maintain 45% of their portfolios in productive loans. These loans, however, were not as attractive as regular commercial loans because of the lower interest rates which could be charged and the additional administrative costs involved. Prior to the Rural Enterprise Project, the banks could rediscount only 20% of their loans to the Central Bank. With the Rural Enterprise Project, banks were able to rediscount 60% of their loans and, more importantly were able to use such rediscounts to meet their portfolio requirements. In addition, the interest differential on the loans was large enough to make this operation

attractive. So the rapidity with which funds were disbursed can definitely be traced to the particular credit and institutional arrangements which were used in the Rural Enterprises Project.

Next, let us examine how these particular institutional arrangements influenced the project's impact on small farmers. The project's economic impact on small farmers is addressed in greater detail in the next section of the study which makes use of comparisons between selected farmers, before and after the project, in an attempt to establish whether their net incomes increased as a result of their participation in the project. While the results of such comparisons are useful in assessing the impact of the project on small farmers, it is also important to take into account institutional changes, changes in the farmers' way of thinking, and changes in society's way of thinking about the small farmer.

An indirect way of evaluating the probable impact of the project on small farmers, in addition to the economic impact data analysis, is to analyze the constraints the small farmer faced before the project and the project's success in focusing on some of those constraints. If the project has, in fact, relieved some of the constraints facing the small farmer, it is reasonable to expect that the farmer's capacity to increase his wealth has increased and will be manifest in the long run.

What were the constraints faced by small farmers before the project? According to the project paper, these constraints could be classified into two categories.

(1) Those related to the

basic resources of the country, such as the amount and quality of land.

(2) Those of a more specific

(a) The lack of more productive technologies embodied in such inputs as small tillage machines, grain driers, silos, and trailers.

(b) Unattractive prices for the farmer's goods as a result of the lack of storage and processing facilities.

The Rural Enterprises Project was designed to relieve constraints.² (a) and 2(b).

All of the 58 subprojects financed under the Rural Enterprise Project either produced an input or service that could be used by a small farmer or purchased an output that could be produced by a small farmer. In fact, the kinds of crops serviced by the subprojects tended to be those which are grown by small farmers, such as sugar cane, coconut, cotton, peanuts, and mint.

We cannot know for sure, on the basis of the data available, how much these subprojects actually helped the small farmer relative to the large farmer. It is worth noting, however, that a large portion (43%) of the subprojects were located in the two departments which have the highest concentration of small farmers—Central and Cordillera. Therefore, it is reasonable to assume that most of these subprojects had some impact on the small farmers. This conclusion is corroborated by the results of various field trips organized by people in the AID Mission during 1978 and 1979.²

In conclusion, the Rural Enterprise Project appear to have reduced some of the constraints identified during the

project preparation phase. It can be assumed, then, that in the future the small farmer's ability to increase his wealth will be greater as a result of the project.

What were the specific consequences of the institutional arrangement established in the project? The above improvement could have been obtained in any number of ways, such as by promotion direct investment in agribusiness sectors by offering certain tax benefits or by having the government invest directly in many of these projects. The results would likely have been the same; that is, a one-time reduction of a constraint facing the small farmer.

The institutional arrangement developed by the project brought an additional benefit to the small farmer. It provided a mechanism by which additional investments could be channelled in the future towards alleviating the same constraints facing the small farmer or other new ones which may arise. The establishment of such a mechanism was, in our view, a major achievement of the Rural Enterprise Project. The permanence of this achievement has been clouded, however, by a dispute between the Central Bank and USAID. Central Bank personnel maintain that they were led to understand that USAID would provide a follow-on loan after the original fund was exhausted, and they proceeded on that assumption. USAID has taken the position that Paraguay has an abundance of foreign exchange and is experiencing substantial economic growth, so that a follow-on loan is not justified and the Central Bank should fund the continuation of the program alone. Based on interviews with all the parties concerned, it is not clear whether the

Central Bank misunderstood USAID's plans or whether USAID changed its mind. The result has been a continuing insistence by the Central Bank that USAID participate in a second loan to fund the program, and USAID's insistence that the Central Bank take the program over entirely on its own. The impasse has jeopardized the continuation of an institutional/financial mechanism which has generated considerable interest on the part of commercial banks in the country.

Although quantitative data was not collected, interviews with interested parties in the project left the impression that the project did effectuate a number of attitudinal changes. The project seemed to have heightened the awareness of decision-makers in the capitol city, who have historically dominated the country, that small farmers are people who are capable of making a positive contribution to the economic growth of the country. Bankers became more aware of the potential benefits to themselves of participating in long term lending to agribusiness development with clients, many of whom were not their traditional customers. Most importantly, entrepreneurs who were not necessarily part of the social and business elites of the country saw that with proper organization and preparation they could become significant participants in their society. In our opinion this type of awareness, along with the creation of the related institutional mechanism, are the root of the real progress effectuated by this project, not only for the small farmer but for the whole society.

V. ECONOMIC IMPACT EVALUATION

A. Methodology

Because of the limitation of funds and the cost of field surveys, the economic impact evaluation focused somewhat narrowly on information relative to the impact of the project on the net incomes of small farmers.

To follow the issues which are treated in this section it is important to have more than a cursory understanding of the methodology which was contemplated for the evaluation. The design of the methodology was to permit the testing of several questions that are frequently raised about the use of statistical comparisons and the flow of benefits.

The methodology of the economic impact analysis was based on comparing small farmers who were linked with agroindustrial borrowers with those who were not, to see if there arose any income differences which could be reasonably attributed to the project. For convenience those farmers who were to link with agribusinesses are referred to as "participant" farmers, and those farmers not linked with project borrowers are referred to as "non-participant" farmers.

The lists which agribusiness borrowers submitted to the Central Bank which listed small farmers who were to link with them were used as the basis for a list frame random sample selection of the participant borrowers. This allowed a random verification of the degree to which the whole list requirement mechanism was functioning. Criteria were established in the selection of non-participant farmers based on their size, production pattern,

distance from major roads relative to participant farmers, and their relationship to agribusiness borrowers under the loan program.

The evaluation provided for the collection of basic data from both participant and non-participant farmers at the end of two agricultural cycles (July/August of 1979 and 1980) so that both longitudinal as well as cross-sectional data would be available for analysis.

Farmers were grouped into three different categories for comparisons. These categories were based and named on the type of agribusiness activities that borrowers carried out and to which the farmers were linked. Participant and non-participant farmers were selected for each of the three categories so that analysis of each category could be carried out in isolation of the others; that is to say, data collection for each group was independent of the other two categories. The three categories were (1) inputs and services (I&S), (2) processing (of agricultural goods), and (3) storage (facilities for agricultural goods).

As it turned out, the I&S category had some distinctive characteristics which added somewhat to the potential of getting extra mileage from the analysis. This category involved agribusiness borrowers who had already undertaken operations and were involved with the participant farmers during the first agricultural cycle as well as the second agricultural cycle from which data was collected. This was not true for the processing category. This "early beginner" characteristic reduced the value of the longitudinal data for the I & S category since there would be no baseline data. It opened up, however, the opportun-

ity to measure the stream of benefits from the project for a period longer than would be otherwise possible. The questions are often raised as to when it is reasonable that benefits will begin to flow to the beneficiaries from a project and also whether those benefits are sustained over more than a very short period of time. Longitudinal data for the processing group would have allowed some evaluation as to whether benefits were felt in the first year of operation of an agribusiness. The I&S category would have allowed an analysis of whether they begin to flow or are sustained in a second year of operation, and whether the benefits continued to increase or level off or decline. The storage category fell somewhere in between the other two. Some of the agribusinesses began their new or expanded operation during the first agricultural cycle of data collection and linked with some of the participant farmers.

Even this length of benefits measurement might be faulted as being too short run. It is often asserted that the long run benefits from a project are those most important to its success, which is undoubtedly true. From an evaluation point of view, however, the further we move away from the project in time, the more difficult it can become to sort out the influences of intervening exterior forces which come to have their own impact on the situation being analyzed.

The collection of baseline data for the processing group also allowed the testing of the comparability of the participant and non-participant groups; i.e. the "attribution problem". It is frequently argued that cross-sectional comparisons between persons partici-

pating in a project with those not participating in a project are not valid because the participant people are often different from those not participating--in fact, this is evident from the fact that they get involved in the project. It is asserted, for example, that participants are often more entrepreneurial than non-participants and this causes much of the differences that are found in the two groups and is incorrectly attributed to a project. Baseline data, on the other hand, allows us to see if there are any significant economic and/or social differences between participant and non-participant groups. Thus, the baseline data for the processing group is examined for this issue. Social profile data which was collected in the survey is also analyzed to determine the comparability of the participant and non-participant groups within all three of the categories. It would seem reasonable to assume that if participant farmers were different in their entrepreneurial drive or economic skills, this would also be manifested in their social characteristics as well.

It was understood from the beginning that there was a certain risk in using the agribusiness/borrower lists to select participant farmers in the first year. It was recognized that the lists would probably be partly defective either because borrowers did not try to fulfill their obligations to link and/or because small farmers might refuse to participate with the agribusinesses. To compensate for this contingency, the sample size of each category was increased 60% larger than would have been otherwise necessary for statistically reliable data. The

second year of the survey, however, showed that for the processing and storage categories the lists proved to be far more defective than anticipated--the vast majority of the small farmers on the lists did not link with the agribusinesses. This reduced the economic impact analysis to only the I&S category, which proved to be the only category in which there was substantial compliance with the list requirement. It did not, however, prevent the use of the first year data for the two groups being used to examine the attribution issue. Equally important, it showed that the small farmer list requirement was not a sufficient one for linking or monitoring linkages between borrowers and small farmers. This does not imply that linkages were not in fact formed between borrowers and small farmers in the storage and processing groups. It means simply that we cannot measure the linkage through the list mechanism, and that project planners in the future will need to try alternative mechanisms to forge the link between borrowers and small farmers in future, similar projects. For processing firms, for example, financing could be limited to only agribusiness activities which inherently require substantial inputs of agricultural raw materials produced by small farmers and then require that they purchase a certain percentage of their inputs from small farmers. This might develop strong linkages in processing industries, and similar types of requirements could be devised for other types of activities.

Before examining the results of the survey, a word might be said with regard to the quality of the survey data. The quality of survey data

depends on both the type of data sought and the manner in which it is collected. With regard to the type of data collected an evaluator often has to settle for less than first best data because of cost considerations as well as cultural factors. The narrowing of the issues to be investigated allows one to concentrate on collecting more detailed and directly relevant data, but compromises are always involved. Employment data collected on a once or twice recall basis for a long period of time such as done in this study, for example, is not very reliable as an absolute measurement of work time allocated to different activities. Therefore, the results must be treated as relatively crude estimates which give reasonable overall comparisons between groups. It is necessary always to balance the "purity" of data with the use which will be made of it--sometimes relatively rough estimates are adequate for the type of policy decisions being made, while other times the data is stretched beyond its reasonable limits in drawing conclusions.

In actual practice, reliable and usable data are determined as much by adequate field collection procedures as by good design considerations. The "creative" massaging of data after it has been collected in order to eliminate inconsistencies is often a dubious practice used to compensate for poor quality control of data collection in the field. This can result from either improper supervision of the data collection process in the field or the failure to take into account local cultural practices which influence the answers a respondent is willing to give. In this study these problems were happily very minimal. The super-

visory staff of the Central Bank of Paraguay and USAID/Asuncion was of a high level of dedication and performance. Also, the Paraguayan farmer proved to be open to the information requested when the proper foundation was laid with local political officials in his area. This all came to be reflected in the low level of inconsistent data found.

B. Economic Impact on I&S Category Farmers

The determination of the relative incomes of participant and non-participant farmers implies a definition of income which serves the purposes of the evaluation. From this point of view, it is probably useful to use several formulations and then see if they appear roughly consistent in their implications. Thus, it is important initially to define a number of terms which will be used in the estimates of this section.

The gross income of the farms, both participant and non-participant, will include several items. First, it will include the gross value of sales of farm output. The farmgate price the farmer received for his products was used as the basis of pricing these goods. Where all of part or a product was consumed, bartered, or stored for seed or animal feed, the farmgate price of that product in that region of the country was used and its total value was included in the farmer's gross income. This was justified as the Paraguayan farmer used much of his production for on-farm family consumption.³ Additionally, the wholesale value of eggs and milk produced and consumed on the farm is included in gross income. This is as much an output as the farmer's other

products. Finally, the off-farm income of family members who lived and worked on the farm was included in the gross income figure. Such possible income sources figure into the strategy households adopt in their farm operations and can be influenced by a project, shifting total gross income for farm households.

The costs which are subtracted from gross income will, of course, determine the net income. It is here that a fundamental problem arises. If we include an imputed value for family labor and imputed return to capital as costs to the operation, we can derive a measurement of private efficiency for the farm operation. In this case, these costs are added to the cost of hired labor; fertilizer, chemical, seed, and other input costs; depreciation; interest payments; and other miscellaneous costs. It is arguable, however, that this private efficiency measurement does not entirely serve the purposes of an evaluation as closely as the welfare calculation discussed below.

1. Impact of Project on Net Farm Income: Welfare Measurement

A welfare definition of net income has been also suggested as an appropriate measure of the net income of a farmer for the purposes of project evaluation. Here all of the costs listed above are included except those of family labor and returns to capital. While this will not give us a good idea of the efficiency with which resources are used, it does give us a useful indicator of family welfare. A family under this measure might increase the income available to it without increasing the efficiency of its operation. In fact, it is

possible that efficiency might decrease but the absolute level of family welfare increase.⁴

As we can see from Table 1, the welfare measurement of net farm income indicates that participant farmers did measurably better than non-participant farmers in both agricultural cycles, although the difference narrowed slightly in the second period.

Since the I&S category farmers were already linked with agribusiness borrowers who were functioning during the 1978/79 agricultural cycle, the 39% superior net income of the participants in this period can be reasonably associated with their linkages with the companies. In this case we do not have baseline data as we do in the processing group. Interestingly, we find a superior income attained in both years by the participant farmers. It might be argued that the participant farmers perhaps already had superior income levels to non-participant farmers before the project began operation and that this superior performance is merely a reflection of this pre-project char-

acteristic. We will test this argument indirectly further on in this section by comparing social profile data of participants and non-participants as well as by looking at the baseline data of the processing category to see if there were significant differences between anticipated participant and non-participant farmers. Since the procedures for the selection of both sets of farms was the same for all three categories, the pattern of the processing category ought to indicate the validity of the comparisons in the I&S category.⁵

2. Importance of Off-Farm Employment

The figures on the importance of off-farm income relative to total household income for participant and non-participant farms shows some interesting shifts. The participant farm group reduced its average off-farm income as a percentage of total household income from 5% in 1978/79 to 1% in the 1979/80 period; while the non-participant group average changed

Table 1
Impact of Project on Net Farm Income:
Welfare Measurement
(U.S. Dollars)

	Participant Farms	Non-participant Farms	Difference in Net Income (US\$)	% Difference in Net Income
1978/79				
Net Income	\$3,234	\$2,327	\$907	39%
1979/80				
Net Income	\$3,556	\$2,628	\$928	35%

Table 2
Importance of Off-Farm Income
(U.S. \$)

	Participant Households		Non-Participant Households	
	1978/79	1979/80	1979/79	1979/80
Off-Farm Income	\$249	\$ 46	\$138	\$128
Off-Farm Income as % of Total House- hold Income	5%	1%	4%	3%

by only 1 percentage point from 4% to 3%.

When we consider this trend in conjunction with the increase in household size of participant farms in the two years, it is possible that there was some movement back to the farm as project participation opened up the opportunity of increasing family labor on the farm operation, resulting in a decrease in off-farm income.

3. Efficiency Measure of Income

As previously mentioned, an efficiency measurement of income is based on imputing a value to family labor and capital.⁶ An imputed rate of return to capital of 10% was assumed and the average wage rate of off-farm employment was used to impute a value for family labor. Although hired labor wages might be used, the off-farm wage received probably represents the opportunity cost of family labor somewhat better. It should be

remembered that the results of this measure are somewhat more rough than those of the welfare measurement because it is influenced greatly by farmer recall of the time family members put in farm labor. The recall reliability for remembering an entire 12 month period is relatively low, especially because it does not take into account accurately periods of underemployment of farm time.

Given these caveats, Table 3 gives an idea of the overall direction of the relative efficiencies of participant and non-participant farmers. The most noticeable shift in the data is the reduced gap in income between participant and non-participant farmers. For the 1978/79 cycle, participant farmers had roughly a 49% greater net income relative to non-participant farms. In the next period, however, the difference decreased to 30%, indicating a drop in efficiency of the participant farmers relative to their non-participant neighbors. This might have been

Table 3
Impact of Project on Net Farm Income:
Efficiency Measurement
(U.S. \$)

	Participant Farms	Non-Participant Farms	Difference in Net Income (US\$)	% Difference in Net Income
1978/79				
Net Income	\$1,655	\$1,114	\$541	49%
1979/80				
Net Income	\$1,957	\$1,500	\$457	30%

due to several factors. First, it is possible that participant farmers expanded their operation on previously uncultivated land which was not as productive as that already in use. It is also possible that the increased household size of participant farms was greater than the possible productive use to which the added people could be put, so the marginal labor productivity was considerably less than the average. It might be noted that in both periods, however, the participant farms registered superior incomes to non-participant farms, indicating that the linkage with the agribusiness borrowers seemed to continue to benefit them through both agricultural cycles. Thus, both measurements of net income support the conclusion that participant farms in the I&S category have benefited from the Rural Enterprise Project.

4. Impact of Project on Farm Production and Resource Productivity

In order to evaluate the reasons for the superior performance of participant

farms, it is useful to look at the overall impact of the Rural Enterprise Project on farm production. This can be an important question because it both allows us to see the degree to which increased production rather than increased productivity has played a significant part in the differences, and it allows us to examine some of the specific reasons for the differences in performance.⁷

From the above table, we see that the project had an important impact on the output of farms which participated with agribusiness/borrowers in the project. Interestingly, it would appear that in the second year, the impact on farm production was greater.

Looking at this project impact on production, agribusiness services and inputs could affect the value of production in any or a combination of the following ways: change the area cultivated, increase crop yields, change crop mix or composition, and alter prices received for farm products. For convenience, these four factors can be used as alternate accounting sources to examine the process level changes

Table 4
Project Impact on Total Production

Agricultural Cycle	Percent Increase in Value of Output Associated with Participation
1978/79	24.1%
1979/80	30.9%

which the project can impact. They are put in indices, the process of computation which is described in some detail in Appendix 2. The results are given in Table 5. It should be noted that the individual source categories total to the value of the first column, "total % difference", rather than to 100%.

From the table we find that the difference in the intensification of land use is the most important source, in fact, the only importance source of the difference in total output between participant and non-participant farms. In the 1978/79 period, differences in yields was one source of output differences, but this diminished in importance in the 1979/80 period. The difference in price remains a nega-

tive source in both periods. In the 1978/- 79 period, the index has a -9% value, although it does decrease somewhat to a -6% in the 1979/80 period. Likewise, the differences in crop mix remains an unimportant source for both periods. It might be noted that the difference in crop mix refers to the difference in the crops which are grown between participant and non-participant farms rather than having reference to interplanting or multiple cropping.

It is not surprising that crop mix had a negligible influence on the production indices. Taking 1979/80 data, for example, we see a remarkable similarity in crop mix in the following table.

This extreme similarity in crop match was not the result of

Table 5
Sources of Increased Output

Agricultural Cycle	Total % Difference	Sources in Change Between Participant and Non-Participant Farms:			
		Diff. in Crop Mix	Diff. in Price	Diff. in Yields	Intensification of land use
1978/79	24.1%	1.9%	-9.1%	8.3%	23.1%
1979/80	30.9%	0.4%	-5.6%	1.7%	34.3%

TABLE 6
Percentage of Total Cultivation in Each Crop
Inputs and Services Category, 1979/80

Product	Participant Farm	Non-Participant Farm
soybeans	36%	39%
cotton	16%	14%
corn	12%	12%
wheat	12%	11%
mandioca	8%	9%
SUBTOTAL	(84%)	(85%)
tung	3%	1%
peanuts	2%	2%
sweet potato	2%	2%
beans	2%	2%
other	7%	8%

field survey criteria in the selection of non-participant farms. In fact, it was felt that for methodological reasons it would be prejudicial to make such a requirement, as participation in a project might influence crop mix. Nor was the match controlled because of the category being limited to one geographic area. A number of regions of the country were covered to survey farms which were selected in this category. Within each region, however, the selection of non-participants was

governed in such a way that an equal number of participant and non-participant farms would be selected for each region in which participant farms were found.

It is, nevertheless, curious that the project has had little influence on crop mix. When we consider the type of I&S agribusinesses included, however, it is perhaps consistent with the type of activities carried out by the firms.

The dominance of the intensification of land use as a source of production differences prevails for both

Table 7
Land Use Intensity: Subgroup Sources
Input and Services Category

Agri-cultural Cycle	Proportion of Total Production Increase Attributable to Land Use Intensity	Absolute size of area cultivated	% of Total farm cultivated	Increased Inter-planting and/or multiple cropping
1978/79	23%	4%	15%	4%
1979/80	34%	38%	-2%	-2%

agricultural cycles. When the category is broken down into subgrouping we find some significant shifts in the two periods shown in Table 7.

Here we see a pattern that would suggest that although the project impacted the participant farmers, they gradually changed the way they benefited from the inputs and services available to them. In the first year of the project, they increased their relative size of farm cultivation to benefit from the project. With time to effectuate more long term changes which would take advantage of the project benefits, they increased their absolute size of cultivation. As they increased their absolute area in cultivation, interplanting and/or multiple cropping became relatively less important.

The pattern can be seen in the data regarding the amount of land participant and non-participant farmers "possessed" and the amount of land they "cultivated", as seen in Table 8.

From the table we see that both participant and non-participant farms increased their farm size between

1978/79 and 1979/80: participants by 37% and non-participants by 3%. This rather substantial change in relative overall land sizes was not as pronounced in the relative areas cultivated. Participants increased their cultivated area by 6% while non-participants decreased their hectares cultivated by 6%. If the non-participants are representative of small farmers in their areas, it would mean that participant farmers were increasing their total cultivation, while other small farmers were actually decreasing theirs in absolute terms. This pattern in conjunction with the reduction in off-farm employment and increase in household size for participant farms are consistent with the conclusion that the project influenced participant farmers. They represent a pattern that would be expected if the agribusinesses were benefitting them.

5. Attribution Issue

Several methods are used here to evaluate the reliability of the comparisons between the participant and non-participant farms of the I&S

Table 8
Land Use of Farms
(hectares)

	Number of Hectares Possessed	Number of Hectares Cultivated
Participant Farmers:		
1978/79	15.4	11.5
1979/80	21.1	12.2
Non-Participant Farmers:		
1978/79	14.8	9.6
1979/80	15.3	9.0

category. The first is to compare the participant and non-participant farms in the processing category where we have baseline data of their characteristics and linkages with agribusiness borrowers before the firms expanded or entered new activities. Here we are looking to see if participant and non-participant farmers were similar in their performance before project influences. The second method is to compare the social profile of participant and non-participant farms of the three categories to see if there appears any social differences which would imply the inappropriateness of comparing them for evaluation purposes. The implication is that since the same procedure was used to select participant and non-participant farmers in all three categories, comparability of one group implies comparability in the others as well.

a. Comparison of Net Income: Processing Category

Employing the first method, we see in Table 9 estimates of the net incomes of participant and non-participant farms of the processing group, using the welfare measurement of net income.

The processing category appears to be a good match with only a 1% dif-

ference in incomes between farms selected for participation relative to their non-participant counterparts. This difference does not begin to approach the differences found in the I&S category of 39% and 34%. It would appear to substantiate the comparability of the participant and non-participant farms in the I&S category, and suggest that their differences in incomes were not due to non-project related factors.

b. Comparison of Social Profile Data

The social profile data from the survey also support this conclusion. If participants are substantially different it would probably be manifested in social characteristics and/or attitudes as well as in economic data. Consistent with the economic data, however, we find that the social characteristics of potential participant and participant farms was very similar to their non-participant counterparts. It should be remembered that the relevant comparison is that of participant and non-participant farms within a category rather than comparisons between categories.

(i). Health Profile and Practices

Table 9
Net Income: Processing Category: 1978.79
(US \$)

	Farmers Selected for Participation	Farmers not Selected for Participation	Diff. in Net Income (A-B)	% Diff. in Net Income (A-B)
Processing Category	\$1,402	\$1,420	-\$18	-1%

Table 10
Health Profile and Practices

	Processing		Storage		Inputs & Services	
	P	non-P	P	non-P	P	non-P
1. % of families with all children living	84%	73%	74%	72%	78%	78%
2. Average number deaths of children 5 years old or less per household	0.2%	0.4%	0.1%	0.1%	0.1%	0.1%
3. Average number cases diarrhea or fever in last week per household	0.2%	0.2%	0.1%	0.5%	0.2%	0.1%
4. First source of help when family member is sick:						
hospital/medical center	51%	53%	56%	56%	59%	71%
private doctor	24%	24%	11%	11%	29%	24%
pharmacy	16%	18%	20%	17%	6%	6%
folk doctor	8%	2%	7%	11%	4%	0%
self-care	2%	4%	6%	6%	2%	0%

Table 11
Educational Profile

Item	Processing		Storage		Inputs & Services	
	P	non-P	P	non-P	P	non-P
1. % of heads of households with the following levels of education:						
a. Illiterate	8%	6%	7%	4%	6%	6%
b. Primary Schooling:						
1st	12%	4%	7%	11%	6%	4%
2nd	12%	20%	17%	22%	18%	26%
3rd	24%	16%	20%	26%	20%	22%
4th	18%	24%	19%	15%	16%	16%
5th	16%	16%	7%	11%	6%	8%
6th	16%	8%	17%	7%	20%	14%
c. Secondary Schooling:	0%	6%	6%	4%	10%	6%
d. University	0%	0%	0%	0%	0%	0%
e. Average educational level: years of school	3.5	4.0	3.6	3.2	3.9	3.5
2. Average % of children between the ages of 7 and 18 who go to school	88%	81%	74%	69%	71%	68%

Looking at health characteristics and practices first, we find few distinctive differences within categories, although there are some between categories (See table 10).

(ii) Education Profile

An educational profile of the participant and non-participant farms for the I&S, processing, and storage categories shows again a general consistency within categories (see Table 11).

The illiteracy rate of both

participant and non-participant farmers was quite low, although the large majority of them did not attend beyond primary schooling. Interestingly, the percentage of school age children who actually attended school was relatively high, although a little bit lower for the I&S category than the other two.

(iii) Housing Profile

Finally, a profile of housing conditions is given in Table 12. The housing profile maintains the consis-

Table 12
Housing Profile

	Processing		Storage		Inputs & Services	
	P	non-P	P	non-P	P	non-P
1. Percentage of families having:						
a. electricity	6%	8%	4%	0%	2%	2%
b. running water	2%	6%	6%	0%	0%	0%
2. Type of house construction:						
a. Walls of:						
-mud & bricks	26%	16%	2%	2%	4%	4%
-mud	18%	18%	0%	0%	0%	0%
-brick	57%	65%	0%	0%	11%	10%
-other	0%	0%	98% ^a	98% ^a	85% ^a	85% ^a
b. Roof of:						
-straw	35%	35%	7%	6%	11%	8%
-tiles	61%	57%	30%	19%	54%	35%
-straw and tiles	2%	8%	17%	2%	13%	10%
-other	2%	0%	46% ^a	74% ^a	22%	46%
c. Floor of:						
-dirt	29%	28%	74%	67%	26%	54%
-bricks	69%	65%	2%	4%	24%	13%
-tile	0%	4%	0%	0%	4%	2%
-other	2%	4%	24% ^a	30% ^a	46%	31%
3. House size in square meters	65	64	61	57	116	79
4. Type of sanitary facilities:						
a. letrina	53%	53%	85%	91%	67%	56%
b. servicio	26%	31%	11%	9%	33%	35%
c. other	20%	16%	0%	0%	0%	2%
d. none	2%	0%	0%	4%	0%	6%

tency of the profile in that the within category comparisons are relatively uniform. In the I&S category, however, there is one conspicuous difference between participant and non-participant farms. The data show that the participant farms had houses which averaged about 116 square meters, while those of non-participant farms averaged 79 square meters; a significant difference. Curiously, the type of construction materials of the participant farms did not seem to vary greatly from those used in the non-participant homes. Nor did they seem to have more amenities relative to non-participant homes, such as electricity, running water, or better sanitary facilities. Since the sizes of the houses were estimated by the enumerators pacing them off, it is not likely that the differences would be due to inaccurate estimating or different criteria in estimation procedures. The size difference of the houses might be partly explained by the fact that the participant group during both periods

had a larger household size in terms of the number of extended family members living on the farm. It is also plausible that the difference is in part due to the project. Although participant farm dwellings were larger in the 1978/79 period as well (by about 33%), the difference in house size increased to 47% in 1979/80. It is not likely that this impact would have shown up the first year as much as the second year of benefits if it were project related, as farmers often buy their building materials and then carry out construction during slow periods on the farm, so that construction can take some time before completion.

(iv) Profile of Technical Assistance

The survey examined several other things of interest to an evaluation and attribution issue. The first was the use of technical assistance in the farm operation. As we can see from Table 13, its use in the I&S category was not widespread:

Table 13
Use of Technical Assistance, 1979/80
Inputs and Services Category

	Participant Farms	Non-Participant Farms
1. % of farms receiving technical assistance	9%	12%
2. % of farms which paid for technical assistance	0%	4%
3. % of farms which received free technical assistance	9%	8%
4. % of farms which felt that the technical assistance they received increased their income	9%	8%

The data reveal that a preponderance of both participant and non-participant farms did not use technical assistance. In almost all cases where it was received, it was free assistance from government agricultural extension services. Interestingly, almost all of the farms receiving the assistance felt that it had contributed to increasing their incomes, although their numbers were too small to draw any conclusions.

(v) Profile of Credit Use

A profile of the sources of credit for participant and non-participant farmers in the I&S category show a

number of similarities with one difference. Table 14 shows that some of the participant farms borrowed from the agribusiness/borrower under the program. In fact the percentage using this source just about equals the difference between participants and non-participants using "other sources". While none of the loan sizes are large in absolute terms, they are large relative to the incomes of the farms and show the frequent use of credit transactions by small farmers. As is usually the case, smaller loans were made through small intermediaries, and family sources remained an important source of

Table 14
Profile of Credit Use
Inputs and Services Category, 1979/80

	Participant Farms	non-Participant Farms
% of farms that received credit from agribusiness/borrower	15%	0%
average size of loan for those borrowing (US \$)	\$901	--
% of farms that received credit from a bank	28%	25%
average size of loan for those borrowing (US \$)	\$1,641	\$1,183
% of farms that received credit from an intermediary	9%	6%
average size of loan for those borrowing (US \$)	\$364	\$285
% of farms that received credit from another source	33%	46%
average size of loan for those borrowing (US \$)	\$633	\$537

investment (or consumption?) capital as seen in the "other sources" category. In general, there do not seem to be significant differences between within category participant and non-participant farms in the I&S category.

(vi) Profile of Land Tenure

Finally, a profile of the land tenure situation of participant and non-participant farms shows some variety, but not characteristics which would suggest fundamental differences:

Table 15
Profile of Land Tenure: Inputs and Services Category

	1978/79		1979/80	
	P	non-P	P	non-P
% of farms with no title	25%	22%	26%	25%
% of farms with "titulo provisorio"	6%	22%	7%	25%
% of farms with "titulo definitivo"	69%	55%	65%	50%
% of farms with "titulo condominio"	0%	2%	2%	0%

VI. CONCLUSIONS

The analysis would suggest that the Rural Enterprise Project was a success in terms of achieving the objectives originally contemplated. An institutional/financial mechanism was established which funnelled long term credit to agribusiness development in activities identified as important to relieve production constraints faced by small farmers in Paraguay. Likewise, where it was possible to trace linkages between small farmers and participant agribusiness, we found that the farmers did better economically than their non-participant neighbors. The data supported the conclusion that these income differences were reasonably attributable to the Rural Enterprise Project.

The success of the institutional/financial mechanism can be attributed to a number of factors. First was the fact that the Central Bank and the commercial banks already had experience in rediscounting procedures among themselves. Secondly, the commercial banks could replace less productive loans which were previously required by the Central Bank with project subloans which were more profitable for them. They, therefore, had an economic incentive to participate quite apart from the interest that could be earned directly on project subloans. Thirdly, there was a strong loan demand for the project funds which was in large part due to a strong economic surge in the overall economy. Finally, an important factor appears to have been a high level of effort and performance on the part of Central Bank and USAID personnel

involved in the project to work out problems as they arose and to keep the project on track.

As with any project, there were problems and weaknesses. Probably one of the more obvious ones was the lack of adequate administration of loan applications and project monitoring by the commercial banks. This was seen in the lack of proper loan appraisal by commercial banks of subloan applications as well as inadequate follow-up after loan funds were disbursed. The manner in which this problem was worked out raises some questions. To some degree the burden of administration of loan appraisal was shifted to consultants and the Central Bank. While actual data were not available, it would appear that the commercial banks found the loan program a profitable one. One cannot help but ask, however, if this would have been the case if the commercial banks had borne the full costs of proper loan administration.

There is, however, a more fundamental question which this project raised in this regard. Did the project really make adequate provision for permanent institution building to happen in the commercial banking sector? There are fixed costs which a commercial bank must bear in building its capacity to make loans to clients with whom it has had little experience and in activities for which it has few expertise. The most number of loans any commercial bank made under the program was five. Given the limited number of loans probable under the program for any one commercial bank and the length of time for which funds would be available under the program, it was unreasonable to expect that commercial banks to make the commitment to building their in-

stitutional capacity in long-term credit lending in the agribusiness area. It is not clear whether AID bears some responsibility to see that the program continues. It is clear, however, that the commercial banks were justified in being cautious about making institutional investments in reliance on a government/USAID funded program. The private sector in most developing country is generally suspicious of government subsidized programs. Private firms including banks are well aware from their own experience that investments based on such programs are very risky because of the abrupt manner in which they are often terminated. Consequently, as AID turns increasing to support private sector institution building, it will have to make long term commitments to such programs and accept the fact that it takes time before private sector investment will be induced as a consequence of them.

Another problem which caused considerable difficulties was the lack of an adequate definition of the social criteria which were to help achieve the social goals of the project. An acceptable monitoring system with regards to benefits flowing to small farmers was never developed. This was partly due to the lack of specific social criteria and also to the inherent difficulty of monitoring the flow of benefits of from agribusinesses to small farmers. In some respects this did not prove to be a great problem for this project, especially with regard to balancing the interests of small farmers with those of agribusinesses. The criteria did not seem to interfere with the profitability of the agribusinesses; yet it appeared to have benefited substantially participant farmers. This can be attributed to both the economic

conditions of the country and the impressive diligence shown by the personnel of the Central Bank and USAID involved in the project. In many respects it would appear that fine tuning the criteria in actual practice and keeping subloan activities focused on areas in which small farmers were constrained was done somewhat informally by the institutions involved. As a general rule, however, it would be preferable to formally fix requirements which limit loan funds to geographic locations where small farmers are concentrated if new lands are not available to them, and/or to the type of agribusiness activities which intensively involve activities in which small farmers are naturally linked. This was, in fact, what appears to have happened in this project and proved to be quite successful.

The institutional/financial analysis suggested a benefit that should perhaps be measured more directly and consciously in subsequent evaluations of similar projects. It would be important to see direct data collected regarding the type of attitude changes which were observed in this project. The change in attitude of the political and economic decision makers regarding non-traditional agribusiness investors and small farmers was an unanticipated but potentially fundamental benefit of the project. Its potential impact on sound economic and social development could be substantial and should be given more central attention in subsequent evaluations of this type.

The economic impact results were encouraging to some and discouraging to others involved in the project. The data presented a consistent and rational picture which would suggest that participant farm-

ers did benefit from the project—sufficiently to affect the way in which they operated their farms and to entice them to make long-term changes, such as expanding the size of their operations. Farm size expansion by participant farmers of the I&S category was not based on increasing the amount of land they rented either. In fact, between the two agricultural cycles they decreased the average amount of land they rented, although the average amount of land they "possessed" increased. In addition, we found household size of participant farms increase, off-farm employment decrease, area cultivated increase, and production increase; consistent trends with the hypothesis that the participant farmers were benefiting from their linkages with agribusiness borrowers.

The principal disappointment was that the data did not show a greater difference in the incomes between participant and non-participant farmers than found. The differences were significant, and for several reasons it is probably unrealistic to expect them to be greater, given the nature of the linkages between the firms and farmers. First, the nature of the agribusiness activities tended to spread benefits over a large group of farm households rather than concentrate them on a small number. Therefore, the benefits to any one farmer will be somewhat diluted because of this spread. Secondly, the expansion of farm input and farm services by some agribusinesses undoubtedly put pressure on their competitors to upgrade their own services to non-participant farmers in the same geographic areas so that non-participant farmers would also indirectly benefit from the

project. Also it is possible that there was a demonstration effect in which non-participant farmers began to be influenced by the benefits they saw accrue to participant farmers so that they too changed the way in which they carried out their own farm operations. These propositions are supported by the fact that non-participant farmers increased their incomes between the two agricultural cycles in the I&S category. These reasons would suggest that the project had an impact over a large number of farmers and to a degree greater than that indicated by the income differences found in the I&S category.

The lack of a relationship between the small farmer lists of the agribusinesses and the farmers with whom they did business presents some problems. This does not mean that the agribusinesses in the processing and storage categories failed to link with small farmers. It is possible they linked and benefited farmers who were not on their lists. It does, however, point up the problem of monitoring the linkage requirement without field visits, which would be no small expense if done on a large scale.

More importantly, however, the economic impact analysis suggest that the model pursued in the project of benefiting small farmers through the development of agribusinesses which link with them is a viable one. While we do not know the profitability of the agribusinesses themselves, the unusually good repayment record would suggest the lack of profitability was not a problem. Likewise, the impact analysis found that small farmers did in fact benefit from the linkages formed with agribusinesses

FOOTNOTES

1. Agribusiness is often defined to include agricultural production, processing, marketing, wholesaling, retailing, and input supply activities in the food production and distribution system. For our purposes, agricultural production is not included.
2. We are referring especially to trips made on February 7, 1978, July 18, 1978 and October 3, 1978.
3. In the I&S category, for example, household consumption of farm output represented from 24% to 32% of the total value of farm output in the two agricultural cycles measured.
4. See, Daines, S.R., An Overview of Economic & Data Analysis Techniques for Project Design and Evaluation, Washington, D.C., 1977. Course manual for the Development Studies Program, AID.
5. Comparisons of incomes on a per capita basis present a number of distortions in developing countries when doing impact evaluations. One of the principal problems is the degree to which farm household size can fluctuate, given the change of opportunities on the farm itself. It can happen, for example, that a project will increase opportunities on a farm which will cause extended family members to return to the farm. The result might be a per capita income calculation might show a decrease in per capita incomes of farms positively influenced by a project, distorting the true impact of the project. Looking at the welfare definition of net income on a per capita basis in this evaluation, for example, we find that again the participant farmers had higher incomes (33% and 20% differences in the two periods respectively), although the differences decreased by 13 percentage points in the two periods. As expected, most of this change in the difference was due to the fact that the size of the average household of participant farmers changed from 6.7 in 1978/79 to 6.9 in 1979/80; while the same household size for non-participants decreased from 6.7 in 1978/79 to 6.1 in 1979/80. If we hold constant their relative household sizes for the two periods (using the 1978/79 figures), the difference in their per capita incomes decreases to 33% in 1978/79 to 29% in 1979/80; a much more modest shift in their relative levels and one consistent with the farm household income comparisons and conclusions drawn from the data.
6. Normally land value would also be included, but this was not obtained in the survey.
7. This distinction is important to keep in mind, since productivity refers to output per unit whereas production simply means total output. Economists sometimes focus too exclusively on productivity and ignore the possibility that a small farm might increase the welfare of the household significantly by increasing production which might decrease productivity.

APPENDICES

Appendix 1

TABLE 1

LOAN DISTRIBUTION BY SECTOR

As of December 15, 1980

<u>Types of Activities Financed</u>	<u>Number of Projects</u>
Sugar cane processing	10
Food storage	9
Silos	5
Agricultural machinery	4
Packing material for agricultural products	4
Seed production	4
Coconut oil processing	3
Peanut processing	3
Cotton processing	2
Fertilizer production	2
Feed production	2
Production of native foods	2
Processing of yerba mate	1
Lime production	1
Cold storage	1
Repair and maintenance of agricultural machinery	1
Rural road construction and maintenance	1
Mint oil processing	1
Production of wood containers for grain	1
Manioc processing	1
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TABLE II
GEOGRAPHICAL DISTRIBUTION OF SUBPROJECTS

As of December 15, 1980

Departments	No. of Subloans	Amounts of loans (in Guaranies)
Central	16	187,080,000
Alto Parana	9	159,502,962
Cordillera	9	119,800,000
Itapua	8	70,085,000
Caaguazu	4	81,050,000
Canendiyu	4	94,400,000
San Pedro	3	62,000,000
Paraguari	2	36,525,000
Boqueron	1	10,000,000
Presidente Hayes	1	20,000,000
Caazapa	1	5,000,000
	58	\$845,442,962

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TABLE III

Commercial Bank	Project or Activity	Department	Loan	Rediscount	Approved
Exterior, S.A.	Factory of Alcoholic Beverages	Cordillera	10,000,000	6,000,000	25 Nov. 77
Asucion, S.A.	Wood Boxes for Agricultural Products	Central	6,980,000	4,188,000	14 Dec. 77
Citibank, N.A.	Collection, Processing & Storage of Grains	Canendiyu	25,000,000	15,000,000	19 Dec. 77
Paraguay de Comercio S.A.	Essence of Mint Factory	Itapua	5,500,000	3,300,000	29 Dec. 77
Londres y America del Sud	Balanced Feed Factory	Itapua	3,000,000	1,800,000	2 Jan. 78
Paraguay de Comercio S.A.	Fertilizer Plant	Central	5,000,000	3,000,000	20 Jan. 78
Asuncion S.A.	Collection, Processing & Storage of Grains	Canendiyu	19,000,000	11,400,000	28 Dec. 78
Exterior S.A.	Collection, Processing & Storage of Grains	Itapua	5,000,000	3,000,000	12 Jan. 78
Aleman Transatlantico	Peanut Oil Factory	Boqueron	10,000,000	6,000,000	23 Jan. 78
Real de Fomento S.A.	Cart Factory	San Pedro	18,500,000	11,100,000	10 Feb. 78
De Londres y Amer del Sud	Agricultural Tools Factory	Central	3,000,000	1,800,000	24 Jan. 78
Nacion Argentina	Collection, Classification of Ag Products	Paraguari	18,525,000	11,115,000	2 Mar. 78
Nacion Argentina	Balanced Pig Feed	San Pedro	25,000,000	15,000,000	21 Apr. 78
Real del Paraguay S.A.	Grain Collection Processing and Storage	Alto Parana	25,200,000	15,120,000	13 Feb. 78
Asuncion S.A.	Collection & Treatment of Soy, Cotton, Tobacco	Alto Parana	2,750,000	1,650,000	23 Feb. 78
Do Brasil	Factory for Fruit Containers	Central	2,000,000	1,200,000	20 Mar. 78
De Londres y Amer del Sud	Peanut Processing, Oil, Syrup	Central	2,500,000	1,500,000	22 Mar. 78
Exterior S.A.	Lime for Agricultural Use	Pte. Hayes	20,000,000	12,000,000	28 Mar. 78
Exterior S.A.	Production of Sugar Cane	Cordillera	4,000,000	2,400,000	28 Mar. 78
Asuncion S.A.	New Roads and Maintenance	Itapua	5,985,000	3,591,000	18 Apr. 78
Real del Paraguay S.A.	Production of Soy, Wheat, Corn, Bean Seeds	Canendiyu	25,200,000	15,120,000	26 Apr. 78
Interbanco S.A.	Cotton Gin	Caaguazu	25,200,000	12,120,000	1 Jun. 78
De Londres y Amer del Sud	Agricultural Machinery Services	Itapua	8,600,000	5,160,000	7 Jun. 78
Exterior S.A.	Coco Oil Factory	Paraguari	18,000,000	10,800,000	31 Jul. 78
Real del Paraguay S.A.	Collection & Treatment of Grains (Soy)	Alto Parana	25,200,000	15,200,000	30 Aug. 78
Exterior S.A.	Collection, Treatment, Classific. of Grains	Alto Parana	22,908,000	13,744,800	20 Sep. 78
Union S.A.	Collection, Treatment, Classific. of Corn	Caaguazu	20,650,000	12,390,000	7 Dec. 78
Union S.A.	Collection of Agricultural Products	Alto Parana	11,017,152	6,610,289	13 Dec. 78
Nacion Argentina	Fruit and Vegetable Box Production	Central	8,000,000	4,800,000	11 Oct. 78
Real del Paraguay S.A.	Soybean Seed Production	Alto Parana	24,927,810	14,956,686	21 Sep. 78

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Table III continued

Commercial Bank	Project of Activity	Department	Loan	Rediscount	Approved
Union S.A.	Cotton Products (Thread, Blankets)	Central	25,200,000	15,120,000	27 Oct. 78
Exterior S.A.	Syrup, Alcoholic Beverages, Wine	Cordillera	20,000,000	12,000,000	13 Oct. 78
Union S.A.	Boxes for Agricultural Products	Alto Parana	10,000,000	6,000,000	27 Oct. 78
Exterior	Alcoholic Beverages Factory	Central	14,000,000	8,400,000	19 Sep. 78
Union S.A.	Agricultural Tools and Implements	Central	22,000,000	13,200,000	23 Nov. 78
Exterior S.A.	Agricultural Machinery and Tools	Central	25,000,000	15,000,000	2 Nov. 78
Real del Paraguay S.A.	Native Foods Production (Chipa)	Central	5,500,000	3,300,000	3 Nov. 78
Union S.A.	Purchase of Perishable Foods	Itapua	12,000,000	7,200,000	28 Nov. 78
Do Brasil S.A.	Agricultural Tools Factory	Central	17,500,000	10,500,000	1 Feb. 79
De Londres y Amer del Sud	Alcoholic Beverages Factory	Cordillera	8,000,000	4,400,550	11 Jan. 79
Real S.A.	Coco Oil Factory	Central	12,600,000	7,560,000	23 Mar. 79
Interbanco S.A.	Peanut Processing	Central	25,000,000	15,000,000	20 Jul. 79
Real del Paraguay S.A.	Collection & Treatment, Soy, Corn, Beans	Alto Parana	12,500,000	7,500,000	12 Sep. 78
Asuncion S.A.	Sugar Cane Processing	Cordillera	1,500,000	900,000	10 Nov. 78
Asuncion S.A.	Grain Storage	Itapua	5,000,000	3,000,000	16 Apr. 79
Citibank	Collection, Treatment, Classif. of Grains	San Pedro	18,500,000	11,000,000	12 Sep. 78
Real del Paraguay	Yerba Mate Processing	Itapua	25,000,000	15,000,000	21 Mar. 79
Real del Paraguay S.A.	Collect., Treatment, Classif. of Grains	Caaguazu	25,200,000	15,120,000	20 Jul. 79
Holandes Unido	Alcoholic Beverages, Syrup	Cordillera	25,000,000	15,000,000	30 Jul. 79
Union S.A.	Alcoholic Beverages Production	Cordillera	6,300,000	3,780,000	20 Aug. 79
Nacional de Trabajad.	Collect., Treatment, Classif. of Grains	Alto Parana	25,000,000	15,000,000	8 Oct. 79
Nacional de Trabajad.	Manioc Products--Starch, Balanced Feed	Caaguazu	10,000,000	6,000,000	13 Nov. 79
de la Nacion Argent.	Alcoholic Beverages, Syrup	Caazapa	5,000,000	3,000,000	19 Nov. 79
of America	Coco Oil Factory	Cordillera	25,000,000	15,000,000	20 Nov. 79
Real del Paraguay S.A.	Industrial Sprays for Vegetables	Central	6,300,000	3,780,000	10 Dec. 79
Real del Paraguay S.A.	Cotton and Garlic Production	Canendiyu	25,200,000	15,120,000	18 Dec. 79
Interbanco S.A.	Syrup and Alcoholic Beverages	Cordillera	20,000,000	12,000,000	16 Apr. 80
Nacional de Trabajad	Sweet Potato Processing	Central	6,300,000	3,780,000	30 May. 80

MISSING PAGE

NO.

56

DESCRIPCION DEL PROYECTO

Solicitante:

Actividad:

Nueva ()

Ampliacion ()

I. Localización del Proyecto: Ciudad o Pueblo:
Departamento:

Describe, en forma breve, el area en que el proyecto propuesto estara localizado (incluya factores tales como tamaño de la ciudad o pueblo; zona de mirifundio, de colonización, o ambas; numero estimado de pequeños agricultores en el area de influencia; métodos actuales de cultivo, etc.)

II. Datos Financieros:

a. Uso de los fondos del préstamo:

- (1) Modernización de planta existente
- (2) Ampliación de capacidad existente
- (3) Adición de un nuevo producto o servicio
- (4) Creación de una nueva empresa
- (5) Capital operativo

<u>Monto</u>	<u>%</u>
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

b. Monto de la inversión propuesta.

- (1) Inversión total
- (2) Préstamo propuesto
- (3) Capital propio del empresario
- (4) Otras fuentes

_____	_____
_____	_____
_____	_____
_____	_____

c. Plazo del préstamo: _____ años; Periodo de gracia: _____

d. Plan de amortización _____

III. Breve Descripción del Proyecto

Indique en forma narrativa la actividad que desarrollara la empresa.

Insumos para el Proyecto (en orden de importancia)

a. Nombre del insumo: _____

<u>Antes del Proyecto</u>	<u>Con el Proyecto</u>	<u>Aumento</u>
---------------------------	------------------------	----------------

b. Cantidad usada por año: _____

c. Tipo de proveedores:

- i) pequeño agricultor () Compra directa del pequeño agric. ()
Compra a través de intermediarios ()
- ii) mediano ()
- iii) grande ()

2. a. Nombre del insumo: _____

<u>Antes del Proyecto</u>	<u>Con el Proyecto</u>	<u>Aumento</u>
---------------------------	------------------------	----------------

b. Cantidad usado por año: _____

c. Tipo de proveedores:

- i. pequeño agricultor () Compra directa del pequeño agric. ()
Compra a través de intermediarios ()
- ii. mediano ()
- iii. grande ()

3. a. Nombre del insumo: _____

<u>Antes del Proyecto</u>	<u>Con el Proyecto</u>	<u>Aumento</u>
---------------------------	------------------------	----------------

b. Cantidad usada por año: _____

c. Tipo de proveedores:

- i. pequeño agricultor () Compra directa del pequeño agric. ()
Compra a través de intermediarios ()
- ii. mediano ()
- iii. grande ()

Produccion del Proyecto (en orden de importancia)

1. a. Nombre del Producto

Antes del
Proyecto

Con el
Proyecto

Aumento

b. Cantidad promedio
producida por año

c. Mercado: Internacional (); Nacional (); Ambos ()

Consumidor primario: _____

Consumidor final: _____

2. a. Nombre del Producto

Antes del
Proyecto

Con el
Proyecto

Aumento

b. Cantidad promedio
producida por año

c. Mercado: Internacional (); Nacional (); Ambos ()

Consumidor primario: _____

Consumidor final: _____

3. a. Nombre del Producto

Antes del
Proyecto

Con el
Proyecto

Aumento

b. Cantidad promedio
producida por año

c. Mercado: Internacional (); Nacional (); Ambos ()

Consumidor primario: _____

Consumidor final: _____

IV. Beneficios del Proyecto

1. Contribucion al Bienestar del Pequeño Agricultor

- a. El proyecto aumentara el ingreso del pequeño agricultor en la forma siguiente (Marque donde corresponda):
- (1) Reduciendo el costo de insumos para el pequeño agric. ()
 - (2) Contribuyendo al aumento de productividad por ha. ()
 - (3) Contribuyendo al aumento del area de cultivo ()
 - (4) Facilitando el cambio a cultivos mas rentables ()
 - (5) Aumentando o estabilizando los precios de prod. agric. ()
 - (6) Otros (especificar) _____
- b. Explique brevemente la forma en que el proyecto cumple con uno o mas de los puntos señalados mas arriba, relacionados con el ingreso del pequeño agricultor.

2. Eliminacion de un Impedimento para el Desarrollo de Actividades Agroindustriales.

- a. El proyecto contribuyendo funcionamiento eficiente de empresas agroindustriales en la forma siguiente: (marque donde corresponda):
- (1) Reduciendo los costes de insumos basicos ()
 - (2) Proveyendo servicios de mercadeo que en el presente no se encuentran al alcance de empresas individuales ()
 - (3) Proveyendo servicios especiales ()
 - (4) Otros (especificar) _____

b. Explique brevemente el problema que sera solucionado con el proyecto y como dicho problema fue identificado como un impedimento para el desarrollo de empresas agroindustriales.

c. Describa brevemente el beneficio esperado del proyecto para las empresas agroindustriales que utilizan los productos o servicios a ser financiados.

3. Empleos Creados:

a. Estimar el número de personas a ser empleados y sus ingresos:

Tipo de	CANTIDAD			Remuneración Mensual	Meses al año que trabaja Años 1 2 3 4 5	Ingreso por año Anso 1 2 3 4 5
	Antes del Proyecto	Con el Proyecto	Aumento			

b. Calcular la inversion por empleo creado \$G _____

c. Empleo de mano de obra femenia:

APPENDIX 2

The Calculation of the Sources of Differences in Output Between Credit and No-Credit Farms

A. ALLOCATION OF THE CHANGE IN TOTAL VALUE OF OUTPUT TO FOUR PRIMARY SOURCES

1. A Description of the Indices Used

The value of output on a given farm is the sum of the value of each crop produced. This crop level value in turn is the product of three factors: the area cultivated in the crop, the yield per hectare and the price received when selling the crop. Thus, if we consider the typical credit farm:

a_{ic} = the area (hectares cultivated) in crop i on farm c

Y_{ic} = the yield (kgs/ha) of crop i on farm c

P_{ic} = the price (Quetzales/kg) of crop i on farm c

then

$$v_{ic} = a_{ic}Y_{ic}P_{ic}$$

where v_{ic} is the value of the i^{th} crop on the c^{th} farm. If we then add up the v_{ic} 's for all the crops grown on

that farm, we will have the total value of production on the farm. Using summation notation, we can say:

$$\text{Total value of production on farm } c = \sum_{i=1}^q a_{ic}Y_{ic}P_{ic}$$

where q is the number of crops grown on farm c . If we let farm c be a credit-receiving farm, then we may define a corresponding no-credit farm as farm n . The total value of output for the no-credit farm would be

$$\sum_{i=1}^q a_{in}Y_{in}P_{in}$$

The ratio of the value of output of the credit and no-credit farm is then

$$\frac{\sum a_{ic}Y_{ic}P_{ic}}{\sum a_{in}Y_{in}P_{in}}$$

If this ratio is greater than one it indicates that the credit farm did better than the other farm. If it is less than one, the reverse is true.

The four sources of change between the credit and no-credit farm may be isolated by means of an algebraic identity. This identity is expressed as follows:

$$\frac{\sum a_c Y_c P_c}{\sum a_n Y_n P_n} = \left[\frac{\sum a_c Y_n P_n}{\sum a_n Y_n P_n} \cdot \left(\frac{\sum a_n}{\sum a_c} \right) \right] \cdot \left[\frac{\sum a_c Y_c P_c}{\sum a_c Y_c P_n} \right] \cdot \left[\frac{\sum a_c Y_c P_n}{\sum a_c Y_n P_n} \right] \cdot \left[\frac{\sum a_c}{\sum a_n} \right]$$

Total Value
Crop Mix
Price
Yield
Area

The subscripts referring to the crops have been dropped for the sake of clarity in the presentation, but it should be remembered that the summation is over crops. By inspection it may be observed that various of the numerators and denominators on the right hand side "cancel

out", leaving nothing more than the terms on the left hand side. Underneath each of the terms in brackets on the right hand side is a label of the component of change which it measures. These are index numbers which will differ from one only if there is variation between farms

at the crop level in the indicated source. Essentially these are a set of weighted indices whose product is equal to the change in total value.

The index numbers measuring price and yield variation are largely self-explanatory, however a few words should be said about the measure of crop mix variation. Basically it answers the question: What would have the credit farm revenue been if this farm had been subject to the prices and yields of the no-credit farm, restricted to a land area equal to that of the no-credit farm yet been allowed to use this land in its "credit proportions"? The revenue so earned is divided by the revenue of the no-credit farms. The quotient is a measure of the change in total revenue due to changes in crop composition.

The area planted in a given crop may change for one or both of two reasons. First, the credit farm may in fact have fewer hectares in low-valued crops and more in high-valued crops while maintaining a total area equal to the no-credit farm. Secondly, the credit farm may just have a greater total area under cultivation. This second possibility does not reflect shifts in crop mix but merely differences in area under cultivation. Therefore, the "area effect" must be separated from the changes in crop composition. This is accomplished by deflating the first term in the mix brackets by the ratio of total area planted on no-credit farms to total area planted on credit farms. This area effect is then considered separately as noted in the last term of the identity.

2. Some Comments on the Indices

a. Alternative Weighting Schemes

Looking at the equation presented in the last section, it can be seen that the measure of change in crop mix is a deflated area index weighted by the no-credit price and yield values. The price index uses credit-farm area and yield weights while the yield index uses a combination of area weights from the credit farms and price weights from the no-credit farms. These combinations of weights are essentially arbitrarily assigned. The mix index could have had credit farm price and yield weights and the other indices would have been adjusted correspondingly. The area index is unaffected by this problem as its computation does not involve a weighting system.

In general there is no "right answer" to the problem of which set of weights to use. The reader must decide for himself which set of weights are most appropriate and then be guided in policy formulation by the resulting magnitudes. Alternatively he may decide to trust only those findings in which the values are close and certainly of the same sign, when converted to percentage changes.

b. Conversion from Multiplicative Index Values to Additive Percentages

The problem concerns the basic issue of interaction between the sources of overall change. This interaction issue is perhaps best dealt with by an example. Suppose yield were 10 percent higher on credit farms while all other potential sources of difference were identical. Then one would expect gross value of output to be 10 percent higher on the credit farms. Now suppose that yield showed a 10 percent difference while area showed a 5 percent superiority on the credit farms. One might conclude that overall output would be greater on credit farms by the sum of these two percentages, namely 15 percent. However, this would ignore the fact that yield increases were registered not only on the original land but on the 5 percent additional area. In other words, there is an interaction effect between the change in yield and the change in area. Thus the true increase in total value is greater than 15 percent. Specifically it is 15 percent plus 5 percent of 10 percent or 0.5 percent. So the total increase in output is 15.5 percent in this example.

The interactive nature of the sources of change in total output is captured in the equation presented above. For the four sources of change specified this interaction is quite involved. Each source is related to each other source on a bilateral basis as discussed in the example, then each is related to two of the others and finally they all are interrelated. The numerical implication of this interaction effect is that the sum of the percentage changes of each of the sources is less than the percentage change in total output.

This conversion from a multiplicative to an additive relationship among sources was done for ease of understanding. The way the conversion was performed was by computing the difference between the percentage change in total output and the sum of the percentage changes in each of the sources. This difference was then allocated proportionately among the sources according to their relative importance. In this way the interaction effect which was picked up as this difference was allocated back into each of the sources. Thus an essentially artificial additive relationship was established among factors which are multiplicatively related.

d. Derivation of Price and Yield Figures When None Exist

Another technical point deals with the problem differences in crop mix so great that some crops grown on credit farms are just not grown at all on no-credit farms. In this case, the no-credit price and yield data are not available. An estimate must be made of what they would have been if they had been grown. This estimate is necessary so as not to bias the index numbers unduly. Two approaches were followed in the course of the analysis. The first was to search among no-credit farms in other size classes to find the needed price and yield data. The second was to use the credit farm data when no-credit information was unavailable. The results were compared and found to be essentially the same in all but a few isolated instances. These discrepancies do not affect the basic conclusions drawn in the text. Thus only one set of results, those based on the second approach, are reported. In general the approach used will conservatively bias the findings. In other words the results derived will be closer to unity than they would have been if another method had been used to derive the missing price and yield data. This is so because the numerator and denominator of the index number in question have a greater number of identical elements.

There are several reasons this measure of cultivated area may be larger on credit farms than on no-credit farms or vice-versa. One of the two farms may be larger in size. In other words one farm may have more land (as conventionally measured - no double counting) than the other. A second possibility is that the two farms are of equal size but on one farm a larger fraction of the farm is dedicated to crops. One group of farmers may, as a third possibility, do more double and triple cropping than the other.¹ Finally the farmers of one group may dedicate more of their land to interplanted crops, corn-and-beans, corn-and-sorghum, etc. Thus four possible explanations of the difference in "area" as defined above have been identified. They are:

1. Size of Farm
2. Cultivated Area
3. Multiple Cropping
4. Interplanting

Other components such as planting density could also be considered, however these should be reflected in the yield measure discussed in the previous section. In fact multiple cropping and interplanting may also be related to yields although not necessarily proportionately. (In some cases interplanting may be associated with higher yields.) There is then some overlap in coverage of the various sources and components considered in this appendix, however they are in the main independent.

The index of farm size is defined as:

$$\frac{A_c}{A_n}$$

where

A_i = Total area (but no double counting) of farm i

$i = c$ (i.e. credit)

$i = n$ (i.e. no-credit)

B. ALLOCATION OF THE DIFFERENCES IN AREA TO FOUR COMPONENTS

1. A Description of the Method Used

Area per farm is defined as the sum of all land planted in temporary and permanent crops where multiple cropped land is counted a multiple number of times and interplanted land is counted twice. Thus given this definition it is possible for a farmer's total "area" to be greater than the extent of his farm due to the multiple counting of some areas.

The index of cultivated area adjusted for differences in farm size is defined as:

$$\frac{T_c / A_c}{T_n / A_n}$$

where

T_i = Area dedicated (but no double counting) to permanent and temporary crops on farm i .

The index measuring differences in rates of multiple cropping is defined as:

$$\frac{M_c / T_c}{M_n / T_n}$$

where

M_i = Total cropped area on farm i counting multiply cropped land the corresponding multiple number of times but counting interplanted land only *once*.

Finally the index measuring differences in the rates of interplanting is defined as:

$$\frac{I_c / M_c}{I_n / M_n}$$

where

I_i = Total cropped area on farm i counting interplanted land *twice* as well as counting multiply cropped land a multiple number of times.

Therefore,

$$I_i = \sum a_j$$

where a_j is defined in the preceding section.

Notice that these four indices are multiplicatively related to the "area" index which they "explain". This area index is in fact (I_c/I_n) and the identity expressing this relationship is:

$$\left[\frac{I_c}{I_n} \right] = \left[\frac{A_c}{A_n} \right] \cdot \left[\frac{(T_c / A_c)}{(T_n / A_n)} \right] \cdot \left[\frac{(M_c / T_c)}{(M_n / T_n)} \right] \cdot \left[\frac{(I_c / M_c)}{(I_n / M_n)} \right]$$

Gross "Area"	Size of Farm	Cultivated Area	Multiple Cropping	Inter- planting
-----------------	--------------------	--------------------	----------------------	--------------------

2. A Few Thoughts About the Components of the Area Index

The identity just defined is similar in some respects to the identity relationship between index numbers specified in the last section. It is used to further examine one of the terms in that expression, namely

$$\frac{\sum a_c}{\sum a_n}$$

In fact it is possible to concatenate the two identities and get a seven term expression which quantifies the components of the ratio of total value of output on credit to that on no-credit farms. In summary these seven components are:

- Crop Mix
- Price
- Yield
- Size of Farm
- Cultivated Area
- Multiple Cropping
- Interplanting

As just explained the last four involve no weighted summation as do the first three. Thus the problem of choosing appropriate weights is not present in the case

Source: S. R. Daines, Impact Evaluation of the Haiti Small Farmer Improvement Project (AID, 1979).

of the area components. Also there is no problem of deriving estimated values for those weights when there are none available.

On the other hand, the problem of converting from multiplicative index values to additive percentages changes still besets the analysis. The technique used in this latter case is the same as was used previously. The index values are converted to raw percentage changes. These are summed. This total is subtracted from the refined total percentage change in area as derived in the preceding section. The difference is allocated proportionately among the raw component values. Specifically each raw component is multiplied by the ratio of the refined area total to the sum of the raw components. The resulting refined component percentage changes by definition sum to the refined total area percentage change.

It should be noted that this technique will tend to exaggerate the refined component percentage change values if the ratio of the refined to raw total area is large. For example, if the adjusted (refined) area is two percent higher on credit farms and the sum of the raw components is one percent, then each raw component value will be doubled when converting it to an adjusted value. Currently, an alternative adjustment technique is under study which involves proportional distribution of the absolute value of the residual. This is discussed in greater detail in a forthcoming Methodological Working Document of the Sector Analysis Division.

APPENDIX 3

FIELD SURVEY INFORMATION

RURAL ENTERPRISE SURVEY PROCEDURES

Farm households were randomly selected from the lists of 9 agribusinesses, 3 of which fell into each of the following categories: processing, inputs and services, and storage. A total of 526 interviews were conducted in two agricultural cycles: in July/August of 1979 and 1980. Data was obtained from a total of 312 farm households, half of which were "participant farms" and half which were "non-participant farms". The interviews were carried out over a 13 day period in each of the two interviewing periods. Nine interviewers and 3 supervisors were involved in the first field survey and 6 interviewers and 3 supervisors in the second phase. Interviewers received training for 4 days in the first phase and 3 days in the second. A manual was prepared and used in the first training session.

Non-participant farm households were selected on the basis of 4 criteria. The "non-participant" farm operation could have no dealings with the agribusiness borrower, it could not have greater than a 40% difference in land size relative to the participant farm it was paired with, nor be more than 30% closer or further away from a major road than its paired participant farm. Finally, the non-participant had to grow the same product which the participant farmer grew which related to the operation of the agribusiness borrower. The overall cropping pattern, however, was not to be considered. These criteria were developed on the basis of the field test conducted before the phase one survey, and it turned out that non-participant farms had closer farm sizes and more similar distances from major roads relative to their participant counterparts than the outside limits of these criteria permitted. Also, on the basis of these criteria there was an equal number of participant and non-participant farm households selected from each region, political or geographic, in which interviews were conducted and data collected.

Quality control over data was carried out principally in the field. Each day supervisors reviewed the interview forms of the previous day to determine whether there were inconsistent data. In those cases where there were, interviewers would return to the farms with the interview form and work through the information with the farmer again.

Because of the political structure of the country, the supervisor visited the local political and police authorities before interviews were carried out in a political region. Letters of authorization from the Central Bank of Paraguay were presented to the local officials and the sponsors and purpose of the study were explained to them.

After the field interviews, the supervisors made a final examination of the interview forms in the AID offices in Asunción. Thereafter, the forms were shipped to the United States where Karl Hancock and his associates carried out further verification, coding and keypunching of interview forms, and programming of the computer analysis.

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Net Farm Income: Efficiency Measurement
 Input & Services Category, 1978/79 & 1979/80
 (\$Guarani)

	1978/79		1979/80	
	Participants	Non-Participant	Participant	Non-Participant
1. OUTPUT	\$G 651,038	\$G 453,638	\$G 753,975	\$G 557,395
a. sales	397,853	295,843	570,015	387,292
b. consumed/ stored	147,922	100,787	127,041	120,839
c. milk&eggs	71,858	38,518	50,675	32,056
d. off-farm income	33,405	18,490	6,224	17,208
2. COSTS	429,329	304,405	491,745	356,359
a. chemicals	17,622	13,862	23,525	16,631
b. seeds/ seedlings	31,905	21,801	40,123	31,197
c. direct labor	191,251	157,510	211,460	159,320
d. depreciation	51,947	29,057	52,648	35,044
e. interest	103,472	52,656	101,622	60,362
f. other costs	33,132	29,519	62,367	53,805
NET INCOME	221,709	149,233	262,230	201,036
% Difference		49%		30%

Net Farm Income: Welfare Measurement
Processing Category, 1978/79
(\$Guarani)

	Participant	Non-Participant
1. OUTPUT	\$G 294,142	\$G 292,353
a. sales	90,000	88,519
b. consumed/ stored	65,557	68,417
c. milk&eggs	105,277	102,129
d. off-farm income	33,308	33,288
2. COSTS	106,322	102,066
a. chemicals	984	1,182
b. seeds/ seedlings	7,337	6,920
c. direct labor	18,888	13,701
d. depreciation	53,292	48,423
e. interest	18,579	18,033
f. other costs	7,241	13,807
NET INCOME	187,820	190,287
% Difference	-1%	

Basis of Depreciation of Equipment and Animals

Equipment	Estimated Unit Cost	Depreciation Period (years)
arado de mano	\$G 23,000	7
carpidora	10,000	4
sembradora	1,000	10
pulverizadora	9,000	10
azada	700	4
machete	500	4
pala	1,800	4
tractor	2,500,000	18
carreta	60,000	15
tripiche	5,000	10
cabillos	27,000	14
bueyes	60,000	10
vacas	55,000	6

ENCUESTA DEL
 PROYECTO AGROINDUSTRIAL
 DEL
 BANCO CENTRAL DEL PARAGUAY
 Y A.I.D

Datos Correspondientes
 al Año Agrícola
 1978|79

Confidencial - Toda la información de esta encuesta será estrictamente confidencial. Los datos que se solicitan en ningún caso tienen fines fiscales y tampoco pueden utilizarse como prueba judicial.

No. de Entrevistador	001
No. de Entrevista	002
Districto/Minicipalidad	003
Nombre del Agricultor	004
Dirección del Agricultor	005

Tipo de actividad de la empresa:

- | | | | |
|---|--------------------------|---------------------|-----|
| 1 | <input type="checkbox"/> | Almacenamiento | 006 |
| 2 | <input type="checkbox"/> | Procesamiento | |
| 3 | <input type="checkbox"/> | Insumos y Servicios | |

Empresa relacionada al agricultor:

- | | | | |
|---|--------------------------|---------------------------------|-----|
| 1 | <input type="checkbox"/> | Agroind. y Com. PIRAGRAN | 007 |
| 2 | <input type="checkbox"/> | Rio Paraná Silos y Almacenes | |
| 3 | <input type="checkbox"/> | J. y L. S.R.L. | |
| 4 | <input type="checkbox"/> | Bodegas Antonina | |
| 5 | <input type="checkbox"/> | Industrial Isla Valle | |
| 6 | <input type="checkbox"/> | Shirosawa | |
| 7 | <input type="checkbox"/> | Agrometal | |
| 8 | <input type="checkbox"/> | Com. Pro-Motoniv. Col. Obligado | |

El Agricultor es:

- | | | | |
|---|--------------------------|-----------------|-----|
| 1 | <input type="checkbox"/> | Participante | 008 |
| 2 | <input type="checkbox"/> | No Participante | |

PARTE 1

1. ¿Cuál es la superficie de tierra que posee?		009 Ha.
2. ¿Vendió Ud. algún producto durante el año pasado a _____? (nombre de la empresa)	1 <input type="checkbox"/> Sí 2 <input type="checkbox"/> No	010
3. ¿Ha recibido Ud. un servicio de _____ (nombre de la empresa) durante el año agrícola pasado?	1 <input type="checkbox"/> Sí 2 <input type="checkbox"/> No	011

4. ¿Compró Ud. algún producto de _____ en el año agrícola pasado? (nombre de la empresa)	1 <input type="checkbox"/> Sí 012 2 <input type="checkbox"/> No
5. ¿Cuántas hectáreas de terreno cultivó Ud. en el año agrícola pasado?	_____ Ha. 013
NOTA AL ENTREVISTADOR. La pregunta Nº 6 es exclusivamente para los agricultores no participantes del programa quienes se están comparando con los agricultores participantes de las categorías de procesamiento de materia prima y almacenamiento (ver pag. 1). Los productos para la pregunta son los productos de interés para la empresa indicados por el último agricultor participante entrevistado de dicha categoría; (ver pregunta Nº 11a de la entrevista anterior al participante). 6. ¿Cuántas hectáreas de _____ cultivó Ud. en el último año agrícola? (productos)	_____ Ha. 014
7. ¿Cuál es la distancia al camino camionable más cercano?	_____ Km. metros 015
8. a. ¿Cuántas personas viven actualmente en su finca, incluyendo su propia familia, familiares, amigos y otros que viven y duermen en la finca? Excluya los que tienen trabajo fijo fuera de la finca. <p style="text-align: right;">Total:</p> b. ¿Cuántas de estas personas (total en 8a) trabajaron a sueldo? c. ¿Quiénes de estas personas (total en 8a) trabajaron sin sueldo más de 6 meses cada una en la finca en el último año agrícola? -primer nombre _____ -meses aproximados trabajados en la finca _____ -jornadas trabajadas fuera de la finca _____ -el valor total de estas jornadas trabajadas fuera de la finca _____	016 Total de personas 017 Total de personas 018 Total de personas 019 Total de meses 020 Total de jornadas 021 % de total de jornadas

9. ¿Tiene título definitivo, provisorio o en condominio de la mayor parte de la tierra que posee?

- 02
1. Ninguno
 2. Provisorio
 3. Definitivo
 4. Condominio

10. ¿Cuántas hectáreas de tierra arrienda Ud. de terceros?

02
Ha.

11. ¿Qué productos cultivó o elaboró Ud. en el último año agrícola?

- | | | |
|----------------------------|-------------------|-----------------------|
| 1. Aguacate | 21. Fecbao | 41. Poroto |
| 2. Ajo | 22. Frutilla | 42. Queso |
| 3. Alfalfa | 23. Girasol | 43. Remolacha |
| 4. Algodón | 24. Habilla | 44. Repollo |
| 5. Almidón | 25. Lechuga | 45. Sandía |
| 6. Arroz | 26. Maíz | 46. Soja |
| 7. Arveja | 27. Mamón | 47. Sorgo para grano |
| 8. Banana | 28. Mandioca | 48. Sorgo para ensoba |
| 9. Batata | 29. Maní | 49. Tabaco |
| 10. Café | 30. Manteca | 50. Tártago |
| 11. Calabaza | 31. Mangua | 51. Tomate |
| 12. Caña de azúcar | 32. Melón | 52. Trébol |
| 13. Cebolla | 33. Mante | 53. Tung |
| 14. Cebolla de verdeo | 34. Miel de caña | 54. Vid |
| 15. Ciruela | 35. Naranja agria | 55. Verbena |
| 16. Citrus | 36. Papa | 56. Zanahoria |
| 17. Coco | 37. Pera | 57. Zorrillo |
| 18. Durazno | 38. Perejil | 58. Zapallito |
| 19. Esencia de petit-grain | 39. Plimiento | 59. Cirro |
| 20. Farfisa | 40. Piña | 60. _____ |

No. y Nombre del Producto		Hectáreas Sembradas	Cantidad Cosechada			Cantidad Vendida			Cantidad Vendida a la Empresa					Cantidad Consumida & Guardada en la Finca	
No.	Nombre	Cantidad	Unidad	USO PARA LA OFICINA	Cantidad	Unidad	Precio de venta por unidad	USO PARA LA OFICINA		Cantidad	Unidad	Precio de venta por unidad	USO PARA LA OFICINA		Cantidad en Kgs., etc.
				Kgs., etc.				Kgs., etc.	¢ por Kg., etc.				Kgs., etc.	¢ por Kg., etc.	
024		025		026				027	028				029	030	031
032		033		034				035	036				037	038	039
040		041		042				043	044				045	046	047
048		049		050				051	052				053	054	055
056		057		058				059	060				061	062	063
064		065		066				067	068				069	070	071
072		073		074				075	076				077	078	079
080		081		082				083	084				085	086	087
088		089		090				091	092				093	094	095
096		097		098				099	100				101	102	103
104		105		106				107	108				109	110	111
112		113		114				115	116				117	118	119
120		121		122				123	124				125	126	127
128		129		130				131	132				133	134	135
136		137		138				139	140				141	142	143

OBSERVACION IMPORTANTE: Tenga en cuenta que todas las cantidades deben expresarse en Kgs. en las casillas marcadas "uso para la oficina"; los precios en ¢/Kg., excepción hecha para las frutas que deberán expresarse en docenas, caña de azúcar en toneladas, lechuga y repollo en atads, perejil y cebolla de verdeo en atados, coco en cajones, y los precios en las respectivas unidades indicadas.

12. ¿Qué implementos agrícolas tiene Ud.?

[Redacted]

Cantidad
Total

Cantidad recibida de la

(empresa)

a. Arado de manquera	144	145
b. Carpidora	146	147
c. Sembradora	148	149
d. Pulverizadora	150	151
e. Azada	152	153
f. Machete	154	155
g. Pala	156	157
h. Cosechadora	158	159
i. Trilladora	160	161
j. Tractor	162	163
k. Carreta	164	165
l. Trapiche	166	167
m. Otros	168	169

13. ¿Qué animales posee Ud.?

[Redacted]

Cantidad
Total

Cantidad recibida de la

(empresa)

a. Caballos	170	171
b. Bueyes	172	173
c. Vacas	174	175
d. Ovejas	176	177
e. Aves de corral	178	179
f. Cerdos	180	181
g. Otros	182	183

<p>18. ¿Arrendó Ud. de terceros algún terreno en el año agrícola pasado?</p> <p>En caso afirmativo:</p> <p>a. ¿Cuánto pagó en efectivo?</p> <p>b. ¿Cuánto pagó en especie?</p> <p>c. ¿Cuánto pagó en mano de obra?</p>	<p>1 <input type="checkbox"/> Sí 231</p> <p>2 <input type="checkbox"/> No (Pase a 20)</p> <hr/> <p>¢ 232</p> <hr/> <p>¢ 233</p> <hr/> <p>¢ 234</p>
<p>19. ¿Pagó Ud. arriendo en el año agrícola pasado a la empresa?</p> <p>En caso afirmativo:</p> <p>a. ¿Cuánto pagó en efectivo?</p> <p>b. ¿Cuánto pagó en especie?</p> <p>c. ¿Cuánto pagó en mano de obra?</p>	<p>1 <input type="checkbox"/> Sí 235</p> <p>2 <input type="checkbox"/> No (Pase a 20)</p> <hr/> <p>¢ 236</p> <hr/> <p>¢ 237</p> <hr/> <p>¢ 238</p>
<p>20. ¿Cuánto pagó Ud. por mano de obra contratada asalariada y/o a destajo en el año agrícola pasado?</p>	<p>¢ 239</p>

21. En el siguiente cuadro deberán incluirse las cantidades de semillas o matas compradas o utilizadas de su propia cosecha para cada cultivo en la finca (columna 3 y 4), y las cantidades adquiridas de la empresa (columna 5 y 6) y finalmente para el cultivo de interés para la empresa (columna 7 y 8).

N.º de Producto 1	Nombre del Cultivo 2	TOTAL		Adquirido de la Empresa		Adquirido para Cultivo de Interés	
		Cantidad 3	Valor 4	Cantidad 5	Valor 6	Cantidad 7	Valor 8
240	241	242	243	244	245	246	247
248	249	250	251	252	253	254	255
256	257	258	259	260	261	262	263
264	265	266	267	268	269	270	271
272	273	274	275	276	277	278	279
280	281	282	283	284	285	286	287
288	289	290	291	292	293	294	295
296	297	298	299	300	301	302	303
304	305	306	307	308	309	310	311
312	313	314	315	316	317	318	319
320	321	322	323	324	325	326	327
328	329	330	331	332	333	334	335
336	337	338	339	340	341	342	343
344	345	346	347	348	349	350	351
22. ¿Cuál es el valor de los otros gastos que tuvo Ud. en el año agrícola pasado?							952
23. ¿Del total de otros gastos (en N.º 22) cuál fue el monto cubierto por la empresa?							953
24. ¿Cuál es el monto de los otros gastos que Ud. tuvo para el producto de interés de la empresa?							954

25. a. ¿Recibió visitas de asistencia técnica en el año agrícola pasado?	1 <input type="checkbox"/> Sí 355
b. ¿Cuántas visitas recibió de las siguientes fuentes?:	2 <input type="checkbox"/> No (Pase a 28)
(i) La Empresa	356
(ii) SHAG	357
(iii) BNF	358
(iv) Otro vendedor o comprador	359
(v) Otra fuente	360
TOTAL	361
26. ¿Cómo pagó Ud. la asistencia técnica recibida?	362
a. -en efectivo	1 <input type="checkbox"/> Sí 2 <input type="checkbox"/> No 363
b. -en especie	1 <input type="checkbox"/> Sí 2 <input type="checkbox"/> No 364
c. -gratuita	1 <input type="checkbox"/> Sí 2 <input type="checkbox"/> No 365
27. ¿Cree Ud. que la asistencia técnica ha mejorado su ingreso?	1 <input type="checkbox"/> Sí 2 <input type="checkbox"/> No 366
28. a. ¿Ha recibido Ud. crédito en el último año agrícola?	1 <input type="checkbox"/> Sí 367
b. ¿Cuál es el valor del crédito (en 200) proveniente de las siguientes fuentes?:	2 <input type="checkbox"/> No (Pase a 29)
(i) La Empresa	<input type="checkbox"/> 368
(ii) Un banco	<input type="checkbox"/> 369
(iii) Un intermediario	<input type="checkbox"/> 370
(iv) Otra Institución ó Persona Privada	<input type="checkbox"/> 370

<p>29. a. ¿Viven todos sus hijos?</p> <p>[Redacted]</p> <p>b. ¿Cuántos murieron?</p> <p>[Redacted]</p>	<p>1 <input type="checkbox"/> Sí (Pase a 30)</p> <p>2 <input type="checkbox"/> No</p> <p>menos de un año</p> <p>entre 1 a 5 años</p> <p>más de 5 años</p>
<p>30. ¿Cuando Ud. o algún miembro de su familia se siente enfermo, recurre con mayor frecuencia a:</p> <p>[Redacted]</p> <p>[Redacted]</p>	<p>1 <input type="checkbox"/> Hospital o Centro de Salud</p> <p>2 <input type="checkbox"/> Médico privado</p> <p>3 <input type="checkbox"/> Farmacia</p> <p>4 <input type="checkbox"/> Curandero</p> <p>5 <input type="checkbox"/> Se automedican</p>
<p>31. ¿A qué distancia encuentra Ud. el hospital, centro de salud, o médico privado más cercano?</p> <p>[Redacted]</p>	<p>Km. Metros</p> <p>[Redacted]</p>
<p>32. ¿Cuántos casos de diarrea o fiebre ocurrieron en su familia en la última:</p> <p>[Redacted] (i) semana</p> <p>[Redacted] (ii) mes</p>	<p>[Redacted]</p> <p>No. 378</p>

33. Para el Jefe de familia:

a. ¿Entiende Español?

- 1 excelente
 2 bien
 3 regular
 4 no entiende

b. ¿Habla Español?

- 1 excelente
 2 bien
 3 regular
 4 no habla

c. ¿Entiende Guaraní?

- 1 excelente
 2 bien
 3 regular
 4 no entiende

d. ¿Habla Guaraní?

- 1 excelente
 2 bien
 3 regular
 4 no habla

e. ¿Entiende otro idioma?

- 1 excelente
 2 bien
 3 regular
 4 no entiende

f. ¿Qué grado concluyó en la escuela el jefe de la familia?

- 0 - Analfabeto
- 19 - Terminó primer ciclo de alfabetización
- 20 - Terminó segundo ciclo de alfabetización
- 21 - Terminó tercer ciclo de alfabetización

Primaria		Secundaria		Universitaria	
Grado	Código	Grado	Código	Grado	Código
1	1	1	7	1	13
2	2	2	8	2	14
3	3	3	9	3	15
4	4	4	10	4	16
5	5	5	11	5	17
6	6	6	12	6	18

Código

<p>... ¿Cuántos de sus hijos tienen entre 7 a 18 años?</p> <p>b. ¿Cuántos de esos hijos (en 34 a) van a la escuela o colegio?</p>		38
<p>35. ¿Tiene electricidad?</p>	<p>1 <input type="checkbox"/> Sí</p> <p>2 <input type="checkbox"/> No</p>	38
<p>5. ¿Tiene agua corriente?</p>	<p>1 <input type="checkbox"/> Sí</p> <p>2 <input type="checkbox"/> No</p>	388
<p>17. Tipo de vivienda:</p> <p>a. Paredes</p> <p>b. Tecno</p> <p>c. Piso</p>	<p>1 <input type="checkbox"/> barro y ladrillos</p> <p>2 <input type="checkbox"/> barro</p> <p>3 <input type="checkbox"/> ladrillos</p> <p>4 <input type="checkbox"/> otro</p> <p>1 <input type="checkbox"/> paja</p> <p>2 <input type="checkbox"/> tejas</p> <p>3 <input type="checkbox"/> paja y tejas</p> <p>4 <input type="checkbox"/> otro</p> <p>1 <input type="checkbox"/> tierra</p> <p>2 <input type="checkbox"/> ladrillo</p> <p>3 <input type="checkbox"/> baldosa</p> <p>4 <input type="checkbox"/> otro</p>	389
<p>38. Total m² cubierto de casa:</p>	<p>m²</p>	392
<p>39. ¿Qué tipo de facilidades sanitarias tiene?</p>	<p>1 <input type="checkbox"/> letrina</p> <p>2 <input type="checkbox"/> servicio</p> <p>3 <input type="checkbox"/> otro</p> <p>4 <input type="checkbox"/> ninguno</p>	393