A.I.D. EVALUATION SUMMARY - PART I

PD-ABL-210

XD

1. BEFORE FILLING OUT THIS FORM, READ THE ATTACHED INSTRUCTIONS.
2. USE LETTER QUALITY TYPE, NOT "DOT MATRIX" TYPE.

IDENTIFICATION DATA

A. Reporting A.I.D. Unit:

Mission or AID/W Office USAID/Bolivia

(ES# _____)

B. Was Evaluation Scheduled In Current FY Annual Evaluation Plan?

Yes [X] Slipped [ ] Ad Hoc [ ]

Evaluation Plan Submission Date: FY ____ Q ____

C. Evaluation Timing

Interim [X] Final [ ]

Ex Post [ ] Other [ ]

D. Activity or Activities Evaluated (List the following information for project(s) or program(s) evaluated; if not applicable, list title and date of the evaluation report.)

Project No.	Project /Program Title	First PROAG or Equivalent (FY)	Most Recent PACD (Mo/Yr)	Planned LOP Cost (000)	Amount Obligated to Date (000)
	PL-480 Title II Rural Development Projects (Funded under Local Currency Title II Monetization Program)	N/A	On Going	6,000 (FYs 1989 - 1992)	6,000

ACTIONS

E. Action Decisions Approved By Mission or AID/W Office Director

Action(s) Required	Name of Officer Responsible for Action	Date Action to be Completed
1. Distribute evaluation to Title II PVOs and obtain written comments on evaluation findings.	Sal Pinzino	1/30/93
2. Organize seminar with Title II PVOs to implement recommendations and to modify criteria for selection of projects to be funded under monetization in FY 1994.	L.F. Moreno	4/30/93
3. Follow-up on implementation of recommendations.	Sal Pinzino	12/93

(Attach extra sheet if necessary)

APPROVALS

F. Date Of Mission Or AID/W Office Review Of Evaluation: (Month) (Day) (Year)

G. Approvals of Evaluation Summary And Action Decisions:

	Project/Program Officer	Representative of Borrower/Grantee	Evaluation Officer	Mission or AID/W Office Director
Name (Typed)	Jonathan Sleeper	José Barrientos Cáritas Boliviana	Stephen Smith	Carl H. Leonard
Signature				
Date	12/14/92			

ABSTRACT

H. Evaluation Abstract (Do not exceed the space provided)

The evaluation assesses the rural development projects and programs implemented by Title II cooperating sponsors in Bolivia. The Title II cooperating sponsors are Food for the Hungry International (FHI), Cáritas, and the Adventist Development and Relief Agency (ADRA). The rural development projects are funded through the Title II monetization program, which involves the sale of donated wheat flour to generate local currency.

The evaluation found that FHI's long-term development approach among the extremely poor rural people in the departments of La Paz, Oruro, and Potosi is sound and "having a substantial impact among beneficiaries." Its three-pronged development approach includes the provisions of drinking and irrigation water, improvement of family nutrition, and development and extension of improved agricultural technologies. FHI's strategy, project and program designs, and monitoring are commendable--the more so given its austere operating milieu.

The evaluators noted that Cáritas, the social arm of the Bolivian Catholic Church, is new to development and has no well-defined development strategy. Five projects sponsored by de-centralized diocesan offices were evaluated. The projects consisted of income generation activities, supported by revolving loan funds, to improve rice, peanut, potato and corn production in the lowlands; micro irrigation systems in drought areas; vegetable gardens to improve nutrition of poor families; and a dairy project for peasant farmers. The evaluators concluded that, except for the dairy project which has promise, the production oriented projects were plagued with problems including unusual flooding conditions, slash and burn agriculture practices, and undulating terrain and erosion-prone soils. These problems surpassed the institutional capacity of the Cáritas regional offices to deal with them effectively, especially because they do not have the research capability to support agricultural extension for the poorest farmers. On the other hand the micro irrigation systems are increasing production and are sound development efforts. The evaluators recommended that Cáritas build on its institutional strength of organizing small farmers to market their products and put less emphasis on production programs. Cáritas should not be involved in credit programs, but rather provide grant funds matched by local contributions as is the case with FHI.

The evaluator assessed two "integrated development projects" supported by ADRA. These projects consist of supporting agricultural development, forestation, health and nutrition. The agricultural activities are geared to income generation, but have not been successful. The health component, although only lightly assessed under this evaluation, is fulfilling a real need of the population, especially since government or other health delivery systems are not available in the areas where ADRA works. The evaluators recommended that ADRA also concentrate on assisting the farmers market traditional crops, and put less emphasis on improving production.

COSTS

Evaluation Costs

1. Evaluation Team		Contract Number OR TDY Person Days	Contract Cost OR TDY Cost (U.S. $)	Source of Funds
mo	Affiliation			
. James C. Jones	Management & Business Associates	511-0000.01-3-20069-01	85,705	PD&S
tohomist, Hugo Vargas				

Mission/Office Professional Staff Person-Days (Estimate)	3. Borrower/Grantee Professional Staff Person-Days (Estimate)
6	55

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A.I.D. EVALUATION SUMMARY - PART II

SUMMARY

J. Summary of Evaluation Findings, Conclusions and Recommendations (Try not to exceed the three (3) pages provided)
Address the following items:

- Purpose of evaluation and methodology used
- Purpose of activity(ies) evaluated
- Findings and conclusions (relate to questions)
- Principal recommendations
- Lessons learned

Mission or Office:	Date This Summary Prepared:	Title And Date Of Full Evaluation Report:
USAID/Bolivia	12/05/92	Evaluation: Rural Development Component PL-480 Title II, August, 1992

I. Purpose of the Evaluation and Methodology

The evaluation assesses the impact on rural peoples of development projects and programs mounted by Title II Cooperating Sponsors in Bolivia with monetization funds. The Title II Cooperating Sponsors are Food for the Hungry International (FHI), Cáritas, and the Adventist Development and Relief Agency (ADRA). The evaluation also assesses the soundness of the projects and programs in relation to their human and physical settings.

The evaluation team consisted of Social Scientist, Dr. James C. Jones, and Agronomist, Ing. Hugo Vargas, who conducted a rapid appraisal assessment of the rural development projects over a two month period. The evaluators reviewed project reports, but mostly relied on interviews (individual and group) with 313 local farmers as well as the staffs of USAID and the PVOs.

II. Purpose of the Activities Evaluated

Each of the three Title II Cooperating Sponsors have a different approach to rural development projects and programs. FHI works only on the Altiplano among the extremely poor in the departments of La Paz, Oruro, and Potosi. Its three-pronged approach includes provision of drinking and irrigation water, improvement of family nutrition, and development and extension of improved agricultural technologies. Family Wells and communal water systems furnish potable water, the wells, always located next to FHI built greenhouses, serve to irrigate vegetable, which are key to improving family nutrition. FHI's simple communal irrigation systems have improved open field crop production on tiny plots in areas of uncertain rainfall. And FHI has worked to improve technologies on open-field crop production on tiny plots in areas of uncertain rainfall. And FHI has worked to improve technologies for producing maize, potatoes, barley, apples, and outdoor vegetable (onions, carrots, lettuce). Through these technologies and other innovations, FHI seeks to improve the quantity and quality of food for household consumption. Income generation is not an objective.

Cáritas is the social action arm of the Catholic Church and has long provided an array of social services to the poor. It is organized at the diocese level, where it has much autonomy. All 16 Cáritas offices are now in transition from social service agencies to development ones. Because Cáritas is a newcomer to development, it has no well-defined development strategy. The emphasis on community sets Cáritas apart from most other NGOs. Five individual projects from diocesan offices of Santa Cruz, Ñulfo de Chávez, Sucre, and the Beni were evaluated. Cáritas/Santa Cruz mounted a project, supported by a revolving loan fund, to increase farmer incomes through introducing beans and rice and corn production. Cáritas/Ñuflo de Chávez organized a two-year project with a revolving loan fund to increase incomes through peanut, cotton, and potato production. A further aim of this project was to recover forest fallow. Cáritas/Beni initiated a one-year project through mothers' clubs to establish communal vegetable gardens to improve household consumption and incomes. Cáritas/Beni also mounted a two year project to increase incomes and improve household diets through the establishment of fifty small dairy farms.

ADRA is sponsoring multi-program integrated develop efforts that operate on a broad front embracing agriculture, forestation, health and nutrition in five micro-regions in La Paz and the Beni. Two of these integrated projects in the small towns of San Pablo and Gonzalo Moreno of the Beni were evaluated. The San Pablo Project, mounted in communities along the Trinidad-Santa Cruz highway, seeks to increase agricultural production and income and to improve nutrition and reduce infant mortality.

The project has introduced a new rice variety, has promoted commercial and household vegetable gardens, and has established two tree nurseries. The Gonzalo Moreno Project, located between the Beni and Madre De Dios rivers in the northern part of the Beni, seeks to increase agricultural production and income and to improve nutrition and reduce infant mortality. The project was to introduce new varieties of corn and rice, and was to promote both commercial and household vegetable gardens. The health component consists of immunization campaigns for children, programs to monitor nutritional status of children, distribution of oral rehydration salts, the treatment of acute respiratory infections, and the provision of health care services to the general population.

III. Findings and Conclusions

1. All of the projects seek to address the needs of the "poorest of the poor" and are in compliance with PL-480's food security mandate as embodied in the Agricultural Trade Development and Assistance act of 1954 as amended in 1990. The 1990 Amendment stated that "It is the policy of the United States to use its abundant agricultural productivity to promote the foreign policy of the United States by enhancing the food security of the developing world through the use of agricultural commodities and local currencies accruing under this Act to--(1) combat world hunger and malnutrition and their causes; (2) promote broad-based, equitable, and sustainable development including agricultural development..."

2. FHI is having a substantial impact among beneficiaries in some of Bolivia's more challenging regions for development. Its strategy, project and program designs, and monitoring are commendable--the more so given its austere operating milieu. At the operations level, FHI employs sound principles from applied social science: changes are introduced on an incremental basis, and technologies accommodate recipients' economic capacity as well as the milieu's agroecology--they square with current farming systems, that is.

3. The ADRA projects evaluated are multi-program integrated development projects. ADRA works on a broad front that embraces agriculture, forestation, health, and nutrition. Both projects have received sufficient funding and ADRA personnel, who reside in the project area, are technically competent and enthusiastic. Both projects have relied on revolving loan funds, but delinquency rates have been high, ranging from forty-seven percent to eighty-four percent. The projects have enjoyed some success in promoting home vegetable gardens, tended by women. The work of the nutritionist, who has shown women how to prepare vegetable salads and soups has reinforced this effort. The projects have not been successful in commercial vegetable, corn and rice production. In the agricultural area, ADRA pursues the "income generation" goal with a vigor that sometimes blinds them to the project milieu. For this reason, ADRA sometimes works with the more economically favored rather than working with the poorer farmers. There is also a tendency to promote technologies without a good understanding of the agroecological milieu or of current farmer practices. This leads to the introduction of inappropriate technologies, which farmers ultimately reject. The health component provides needed services to the poor families served by the project, but the program lacks a clear strategy.

4. The agricultural production projects of Cáritas are overly ambitious, certainly in relation to funding and staffing levels. To stabilize agriculture by checking the pace at which very poor people, farming in zones of Santa Cruz extremely refractory to agriculture, cut and burn the forest is a goal beyond the reach of a PVO. It is also unrealistic to expect farmers to grow vegetables for the market in the Beni's cattle region. In each of the four agricultural production projects, Cáritas has been successful in organizing the community toward self-help activities. This is the institutional strength of Cáritas, but the logistics of mutual help must be more carefully considered before it is advocated for every project. All but one of the five projects evaluated employed revolving loan funds, and delinquency rates in three of the projects were high, ranging from thirty-three to forty-seven percent.

The dairy project in the Beni, which began in January, 1992, is progressing satisfactorily. The forty-five farmers in seven communities have completed sowing pasture grass and are now erecting wire fencing. The project squares especially well with the agroecology of its location and responds to the felt needs of residents there. The eventual success of the project will depend on marketing, which has been well thought out by both the participants and Cáritas staff. The Sucre micro irrigation projects had rehabilitated 59 hectares of land benefitting 67 families and another 121 hectares will be irrigated by the end of November, 1992 benefiting an additional 118 poor farm families. Production increases are significant in these drought prone regions and the project is having a substantial impact among beneficiary communities.

IV. Recommendations

1. FHI is doing an excellent job and the evaluators found little room for improvement, expect for giving more attention to the role of women in tending greenhouses; providing more technical training to small farmers; and, using integrated pest management methods to control pests in the greenhouses.

2. ADRA should scrutinize more closely the socioeconomic level of participants in its agricultural programs; plan fewer and more focused interventions in its integrated development projects; decrease emphasis on agricultural production and focus more on removing marketing constraints for existing crops and forest products; and, improve the strategic planning of its health and nutrition component of its projects.

3. Cáritas, because of its comparative advantage in working with community organizations and promoting mutual self-help, should focus on agricultural marketing rather than on production with the exception of home vegetable gardens and the dairy project. Cáritas' micro-irrigation project in Chuquisaca should be continued, because of the devastating consequences of chronic drought in recent years and the low cost of the projects which have high social and economic returns.

V. Major Lessons Learned

The major lesson learned was that PVOs should avoid establishing revolving loan funds when working with the "poorest of the poor" and establish systems similar to FHI where grants are made and the participants cover part of the costs of the innovations introduced in agriculture. Secondly, the PVOs do not have a comparative technical advantage in promoting production in difficult terrain where slash and burn agriculture is common. The emphasis should be on limiting the constraints of marketing, rather than on increasing production.

ATTACHMENTS

K. Attachments (List attachments submitted with this Evaluation Summary; always attach copy of full evaluation report, even if one was submitted earlier; attach studies, surveys, etc., from "on-going" evaluation, if relevant to the evaluation report.)

Management & Business Associates, Evaluation: Rural Development Component PL-480 Title II, August 1992

COMMENTS

L. Comments By Mission, AID/W Office and Borrower/Grantee On Full Report

The evaluation adequately met the Scope of Work and provided answers to key questions regarding improving the decision-making process on Title II monetization funding of rural development projects.

The evaluators had a good understanding of the rural context in Bolivia, the activities evaluated, and their impacts.

The technical aspects of the report sometimes lacks specificity, but, in general, the conclusions and recommendations are valid.

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EVALUATION:

RURAL DEVELOPMENT COMPONENT PL-480 TITLE II

August 1992

Report Prepared for
United States Agency for International Development

CHIEF OF PARTY AND SOCIAL SCIENTIST: DR. JAMES C. JONES

AGRONOMIST: ING. HUGO VARGAS

ACKNOWLEDGEMENTS

This report would not have been possible without the assistance and understanding of numerous persons. We first thank Mr. Salvatore Pinzino and Mr. Jack Sleeper of USAID/Bolivia for their confidence in us and for giving us the flexibility to alter the Scope of Work's logistics, and especially to reduce the number of projects evaluated so that our effort could be accomplished with quality and within the allotted time and budget.

We also give warm thanks to numerous technical and administrative staff of FHI, CARITAS, and ADRA. They freely supplied us with information and gave us all-important logistical support in our visits to some of Bolivia's remoter regions. Many of these staff work under harsh physical conditions and face isolation of a kind few city residents can know. We respect them deeply.

But most of all, we thank the long-suffering rural dwellers into whose lives we intruded over the past two and a half months. Many are among the wretched of the earth, buffeted about by forces they little comprehend, neglected by those of power and privilege. The story we tell is theirs--and, through a shared humanity, that of all our kind.

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ACRONYMS

ADRA	*Agencia Adventista de Desarrollo y Recursos Asistenciales* (Adventist Development and Relief Agency)
ARI	Acute Respiratory Infection
ASOPROF	*Asociacion de Productores de Frejol* (Association of Bean Producers)
CDC	*Centro de Demostracion y Capacitacion* Demonstration and Training Center)
CDF-RN	*Centro de Desarrollo Forestal--Regional Norte* (Forestry Development Center--Northern Region)
CEDETI	*Centro de Tecnologia Intermedia* (Intermediate Technology Center)
CIAT	*Centro de Investigacion en Agricultura Tropical* (Center for Tropical Agricultural Research)
CORDEPANDO	*Corporacion de Desarrollo del Pando* (Pando Development Corporation)
CRS	Catholic Relief Services
EEC	European Economic Community
FEGABENI	*Federacion de Ganaderos del Beni y Pando* (Federation of Beni and Pando Ranchers)
FHI	Food for the Hungry International (*Fundacion contra el Hambre*)
GOB	Government of Bolivia
IBTA	*Instituto Boliviano de Tecnologia Agropecuaria* (Bolivian Institute of Agricultural and Livestock Technology)
INMABOL	*Industria Maderera Boliviana* (Bolivian Wood Industry)

IPDRE	*Instituto Popular de Desarrollo Regional Educacional* (People's Institute of Rural Educational Development)
MACA	*Ministerio de Agricultura y Asuntos Campesinos* (Ministry of Agriculture and Rural Affairs)
MP	Monetization Program
NGO	Non-Governmental Organization
OFASA	*Obra Filantropica y Asistencia Social* (Philanthropic Work and Social Assistance)
ORT	Oral Rehydration Therapy
ORU	Oral Rehydration Unit
PAC	*Programa de Autodesarrollo Campesino* (Farmer Self-Help Program)
PDAI	*Proyecto de Desarrollo Agricola Integrado del Beni* (Beni Integrated Agricultural Development Project)
PROCAL	*Productora Integral Campesina de Alimentos* (Farmer Integrated Food Production Organization)
PROMAPA	*Produccion de Mani, Algodon, y Papa* (Peanut, Cotton and Potato Production)
RPS	*Responsable para la Salud* (Responsible for Health)
SEPA	*Semilla Productora de Papa* (Potato Seed Producer)
USAID	United States Agency for International Development

EXECUTIVE SUMMARY

Introduction

This document reports on an evaluation, the first since 1989, of the Rural Development component of Bolivia's PL-480 Title II program. The evaluation assesses the impact on rural peoples of development projects and programs mounted by three NGOs as well as evaluates the soundness of those projects and programs in their human and physical settings. The NGOs are Food for the Hungry International (FHI), CARITAS (part of the Catholic Church), and Adventist Development and Relief Agency (ADRA).

We (two persons) conducted the evaluation between June 12 and August 22, 1992, drawing on numerous project reports, but relying mostly on information obtained from interviews (group and individual) with local farmers (311) as well as with USAID and NGO administrative and technical staff (61). We evaluated a total of eight projects or programs in the Departments of Potosi, Oruro, La Paz, Chuquisaca, Santa Cruz, Beni, and Pando.

For most of its thirty-year history in Bolivia, PL-480 Title II donated food to the poor; only recently did the program assume a development character. Today, it is part of USAID's mainstream development agenda, where it links closely with Alternative Development, which is part of the U.S. Government's anti-narcotics strategy and one of USAID's six development objectives for Bolivia. Title II's Rural Development component "will include investments that are geared toward increasing rural productivity,...toward generating sustainable income opportunities in rural areas" (USAID 1991: 9).

The Rural Development component is entirely "monetized" and is funded through the sale of donated wheat flour in Bolivia. A Monetization Program, which is a separate unit within Title II, acts as broker in the sale of the flour, screens and selects NGO projects, monitors their implementation, and provides technical assistance to projects when needed.

Annex F summarizes the goals and objectives for each project or program, and the degree to which they had been met as of the indicated date. Financial and sundry other data are also included. To make information in the report more accessible, the chapter on each project closes with a "Discussion and Conclusions" section.

Food for the Hungry International (FHI)

FHI works only on the *altiplano*, where it emphasizes long-term development among the extremely poor in the departments of La Paz, Oruro, and Potosi. Its three-pronged rural-development thrust includes provision of drinking and irrigation water, improvement of family nutrition, and development and extension of improved agricultural technologies. Family wells and communal water systems furnish potable water; the wells, always located next to FHI-built greenhouses, serve to irrigate vegetables, which are key to improving family nutrition. FHI's simple communal irrigation systems have improved open-field crop production on tiny plots in areas of uncertain rainfall. And FHI has worked to improve technologies for producing maize, potatoes, barley, apples, and outdoor vegetables (onions, carrots, lettuce). In our evaluation, we thus visited households with wells and greenhouses, and communities with irrigation and potable water systems; and we talked with farmers who were using new or improved technologies.

Through these technologies and other innovations, FHI seeks to improve the quantity and quality of food for household consumption; income generation is not an objective. FHI promotes integrated rural development, or the development of different aspects of a community in a coordinated fashion. Household wells, for example, furnish drinking water as well as water for greenhouse vegetables; the wells and the vegetables work together to improve nutrition and health. FHI's Infant Survival Program (not evaluated here), headed by a nutritionist, reinforces the other programs by teaching mothers home hygiene as well as new and improved culinary practices. The institution does not mount "projects," but rather activities, each with a beginning date but no ending date. FHI withdraws from a community when certain development criteria (see Section 2.1.) have been met. Objectives and budgets are prepared for each fiscal year.

We think FHI is having a substantial impact among beneficiaries in some of Bolivia's more challenging regions for development. Its strategy, project and program designs, and monitoring are commendable--the more so given its austere operating milieu. At the operations level, FHI employs sound principles from applied social science: changes are introduced incrementally, and technologies accommodate recipients' economic capacity as well as the milieu's agroecology--they square with current farming systems, that is.

FHI's staff, which engages periodically in self-criticism and self-evaluation, is well qualified and dedicated. We were especially impressed with the commitment of some of the promoters, who often labor under extremely adverse conditions. Several staff have been with FHI for many years, and have played a key role in incorporating the institution's experience in its evolving programs.

FHI seeks to make its activities sustainable over the long term, as can be seen by its work with technologies that are within farmers' management capacity and economic means, and that harmonize with local agroecology. The planned introduction of stores (ultimately to be villager-managed) in the rural areas to supply well-pump parts and items such as plastic greenhouse roofing is further evidence. We do not think FHI is fomenting a sense of dependency among beneficiaries. Because of their extreme poverty, the institution cannot expect to recover all of its initial costs from them--costs for seeds and pumps, for example. Without these "priming" costs, nothing can happen.

CARITAS

An institution of the Catholic Church, CARITAS (meaning "charity" in Latin) has long provided an array of social services to the poor. It is organized at the diocese level, where it has much autonomy. Since the needs of diocese populations vary across regions, the organization and programs of CARITAS also vary by diocese. All CARITAS in Bolivia are now in transition from social-service agencies to development ones. CARITAS' prior *institutional* experience with "development" in the case of the five projects we evaluated was brief, and in no case much exceeded two years. Probably because CARITAS is a newcomer, it has no well-defined development strategy. But it does have, as has the Catholic Church in general, considerable experience in developing and working with community organizations (the spirit of the Mass is communal). This emphasis on *community* sets CARITAS apart from most other NGOs.

In the Buena Vista/Huaytu area of Ichilo Province, CARITAS/Santa Cruz mounted a project, supported by a revolving loan fund, to increase farmer incomes through introducing beans and improving rice and corn production. Beans were to be a rotational crop for the winter dry season, and would retard the rate at which farmers cut and burn the forest. The project was also to build two bulking centers to aid marketing. But foul weather, especially heavy rains this year, and volatile market prices compromised results. For other reasons, the bulking centers were never built. Delinquency rates on the revolving loan funds reached forty-seven percent.

In the San Julian zone of Nuflo de Chavez Province (Santa Cruz), CARITAS/Nuflo de Chavez mounted a two-year project (with revolving loan fund) to increase incomes through peanut, cotton, and potato production. A further aim was to recover forest fallow (and retard the swidden cycle) by removing boles and stumps, and then planting cotton, peanuts, and beans in the summer, followed by potatoes in the winter. But drought reduced potato yields in the first year, while uncertified seed rotted in the ground the second year. Hail destroyed the beans, and heavy rains this year destroyed the cotton. Peanuts were never planted because of scarce seed. And the task of

removing stumps and debris daunted farmers. The loan delinquency rate on first-year potatoes was thirty-three percent; rates on other crops were unavailable.

CARITAS/Sucre initiated the construction of micro-irrigation systems in several provinces of Chuquisaca Department in order to increase crop production on 140 hectares in a drought-prone region. The systems will have irrigated 180 hectares by November, 1992, and there are early indications of production increases. Whether these translate into substantially higher incomes may depend on follow-up agronomic and marketing support. The system in one community, however, had already kept farmers from migrating seasonally to Santa Cruz to harvest sugar. Almost any water project in this drought-stricken region will have high social and economic returns.

CARITAS/Beni mounted a one-year project (through Mothers' Clubs) to establish communal vegetable gardens in Marban and Cercado Provinces. The gardens were to improve household nutrition and incomes; half of the vegetables was to be sold, half consumed. Only about half of the planned number of hectares was planted, however, and households consumed more than ninety percent of the harvest. The project used a revolving loan fund, but data on delinquency rates (quite high) were unavailable.

Only this year, CARITAS/Beni initiated a two-year project in Marban Province to increase incomes and improve household diets through the establishment of fifty small dairy farms. The project hired a veterinarian, and forty farmers have sown pasture and are now (late July) building fences and stables to receive a pregnant cow each in September. Fencing and veterinary supplies are furnished through a revolving loan fund, and farmers must return the cow's first offspring. The project is promising: it is well conceived, its agroecological setting is congenial, its staff are competent, and its beneficiaries are enthusiastic.

We think CARITAS' long use of food incentives, which lead farmers to expect free services, to some degree compromises its development efforts during this transitionary period. We further observed that project staffing (staff is generally of high quality) tended to be "thin" relative to project objectives. On the other hand, project funding levels have tended to be low; there is probably some relation between the two.

We also observed a tendency for agricultural production projects to be overly ambitious, or sometimes to pursue unrealistic objectives. To stabilize slash-and-burn agriculture, for example, is a major challenge for an NGO, certainly in zones like the Yapacani (Buena Vista/Huaytu), with its undulating terrain and erosion-prone soils. And it is unrealistic to expect farmers to grow vegetables (or anything else) for the market in the Beni's cattle zones, where suitable forest is limited--and in any case, already belongs to the ranchers--and marauding cattle destroy the gardens. There can be no commercial agriculture in these zones pending the advent of rational government policies--and the political will and strength to enforce them--regarding land tenure and resource use.

CARITAS prizes and promotes mutual help among project beneficiaries; individualism is unrewarded and disdained. In each of the four agricultural production projects we visited, we observed this theme, which sets CARITAS apart from other NGOs. It is the logic behind each project-sponsored beneficiary organization in the communities--and probably behind all Church-sponsored community-level organizations. CARITAS sometimes structures its projects around this ideal of mutual help. Communal credit guarantees, whereby all members are liable for the debt of each, is one instance. The emphasis on community is a CARITAS strength.

Adventist Relief and Development Agency (ADRA)

Founded by the Seventh Day Adventist Church to promote community (and individual) development and provide disaster relief, ADRA began working in Bolivia in 1964 as OFASA, distributing food, clothes, medicines, and other items to low-income peoples. The agency's fundamental objective and world mandate is "to develop the poor through physical, mental, social, and moral change" (ADRA 1991: 10).

ADRA has implemented "food-for-work" (PL-480) activities in Bolivia since 1983. Agriculture and health have been key program areas since 1986, but ADRA did not implement agricultural production projects until 1987. For most of the period since 1983, the agency implemented an array of highly dispersed and unrelated activities, poorly monitored and little coordinated. This strategy yielded three years ago to an integrated approach, with interrelated and coordinated activities concentrated in a small geographical area. In 1991, ADRA improved its planning, monitoring, and evaluation procedures. The two projects we evaluated follow the new strategy, which, according to one staffer, marks the beginning of ADRA's "development" work.

Both projects are multi-program integrated development efforts that operate on a broad front embracing agriculture (including tree nurseries), health, and nutrition. They establish objectives for each fiscal year and report on progress through year-end reports. They had no specified ending dates until recently. Both have been well funded, and to their credit their personnel reside, often at considerable sacrifice, in the project zones.

The San Pablo Project, mounted in communities along the Trinidad-Santa Cruz highway, near the Santa Cruz border, seeks to increase agricultural production and income and to improve nutrition and reduce infant mortality. The project has introduced a new rice variety, has promoted commercial and household vegetable gardens, and has established two tree nurseries. (We did not evaluate the project's substantial health component.) Heavy rains this year damaged the rice harvest; drought last year diminished vegetable yields, and a price drop in tomatoes caused by a market glut further reduced earnings. Most of the commercial vegetable farms we

visited were owned by highlanders well off by regional standards. Drought and rains had also lowered production on household vegetable gardens. Current delinquency rates on revolving loan funds are seventy-five percent for rice and forty-seven percent for vegetables.

Well to the north, between the Rivers Beni and Madre de Dios in Pando Department, is the Gonzalo Moreno Project, which seeks to increase agricultural production and income and to improve nutrition and reduce infant mortality. The project was to introduce new varieties of corn and rice, and was to promote both commercial and household vegetable gardens. The health component was to immunize children and to institute programs to monitor nutritional status, to provide oral rehydration, to treat acute respiratory infections, and to provide health care to the general population.

The new corn variety failed agronomically because of ill-adapted seed, and the new rice varieties (which too often failed agronomically) are not appropriate for the zone. Marketing constraints compromised commercial vegetable production, but home vegetable gardens have enjoyed a modest success. Current delinquency rates on revolving loan funds are seventy-three percent for vegetables harvested last year, eighty-four percent for rice harvested this year.

The Ministry of Health's new policy, effective January 1, 1992, of charging peasants for all but a few medications has cast a pall on the health program. Monthly visits to the project doctor have dropped thirty percent since last year. Poverty puts medicines, including antibiotics and vermifuges (acute respiratory infections--viral and bacterial--and parasitosis are major ailments), beyond the reach of the sick; moreover, little cash circulates in these remote communities, and there is no provision to pay in kind. Vaccinations, however, are free; the health program renders a valuable service here. Beyond this, the program lacks a clear strategy for health-care delivery; the roles of the doctor and community health specialists (trained by the project) are ill-defined. The specialists seem little effective, and in any case lack medications (except for oral rehydration powder donated by USAID).

In the agricultural area, ADRA pursues the goal of "income generation" with a vigor that sometimes blinds it to the project milieu. As already noted, we saw several cases (of commercial vegetable production, a high-risk venture) in San Pablo where ADRA was working with the economically favored. This is an easy trap to fall into since one gets results quicker--gets the all-important numbers that busy donors value and act upon. There is also a tendency, marked in the Gonzalo Moreno project, to promote technologies without adequate prior understanding of either the agroecological milieu or of current farmer needs and practices, especially of the logic underlying those practices. This lack of understanding leads to the introduction of inappropriate technologies. Traditional rice varieties satisfy farmer requirements in the Gonzalo

Moreno zone, for example; production is not the problem, but rather marketing--of both crops and forest products such as Brazil nuts.

Conclusions

The impact *at the beneficiary level* of the projects we visited can only in part be measured by numbers, whether of hectares planted, or hectares harvested, or yield per hectare, or income generated. In many cases, we found the numbers misleading, or of dubious validity. This is often explained, we think, by donor pressure to express results numerically. Numbers make for concise reports, and are easy for busy donors to comprehend. Nonetheless, to the extent that numbers exist, and for what they are worth, we have included them in several annexes keyed to the text. Information in the body of the report is based on visits to project sites and on interviews with beneficiaries. Therein, we think, lies the projects' real story.

The impact *at the regional level* of the projects is in all cases minimal. Strong exogenous forces have made this so. These forces include adverse weather and climate, but they also include ill-defined agricultural policies, or policies unconducive to small-farm agriculture. They include land-tenure and resource-use policies that disfavor small farmers. And they include a weak national research capacity, despite enormous needs for it. NGOs can achieve but little in the face of such opposing forces. Indeed, the latitude for "income generation" itself is circumscribed.

There are those who would question the wisdom of funding these projects, which, unlike many USAID-funded projects of the past decade or so, seek to address the needs of the "poorest of the poor." To address these needs responds unequivocally to PL-480's food-security mandate as embodied in the Agricultural Trade Development and Assistance Act of 1954 and subsequent legislation. According to Section 2 of that Act (as amended in 1990): "It is the policy of the United States to use its abundant agricultural productivity to promote the foreign policy of the United States by enhancing the food security of the developing world through the use of agricultural commodities and local currencies accruing under this Act to--(1) combat world hunger and malnutrition and their causes; (2) promote broad-based, equitable, and sustainable development, including agricultural development;..." (United States Government n.d.).

USAID has incorporated this legislation into its definition of the state of "food security": "When all people at all times have both physical and economic access to sufficient food to meet their dietary needs for a productive and healthy life" (USAID 1992: 1). The projects discussed in this report, therefore, comply with legislative mandates; and to use PL-480 Title II funds to address the needs of other than "the poorest of the poor" would be a violation of United States law. Apart from the projects' legal justification, many would argue that they are also justified on ethical and humanitarian grounds.

Delinquency rates on project loan programs have been high. Rates in three of the CARITAS projects ranged from thirty-three to forty-seven percent; in the two ADRA projects, from forty-seven to eighty-four percent. Weather alone (which has been unusually severe over the past two years) would have made for high rates, though volatile market prices and poor transportation have also played a part. With short loan terms, a single bad harvest can make delinquents of these marginal farmers. Given their general poverty and low cash flow, recovering from a failed harvest (or market-price drop) and paying back a loan can require much time and enormous effort.

It may occasionally be true that economically marginal debtors make less effort to repay loans to NGO creditors; and conversely, that NGOs make less effort to collect from highly marginal debtors. As part of the Catholic Church, CARITAS finds itself in the position of collecting debts from some of Bolivia's poorest peoples (a matter of concern to elements within the Church). But we do not think that such debtor-creditor accommodation accounts for more than a small part of the high delinquency rates. To reason that it does obscures their fundamental cause, which is social and economic marginality.

Because of this marginality, it is doubtful that any proposed credit scheme based on real-cost recovery from recipients could be viable in the Bolivian setting. It is difficult to imagine that Bolivian commercial banks would lend (short of external guarantees) to farmers as marginal as most of those participating in these projects. From the point of view of the banks, there is no adequate way to secure the loans (many farmers do not have *legal* titles to land), and the costs of monitoring in remote areas would be high. The banks would at least demand that the risk be covered by interest rates. In general, the socioeconomic and geographical gap between Bolivia's commercial bankers and its marginal farmers is enormous.

Any loan program must work in tandem with a marketing program. Bulking centers (*centros de acopio*--these are not for storage), operating in conjunction with some sort of marketing cooperative, would give farmers a measure of control over the price paid them by farm-gate intermediaries. But to the extent that product prices are set by forces beyond the immediate region, severe price drops can paralyze marginal farmers, who must sell at *any* price because of limited cash flow. Storage facilities alone are not the answer, and any loan program would still face high delinquency rates under these conditions.

Four of the projects have promoted home vegetable gardens (to improve nutrition), either in open fields or in greenhouses (FHI), and three of the four, all in the lowlands, have promoted commercial vegetable gardens. We question the wisdom of promoting commercial vegetable production among marginal lowland farmers in remote areas. Vegetables in the humid tropics are especially susceptible to pests; production costs are high because of the need for pesticides. The labor demands to weed and water

(vegetables in the Bolivian lowlands are grown in the winter dry season) are also high. Markets are limited, prices are volatile, and roads are poor to non-existent. Commercial efforts in two of the projects have been unsuccessful. ADRA's efforts among farmers in San Pablo have been only modestly successful, but participating farmers there are highlanders who are prosperous by local standards, and so can tolerate the risks. Several work their gardens with sharecropper-caretakers (*partidarios*).

Home vegetable gardens have enjoyed some success in the four projects. Seeds have sometimes been supplied free, sometimes through loans (often delinquent). Given the country's high malnutrition rates, especially among young children, one could argue that free vegetable seeds are a reasonable social cost.

Home gardens as well as commercial ones have relied on inorganic pesticides. This is cause for concern. Women make and tend these home gardens, often with young children at their side. Despite project training in pesticide handling, we encountered cases of women applying these toxic chemicals without taking the prescribed precautions. The dangers of pesticide poisoning are especially great for pregnant and lactating women. Yet no project can train enough, or monitor enough, to insure safe pesticide use among dispersed and poorly educated peoples in remote areas.

One might argue that the pesticide problem in home gardens is ultimately self-correcting since pesticides are costly, and poor farmers tend to reserve scarce cash for the production of commercial rather than household crops. The farmers we visited though, know well the susceptibility of vegetables to pests, especially in the humid tropics, and now know the effectiveness of pesticides in combatting them, and so may elect to quit making home gardens if pesticides are unavailable. Furthermore, one must recall that vegetables are new to many households, whose members are not fully convinced of their nutritional value. It becomes imperative, therefore, that all projects strive to provide appropriate technologies to produce home vegetables without the use of inorganic pesticides.

Three projects have sought in some measure to stabilize shifting cultivation and retard the pace at which farmers cut and burn the forest. The strategy in each case has been to initiate a crop-rotation scheme and introduce beans. It is unlikely that such a strategy would much affect the slash-and-burn cycle. To stabilize shifting cultivation among marginal farmers is a major challenge for an NGO, certainly in zones like the Yapacani, with its undulating terrain and erosion-prone soils. Highland settlers there and elsewhere in the lowlands are very market oriented and seek to exercise a wide range of consumer demands. To develop a stable production regime that responds to those demands and that also harmonizes with local agroecology--as it must if it is to be sustainable--requires major research. It is beyond the capacity of an NGO to conduct this kind of research. This is a role for the State.

The pernicious effects of widespread shifting cultivation and of inorganic pesticide use in home vegetable gardens point to the need for research--and to the limits of NGOs, which are not research entities. It is easy to forget this and to treat them as if they were, and so to make unrealistic demands of them. NGOs know the rural areas where they work and can serve as technology transfer agents, or can even conduct adaptive research on a limited scale, as FHI does. But this role presupposes a source for viable technologies--and linkages between the source and the NGOs. In Bolivia, this source is weak to non-existent.

We were struck by the enormous and ubiquitous obstacles to marketing in all of these "income generation" projects. The tendency has been to seek income gains through improved production technologies, especially through new crop varieties. But substantial gains could often be achieved, we think, by ignoring production and eliminating marketing constraints. (Bolivia is the land *par excellence* of the *rescatador*, or middleman.) ADRA's Gonzalo Moreno project is especially instructive here.

Delayed disbursements from MP have caused serious problems for agricultural programs. Since the seasons govern agricultural activities, late disbursements can delay them until the following season, or else compromise the results of activities begun late. And we note that four of the five CARITAS projects seek to increase agricultural production, yet the (modest) funding for none exceeds two years. Little can be achieved in agriculture in only two years.

Of the three NGOs, FHI has the most development experience as an institution. Activities tend to be well focused and closely monitored; self-criticism has been institutionalized. Method makes technologies appropriate to both the agroecological and the socioeconomic milieu. All of this is made somewhat easier, one might argue, because "income generation" is not an objective. We found the technical staff to be competent; indeed, in none of the NGO projects we visited did we find a technical staff we would characterize as incompetent.

ADRA has had fewer years of institutional experience with development than FHI. Their programs are conceptually good, their integrated approach theoretically sound. But the concepts and the theory do not always transfer well to the operations level. (It takes time for this to happen.) Whereas the design of the agricultural component of the San Pablo project seems adequate for San Pablo, that of the Gonzalo Moreno project is inadequate. Unlike CARITAS, ADRA gives less emphasis to conducting *ex ante* diagnostic surveys of an area to learn community needs and points of "development" leverage. This results in projects that tend to be imposed from "above" rather than those that rise naturally from "below." There is also a need for closer project monitoring and more self-criticism; this need is acute in the case of Gonzalo Moreno.

CARITAS is a newcomer to development. In two of the five CARITAS projects (both in Santa Cruz), we found a lack of congruence between project design and project funding (including staffing) levels. In the case of CARITAS/Beni's Nutritional Vegetable Gardens project, the design did not square with either the agroecological or the socioeconomic milieu. In less degree, this was also true of CARITAS/Nuflo de Chavez's Peanut, Potato, and Cotton project. In four of the five CARITAS projects, staffing levels were inadequate to effectively monitor activities. But again, this problem cannot be divorced from funding levels.

CARITAS is part of the Catholic Church, which has years of experience--more experience than ADRA or FHI--working at the community level, developing and supporting grassroots organizations. As part of the Church, CARITAS enjoys an advantage denied to other NGOs, who are "guests" in Bolivia and can be dismissed at the pleasure of the government of the moment. Other NGOs are thus more susceptible to political and other pressures that would distort a development agenda.

Both CARITAS and ADRA are church-affiliated NGOs, whereas FHI is non-denominational Protestant. In no instance did we observe religious or political discrimination in the selection or treatment of project participants. Rapid visits of a kind we made, however, do not lend themselves to such observations except in the most egregious cases. There are subtle ways to use development projects to leverage other ends.

Recommendations

We make the following recommendations for USAID, for PL-480 Title II's Monetization Program (MP), and for the NGOs:

(1) MP's delays in disbursing funds are causing substantial harm to projects with agricultural activities. These activities must be synchronized with the seasons, and so cannot be delayed. This problem needs urgent attention.

(2) Agricultural production projects should be designed and funded for a period exceeding two years, and their funding level should bear a reasonable correspondence to planned project life and to project objectives.

(3) MP should not fund NGO-implemented projects to stabilize slash-and-burn agriculture, or projects to produce *commercial* vegetables among poor farmers in the humid tropics. As regards vegetables, production costs are high because of the need for pesticides; demand is limited, markets are remote, and prices are volatile; and roads are poor to non-existent.

(4) It is imperative that *all* NGOs promoting household vegetable gardens, whether in greenhouses or open fields, search for technologies that do not require the use of inorganic pesticides. The use of such pesticides poses enormous health risks; yet without some form of pest control, households, especially in the humid tropics, cannot produce vegetables, and so cannot derive the intended nutritional benefits.

(5) Notwithstanding the recent unusually adverse weather, there is little evidence that revolving loan funds established by these projects are otherwise sustainable. They should be discontinued. If income generation is to be a goal, these loan funds should be replaced by a scheme comparable to that FHI uses, whereby the NGO and recipients share in the costs, with the NGO's share considered a donation necessary to "prime" the development effort.

(6) Regarding CARITAS, we recommend the following:

(a) That CARITAS, because of its comparative advantage in working with community organizations and promoting mutual help and solidarity, focus its efforts on agricultural marketing rather than on production (with the exception of home vegetable gardens). Income gains can often be achieved by removing marketing obstacles.

(b) CARITAS' micro-irrigation project in Chuquisaca should be continued. Because of the devastating consequences of chronic drought in recent years, all such low-cost projects have high social and economic returns.

(c) CARITAS/Beni's small-farmer milk project shows much promise and should receive full support; it is most important that MP disburse funds in time for the project to buy pregnant cows before mid-September, 1992.

(7) Regarding ADRA, we recommend the following:

(a) That ADRA scrutinize more closely the socioeconomic level of participants in its agricultural programs.

(b) That ADRA further "tighten" the scope of its projects, in response to participant-defined needs. This "tightening" implies fewer interventions, both less complex and better focused.

(c) That Gonzalo Moreno receive more administrative support and better supervision at both the regional and national levels.

(d) That Gonzalo Moreno's agricultural program cease efforts to increase production and focus instead on removing constraints to the marketing of existing crops and forest products.

(e) That Gonzalo Moreno's health program find a way to enable patients to pay for medications in kind rather than in cash.

(f) That Gonzalo Moreno's health program elaborate a well-defined strategy for rural health delivery and better define the roles of rural health specialists (RPSs) and the doctor. If necessary, MP should make funds available to hire a qualified health consultant to assist with this strengthening effort. Since we did not evaluate San Pablo's health program, we suggest a review of that program as well.

(8) Regarding FHI, we recommend that they give more attention to the role of women in agriculture, especially their role in tending the greenhouses.

(9) MP should bring the different NGOs together periodically to discuss their mutual successes, problems, and how they have addressed those problems. There are three areas where we think such gatherings, which should take the form of workshops, would be useful:

(a) Greenhouse vegetable production: FHI and ADRA have experience, and CARITAS/Sucre plans to introduce greenhouses. A workshop might deal with several topics, including pest control without the use of inorganic pesticides.

(b) Household vegetable gardens in the humid tropics: ADRA and CARITAS have experience here. A major topic of any workshop should be pests, and how to combat them without using inorganic pesticides.

(c) Micro-irrigation systems: FHI, ADRA, and CARITAS have experience with these.

1. INTRODUCTION

1.1 The Evaluation Mission: Objectives and Method

This document reports on an evaluation, the first since 1989, of the Rural Development component of Bolivia's PL-480 Title II program. The evaluation assesses the impact on rural peoples of development projects and programs mounted by three NGOs as well as evaluates the soundness of those projects and programs in their human and physical settings. The Scope of Work for the effort, as prepared by USAID/ Bolivia, appears as Annex A. However, because of limited time and our small team, several projects had to be deleted subsequent to our arrival in Bolivia.

The bulk of the presentation below is organized by NGO. We first delineate the formal development strategy adhered to by the NGO as well as the NGO's organization. FHI, for example, formally and in considerable detail documents this strategy and organization. We sometimes include such documentation as annexes. We then describe the NGO's programs and projects that we visited. We spent by far most of our time conducting interviews of NGO personnel and beneficiaries, for therein, we think, lies the real story of any project. We read project materials as time permitted, but when limited time forced us to choose between reading and interviewing, we opted for interviewing.

At the close of each NGO chapter, we briefly discuss our findings and draw conclusions from our observations of that NGO's projects and programs. We fully recognize the complexities of the Bolivian rural milieu and the difficulties of working there. And we recognize the potential failings that the haste of our mission gives rise to.

We should perhaps comment briefly on indicators by which a "successful" project should be measured. We can do this best by example. If a project's objective is to improve family health by introducing greenhouse-produced vegetables, then the presence of such greenhouses, or rather family consumption of the vegetables produced there, is a sufficient indicator of success. Barring good evidence of the presence of forces tending to offset such obvious nutritional gains, special studies to verify these gains are a waste of scarce resources. In like manner, it is entirely rational to assume that the introduction of potable water will improve health status. One should not go to great expense to verify that such has indeed happened--and thus to justify the continuation of efforts to supply potable water.

As Annex F, we provide a summary profile of each project (or program) we evaluated. We state its goals and objectives, and then give data--quantitative, where possible--indicating the degree to which those goals and objectives have been met.

1.2 Monetization and Development Strategy

Bolivia has received PL-480 Title II donations for thirty years. For most of this period, these donations were used to provide food to the poor; only in recent times has the program assumed a development character (USAID 1991: 2). In 1991, the program was reoriented and inserted into USAID's mainstream development agenda. Today, it links closely with Alternative Development, which is part of the U.S. Government's anti-narcotics strategy and is one of USAID's six development objectives for Bolivia (USAID 1991: 4). Title II's Rural Development component "will include investments that are geared toward increasing rural productivity, broadly defined--that is, toward generating sustainable income opportunities in rural areas" (USAID 1991: 9).

This component is entirely "monetized" and is funded through the sale of donated wheat flour in Bolivia. Under the monetization scheme, each NGO receives (through USAID) wheat flour from the United States. The NGOs are charged with handling the shipping and storage of this flour until it reaches La Paz, where each NGO has a warehouse. The flour is then turned over to the Title II Monetization Program, which sells it to the highest bidder. Monies from these sales are disbursed to the NGOs for their development projects and programs.

The Monetization Program is a separate unit within the Title II program, with its own offices and staff. Represented on its directorate are USAID, GOB, and four NGOs. The MP does more than act as broker in the sale of flour. It screens and selects Title-II-funded NGO projects, and its Projects Department supervises the implementation of NGO projects. A technical unit within this department assists NGOs in project design and implementation. Also, PM controls a fund to hire short-term consultants to assist NGOs should they need it. This MP function complements the NGO technical staffs, which tend to be numerically small as well as cover a limited range of technical areas.

2. FOOD FOR THE HUNGRY INTERNATIONAL (FHI)

2.1 Strategy and Organization

Founded in 1971, FHI is incorporated in both the United States and Switzerland. Its primary emphasis is on long-term development among the extremely poor, where it stresses community participation and self-reliance (FHI 1991: 1). In Bolivia, FHI works only on the *altiplano*, in the departments of La Paz, Oruro, and Potosi. The *altiplano* accounts for about a third of the Bolivian national territory, is home to more than half the country's population, and is considered Bolivia's poorest area (FHI 1991: 1).

According to its 1991 Progress Report, FHI works in a community until:

(1) "the interested families have overcome hunger, lack of water, and preventable disease; and have employment in a sustainable manner without FH/B,

(2) there exists a process of innovation and spontaneous replication of the technologies learned,

(3) there exists a community organization to sustain processes and technologies learned,

(4) the community organization has a relationship with institutions outside of the community that contribute to sustainability (Ministries of Health, Suppliers of parts, etc.), and/or

(5) over 7 years of time has elapsed since FH/B began work in the community" (FHI 1991: 2).

FHI decentralized its planning and evaluation functions to the three departments in 1990, a move that FHI staff deem very successful (FHI 1991: 16). The agency's three-pronged rural-development thrust in Bolivia includes provision of drinking and irrigation water, development and extension of improved agricultural technologies, and improvement of family nutrition. Agricultural technologies seek primarily to improve the quantity and quality of food for household consumption rather than for the market; moreover, the technologies are designed to require a minimum of purchased inputs. (FHI's work does not have "income generation" objectives in the same degree as do the other projects evaluated here.) The "tight" focus of this thrust flows out of Bolivia's severe drought in 1983-1984, when dire conditions obtained in much of the countryside.

FHI promotes integrated rural development, or the development of different aspects of a community in a coordinated fashion. Household wells, for example, provide drinking water as well as irrigation water for greenhouse vegetables; the wells and the

vegetables work together to improve nutrition and health. FHI's Infant Survival Program (not evaluated here), usually headed by a nutritionist, reinforces the other programs by teaching mothers home hygiene and new and improved culinary technologies and skills (how to prepare vegetables, for example).

Beginning in about 1986, FHI mounted its development programs through Rural Development Modules. Using these modules, FHI promoted a broad range of agricultural technologies. In the 1990-1991 agricultural year, these modules gave way to Demonstration and Training Centers (as a result of an FHI self-evaluation), or CDCs. The range of agricultural technologies has been considerably narrowed in the CDCs, and much more emphasis is given to the training of beneficiaries--training throughout the agricultural cycle. Agricultural trials are conducted at the CDCs, which also serve as rural bases for promoters (who live either on the CDCs or in a nearby community) who work directly with farmers in the CDC-served areas.

Annex B contains FHI program organization charts. Of concern to this evaluation are three programs: Household Wells and Greenhouses, CDCs (the source of agricultural innovations), and Special Projects (charged with irrigation systems, community potable water systems, and latrines). The promoters are attached to these programs.

These promoters, trained at least to the *tecnico medio* level (about two years beyond high school), are from the provinces and know the rural milieu. But they are not from the areas where they work. By one informed account, this is a conscious FHI policy; it is said that family and *compadrazgo* ties deny promoters that edge of authority they need to do an effective job. Also, promoters are rotated every three or four years; it is said that communities tire of them and want replacements. Promoters work for twenty days in their assigned rural areas, followed by six or seven rest days and three office days.

Many FHI staff have been with the organization for several years. This includes some of the senior administrative and technical staff. The Projects Chief for Potosi, for example, began as a promoter in the early 1980s. And Potosi's Departmental Administrator has been with FHI for as long.

FHI projects tend to be well supervised. A Departmental Projects Chief typically visits CDCs within his jurisdiction once per month. For all activities, visits by promoters and technical personnel are programmed from the time farmers sign contracts to participate in the activity until it is fully implemented and farmers are trained. FHI uses special control forms for these visits. A sample of these forms for greenhouses is included in Annex B.

We encountered no complaints from FHI in regard to disbursements from the Monetization Program. But we did hear complaints about delays of flour shipments from

the United States, delays in the port of Arica, and delays due to poor roads between Arica and La Paz.

We did not find any instance of discrimination against beneficiaries on the basis of religion. FHI is a Christian (Protestant) organization, but they have not built churches and do not proselytize. In the CDCs, we found no religious symbols beyond an occasional reference to God on a poster or wall hanging. In Juntavi, FHI cooperates with the Catholic Church in health programs.

2.2 Observations

2.2.1 Introduction

We visited FHI activities in all three departments--Oruro, Potosi, and La Paz. We began our tour with a visit to the CDC at Jarana Alta, in Chayanta Province of northern Potosi. In this area, we looked at family wells and greenhouses and talked with farmers in the surrounding communities of Jarana Alta (1 farmer), Huancarani (1 farmer), Centro Esquena (2 farmers), Churicala (2 farmers), and Ayoma (1 farmer, and group interview with 8 farmers). In addition, we interviewed four promoters in Chayanta Province. We also interviewed FHI technical staff in Potosi Department and in the other two departments; a list of names of all persons interviewed in the three departments is included at the close of the report.

From Jarana Alta, we journeyed to Alonso de Ibanez Province, in the extreme north of Potosi, to look at Agricultural Innovations. Here, we visited the CDCs of Juntavi and Caripuyo and talked with farmers in and around these communities. We conducted a group interview with eight farmers in Juntavi, a group interview with twelve farmers in Caripuyo, and an interview with a single farmer there. And we interviewed two promoters for the province. Although located in Potosi, FHI's activities in this remote area depend on FHI's Oruro office.

From Jarana Alta, we drove to the community of Ulloma, in Pacajes Province of La Paz Department, near the border with Chile. We visited the CDC there and looked at an irrigation system and a potable water system in the community, where we conducted a group interview with seventeen farmers. We conducted one other interview with a farmer in the community of Calacoto, and we interviewed two promoters for the province.

Although we looked at Household Wells and Greenhouses in Chayanta Province of Potosi, at Agricultural Innovations in Alonso de Ibanez Province of Potosi, and at Community Irrigation and Potable Water Systems in Pacajes Province of La Paz, one must not assume that these activities are confined to the areas we visited. There are

greenhouses, for instance, in all three areas, and agricultural innovations as well. In the text below, we do not confine ourselves to discussing, say, Agricultural Innovations only in Alonso de Ibanez Province.

What we visited and where, even the farmers we interviewed, were more often dictated by time and budget; there was no "scientific" sampling at any point--nor could there have been under the conditions of the evaluation.

The material below is organized by the three areas we visited and by what we mostly saw there. Information on the number of interventions (i.e., family wells, greenhouses, etc.), the number of beneficiaries since the inception of an activity, and the amounts budgeted and spent to date on that activity is contained in Annex B. The information is further summarized in Annex F.

2.2.2 Family Wells and Greenhouses

Jarana Alta was the first community we visited. Farmers hold land individually here; one farmer we interviewed had a total of three hectares, but broken into dispersed plots. Sheep graze on communal lands in the surrounding hills. This same farmer, who was also a brickmason, regularly went to Santa Cruz to harvest cotton. We were struck by the number of farmers in this area who also practiced off-farm occupations. One farmer in the nearby community of Huancarani estimated that *artesania* (here, the making of wool hats for sale in Cochabamba) was the main source of income for ninety percent of the households.

According to one farmer, the community's foremost need was for irrigation water, followed by potato, corn, and wheat seeds. Last season's hard freezes had destroyed all crops, leaving farmers without seed for next season's planting. When FHI entered the community in 1987 and conducted a survey, it learned that irrigation water was a major need, and so now is constructing an improved community irrigation system.

Household wells and greenhouses (for tomatoes, lettuce, carrots, radishes, chili peppers, bell peppers, squash, parsley, cucumbers, and other assorted vegetables; coca, grapes, and corn are also said to have been grown in these greenhouses) are usually found together, with the well situated beside the greenhouse--they "are married," as one farmer said. Greenhouse vegetables require frequent watering, and the wells provide the family with potable drinking water. FHI contributes most (but not all) of the material items for the construction of wells, while the beneficiary provides the labor. The contribution of each party is specified in a contract between FHI and the beneficiary. (The respective contributions for all FHI activities are detailed in a FHI policy document included in Annex B.) If a beneficiary cannot meet his share of material costs, FHI maintains an interest-free revolving fund (for wells and greenhouses) from which he can draw. According to an FHI official in Potosi, the loan is to be paid back within a period

of six months. There is no delinquency, probably because promoters are in the zone twice per month and constantly remind beneficiaries of their debt, he said.

FHI plans to initiate small stores (*tiendas*) on the CDCs this year. These stores will sell at cost (plus a transportation and administrative charge) and will handle items such as pump parts (all made in Oruro), plastic greenhouse roofing (roofs last about three years), and agricultural tools. Community residents are to be trained to run the stores, which will be important to long-term program sustainability.

In the community of Huancarani (145 families), FHI is working with five greenhouse beneficiaries, only one of them with a well. CARE completed a potable water system in the community in 1990 (with a spigot in each house), though the water is said to be less potable than that drawn from the single well. The one farmer we interviewed there (whose main source of income was the sale of wool hats) said that before he had the greenhouse, he brought tomatoes (tomatoes seem to be the favored greenhouse vegetable; children especially like them) and other vegetables from Sucre, at considerable cost. He said that the well was the major benefit that FHI had brought to him. (This man's house, where he has a spigot, is on a hill, above his plot in the valley, where the well and greenhouse are located. Yet his family drinks water from the well, not from the spigot.)

We talked with two farmers in Centro Esquena, a highly dispersed and remote community accessible by vehicle only in the winter dry season (by driving along the river bed). The first farmer we talked to, who lived atop a small hill above the river bed, had a greenhouse but no well. He complained that the promoter had not visited him, and he had not harvested anything from the greenhouse. He lived alone with his wife; his four sons had all left for Santa Cruz "to make a living." Because of the location of the greenhouse atop the hill, a well shaft would have had to be deeper than he alone could dig to reach water. He had a small plot at the foot of the hill, nestled at the head of a narrow valley and thus protected from killer freezes. There, he grew beans, potatoes, and wheat, selling these in small quantities. He could not have put the greenhouse here because it would have taken up valuable planting space.

We talked with a woman in a household less than a hundred meters away, on an opposing hill. This house had a greenhouse and well at the base of the hill. This woman, with three small children, two of them with *mal de ojo* (probably conjunctivitis), said that the community most needed vegetable and other seeds (many communities expressed a need for seeds because killer freezes had left them bereft of planting material). Extensive *tuna* plants surrounded this house, which exchanged the fruit for needed items in other communities in the area. Barter is common in these rural areas, where little cash circulates.

FHI promoters had not been able to service dispersed beneficiaries in this area adequately because of limited staff and difficult access in the rainy season. During this

year and next, FHI will reduce the number of new wells and greenhouses throughout the country and concentrate on training beneficiaries.

We visited two farmers, brothers, in the community of Churicala (45 families), but talked at length with only one. Both had greenhouses cum wells, the only in the community. More farmers did not have greenhouses, we were told, because they had no space for them. Level lands along the local river had been heavily contaminated by effluvia from nearby mines and were now useless for agriculture. Many persons had abandoned the community, either for Cochabamba or to work in the mines. According to the farmer we interviewed at length, many residents left with their families for the valleys, where they stayed with relatives for a couple of months during the winter; these migrants referred to this absence as a "vacation," he said, but they were really trying to escape the cold. The journey lasted from three to four days, and those who made it took their burros laden with purchased clothes and noodles to exchange for maize and potatoes in the valleys.

According to this same farmer, what residents here needed most was a potato that would produce a second year; the yields from seed saved from the first year were very low. And he also asked for an improved apple variety, and for more courses on greenhouse cultivation. He said he now needed a course on how to deal with greenhouse pests. We heard complaints of greenhouse pests in all the areas we visited. We discuss pest problems in these areas in Annex G.

The last community we visited in this region of Potosi was Ayoma (64 families), where we conducted a group interview with nine farmers. The tight nucleation of Ayoma gave it an urban air, and it appeared to be the most prosperous we had yet seen. Here, FHI had installed twenty greenhouses, two of them with wells. Almost a third of the community thus had greenhouses. And the EEC, through its *Programa de Autodesarrollo Campesino* (PAC), was building a small dam and also provided technical assistance in crop cultivation and livestock husbandry. According to the FHI promoter, residents did not migrate to the valleys, as in other communities, and there were no nearby mines. Farmers thus had a greater commitment to agriculture.

Residents we interviewed said that the community's greatest needs at present were for irrigation dikes, road bridges, and seeds--for potatoes, wheat, beans, and corn. Drought and freeze had destroyed everything. (The community had previously sold potatoes and beans in Yayagua.) CARE had installed a potable water system in 1988, with a spigot in each house. And the community had an old irrigation system dating from pre-1952 *hacienda* times.

2.2.3 Agricultural Innovations

Although we visited the communities of Juntavi and Caripuyo (each with a CDC) in the extreme north of Potosi to see Agricultural Innovations, we encountered such

innovations throughout our tour of FHI activities, and so do not confine our comments to observations in Juntavi and Caripuyo. (We also touch on the topic of innovations in the section just above; the integrated character of FHI's programs makes it most difficult to establish divisions of a kind established in this report.)

Alonso de Ibanez Province is one of the poorest in Bolivia. Landholdings in the Juntavi and Caripuyo areas are very small; farmers typically have between one and two hectares, with only three or four individuals having up to ten hectares. And holdings tend to be broken into widely dispersed parcels; a farmer may leave his house at 8:00 a.m. and not arrive at one of these parcels until 11:00. It is no coincidence that northern Potosi has contributed substantially to the Chapare's settler population and to its migrant labor force. By one account, FHI has tried to occupy local farmers year round; greenhouses, for example, require year-round attention.

The CDC in Juntavi has worked with three innovations, or technologies. These include a winter onion introduced to give farmers two onion harvests per year, thereby complementing a traditional cereal diet and perhaps providing a modest surplus for the market. We visited one farmer who had prepared a small onion seedbed from which he would later transplant to a field. The Juntavi CDC had also experimented with a new maize (non-hybrid) variety, its second innovation. (Maize here is both a human staple and a livestock fodder.) Local genetic material had undergone severe degeneration over time and yields were low. FHI's technical personnel selected this new variety, a yellow maize from southern Potosi, because it required few inputs and was within farmers' capacity to manage. Both its grain and fodder yields are superior to those of the traditional variety, and it is less susceptible to freezes. The Juntavi CDC's third innovation (for the area) was the greenhouse.

The eight farmers we interviewed (in a group) from Juntavi said the community's first need was to have their irrigation canal lined (with concrete, to prevent seepage). Also, the catchment (*toma*) did not hold water well when it rained. This system was about forty years old and needed attention. They also expressed a strong need for potable water; residents mostly drank contaminated water (contaminated by nearby mines) from the local river. FHI completed a potable-water system in this community last year, but it served only the school, the *Centro de Madres*, and the CDC; the system did not provide enough water for a spigot in each house, which is what residents wanted. According to FHI personnel, they planned to rehabilitate the irrigation system, and would perhaps subsequently look for a water source ample enough to supply each household.

In a group interview we conducted in Caripuyo, an articulate woman eloquently said that the community's foremost need was for irrigation water; the crops were drying up for want of water. And she added that farmers were unable to obtain seeds, a concerned expressed by the men as well. There was water, but it was not enough for irrigation and could be used only for cooking. An FHI official told us later that water for drinking and irrigation was a critical need in both Juntavi and Caripuyo, but that FHI

did not have the "operational capacity" at present to address these needs. The zone was not suitable for wells, and water would have to come from a considerable distance, and so a system would be costly.

Out last interview in this area was with a farm woman near Caripuyo. The house and land were located on a floodplain, where a low mud wall ran parallel to the river. Just inside the wall, elms (*alamos*) had been planted (at FHI's behest) to further stem erosion by the river. Many farmers in this area reject trees, which they say attract birds (which cause crop damage) as well as cast shade on limited land (this type of elm casts little shade). On this farm, FHI had introduced apple trees (which cast little shade) and the new yellow maize variety discussed above. Also present were a greenhouse and well. This woman (whose husband was away at the time) was pleased with the introductions.

The farmer here had been planting maize year after year on the same land, without rotation or fallow. FHI had introduced new crops (including the winter onion) to the farm, and also the practice of rotation in a cycle that included beans to improve the soil. The farmer had planted both the traditional maize variety and the new maize, whose ears were three to four times the size of traditional ones. The woman said that they would continue to plant the traditional variety, which was better for *lagua* (maize-flour soup) and *chicha*, but would continue to plant the new variety for toasting (*tostado*) and for *mote* (maize grains boiled in water). Most maize here seems to be consumed as *mote*. The new maize was also superior to the old variety for fodder. This woman was clearly delighted with the new maize. A neighbor, who had seen FHI's work here, asked the promoter for onion seeds and apple plants.

The CDC at Jarana Alta has worked with three technologies, or crop varieties. Since this is a potato-producing zone, FHI had introduced a new potato variety, *Desiree* (*Huaycha* is the local variety), in 1990 and had begun to work with seven participating farmers. Farmers were given a *quintal* of semilla, and were obliged by their contracts to return half of this at harvest. Farmers initially received only the seed and instruction in the use of animal manure (the new variety requires greater attention to manuring). Instruction in pest control was to be added in 1991, but there were no pests in that year because of little moisture. This lack of moisture also resulted in low yields for the new variety. Under conditions of freezes and low moisture, the traditional variety is superior, and is also said to store better and be better for *chuno*. But if moisture is adequate, the yields of *Desiree*, an early-maturing variety, are superior, and this makes it suitable as a cash crop (at nearby mining centers). Farmers are thus interested in the new variety, but not as a replacement for the traditional one.

It is FHI's policy to introduce change incrementally; in the case of potatoes just discussed, the new variety and manuring technology were introduced the first year, with pest control to be added the following year. According to an FHI technical expert, only one innovation is introduced to a beneficiary farmer each year.

The Jarana Alta CDC has also worked with a new barley variety, IBTA 80, which matures earlier and gives higher yields. The variety traditional to the area has a low yield and is subject to yellow rust (*roya amarilla*). IBTA 80 is resistant to yellow rust. Again, CDC personnel had given participating farmers one *arroba* (about 25 lbs.) of seed and required them to return half this amount at harvest. The CDC has also worked with vegetables (onions, carrots, and lettuce) grown in open fields (as well as in greenhouses); except for onions, farmers in the area had not grown vegetables before. Participating farmers were given free seed the first time, but were required to buy it from FHI (at cost) thereafter.

Of the 75 families in the community of Jarana Alta, there are now 14 potato and barley beneficiaries, and ten beneficiaries growing vegetables in open fields. Many farmers in this area grow wheat, and one farmer asked us and our FHI colleagues when he could get wheat seeds; he was interested in an early-maturing variety--one that would mature before the arrival of strong winter freezes. (FHI had taken several participants to an agricultural experiment station to see new wheat varieties.) The severe crop damage caused by these freezes in recent years probably explains farmer interest in early-maturing varieties of any traditional crop. To the extent that these varieties can satisfy household culinary, gustatory, and cultivation requisites, they will arouse farmer interest.

2.2.4 Irrigation and Potable Water Systems

To observe community potable water and irrigation systems, we journeyed to Ulloma, a community (and canton) in Pacajes Province of La Paz Department. FHI has a CDC there. Although Ulloma is a nucleated settlement, most farmers in this province are primarily sheep and camelid (llamas and alpacas) herders (there is some cattle), and are widely dispersed. The geographical notion of "community" is different here. Obstacles to FHI's work in the area include freezes (which occur year round; early morning temperatures dropped to minus 12° C. during our visit) and drought in an already arid zone; as one observer put it, there are no good years here, only average to bad ones. In recent times, the area has also experienced heavy out-migration to the cities (many have gone to El Alto), to the Yungas (rather than to the Chapare), and to Chile (Pacajes is on the Chilean border). Young children and the old remain. All of FHI's work in La Paz Department is confined to Pacajes Province, which is the most challenging area in the country for the institution.

We conducted a group interview of seventeen farmers in the community of Ulloma (37 families). FHI completed a potable water system here in 1991, and an irrigation system as well, both designed by MP's Projects Department. The potable water system provides spigots to thirty-two households, the local school, and the *Centro de Madres*. Children now take showers at the school, where the water is heated by burning *tola*, a fuelwood plant native to the area. (Rural peoples on the *altiplano*

typically bathe three or four times per year.) The community had potable water before, but it had to be carried in buckets from a catchment above the community, where it often froze. Everybody was highly pleased with this system.

The community irrigation system was completed about the same time as the potable water system. It has two catchments, both near the potable water catchment, and channels water to four community irrigation zones. The community had a rustic irrigation system before, but farmers were able to water only every fourteen days. With the new system, they can water every four days. And the new system irrigates a wider area than the old one did (for area irrigated and crop yields, see Annex F). Interviewees were quick to express appreciation for the system and to acknowledge its merits. But we also heard comments to the effect that water force was not sufficient to irrigate fields in the higher areas (most community lands are flat and on about the same elevation), or that the volume of water was inadequate for both croplands and pastures (it was never intended for pastures). But as an FHI technical person reminded us, the system was new and still in an experimental phase; some of these problems could be worked out in time. FHI has also worked with the community to organize an Irrigation Committee, which establishes irrigation and maintenance schedules and generally regulates water usage.

The irrigation system was being used to grow vegetables in open fields--vegetables like carrots, which can tolerate most of the freezes (as can onions). One farmer dug up a couple of healthy carrots to show us. Before, he had brought vegetables from La Paz, paying high haulage costs. Three families in the community also had greenhouses.

When we asked what the foremost need of the community was, several respondents replied unequivocally that Ulloma most needed electricity. This need was usually couched in terms of improved welfare for the children, who had to work of the day and did not have adequate light to study at night, and so could not compete with students from urban settings. Furthermore, their children were denied the information provided by television, radio, and videos, they added. The politicians neglected remote communities like Ulloma, they said.

Interviewees also told us that they had lost all their harvest this year to killer freezes. They had sown oats and barley for their livestock (sheep and cattle; there are no camelids here), but the freezes had killed those too. Unavailing efforts had been made to have the government declare Pacajes an "emergency zone," thus qualifying it for national assistance. Farmers strongly expressed a need for forage grasses adapted to the zone. A few farmers in the area had begun to cooperate with the Norwegian Mission to experiment with freeze- and drought-resistant grasses. Farmers also asked for courses on livestock health; internal parasites were a problem and their animals also needed vaccinations.

2.3 Discussion and Conclusions

FHI has established itself in some of Bolivia's more challenging regions for development work, and we think it is having a substantial impact among beneficiaries. (See Annex F for statistics on beneficiaries and FHI program activities.) Its development strategy, project and program designs, and monitoring are commendable--the more so given the austere milieu in which it operates. At the operations level, FHI employs sound principles of applied social science: introduced changes tend to be incremental, and technologies are sought that "fit" recipients' economic capacity and the milieu's agroecological parameters (that "square" with current farming systems, that is).

We think FHI's staff is well qualified and dedicated; we were especially impressed with the commitment of some of the promoters, who often labor under extremely adverse conditions. These promoters are on development's critical "edge"; their job is an extremely important one. Several staff have been with FHI for many years, and have played a key role in incorporating the institution's experience in its evolving programs. We admire the willingness of the staff to engage in self-criticism and self-evaluation.

FHI is aware that its activities must be sustainable over the long term, and so works to that end. Introducing technologies that are within the management and economic means of local farmers as well as that fit the agroecological milieu demonstrates this awareness. And the planned introduction of stores (ultimately to be managed by villagers) at the CDCs to supply pump parts and items such as plastic roofing for the greenhouses is further testament. We do not think that FHI is fomenting a sense of dependency among beneficiaries. With farmers as poor as those FHI works with, the institution cannot expect to recover all of its initial costs from beneficiaries--for seeds and pumps, for example. Without these "priming" costs, nothing can happen.

FHI now plans to reduce the number of greenhouses it will build and to concentrate on further training beneficiaries. It is probably time for such a consolidation. Several farmers cited pest problems in the greenhouses; the planned training should address this matter (see Annex G for a detailed discussion of pest problems). There continues to be a great need for potable water and irrigation systems--a need recognized by FHI, which correctly plans to intensify its work in these areas.

2.4 Recommendations

Since FHI program activities are long term, we take the liberty of offering the following recommendations, which are more in the way of suggestions for FHI to ponder (or for other NGOs who might work in these remote, deprived areas):

(1) FHI should continue to look for crops/technologies that fit traditional farming systems, yet in some way represent improvements (early-maturing varieties, varieties resistant to drought and freeze, and so on). The "technological space" within which one can work in these resource-poor settings is often narrow indeed. One must look to the past as well as to the future. Archaeological work in the area of Tiahuanaco has revealed a complex hydraulic system of raised fields surrounded by irrigation canals. This system has been successfully employed recently in communities around Lake Titicaca. At night, vapor from the canal water keeps crops from freezing.

(2) FHI should give greater consideration to the role of women in agriculture, especially their role in tending to the greenhouses. Greenhouse plants must be frequently irrigated, and the windows must be opened and closed to control humidity and temperature. The men are often away, so these tasks fall to the women--which they often do anyway. As FHI begins to slow its construction of greenhouses (and wells) and focuses more on training (a decision we endorse), this should be kept in mind.

(3) FHI should give more attention to combatting pests in the greenhouses. We observed that pests are clearly a problem, and that farmers are not dealing effectively with them. In some areas, FHI seems to be promoting the use of inorganic pesticides; the dangers of using these pesticides in a confined environment are substantial. We do not think that this promotion is carried out in reckless fashion, and in some areas, FHI staff have been reluctant to use such pesticides because of the hazards. With FHI's planned intensification of training, we suggest that greenhouse pest control be amply dealt with--and that other than inorganic pesticides be sought to deal with the pest problem (see Annex G for a discussion of the pest problem).

(4) We suggest that FHI consider the use of greenhouses to establish tree seedlings as a way to promote forestation. Trees could stem soil erosion as well as embellish communities and homesites. But this is only feasible if there is sufficient latitude within the greenhouses for trees--and if such an effort would not distort FHI's highly-directed focus. The greenhouses, we realize, are first and foremost to promote household nutrition.

(5) We encourage FHI to give greater attention to the need for irrigation and potable water systems. It is our understanding that FHI plans to intensify its efforts in these areas. We fully endorse this intensification.

3. CARITAS

3.1 Strategy and Organization

An institution of the Catholic Church, CARITAS is charged with providing a variety of social services. Although not a development organization in the strict sense, CARITAS does engage in development work and is represented in dioceses throughout Bolivia. Indeed, CARITAS is organized at the diocese (*vicariato*, or bishopric) level, where it has much autonomy. In the Department of Santa Cruz, for example, there is CARITAS/Santa Cruz, CARITAS/Nuflo de Chavez, CARITAS/Chiquitos, and CARITAS/Camiri. And since the needs of diocese populations vary across regions, the organization and programs of CARITAS also vary by diocese.

Probably because CARITAS is a newcomer to "development" in any strict sense, it has no well-defined development strategy, even at the diocese level. CARITAS/Santa Cruz, for instance, has a five-part "Action Strategy"--"to establish a basis for the integration of projects and programs into a single institutional project." Key to this strategy is the development and support of community-level organizations to help the poor better understand their plight and work collectively to improve it. The Catholic Church has considerable experience in developing and working with community organizations (the spirit of the Mass is communal). This emphasis on *community* sets CARITAS apart from many other NGOs.

3.2 Projects Evaluated

3.2.1 Development of Traditional Crops (CARITAS/Santa Cruz)

3.2.1.1 Objectives, Organization, Strategy

Designed by CEDETI (a Bolivian consulting firm) at the request of CARITAS/Santa Cruz, this project, say informed sources, is the first agricultural production project that CARITAS/Santa Cruz has implemented without the use of food incentives. The goal of the project is to increase the incomes of 350 families in 25 communities of the Caranda (11 communities) and Buena Vista/Huaytu (14 communities) zones of Ichilo Province, Santa Cruz Department, by improving the production of corn and rice (both traditional crops) and by introducing beans.

The goal was to be met by pursuing four objectives: (1) to increase by fifty percent the production of 210 hectares of rice and 280 hectares of corn by the end of the second year (of the third year in Caranda, where the project began a year sooner as a pilot effort); (2) to introduce 350 hectares of beans in the winter season as a rotation with summer crops; (3) to establish two bulking/marketing centers (*centros de acopio*), one in

each zone; and (4) to provide training and technical assistance (See Annex C for miscellaneous numerical results.) The introduction of a revolving loan fund would make production increases possible by allowing farmers to purchase seeds and other agricultural inputs--herbicides, insecticides, fungicides, back-pack sprayers, and seeders.

Beans are an important part of the project strategy, for small farmers in these zones, as in most of the Bolivian *oriente*, practice slash-and-burn agriculture. Beans in the winter dry season would provide a ground cover after the summer harvest (thus keeping weeds down), would improve the soil (and thus retard the traditional cycle of cutting and burning the forest), would add vegetable protein to the household diet, and would provide a household cash crop (ultimately, for an export to Brazil).

The rice and corn technologies promoted by the project all come from CIAT, which is part of the IBTA system (the British Tropical Agricultural Mission has heavily supported CIAT). (According to the project agronomist in Caranda, it was necessary to change some of the CIAT recommendations after experiences during the pilot year revealed them to be ill-adapted to the zone.) The bean technology came from I.I.E. EL VALLECITO. A previous project conducted on-farm bean trials in the zone and found that technology to be suitable.

The project is managed out of the Promotion Department of CARITAS/Santa Cruz (an organization chart of CARITAS/Santa Cruz is included in Annex C). There is a project supervisor/ manager, an agronomist who is also the technical person working in the Caranda zone. Two more CARITAS staff, one of them an agronomist, work in the Huaytu/Buena Vista zone. These three persons work full-time on the project. Staff in the CARITAS/Santa Cruz office (in Santa Cruz) provide support to the project--and to other CARITAS activities as well. The three-year project, which ends at the close of August of this year (1992), began in September of 1989 as a pilot effort in the Caranda zone. It did not begin until a year later (September, 1990) in the Huaytu/Buena Vista zone. CRS provided funding for the first year in Caranda, Title II Monetization for the final two years in both zones.

In each community, the project has created an organization called PROCAL, which is sometimes (but not always) based on pre-existing Church-founded community structures. This incipient organization manages the project's credit component, and in theory helps to coordinate other project activities. We describe it in more detail below when we discuss project activities in El Carmen, a village in the Huaytu/Buena Vista zone. We also describe the revolving loan fund there.

Like many NGOs, CARITAS/Santa Cruz has limited physical infrastructure for implementing agricultural production projects; we saw no stations for experimental plots or demonstrations, for example. But as part of the Catholic Church in a predominantly Catholic country, CARITAS does enjoy the physical infrastructure of the Church as well as its large social infrastructure, which is powerful and far-reaching.

3.2.1.2 Observations

3.2.1.2.1 Introduction

The project has been active in three zones: Huaytu, Buena Vista, and Caranda, all in Ichilo Province of Santa Cruz Department. However, CARITAS/Santa Cruz has combined Huaytu and Buena Vista for activity purposes, and so recognizes only two zones, Caranda and Huaytu/Buena Vista (see organization chart in Annex C). We visited three communities, where we conducted group interviews: El Carmen in the Huaytu zone, and Monte Rico and Caranda in the Caranda zone. For lack of time, we were forced to eliminate a planned visit to Santa Barbara, a community near Buena Vista. But we did interview the president of that community's PROCAL one evening in Buena Vista.

The terrain is this region is undulating, with soil quality varying considerably over small areas. Small farmers, mostly from the country's highlands and valleys, began to settle here in the mid-1960s and now heavily populate the region, where they practice slash-and-burn agriculture. Heavy rains and chronic flooding of the past several months--the worst in seventy-five years, by one local account--had washed out bridges in the area and made many roads virtually impassable. Long stretches of the Cochabamba-Santa Cruz highway, which passes through Buena Vista and is the country's main road artery, were negotiable only by heavy truck and four-wheel-drive vehicle. Years of heavy summer rains had already washed away the hard surface of this road between Montero and the River Yapacani. In places, raging water had recently carved giant crevasses in the land in its violent course toward lower ground. Trees were everywhere uprooted, and large chunks of forest had been dislocated. "The forest has collapsed," as one farmer aptly put it.

The water had clearly devastated the region's agriculture; indeed, our questions, if not the evaluation mission itself, often assumed a surreal quality vis-a-vis the magnitude of the disaster. And the rains, now alarmingly unseasonable, continued, thus threatening the forthcoming agricultural cycle.

In addition to the project crops of rice, corn, and beans, CARITAS technical staff have promoted other crops in these communities. These include citrus (Valencia oranges and a Japanese variety of *mandarina*), *urucu* (*achiote*, a food dye), and Cavendish bananas (the giant variety), known locally as *hualele*. None of these plants is generically new to the area: farmers have long had a few citrus trees, *urucu* grows wild in the zone, and a dwarf variety of Cavendish was already present. CARITAS has promoted *urucu* and Cavendish bananas through a micro-enterprise project. The work with *urucu* (to be grown in plantations) has not been successful, according to one informed source, but the work with bananas has enjoyed some success through the production and local packaging of dehydrated bananas for sale in regional markets. Since these activities do not fall

within the Traditional Crops project, we say nothing more about them. Some of the same CARITAS personnel, however, have worked on both projects.

The material below is organized by community visited. Our treatment of topics across the communities is necessarily uneven because of logistical and other conditions governing our visits. We arrived at El Carmen on horseback less than forty-five minutes before nightfall, for example, and so had limited time for a group interview before leaving. Some of the topics we had planned to deal with--training and extension, for instance--often elicited little significant comment in the communities--probably because the topics struck farmers as irrelevant in the face of volatile market prices and recent (and current) weather-related problems.

Also, because of the intricacies of the revolving loan funds, we found the returns on time expended to pursue this topic in much detail in the communities to be low; to the extent that we probed, we took valuable time from other important topics. We limit our comments to the structure of the loan program, and supplement them with other information as it was readily available to us, or as we had time to gather it. The same can be said for economic data on production costs, market prices, and yields. In slash-and-burn agriculture, these data vary enormously from one farm to the next. Crops are interplanted, and yields alone fluctuate around such factors as when the land was cleared and whether it was cleared in high forest or in fallow forest (*barbecho*). The gathering of good economic data, and good data on the revolving loan programs, must be the subject of highly-focused efforts.

3.2.1.2.2 Community Visits

<u>El Carmen</u> (June 26, 1992)

We conducted a group interview with twenty-two persons, including two women. As always happens in such interviews, a couple or three individuals take the lead in responding, with the silent majority serving to stimulate veracity among the more vocal.

To arrive at El Carmen, we journeyed by vehicle along the Santa Cruz-Cochabamba highway to a point about forty-five minutes from Buena Vista. There, a small contingent of villagers met us with horses. We rode across the River Surutu, and then through forest for an hour before arriving at the community. Aside from its remote location, a unique feature of this community is its location within the Amboro National Park, about four kilometers from the "Red Line." This line is a swath recently cut in the forest as a reminder that no settlements are allowed beyond it. Several communities, founded well before the area acquired national-park status in 1984 and whose residents are organized into *sindicatos* (peasant unions) with valid land titles, lie between this line and the River Surutu.

Those who live within the park do so at considerable sacrifice. There are no health facilities, and only twelve schools, with offerings at the *básico* level, served the area at the time of a 1989 survey financed by USAID (see SEGMA-BID: 1990). Some of the children had to walk (or ride horseback) eight kilometers to school. Both malaria and malnutrition are common afflictions today. Most of the farmers grow rice, which is a staple as well as a cash crop. Many of the residents have horses, which they use to carry produce to market and fetch necessities. When the River Surutú rises during the rainy season, the zone becomes isolated for several months.

According to one villager, El Carmen was founded in about 1954 by *cambas* (lowlanders). *Kollas* (highlanders) began to enter in the early 1970s; most of the *cambas* have long since departed--left because of dwindling game supplies, one villager said. (This pattern of encroachment by highlanders on lowland areas has occurred, and continues to occur, all over the Bolivian *oriente*.) About seventy families belong to the local *sindicato*, with another thirty not affiliated. Most community residents have land titles, secured through the local *sindicato*, but a few persons rent land. Most of the residents are from Potosi, Cochabamba, and Chuquisaca. CARITAS is the only agency providing social services here.

In ranking community needs, respondents gave roads top priority, followed by potable water, improvement of the local school building, and health. (It is unlikely that a road will be built to serve communities here because of the area's park status.) Respondents cited major project benefits as technical assistance, the provision of pesticides (acquired with project loans for use on corn, rice, and beans), and the project purchase of rice. Before the project, they had sold rice in advance of harvest at low prices in order to meet household needs. CARITAS had bought some of farmers' rice this year as an experiment; farmers sold the remainder in Montero, where they also sold their corn.

The project never constructed the two planned bulking centers (not for storage) for the marketing of corn, rice, and beans. Two reasons were given. First, not all of the communities in the CARANDA area could agree on a location for the center. And second, ASOPROF installed a bulking center in Montero before the 1991 winter harvest, by which time the project bulking center was to have been completed, so farmers began taking their produce there.

The project established the El Carmen PROCAL in 1990. Its officers include a president, a vice-president, a treasurer, an agricultural promoter, and two *vocales* (whose function is to assemble people). The project created this community-level organization to help villagers work together to achieve project goals. Its structure is the same as that found in other communities, except that here the project seems to work through the promoter to a greater degree than it does elsewhere (probably because of El Carmen's remote location). The treasurer, who received special training from CARITAS, locally

maintains records on the credit received by each farmer, repayments, and balance owed. The services of these officials are unremunerated.

The project began in El Carmen in 1990, with thirty-two participants, or PROCAL association members. Today, there are nineteen. Villagers said that the attrition was due to the remote locations of some of the farmers, making it difficult for them to attend meetings and participate in project activities. (See Annex C for numbers of participants in all communities of the Caranda zone; CARITAS/Santa Cruz staff are preparing data for the Huaytu/Buena Vista zone.) Only a member of the association can participate in the project, and former members who have left the association can return at any time. All departed members had repaid their loans, we were told.

The project extends credit for the production of maize, rice, and beans through a revolving loan fund. The credit covers seeds (for rice, only in the first year), pesticides (herbicides, insecticides, and fungicides), backpack sprayers (with accessories such as masks; five farmers share a sprayer), and hand seeders. The dollar-denominated loan is for six months, at six percent annual interest (the commercial rate is twenty-one percent), with the balance adjusted every six months until the loan is paid. Credit is in kind, not in cash (but must be returned in cash), and the guarantee is communal (i.e., all PROCAL members are liable for the debt of each).

Loan funds move from CARITAS to the PROCAL *central* for each of the two zones, Caranda and Huaytu/Buena Vista, thence to individual communities, where funds are distributed to individual PROCAL association members. Loan data and delinquency rates for El Carmen and Santa Barbara in the Huaytu/Buena Vista zone (CARITAS/Santa Cruz is preparing summary loan data on all communities in the zone), and for all of Caranda (with a delinquency rate of almost fifty percent of amount borrowed) are given in Annex D.

Participants planted rice and corn during the summer 1990/91 growing season, when the project began, followed by beans in the winter of 1991. Most of the delinquency in the zone Huaytu/Buena Vista zone stems from a drop in international bean prices. ASOPROF, a marketing association in Montero through which the project purchased certified bean seed and marketed the beans, paid low prices. Also, farmers in El Carmen said that early rains prohibited them from getting the beans to market in a timely manner, and that the price they received was discounted because of alleged impurities and humidity. A few farmers in El Carmen had planted beans during the winter cycle this year--for household consumption and without credit support. Prolonged rains and the bitter marketing experience of last year had deterred many from planting beans again.

Farmers in El Carmen say they clear and burn each year from two to four hectares, often in fallow forest; how much they clear depends on access to labor and on

how damp the forest is. We deal with this swidden cycle in greater detail below, under the community of Monte Rico. The cycle is basically the same throughout the region.

Farmers reported no serious problems with crop pests. We did hear complaints about debt and intemperate weather; heavy rains had reduced crop yields this year, and persisting rains during the winter dry season, at the time of our visit, threatened the forthcoming summer crop by reducing the drying time for cleared vegetation. Production here depends fundamentally on a good burn in early September. We also heard complaints that the project did not provide support for livestock production--a complaint of several villagers here, according to the project supervisor for the zone.

Villagers said that a project technical person visited the community about every two months, or more often if the local promoter called him in. Visits are conditioned by the state of the River Surutu, which is dangerous to cross on horseback at high water; several villagers have drowned at this crossing. Courses are often given at *central* headquarters in Huaytu. The project had trained the PROCAL village treasurer (himself among the delinquents) to keep records and manage the loan portfolio.

Santa Barbara (June 26, 1992)

Although we were unable to visit this community, we did interview its PROCAL president one evening in Buena Vista. The information below comes from that interview.

The population of Santa Barbara is about 200, with 84 persons registered in the local *sindicato*. Fifteen families (or project participants) belong to the local PROCAL. (According to the project supervisor, the project's economic limitations limit the number of project participants to no more than about fourteen per community.) Villagers hold title to about thirty-six hectares of land each. Like El Carmen, this is a community of uplanders and few lowlanders --who wander about like *jochis* (a lowland game animal), the president said (this reflects a common uplander perception of *cambas*).

Santa Barbara's first need is for a road, we heard. The major project benefit had been *venenos* ("poisons," the term farmers in the project area use for pesticides) and other inputs supplied through the revolving loan fund. When asked how the project could be improved, the president said that farmers needed to know how better to manage their lands; some soils were sandy, others were clayey. This comment comes as no surprise, for the undulating, erosion-prone lands here do not lend themselves to the practice of slash-and-burn agriculture (yet there are few socioeconomically viable alternatives for these marginal farmers).

Farmers in Santa Barbara, like those in El Carmen, plant rice and beans in swidden gardens at the beginning of the summer rainy season. According to the president, they typically clear from two to three hectares of forest per year. Upon harvesting these grains, they plant beans (since the project began; beans were not planted

before) in the same area. If they cleared in high forest (*monte alto*), they can repeat the cycle up to three times before resting it for at least five years. If they cleared in *barbecho*, they can use the land only for a single summer growing season.

The president complained about low crop yields this year because of the heavy summer rains. He complained about the heavy labor demands of weeding and harvesting rice. "You produce for the truckers," he said. And he suggested rhetorically that perhaps farmers should be producing vegetables, which could be sold anywhere and which required less work. (Vegetable production in the lowland tropics is extremely demanding--is costly and hazardous--because of pest susceptibility. He does not appreciate the requirements and the risks of commercial vegetable production.)

The project has given courses at the *Central* every two months. It has worked directly with farmers in Santa Barbara to a greater degree than it has in El Carmen, where it has relied more on the local promoter. The president says this is necessary since the local promoter is often unable to convey information in a reliable manner. The project supervisor reminds us that these promoters are unpaid, so one cannot demand too much of them; also, to train promoters further would require more time and resources than are available to the project.

Monte Rico (June 27, 1992)

Here, we conducted a group interview with sixteen persons. Thirty-three families reside in this community, which has twelve PROCAL members at present (see Annex C for number of project participants in all communities of the CARANDA zone). Most community residents are from Tarija, Cochabamba, and Chuquisaca; settlers began arriving in about 1968. Today, there are said to be only three or four *camba* families in Monte Rico. The modal size of titled lands is said to be between twenty-five and thirty hectares, with some persons having as little as ten hectares; others have no land and must rent. CARITAS has a livestock project in this community, and has also worked with citrus. As in the other project communities, corn and beans are traditionally the major cash crops, though any crop--plantains, citrus, and so on--is sold if there is a surplus and a market.

As in the two communities above, respondents cited the community's major need as a road to get their produce to market. And as in the other communities, the project's major benefit in Monte Rico is seen as its credit program--"You can pay with your harvest," as one farmer said. Respondents cited technical assistance as a second benefit: instructions on how to prepare the land for corn and beans, and on proper spacing and planting time for beans.

Farmers here customarily begin to clear the land (to *rozar* with the machete, then to *tumbar* with the axe) in June and July, in time for the cut vegetation to dry and be burned in early October. A good burn is vital, for the ash contains nutrients for the soil.

Three to four hectares of land are typically cleared, in accordance with each farmers' seasonal abilities. Rice and corn are sown in mid-November, though rice can be sown as late as December (since it tolerates moisture better than corn). Some of the corn is interplanted with rice, though most of it is planted separately. A few farmers with cattle sow grass with the corn in some years, thus permanently turning the field to pasture after the corn harvest. Most of the corn is harvested in about mid-May, some of it a month earlier for *choclo* (tender grains); rice is harvested at about the same time unless it is planted later than corn--which it often is because its harvest requires a concentration of labor.

If the garden was cleared in high forest, corn may be sown again at the beginning of the winter dry season, thus giving two corn harvests in a single year. When the project entered, farmers began to plant beans after the summer rice/corn harvest and on the same land. The beans were harvested in late August or early September. This cycle of corn/rice followed by beans can be practiced twice in gardens cleared in high forest, only once in those cleared in fallow forest. According to respondents, local farmers can never use a cleared area for more than two years because weeds invade and yields consequently decline. Plantains are often planted as a cleared area is being phased into fallow.

The project began here in 1989, at the beginning of the summer growing season, by promoting new varieties of corn and rice and the use of pesticides. Farmers in our interview described this first year as "average to bad" because they planted late. And they planted late because late rains from the previous season forced them to clear late. Yields were consequently low. Their 1990 winter bean harvest was good and the price was good, but not all farmers had land for beans (some had planted pasture grass instead), and many of them had little experience with the crop, and so were reluctant to plant it. A few farmers regretted this decision because of the high market price. Encouraged by this high price, more farmers planted beans during the 1991 winter season. But in that year bean prices dropped (from 52 to 29 *Bolivianos/quintal*), leaving participating farmers indebted and disillusioned. None had sown beans this year because of an uncertain market--and because of the unseasonably heavy rains.

Farmers reported that they had received bi-monthly instruction in the new technologies at the beginning of each agricultural year, less often as the year wore on. These instructions included precautions in the use and application of pesticides. In none of the communities we visited did we hear reports of pesticide poisoning during the project period. As in Santa Barbara, the project had worked directly with farmers rather than through the local promoter, who, we were told, "was still learning."

Caranda (June 27, 1992)

In the community of Caranda, from which the Caranda zone takes its name, we interviewed seven farmers. A *subcentral* composed of nine *sindicatos* centers on this

area. The community proper is composed of thirty members in each of two *sindicatos*, "San Rafael" and "24 de Octubre." There are currently seventeen PROCAL farmers (see Annex C). The community was founded by uplanders about twenty-two years ago; according to one respondent, in 1964 there was only a sawmill here. As in the other communities, corn and rice are the main cash crops, which farmers market in Montero. The project began here about six months later (i.e., in early winter, 1990) than in other communities of the zone because of delays in organizing the community.

Respondents cited as the major project benefit the provision of certified seeds of corn and rice. The corn varieties, *swan* and *maiz cubano amarillo* (the certified seeds were purchased at Semillas del Sur in Santa Cruz), they said, gave good yields if planted on "good land" (see Annex F for technical data on crops). Their heavier weights made them better for the market, and their grains were suitable as feed for chickens and pigs. But farmers preferred the old corn for household consumption; this is a softer corn and its grains are more easily removed from the cob.

The project had also introduced certified seed for *dorado* rice, a variety already present in the community. If planted on better soils, this variety has heavier grains and greater yields, and so is better for the market. *Dorado* requires six months to mature, and on average to poor soils fares worse than traditional varieties (that mature in four to five months). Respondents found the new variety satisfactory for *locro*, a rice gruel widely consumed in the *oriente*.

Farmers noted the great variation in rice and corn yields as a function of soil and weather. They pointed out that the land was undulating, which they felt contributed to yield variations. They also said that farmers with little land could leave fields fallow for only four years.

Farmers here expressed several concerns. They were experiencing serious pest problems in their citrus and banana plants and wanted project assistance to deal with them. The discussion of pests incited some passion among respondents. One observed that when they settled the land fifteen or twenty years ago they grew rice without the use of pesticides. At that time, oranges and limes yielded abundantly, but now everything was subject to pest infestations.

One man astutely and eloquently analyzed the situation that Caranda farmers faced. Since the lands were tired, he said, he had begun planting pasture grasses for cattle. There was no way farmers could escape the cycle of poverty on their lands using slash-and-burn agriculture, he reasoned. They could barely grow enough household food; they were too small and could not make money in the market, where they had to compete with large farmers. Local farmers should be raising dual-purpose cattle, he said. (Of the seven farmers present, one had six cows, another had one, the others had none.)

Farmers said they had received a total of four courses in the *Central*, one about every three months. The project technical supervisor visited each PROCAL once per month, they said. Here, as in the previous two communities, the project has worked directly with local farmers; a PROCAL promoter is now being trained.

3.2.1.3 Discussion and Conclusions

The project worked in twenty-three communities with 437 beneficiary families. Reliable income data do not exist, but delinquency rates on revolving loans are around forty-five percent for the two zones. The project planted 356 has. of rice its last year, with average yields for all cycles of 9.9 fan./ha. Project rice yielded about fifty percent more per hectare than rice had traditionally used. The project planted 242 has. of corn the last year, with average yields for all cycles of 48.1 qq./ha. This corn yielded 9.3 percent more per hectare than corn farmers had been planting. The project planted 360 has. of beans, with yields about half (about 500 kg./ha. on average over two cycles) those expected (see Annex F).

Inclement weather, undulating terrain, weathered soils, and poor roads have made for a refractory agricultural environment in the project area. In three of the four interview communities, farmers cited credit as the major project benefit. Yet the loan program on which technological introductions are based has a high delinquency rate owing to adverse weather and volatile market prices. For reasons given under the community of El Carmen above, the project never constructed bulking centers (*centros de acopio*), as was envisioned in its design.

We found the project technical staff to be competent, and working under trying conditions. But they are few in number, and the local PROCALs appear to be weak, their agricultural promoters unable to be of much assistance. Farmer morale is low. It is unfortunate that unusually inclement weather (one could not design worse weather conditions for a project) has plagued the project--the first of its kind for CARITAS/Santa Cruz--during its life. This weather has hampered extension efforts of CARITAS staff as well as has dampened farmer enthusiasm and support for the PROCALS. The e. ension effort is clearly weak; there is little evidence that these PROCALs can sustain project activities.

Project results, including those of the loan program, are fundamentally tied to weather and commodity markets, both highly volatile over the project period (and volatile generally in this part of Bolivia). Project sustainability under such conditions is most problematic. Indeed, the slash-and-burn system in the Huaytu/Buena Vista and Caranda zones of Bolivia is not sustainable over the long term--and there is evidence that local farmers are approaching the end of that term. Under stable weather and market conditions, the introduction of beans may in some measure retard the pace at which the forest is cut (one objective of the beans), but that measure is small relative to the magnitude of the problem.

Any sort of loan program must work in tandem with a marketing program. In the project zone, weather alone has contributed to high delinquency rates; a loan program with a longer pay-back period would give some relief. But a longer-term loan program would not overcome marketing obstacles. It is true that bulking centers (*centros de*

acopio--these are not for storage), working in conjunction with some sort of marketing cooperative, would give farmers a measure of control over the price paid them by intermediaries who gather the product. But to the extent that product prices are set by forces beyond the immediate region, severe price drops can paralyze these marginal farmers, who must sell at *any* price because of limited cash flow. Storage facilities alone are not the answer, and any loan program under these conditions would still face high delinquency rates.

Loan programs such as the one the project has initiated place CARITAS, an agency of the Catholic Church, in a bind. The programs place the Church in the uncomfortable role of collecting debts from some of Bolivia's poorest peoples. Elements within the Church argue that this role conflicts with the institution's social ministry.

Certainly a major problem of the project--a design problem--is its short duration--three years (only two funded by MP) in the Caranda zone, two in the Huaytu/Buena Vista zone. Little can be accomplished in agriculture in two years. This short duration, combined with poor weather, volatile market prices, bad roads (serving dispersed and remote communities), and small project staff have made for little positive impact among beneficiaries. More generally, any sustainable long-term program to stabilize agriculture here will probably involve agroforestry, perhaps combined with pasture (*sistema agrosilvopastoril*). The complexity of such a system, the development and implementation of which inevitably requires research, puts its realization largely beyond the institutional reach of NGOs like CARITAS.

3.2.2 Peanut, Potato, and Cotton Production (PROMAPA-CARITAS/Nuflo de Chavez)

3.2.2.1 Objectives, Organization, Strategy

PROMAPA is a two-year project that seeks to increase income among 100 small farmers in five communities of the San Julian colonization zone of Nuflo Chavez Province, Santa Cruz Department (see Annex F for statistical data on the project). The project began in December, 1990, and will end at the close of 1992. Like farmers in the Huaytu/Buena Vista and Caranda zones discussed above, small farmers here practice slash-and-burn agriculture to produce corn and rice for household consumption and for sale in local markets.

Designed by CARITAS/Nuflo de Chavez, this project pursues income gains through crop diversification--the introduction of peanuts, cotton, and potatoes--supported by a revolving loan fund (for seeds and other inputs), technical assistance, and farmer training. These crops were selected because of their marketing potential and because other farmers in the zone had success with them. CARITAS/Nuflo de Chavez would also provide farmers with marketing assistance. Important to the PROMAPA strategy is the

recovery of 300 hectares of forest fallow (*barbecho*) and the promotion of crop rotation to address the "fallow crisis" associated with slash-and-burn agriculture.

During project year 1991, trunks and other vegetative debris would be removed from 200 hectares of forest fallow, where cotton, peanuts, and beans would be planted during the summer rainy season. These would be followed by potatoes and other crops during the winter dry season. Another hundred hectares of fallow would be likewise rehabilitated in 1992, the second and final year of the project. To recover the lands and ready them for planting, the debris would be removed by hand and by animal traction, thus allowing the lands to be plowed. According to the project design, the land would be prepared by tractor once the debris (trunks and stumps) had been removed.

(Beans and other crops forming part of the project strategy were to be financed through loans and technical assistance from another institution working in the zone. This points up a phenomenon we encountered also in the Huaytu/Buena Vista and Caranda zones with the CARITAS/Santa Cruz project: CARITAS engages in several activities in a single community; these may be separate "projects," or they may be activities carried out under a single "project," yet financed by different institutions--each of which considers the activities it finances as "the project." By one estimate, fifteen NGOs work in the project zone.)

The year before PROMAPA began, CARITAS had worked with peanuts in the area. Peanut seed adapted to the area was to come from Guarayos, in the same diocese 120 kilometers distant. But because of prolonged drought last year, the seed was in short supply, of dubious quality, and expensive; moreover, drought had already delayed planting in the project zone. When it became too late to plant peanuts, the project elected to promote corn instead (but without using project loan funds). The project, therefore, has not yet worked with peanuts--but, according to the project agronomist, will promote their planting in October of this year.

CARITAS/Nuflo de Chavez, like CARITAS/Santa Cruz, only recently began to implement agricultural production projects without using food incentives. Their institutional experience dates from just over two years ago, when the organization began to promote (with funds from the *Fondo de Emergencia*) potato production in several communities after a diagnostic survey revealed farmer interest in that crop. This work was experimental: potatoes were planted communally, using credit for seed and pesticides. It was subsequently decided that peanuts, which CARITAS had also experimented with (using the *Fondo*), would be another viable cash crop. It is out of these experiences that PROMAPA was born. According to CARITAS technical staff, a development strategy and working methodology are still evolving within the institution.

An agronomist, who assisted in the design of PROMAPA, supervises (or manages) the project as well as serves as its chief technical person. He is assisted only by a CARITAS/ Nuflo de Chavez general promoter, who works with other CARITAS

activities as well. CARITAS staff in Fortin de Libertad, where CARITAS/Nuflo de Chavez is based, provide administrative support to the project.

The former director of CARITAS/Nuflo de Chavez left in October of 1991 and a new director did not arrive until January of 1992. During this hiatus, which occurred during the important summer planting season, project implementation suffered from tensions between the administrative and technical staff. At one point, technical staff took their complaints to the bishop. These tensions still have not been resolved and continue to affect the project adversely.

In a technical report for the period December, 1991-February, 1992, there are complaints that no implementation funds had been received as of February 29 from "CARITAS Nacional," and that this delay was "placing the second phase of the project in doubt" (Diez C.: 1992:4).

In each of the five communities, the project has created a *Comite de Desarrollo Agropecuario* (Agricultural and Livestock Development Committee) to assist with project implementation. Under the community of Alto Peru below, we describe the structure and function of this committee, and the revolving loan fund that it helps to manage.

The project began with ninety-seven participants and today has 107, owing to additional requests. It initially set a ceiling of 100 participating farmers, twenty in each community; it was felt that staff could not accommodate more than this number. The initial participants volunteered when CARITAS/Nuflo de Chavez technical staff entered the community, and working through the *sindicato* called a meeting to explain what the project was about and what would be required of participants.

According to the agronomist, project results were "measured" in two important ways: by whether project-created organizations in the communities were functioning, and by whether farmers were implementing project-recommended practices. Data on production costs and yields were kept (no reports available), but these varied much from farmer to farmer; some lands were more pest-prone than others, some more fertile than others (see Annex F for project statistics).

3.2.2.2 Observations

3.2.2.2.1 Introduction

CARITAS/Nuflo de Chavez is based in El Fortin Libertad, a community about 120 kilometers from Santa Cruz. This is the San Julian colonization zone, for many years a major Bolivian "development pole." PROMAPA has worked in five communities, each representing spontaneous colonization and all but one (Jerusalem, founded in 1968) founded by uplanders in the early 1980s. We visited and conducted

group interviews in three of the communities: Alto Peru, Colonia Independencia, and Belen. Each community is between forty-five minutes and an hour by road from El Fortin. If the road is good, El Fortin is about four hours by vehicle from Santa Cruz.

Unlike lands in the Huaytu/Buena Vista and Caranda zones, those here are flat and have some of the region's better soils. Plantain groves will yield adequately for six years if kept clean. Large Mennonite farms, well-tended and productive, attest to the agricultural potential of the zone. These Mennonites have cultivated the same lands for more than twenty-five years, using machinery and pesticides and crop-rotation schemes; they are said to use chemical fertilizers only minimally. But it is also said that even these lands are beginning to tire, and that the Mennonites may soon move on. A major constraint to improved agriculture here is the region's roads, especially the long access roads into the newly-settled communities. Although the recent rains had caused extensive agricultural damage, the damage was less in San Julian than in areas near the rivers.

3.2.2.2.2 Community Visits

Alto Peru (June 29, 1992)

Here, we conducted a group interview with eighteen farmers. Founded in 1981, Alto Peru has thirty families registered in the local *sindicato*, with five more families unaffiliated. Each family has about thirty-six hectares of land. Most of the residents are from Potosi.

The local *Comite de Desarrollo Agropecuario* dates from early 1991, when PROMAPA began. Its officers include a president, a general secretary, a treasurer (to manage loan funds), and two *vocales* (some communities have only one *vocal*; the function of the *vocal* is to call people together). This committee works directly with the project agronomist, we were told.

We later talked with the agronomist about the committee, which is a project creation and exists in all the communities. Its officials are chosen by the community and hold office for two years. The committee manages the receipt of agricultural inputs acquired through the revolving loan funds, and one of its major functions is to guarantee against loan default. The committee president signs a contract on behalf of those in the community participating in the project and receiving loan-financed inputs. The president himself distributes seeds acquired with the loans, whereas participating individuals must collect their own pesticides in El Fortin, where the project maintains a warehouse. Pesticides are not stored in the communities for safety reasons.

According to the agronomist, to participate in the project an individual must reside in the community, must agree to attend project training sessions conducted biweekly in the community (attendance is obligatory), and must agree to participate in a community

credit fund, to be managed by the committee. The fund would be established in a bank, and would be co-managed by the president of the committee and the director of CARITAS/Nuflo de Chavez. The idea of the fund is to provide credit when the project ends. But such a fund is still in the planning stage and nowhere yet exists.

Through a revolving loan fund, the project extends credit for the production of potatoes, cotton, and peanuts (which the project has not yet worked with). The credit covers seeds, pesticides (herbicides, insecticides, and fungicides), and backpack sprayers (with accessories such as masks). The dollar-denominated loan has no fixed term, but rather comes due when the harvest is sold. There is no interest; the price of inputs is adjusted to cover administrative and transportation costs. In the case of natural crop disasters, the borrower is given another loan under the same terms, and is now liable for them both. If the crops fail again, the borrower must return the loan through the sale of a cow or some other asset. Credit is in kind, not in cash (but must be returned in cash), and the guarantee is communal.

Farmers said that the greatest need of the community was for a new school, followed by improved roads. (Vehicular traffic, especially the heavy trucks, destroys these mud roads in the rainy season.) Respondents also expressed a desire for debt relief. As one farmer put it, they had lost all the way around--on the loan and on their crops; they had no food for their families. Drought had reduced winter potato yields in 1991, and poor potato seed had already led to the rotting of potatoes planted in the winter of this year. Also, unusually heavy rains had destroyed this year's summer cotton (as well as reduced the yields of corn and rice, which are food staples.)

According to the project agronomist, delinquency rates from the 1991 winter potato cycle were low for Alto Peru: all but two farmers, who had paid off half their loans, had paid in full. And all farmers in the other two communities we visited had paid their 1991 potato loans in full, the agronomist said. [This may have been true at the time of our visit. However, as of early March, 1992, the delinquency rate from the 1991 winter potato cycle was thirty-three percent (Diez C. 1992: 13). The unpaid balance ($5,038) was to be added to loans for the 1991-92 summer season.] Farmers in ten communities (including the five project communities; CARITAS/Nuflo de Chavez has other projects and other loan funds), he continued, had borrowed $15,035 to plant potatoes during the 1991 winter cycle; of this amount, the project had recovered $10,025 (66%) at the time of our visit. (No written summary data on delinquency rates were available.) Farmers in Alto Peru had lost both cotton and potatoes this year and knew that the delinquency rate would be high. This is why they wanted relief.

PROMAPA's major benefit, we heard, was the provision of seeds (through the loan program, that is) and instruction in the use of pesticides. The project had supplied corn seed as well as potato seed; from the point of view of the villagers, PROMAPA was working with corn also.

Since the community is new, farmers still have plenty of high forest in which to make gardens. A typical family will clear two hectares of forest per year, more or less, depending on its access to labor. Farmers begin to clear in early June and require about two months to clear two hectares. The debris is left to dry for a month before being burned in early September. Corn and rice are sown in early October, about a hectare of each, with corn on the higher ground and rice on the lower. Farmers usually sow after a couple or three rains. The rice matures in four to five months, the corn in four months, with some harvested as *choclo* after three months. In high forest, farmers can take up to three successive rice/corn harvests from the same land before fallowing it.

With the advent of the project, participating farmers began to sow cotton in fallow forest after laboriously removing (in many cases, not completely) trunks and other past-felled debris. They sowed the first project cotton in October of last year, but excessive rains during the summer growing season destroyed it. Cotton is a demanding crop: it must be weeded three times during the growing cycle, and because of its extreme susceptibility to pests, must be frequently sprayed. But farmers agreed that in a good year, one could make money from cotton.

Farmers also began to grow potatoes with the advent of the project, planting them in early May (to mature in three months), just after the rice harvest and on the same land. The first project potatoes were planted in the 1991 winter cycle, but drought reduced yields--by sixty or seventy percent, one farmer said. The project obtained certified seed from SEPA in Cochabamba. Only half the farmers in the community had lands suited for potatoes, we heard; much of the land was either too hard or too low. Several farmers had at the same time also sown beans, under the auspices of another project, but hail had destroyed those.

Respondents told us that the project delivered courses every fifteen days in the community at first, but now only once per month; the rains often made attendance difficult. Training had included the handling and application of pesticides, they said. According to the project agronomist, he visits participants' gardens when he conducts the training courses.

Since they had few potatoes and no cotton to market, respondents did not talk about marketing. But the project was to assist with the marketing of both crops. For potatoes, CARITAS was to make arrangements with a marketing cooperative in Santa Cruz, advising them that a certain volume of potatoes was ready for sale in the communities. Farmers would sell at the market price, there were no contracts; CARITAS' role was to bring buyer and seller together.

Cotton was to be handled differently. A contract was to be drawn up between CARITAS/Nuflo de Chavez and a cotton buyer whereby farmers would deliver their cotton to the buyer's gin, where it would be weighed and graded. The farmer would be

given a certificate, which he would turn over to CARITAS for payment. CARITAS would then cash in the certificates with the buyer.

Colonia Independencia (June 30, 1992)

We conducted a group interview of seventeen farmers in this community of twenty-seven highland settler families, founded in about 1981. Each family has roughly thirty hectares, fifteen to twenty of which are now *barbecho* (fallow); the high forest is disappearing, farmers said. As in every Santa Cruz community we had visited to date, corn and rice were the major cash crops.

Respondents said that the major need of the community was for a *posta sanitaria* (health post). There had been several accidents with cutting tools (axes and machetes), they said. This is no surprise, for these highlanders have been in the *oriente* for little more than a decade, and are less accomplished in the use of these tools than are local *cambas*. It also takes them longer (often, about twice as long) to clear forest for gardens than it takes *cambas*. And whereas *camba* farmers approach the slash-and-burn enterprise with casual acceptance, highland farmers find it overwhelming.

Respondents cited technical assistance as a major project benefit and noted that other institutions working in the area did not involve local farmers in planning, but rather "ordered" them around. PROMAPA worked directly with them, they said. But they also observed that the project could be improved by providing mechanization and long-term credit. Short-term credit was not satisfactory: you could not return the money within three or four months if the harvests failed, they said. They wanted access to a tractor to clear their fields (to remove felled trunks, which is part of the project's fallow-land rehabilitation) and to prepare them for planting.

As we initiated the interview, farmers immediately began to express what was foremost on their minds. They had planted potatoes in the winter of last year, but yields were low (from drought; the same story is related in greater detail above for Alto Peru). And then they had lost their cotton this year to heavy rains--after working hard during the season to keep the pests out. They were in debt, and now had no working capital. What could they plant? There were lots of pests where they had planted cotton, and they needed to clear the area. (Unusually humid conditions had worsened the pest problem, requiring the heavy use of pesticides, which further indebted the farmers.) They needed machinery for this. (In theory, fallow lands were to be cleared before the cotton was planted, but not all farmers had the means to remove the often large boles from these lands, and so they planted the cotton around them.)

These farmers wanted to remove the trunks (to *destroncar*) from their fields so they would not have to turn them to fallow and clear again. It takes a family a month to clear one hectare, they said. If a farmer got sick, he got behind in the cycle (i.e., he

would not be able to clear enough land in time for it to dry and burn well). And weeding was exhausting. They wanted to clear a field and plant it continuously, they wanted to farm in the winter as well, they wanted to stay in one place. But to do this they needed a tractor--one tractor with cultivating equipment for the *colonia*, they said.

Farmers commented on the nearby Mennonite farms and noted that their lands were as good as those of the Mennonites. But the Mennonites had tractors and equipment. Farmers also observed that the Mennonites paid their workers five *dollars* per day, whereas *they* could only pay ten *pesos* ($2.60 U.S.) per day (plus one meal). They could not compete with the Mennonites, they said.

Farmers often commented on the pests in the cotton fields, so we pursued this matter to some depth. A couple of farmers said that cotton had attracted pests to other crops as well (thus acting as a reservoir); pests had become worse since they began planting cotton. (Farmers in several of these communities had planted cotton before the project, and non-project-participating farmers had also planted it under contract with a buyer.) Project cotton-producing technology involves burning cotton fields immediately after the harvest to kill off pests. According to the agronomist, farmers not participating in the project did not always burn their cotton fields. (In the following community, we pursued the hypothesis that cotton attracts pests to other crops, but did not get confirmation. However, we cannot discard the hypothesis, which gives rise to the issue of whether small farmers should be producing cotton. We do not have the technical expertise to resolve this issue.)

Farmers complained that the potato seed they had obtained from the project this year was now rotting in the ground (they had planted two weeks before our visit of June 30). The project had provided certified seed obtained from SEPA in Cochabamba the year before, but had purchased common seed on the market in Santa Cruz this year. The rotting was due to the inferior seed, they insisted, not to the moisture. The decision to purchase common seed had been made by the CARITAS/Nuflo de Chavez administration, which argued that the project did not have enough money to buy certified seed again. (Tensions between technical staff and the administration regarding potato seed and other issues are discussed above.)

We then pursued the issue of why farmers had not saved some seed from the previous year's planting (yields were low, but this was not the reason). These are farmers from the uplands, so they know a lot about potatoes. The reason is simple: humidity. Seed from last year's planting would have had to be stored for six months. In the dry uplands, potatoes are stored in the ground, but could not be stored that way here because of the damp.

Farmers further complained to us about the unstable prices paid for corn and rice in Montero and Santa Cruz, where they sell their grains. They wanted PROMAPA to provide them with a silo.

The project provides training and technical assistance here in the same way that it does in Alto Peru (described above). Training includes the handling and application of pesticides. Farmers reported no cases of poisoning during the project period. The son of one farmer, however, had previously died of pesticide poisoning.

Belen (June 30, 1992)

Forty-four upland families belong to the community of Belen, where they began to arrive in 1982. Each farmer has about forty hectares of land, and there is said to be still more high forest than fallow. The project has twenty-five participants in Belen, where we conducted a group interview with twenty-one farmers.

The community's first need was for health care (a *posta sanitaria*), we were told, followed by a new school and more agricultural credit. The major project benefit, they said, was the potatoes PROMAPA had made available last year (the drought seems to have done less damage to the potato harvest here) and project corn seed, which they had received on credit. (Again, according to the project agronomist, CARITAS replaced peanuts with corn, and even provided credit for the new seed variety, *suan*, but the credit came from another loan fund.) They were happy with the new corn variety, which gave higher yields for the market, but they were still using the *cubano* variety for home consumption.

When we asked how the project could be improved, farmers responded that they should receive good potato seed, not the seed they had received for the winter planting this year and that was already rotting. Furthermore, the seed had arrived late, they said. Except for the late arrival, this was the same story we had heard that morning in the previous community, Colonia Independencia.

And as in the former community, farmers here lamented vigorously that they had lost this year's cotton to the heavy rains. They were worried about how they would pay their loans, and pressed the project agronomist on this. They also noted that cotton was the crop most vulnerable to pests; it had to be sprayed four or five times during the growing period. The pests were worse in sandy soils than in clayey ones, they said. Three or four farmers in the community had previously planted cotton under another project, burning the fields after the harvest to kill the pests. A couple of farmers said that cotton did not attract pests to other crops; each crop had its own pests, they insisted. (Again, this is a technical issue that needs to be looked into.)

Farmers expressed an interest in obtaining credit to sow pasture grasses after the corn and rice harvests; they wanted to get into livestock production. Only three or four of those present had cattle--and no more than three head per household.

We also heard, as we had before, that farmers wanted a tractor to remove trunks from their fallow lands and to mechanize their operations, thus making them more

economic. Renting a tractor would not be economic; the community needed its own tractor. And they wanted chainsaws to clear the forest.

Farmers were satisfied with the training and technical assistance they had received, and reported no cases of pesticide poisoning.

3.2.2.3 Discussion and Conclusions

Drought reduced the yields--more in some communities than in others--of potatoes planted during the 1991 winter dry season. The project was unable to obtain peanut seeds for 1991-92 rainy season, and so substituted corn (financing production loans through another project). Beans (part of the strategy to rehabilitate forest fallow, but whose production was financed by another project) were also planted during this season, but were destroyed by hail. Unseasonable rains destroyed the season's cotton just as the pods were opening. And potatoes planted (about two weeks before our visit) during this year's winter dry season
were rotting in the ground because of poor (uncertified) seed. The decision to purchase this seed was an administrative one (insufficient funds, we heard), not a technical one (the project had purchased certified seed the year before), and speaks to current tensions between administrative and technical personnel. These tensions (discussed above) are harming the project and need to be resolved. (See Annex F for statistical data on the project.)

The project strategy of rehabilitating forest fallow involves first clearing fallowed land of trunks and stumps, then planting cotton, peanuts, and beans (a key crop in the rotation sequence and in retarding the rate at which forest is cut) in the summer rainy season, followed by potatoes in the winter dry season. We have no data on the number of hectares thus cleared, but farmers complained that they did not have sufficient labor to effect such clearings. It was obvious that many had planted without fully clearing the land. They wanted machinery, especially tractors, they said. In its design, the project envisions the clearing of fallowed lands so they could be cultivated by tractor; the farmers we talked with were expecting tractors--both to clear the fallow and to prepare the land for planting (to plow it and to control weeds, the main force driving farmers to shift cultivation sites after two or three years). To expect farmers to clear these fields by hand (even with the help of animal traction) is not realistic. And the project does not provide for tractors.

There are two technical issues that need to be addressed. One is the issue of potato storage. Seed cannot be saved from potatoes introduced by the project because excessive moisture precludes its storage. The question is whether there is a feasible way to store potatoes in this humid environment, or whether there is a potato better adapted for storage in the lowland tropics. (The International Potato Center began research some years ago on "bringing the potato down the hill.")

[If we can digress momentarily, the seed issue, for potatoes and other crops, is an important one. In our following visit to irrigation projects in Chuquisaca, we encountered farmers who could not save potato seed because of disease (and the agroecological zone of these communities is generally considered ideal for seed production). It is our sense that seed research is weak in Bolivia--indeed, that agricultural research in general is weak. And for NGOs (with limited to no research capacity) to tap research knowledge, whatever its status, and apply it poses special challenges.]

The other issue concerns the production of cotton, which is highly subject to pest infestations. There is *some* indication that cotton, despite the preventive measure of field burning, may attract pests to other crops on these small farms, thus making life even more precarious for farmers. And in any case, cotton quickly tires the land [according to a project report (Diez C. 1992: 3), the variety planted, *Guasuncho* II, is least demanding of fertile soils; three successive harvests, we were told, could be taken from fallowed forest of a kind the project is trying to reclaim with cotton] and requires the heavy use of pesticides, thus rendering farmers vulnerable to fluctuating market prices. (Unusually high humidity during the 1991-92 summer season worsened the pest problem and required heavy application of pesticides, thus further indebting farmers.) Project sustainability varies inversely with this vulnerability. Also, the labor demands of clearing trunks from forest fallow to plant cotton tax these small-farm households--many of whom seem not to have cleared completely, and some not at all.

Failures in the winter cotton harvest as well as the already-apparent loss of potatoes planted in the summer of this year suggest that loan delinquency rates will be high. Observations regarding the loan program for CARITAS/Santa Cruz (Section 3.2.1.3) apply here. Furthermore, the *Comite de Desarrollo Agropecuario* established in each of the five communities is too recent and inexperienced to sustain project activities. And weather-related crop failures have discouraged farmers and dampened incentive--a tough psychological environment for initiating such an organization.

It is unreasonable to expect much of any agricultural project in only two years, the term of PROMAPA. Weather and poor roads further impeded project implementation. Furthermore, finding a sustainable agricultural system (one that would stabilize the farmers) for these farmers *at their economic level* is a challenge that lies largely beyond the institutional reach of an NGO like CARITAS. PROMAPA has had little discernible impact among beneficiaries to date, despite the laudable enthusiasm and abilities of the young project agronomist, who had excellent rapport with the farmers we visited.

3.2.3 Micro-Irrigation Systems (CARITAS/Sucre)

3.2.3.1 Objectives, Organization, Strategy

This project seeks, through the construction of small, low-cost irrigation systems to increase the agricultural production (and hence income) of small farmers in seven communities (one system per community) of the Provinces of Hernando Siles, Zudanez, Yamparaez, Tomina, and Nor Cinti, Chuquisaca Department. Chuquisaca has suffered most from the constant droughts of the past several years (CRS/Bolivia 1990: 2). Last year, for example, rains in the project area did not begin until late December, and then ceased abruptly in mid-February. On average, these droughts (said to be getting worse) have caused crop losses of seventy percent (CRS/Bolivia 1990: 2).

The project, which began in June, 1990 (with the initiation of construction; an engineer was hired with the first project disbursements in December, 1990), and will end at the close of November of this year, has two objectives: (1) the irrigation of a total of 140 hectares in seven communities, thus benefitting 138 families by increasing agricultural production by fifty percent; and (2) the organization of beneficiary groups in such a way that they can administer and maintain the irrigation systems (CRS/Bolivia 1990: 2-3). (See Annex F for project statistics.)

Production increases are to be achieved by irrigating crops traditional to the area--corn, potatoes, wheat, and fruit trees (citrus and peach). The irrigation systems are simple and do not involve prior hydrological studies. Indeed, the systems themselves are not technically ideal in any absolute sense, but rather are designed to respond, within the limits of modest project economic resources, to farmers' desperate need for water and keep them from starving. The project is concerned strictly with infrastructure; it has no agronomic component.

MP has recently approved another project that will provide agronomic assistance to farmers with the new irrigation systems. This assistance will promote irrigated home gardens and will experiment with terracing to make better use of steep lands and to prevent erosion. And if operating funds are available, there is also talk of creating retention ponds (*atajados*) using an old bulldozer that CARITAS/Sucre has acquired. The idea is to find clever ways to capture scarce water.

The project is working with only four of the original seven communities appearing in its design. These four are Sajtreyoj (Nor Cinti Province), Quiscoli (Zudanez Province), Pampas Abajo (Tomina Province), and Limabamba (Tomina Province). CARITAS/Sucre replaced the remaining original three (La Plateada, Vallecitos, Chanarmayo) with ten others: Santa Rosa, Palqui-Pampa, and Chiri-Jakhu, all in Nor Cinti Province; Mandinga, Pupa Huayco, Collpa Pampa, Chaco-Pampa, and Zundu-Huasi, all in Zudanez Province; and Thuru Mayu and Thakhakamayu, both in Tomina Province. According to CARITAS/Sucre, they replaced Vallecitos when farmers

there became disillusioned and the project lost credibility because funds committed by MP arrived late. In the other two original communities, subsequent inquiry revealed that there were fewer families than originally thought--too few to justify project "social ends," we were told. (See Annex E for statistics on the irrigation systems.)

CARITAS/Sucre reported serious delays in MP's disbursement of project funds. Projects had been budgeted and MP had approved them, but delayed disbursements, especially damaging to agricultural projects, impeded implementation; delays of up to a year were reported. (These delays are alleged to derive from MP's holding wheat flour off the market until the price rises.) Projects were budgeted in dollars and disbursements made in *pesos* at the prevailing exchange rate. Inflation, however, eroded the value of funds between disbursements. And since CARITAS was not allowed to keep the interest from disbursements, it could not recover these losses. CARITAS also cited the routing of disbursements from MP through CRS as a further source of delay. CARITAS would prefer that MP make disbursements directly to them--and in dollars.

We also heard complaints about the long process for project approval. CARITAS/Sucre sends projects first to CRS/La Paz, which then sends them to Lima or Quito, where CRS consultants review them before returning them to CRS/La Paz. Projects then go to MP for further review.

Instead of a "development strategy," CARITAS/Sucre has what they call a "social service doctrine." For irrigation works, they have selected deprived communities in remote areas, where no other institutions are active. This is the agency's first infrastructural project in which food has not been used as an incentive. But they have had previous experience with agricultural production projects not involving food incentives.

The project began with one civil engineer, who left the project after a car wreck. A second engineer was then hired, but soon left for other employment. CARITAS/Sucre currently has a project technical staff of two civil engineers. All of the irrigation systems have been designed by CARITAS/ Sucre, without technical assistance from MP's Projects Department.

The project has organized Irrigation Committees (*Comites de Riego*) in each beneficiary community. These committees are small and simple in structure, corresponding to the small size of beneficiary groups and the simplicity of the irrigation systems. They consist of two persons, chosen by the community and charged with organizing labor during the construction phase. These persons work closely with the project engineer. Once a system is built, the committees take charge of regulating water usage and of generally maintaining the system. The project seems to have worked little with the committees to date on system maintenance, however. In the case of systems still under construction, the project has also organized Oversight Committees (*Comites de Vigilancia*). These two-member committees oversee the work of the Irrigation

Committees during system construction; they monitor especially the use of construction materials so that these are not diverted to non-project uses.

The project donates construction materials not available locally such as concrete, wood for molds (to form concrete), wire, nails, dynamite, and a few simple tools. Beneficiaries provide local construction materials and all labor; they are asked to provide nothing that must be purchased.

According to CARITAS/Sucre, the project will promote the creation of a fund in each community to be used for system maintenance. Pressures in the earth will inevitably cause cracking in the concrete lining the canals, for example. The project plans also to promote the formal drawing up of local codes to govern water usage, we were told.

3.2.3.2 Observations

3.2.3.2.1 Introduction

We visited three irrigation systems. Two of these were in service and had been used by farmers for one agricultural season. The third was still under construction. The completed systems were in Pampas Abajo (Tomina Province) and Quiscoli (Zudanez Province), the one under construction in Pupa Huayco (Zudanez Province). Pampas Abajo is about seven hours by winding, hilly roads from Sucre; Quiscoli and Pupa Huayco about four hours from Sucre. The systems are highly dispersed.

The land is extremely hilly in the project zone, with households scattered along stream beds and on the lower reaches of surrounding hills. Holdings tend to be small and highly fractured. Thirteen residents in one remote community recently sent a memorial to CARITAS/Sucre asking for an irrigation system. Land holdings, detailed in the letter, ranged from three hectares (one holding) to one-fourth of a hectare. Seven residents had one hectare, and the average holding size was just under this. Sheep, goats, and sometimes cattle graze on the surrounding hills, where land, often highly eroded, tends to be communally owned.

3.2.3.2.2 Community Visits

<u>Pampas Abajo</u> (July 7)

This community is located just over two hours by road from Zudanez, toward Camiri. The project completed the irrigation system here (there was none before) in August of last year, enabling beneficiary farmers to use it for the summer crop cycle. The material below is based on our interview of one farmer, who said that the system

served twelve families. CARITAS/Sucre records, however, report seven beneficiary families and thirteen hectares rehabilitated (see Annex E). An estimated sixty-eight families comprise the entire community and belong to the local *sindicato*. According to the farmer we interviewed, families here were born in the area. Unlike the migrant communities we visited in Santa Cruz, those here have much greater temporal depth.

We first visited the system's water intake (*toma*), on the River Tarabuquillo. Here, the project constructed a small channel interrupt (*tajamar*), or dam, with the system intake on one side of the low spillway (dry at the time of our visit). A primary canal about two kilometers long, lined with concrete near the intake, delivers water to secondary canals serving participating farmers along the valley. This is the basic design for all of the project's micro-irrigation systems.

Before the irrigation system, this farmer and other beneficiaries left the community in July for Santa Cruz, where they harvested sugarcane; they returned home in September to plant the summer crops. Household income derived from employment in Santa Cruz, not from the sale of crops, which were planted for consumption only. The interviewed farmer typically planted four hectares, mostly in wheat and corn.

He continues to plant four hectares, but two of them are now under irrigation. Harvests from the irrigated land are almost entirely for market, with any surpluses retained for consumption. Under irrigation last year, this man planted, between the first and middle of August (only with irrigation can farmers plant at this early time, which is still well within the dry season), one hectare in potatoes, one-half hectare in corn (for *choclo*), and one-half hectare in peanuts. He also planted a few chili peppers and vegetables (lettuce, tomatoes, cabbage, onion), mainly for consumption. On the two hectares of dryland he planted wheat, corn (to harvest at maturity, not as *choclo*), and barley.

We asked him to compare his financial situation before irrigation and now. After paying for food and lodging in Santa Cruz, he cleared between 500 and 600 Bs, he said. From his irrigated harvest, he had cleared 800 Bs.--and still had cash left over at the time of our interview. His planting costs went for potato seed (stored seed becomes diseased, he said, and farmers were having trouble finding good seed), fertilizers (which he mixes with manure), and sundry other inputs. Farmers save seed from corn and peanuts. He noted that he and others sold their produce to buyers who came with trucks. It was a buyer's market, he complained; if farmers were organized, they could obtain even better prices, he said.

The local Irrigation Committee consists of a president, a vice-president, and a treasurer, the farmer told us. The president's job is to coordinate the maintenance work of beneficiaries; the vice-president does this in the president's absence. The treasurer collects money from those who wish supplies, which a commission dispatched by the

community buys in town. (The office of treasurer does not fall within the purview of the project, but rather is a position that beneficiaries have added to the committee structure.)

This committee manages the use of irrigation water, which participating farmers receive by turn. When the potatoes are in the early stages, farmers water them once every two weeks; as they mature, the rate is increased to once per week. It takes two days and two nights to irrigate four hectares, the farmer said. And participants had to sow crops in measured amounts so that the water would be enough for everybody.

The system here has generated social conflict. When beneficiary families organized to ask for an irrigation system, four families downriver from them declined to participate, saying that they had no confidence in such a scheme. The past summer growing season was an unusually dry one. The rains did not come until late December (and then stopped in mid-February). As the season wore on without rain, water in the River Tarabuquillo fell to a level where all of it was being diverted to participating farmers (who were rationing it among themselves), thus denying water to the four families downstream. These families then began to break the canal open at night to divert water back to the river channel and toward their own fields.

The farmer we interviewed, also president of the local Irrigation Committee, was talking with these downriver families in hopes of avoiding a serious confrontation. His solution was to admit them to the beneficiary group (he said they now wanted in) so long as they would help maintain the system. Farmers in the higher areas of the community had created no problems since the water was never accessible to them anyway.

Pupa Huayco (July 8)

Pupa Huayco is the name of one sector of a much larger community. Construction of the irrigation system here began six months ago; local farmers were working on the primary canal from the intake during our visit. A *tajamar*, longer and higher than the one we saw in Pampas Abajo, had already been built in a deep ravine along the River Pupa Huayco. According to the project engineer with us, the system would be ready for use in two months. Twenty-one families (as CARITAS/Sucre records indicate--see Annex E) originally asked for the irrigation system, but since then another seventeen had joined the beneficiary community, bringing the total number to thirty-eight families. We conducted an interview here with six farmers as we stood at the dam.

Farmers here traditionally planted potatoes and corn in November, wheat and barley in December. Potatoes were the major cash crop, but they also sold onions. Unlike farmers in Pampas Abajo, those here did not leave the community to work elsewhere, respondents told us.

We asked them what benefits they expected from the new system once in service. Their wheat had dried up this year when the rains abruptly stopped (in about mid-February), they told us. With irrigation, they could have saved the wheat.

The community had an Irrigation Committee (which they may or may not recognize by this name) composed of a president, vice-president, *vocal*, and recorder (*secretario de actas*). The community formed the committee at the behest of the project. The president organized the construction work, the recorder (a treasurer, like that of Pampas Abajo described above) collected money from those who ordered supplies from town through a commission sent by the community. Nobody had yet received training on maintenance of the system, they said.

Farmers pointed to a stretch of canal blasted out of rock rising sheer from the ravine and complained to the engineer that the canal was already filling (from debris falling from the steep hill above) and would have to be cleaned often. They wanted a pipe rather than an open canal, and observed that water would evaporate from the canal. The engineer responded that a pipe would be too costly, and would still be subject to sedimentation because of the canal trajectory's low gradient. A closed conduit would not be feasible.

Quiscoli (July 8)

The irrigation system in this community, completed in early September of last year, serves fourteen beneficiary families. The community is much larger; fifty families are registered in the local *sindicato*, and there are several unaffiliated families in the area. We conducted two interviews among beneficiaries here: the first one of a single farmer, the second of a group of three farmers. The text below is a composite of the two interviews.

On irrigated lands, beneficiary farmers last year planted potatoes, corn, beans (to climb the corn), and wheat. Several also planted onions and had peach trees on the lands. Corn and potatoes were sown in September, the potatoes were harvested in mid-January, the corn in April to mid-May (as hard grains, not *choclo*). Wheat was sown in December, barley in January. The wheat was harvested in June; farmers were harvesting (and threshing) barley (and sometimes wheat) during our visit.

These farmers also continued to plant wheat, barley, beans, and potatoes on non-irrigated land. What irrigation had made possible was the early planting of potatoes (*papa mishka*--early potatoes), enabling farmers to take two potato crops (potatoes were planted again in early November); and the early planting of corn. A pre-existing irrigation system, inferior to the new one, served this community, or parts of it, so that a few beneficiaries had planted *mishka* (early) crops before. But the new system had brought more land under irrigation.

Farmers here, however, had not been able to benefit optimally from irrigation. Indeed, we heard that their incomes had not changed because of the new system (which had only been in service for one season). As the 1991 planting season wore on toward December without rains, beneficiary farmers as well as those upstream from the irrigation intake relied increasingly on the ever-dwindling stream for water. Farmers upstream had begun to divert the stream to their own fields. Toward November, when beneficiary farmers' *mishka* potatoes were beginning to flower, there was little water available. Those beneficiaries farthest downstream of the intake had begun to experience water shortages even before. Crops dependent on this water, especially potatoes at the critical flowering stage, thus had low yields. Farmers were quick to point out, however, that last year was very unusual; in normal years, water in the river would support early crops for all area farmers.

After our first interview, we moved up the valley for a second interview and to look at the system intake on the River Quiscoli. There, we saw the long dam, but noticed that the water (now reduced to a tiny stream) had cut a deep channel just beyond the guide wall extending from the dam on the side opposite the intake. Farmers told us that a cloudburst upstream in early February had caused this disaster. The wall was not wide enough to channel the massive down-flow of water across the spillway. Farmers said they had sent word of the disaster to CARITAS/Sucre; the engineer with us said that CARITAS/Sucre had received no word. Until this problem is corrected--the concrete wall will have to be extended--the irrigation system is only marginally functional.

According to the engineer, funds remain in the project to repair this damage. But had it happened when the project was over, one wonders how local farmers would have dealt with the problem.

3.2.3.3 Discussion and Conclusions

As of March, 1992, the project had rehabilitated 59 hectares (67 beneficiary families) for irrigation; irrigation systems to rehabilitate another 121 hectares (118 beneficiary families) were still under construction (CARITAS/Sucre 1992: 1). When the project ends at the close of November, 1992, it will thus have rehabilitated 180 hectares, benefitting 185 families. These figures exceed project objectives. Number of hectares rehabilitated (or to be rehabilitated) per community ranges from twenty-eight to four, with an average per community of just under thirteen hectares. The largest beneficiary group has thirty families, the smallest has six. The average size of a beneficiary community is thirteen families (calculations from CARITAS/Sucre 1992: 1). (See Annex E for micro-irrigation statistics.)

Based on approximate yields of project beneficiaries (see Annex E), potatoes yield 8 tons/ha. under irrigation versus 4.10 tons without it (a production increase of 95%), wheat yields 1.5 tons/ha. under irrigation versus .8 tons without it (an increase of 88%),

and corn (*choclo*) yields 3 tons/ha. under irrigation versus 2 tons without it (an increase of 50%). Based on yield figures for these crops and others grown by project farmers (see Annex E), and using approximate production costs and current market prices, calculations suggest that irrigation leads to an increase in net income of about 265%. Both yield and income data thus more than meet the project objective of increasing production by 50%. (See Annex F for a summary of project statistics as they relate to goals and objectives.)

So long as water is sufficient to feed the irrigation systems constructed by the project, and so long as those systems are well designed and function in accordance with their designs, it is reasonable to conclude that project beneficiaries will achieve *per-hectare* production increases in the general magnitude of those cited above. It does not follow, however, that beneficiaries will necessarily achieve those same gains at the *total production* level. In the two working systems we visited, low rainfall in the watersheds as well as competition from non-system water users had reduced the timely access of beneficiaries to irrigation water, thus resulting in less area planted than otherwise would have been--and conceivably in lower *per-hectare* yields.

Farmers in Quiscoli (after the experience of one season) said that they were little to no better off with the irrigation system than they had been before. Their incomes were about the same, one said. This is because low rainfall in the watershed and competition from non-system users had denied users timely access to water in the amounts they needed.

To a much less extent, we encountered this same problem in Pampas Abajo. But there, the irrigation system had kept farmers from migrating seasonally to Santa Cruz to harvest sugarcane; and in the case of the farmer we interviewed, had increased his cash income between 200 and 300 Bs. over what he had earned in Santa Cruz. We do not presume to impute economic benefits to stemming migration to the *oriente*, but there are clearly benefits to the migrants as well as to Bolivian society. (In the case of migration to the Chapare to work coca, the benefits transcend Bolivia.)

There are several technical issues in the design of these simple irrigation systems that lie beyond our competence to evaluate. In both of the functioning systems that we observed, low rainfall during the last growing season (the first year that the systems were in service) and competition from non-system water users during peak dry periods denied system users the timely availability of water in optimal amounts. On the one hand, these beneficiaries did have *some* water, and so were better off than they would have been without irrigation. One can argue that these simple systems are not designed for more. On the other hand, one wonders whether within the economic limitations of the project there is latitude for design improvement that would address these problems.

The same observation applies to the system constructed in Quiscoli, where the guide wall from the dam had failed to channel water from a cloudburst. For this system

to function, the wall must be lengthened. Another issue arises here: had this disaster occurred after the project had ended, one wonders how local farmers would have dealt with the problem. The project is aware that it must address the issue of system maintenance--through training and through, perhaps, the establishment of a fund destined to that end. We concur with CARITAS/Sucre that this is a present need, one that is fundamental to project sustainability. The fact that this disaster occurred in February, yet was not discovered by CARITAS/Sucre until our visit, might suggest a need for closer follow-up on systems already built.

We would point to the need for systematic follow-up of systems already built and in service. Visits should be programmed to discuss with users problems they have had *with the system*. Information from such visits should then feed back into the design and implementation process in order to improve it. Because of poor roads and the remote locations of the systems, such follow-up is a high-cost endeavor. Funds for it should have been included in the initial budget; it is our sense that they were not.

In Pampas Abajo, four families, located just downstream of the new irrigation system, did not want to participate in the project at the beginning (but do now). When water levels fell in the local river, the families began tapping scarce water from the new system, thus creating social conflict. Building irrigation systems that serve only a few members in a community is a tricky business. For technical (and economic) reasons, not everybody can always benefit from such a system. But every effort should be made to design systems so as to include all persons who might benefit, including those who show no interest initially but may want to be included later. We are not saying that CARITAS/Sucre has not done this, or has been insensitive to this issue. We merely wish to underscore the importance of being aware at the design stage of potential social conflict. Also of use here would be a community water-users' code applying to both system and non-system beneficiaries. CARITAS correctly plans to promote these much-needed codes in the communities.

Before CARITAS/Sucre initiates construction of a new irrigation system, we think it might be useful for leaders of the group requesting the system to visit communities where such a system has been completed. There, they can see a system in operation, and can talk with beneficiaries about it. Farmers building the system in Pupa Huayco seemed to think that the primary canal should be covered, and were concerned about the work involved to keep it clean. By working more with community leaders prior to construction, project staff may be able to allay these later doubts and concerns. However, the project will need funds to do this; and again, indications are that current funding levels would not permit such visits.

We also concur that farmers need agronomic technical assistance in order to get the most out of the new irrigation systems. The new project that MP just approved to provide such assistance is much needed. Although CARITAS wanted the project to begin in 1992 and MP approved it early this year, disbursements will not likely be made until

after the beginning of the forthcoming summer agricultural cycle. This delay is unfortunate. (Such delays are discussed more fully under "Objectives, Organization, and Strategy" above.) We would also observe, after hearing scattered comments from farmers regarding marketing problems, that marketing assistance would be helpful. Farmers in the area usually market produce by selling to truckers who enter the area. Some sort of agricultural marketing cooperative could provide relief here.

All considered, we think this project is having a substantial impact among beneficiary communities. Indeed, given the critical need for water in the area, almost any water project will have high social and economic returns.

3.2.4 Nutritional Vegetable Gardens (CARITAS/Beni)

3.2.4.1 Objectives, Organization, Strategy

This project, which began in September of 1990 and ended in December of last year, sought to improve the nutrition and income levels of 379 families in twenty-one communities of Marban and Cercado Provinces, Beni Department, through community vegetable gardens worked by Mothers' Clubs. Half of the vegetables was to be consumed and half marketed (see Annex F for project objectives, and Annex L for a technical report prepared by the evaluation team's agronomist). Through one garden in each community, the project was to promote twelve vegetables: tomatoes, carrots, radishes, lettuce, onions, peppers, cauliflower, watermelon, cabbage, cucumbers, garlic, and eggplant. Key to the project and its sustainability was to be a revolving loan fund for the purchase of seeds and chemicals. With the income from vegetables, women could either continue to work communal gardens or make their own family gardens, using the newly-acquired knowledge of vegetable production.

CARITAS/Beni has long worked with Mothers' Clubs, and so chose them as a convenient grassroots vehicle for mounting the project. Indeed, CARITAS had previously promoted vegetables through Mothers' Clubs, but hoped under this project to intensify its efforts and thus reach a larger number of beneficiaries. And the efforts, unlike previous ones, would be sustained through the loan fund.

As with CARITAS elsewhere in Bolivia, development without the use of food incentives is a recent thrust for CARITAS/Beni. CRS/Bolivia financed a small project in 1989 with CARITAS/Beni to promote chicken production in rural communities (some of which have also been served by the nutritional gardens project) near Trinidad. And at the time the nutritional gardens project began, CRS/Bolivia funded CARITAS/Beni to install *noques*, or rain-water catchment tanks, in several communities.

The CARITAS "regional technical team" consists of a veterinarian, an agronomist, and an economist, all based in Trinidad. They supervise the development

activities of CARITAS/Beni. The nutritional gardens project began with an agronomist and one support person before CARITAS detailed an extension agronomist (trained at the *ingeniero agronomo* level; one was a woman) for each of the two project zones--communities along the Trinidad-Santa Cruz highway, and those along the Trinidad-Loreto highway. CARITAS/Beni staff in Trinidad supported the project administratively.

CARITAS/Beni administrators, like those of several other projects we had visited, complained of late financial disbursements from MP. MP disburses funds without regard for the agricultural cycle, they said, and this had created problems for the Nutritional Gardens Project--and was currently creating them for the milk-production project just begun.

3.2.4.2 Observations

3.2.4.2.1 The Project Experience

Before we relate our observations from the two communities we visited, we will first summarize the project experience using material from a CRS/Bolivia report (CRS 1992), from the final project report prepared by CARITAS/Beni (CARITAS/Beni 1991), and from our talks with project implementation personnel.

CARITAS structured the project around communal gardens as a cost-effective way to introduce new vegetables to the communities and give participants experience in cultivating them. Communal gardens were thus a priming effort. Given a limited technical staff to work in several dispersed communities, this was thought a reasonable strategy. CARITAS could not maintain a long-term presence in the communities, and so hoped that residents would learn enough to sustain the effort and demand future assistance from other agencies as they needed it.

Because of land-distribution patterns and the consequent inconvenience to some residents of working in communal gardens, about twenty percent of the beneficiaries implemented gardens on an individual basis, though they usually cultivated seed beds in a communal garden. Also, thievery of mature vegetables by community residents reduced beneficiary harvest volumes substantially. (The problem of theft further favors the cultivation of individual gardens, where owner control is greater.)

CARITAS set up a revolving loan fund to enable commercial production. Loans to the Mothers' Clubs (to a committee within the Club) covered seeds, pesticides (insecticides, fungicides, soil disinfectants, and sometimes fertilizers), and tools (axes, machetes, hoes, small shovels--*palas*). CARITAS lent backpack sprayers to the communities. (See Annex H for a listing of items included in the loans and their values.) The interest-free dollar-denominated loans were in kind, not in cash, but were to be paid

back in cash (at constant dollar value) just after the vegetables had been marketed. (Borrowers had the option of repaying at least part of the loan in seed, which CARITAS would later redistribute.) The loans did not include administrative or transportation costs since these would have excessively burdened the debt. The total per-capita loan was quite small, amounting to about $5.00 U.S. Since beneficiaries consumed over ninety percent of produce harvested, many of the loans remained delinquent at the close of the project in December, 1991.

Vegetables were to be grown during the winter dry season. The seedbeds (for vegetables requiring them) were to be prepared in May, with the seedlings transplanted in June. The vegetables would be harvested from late August into October or November, depending on the vegetable, and would be marketed during October and November. This was the ideal cycle for producing vegetables as conceived by the project.

The degree to which an actual cycle approximates this ideal depends fundamentally on the weather. If the summer growing rains continue into the winter dry months, as happened this year, seedbed preparation and the entire cycle are delayed. If the summer growing rains begin early (in late September or early October, say), the harvest can be adversely affected, not to mention the prospects of marketing in the face of impassable roads. Furthermore, drought conditions often obtain in the Beni as the winter dry season enters August and September. Vegetables may require frequent watering at this time (as often as twice per day), and this can be time-consuming. Anticipating this contingency, project technical staff required that communal gardens be close to water--either a ditch along the highway, or an artificial pond.

Men performed the heavy work of clearing forest (and removing the stumps) to make the small communal gardens, while women (of the Mothers' Clubs), assisted by their children, cultivated the vegetables--and even performed the laborious task of turning and mounding the earth to make the seedbeds. Project extension agronomists thus directed their training at women in the Mothers' Clubs. In each community, the extensionists delivered courses covering eleven themes on the theory of vegetable production. Following the presentation of each theme, the extensionists led the women through its practical application in the communal garden. Each beneficiary also received pamphlets to reinforce the practical training. The technical personnel working on the project struck us as dedicated and qualified, and we think the training they imparted was sound and as efficacious as could be expected considering the project's time and resource constraints.

The project began in September, 1990, but because of heavy rains commencing in November, did not fully initiate activities until April of 1991. It planted three of the twenty-one gardens on an experimental basis before the rains began. Although the project planted gardens in all twenty-one of the designated communities, it planted a total of only 9.83 hectares rather than the planned 16.4 because of a labor shortage (CRS 1992: 4-5) (see Annex F for a synthesis of objectives and achievements). Other

implementation problems included thievery, as discussed above, and inclement weather. Flooding from January through March, and drought from July to October, were the major determinants of low yields (CARITAS/Beni 1991: 3) (see Annex H for yield data). Pests and disease were also something of a problem, though less so than adverse weather.

The project encountered serious marketing problems. Excessive quantities of the same vegetables at harvest caused prices to drop, and transportation costs to the market in Trinidad pushed total costs above the market price. As already noted, the project marketed--sometimes in the communities themselves--only ten percent of total harvest (CARITAS/Beni 1991: 3).

3.2.4.2.2 Community Visits

A sprawling web of forest, savannah, river, and lake, the Beni is more than forty percent savannah or shrub, and about the same percent forest. The natural savannahs, or *pampas*, which dominate the central part of the department, have supported a rustic cattle industry (in decline in recent years) over the past thirty years. Forests in this central zone tend to be either gallery forest or patches of island hammock (as in parts of Florida) surrounded by grassland. Peasant farmers make gardens in the forest using slash-and-burn techniques.

Much of the region is subject to chronic flooding during the summer rainy season, commencing usually in December. The floods typically begin to recede in early April, leaving behind a myriad of ponds and sloughs. By the peak of the winter dry season in mid-August, drought conditions often obtain: the *pampa* grasses have hardened, and what were swales six months before have turned to yellow mosaics of parched earth. Further adding to the Beni's climatic asperity are Patagonian fronts (*sures*), which last from a day to a week and lash the region with cold winds, and sometimes rain, during the winter dry season. These winds, which can reach gale force, cause temperatures to plummet, sometimes more than twenty-five degrees Centigrade. These annual extremes, with the area's generally poor soils and fragile ecology, make the Beni one of Amazonia's more unique regions.

Project communities, all south and southeast of Trinidad, in Marban and Cercado Provinces, fall into two broad areas: those along the highway between Trinidad and Loreto, and those along the Trinidad-Santa Cruz highway. The communities range between 27 and 110 km. by road from Trinidad. We conducted group interviews (with a total of twenty-five women) in two of these communities: Casarabe, on the Trinidad-Santa Cruz highway, and Sachojere, on the poorly-maintained Trinidad-Loreto road. Traditional crops here, as in most Beni communities, are corn, rice, yuca (cassava, or manioc--sweet variety), sugarcane, and bananas (vegetables address dietary deficiencies, especially in children). The population of the project communities is overwhelmingly lowland (or *camba*), with only a smattering of highlanders (or *kollas*).

Casarabe (July 24)

Eighty-two families reside in Casarabe, according to a survey conducted in January of this year. Several of these came to Casarabe from remote areas in order to put their children in the local school; they are not permanent community members. Many families have settled in the community in recent years as refugees from frequent flooding along the region's rivers, where they made gardens in the richer alluvial soils of the levees. The completion of the dirt road between Trinidad and Santa Cruz five or six years ago further spurred settlement. Unlike some of the other project communities, Casarabe has ample forest for gardens. Sixteen women make up the local Mothers' Club, and twelve of them attended our group interview. The president of the club was younger and appeared considerably more affluent than the others. Her husband was not a farmer, but rather a *motoserrista* (one who hires out with a chainsaw to fell forest).

The community's first need, the mothers said, was for a new school; the past summer's heavy rains had destroyed the school, and classes were being held in private homes. The community's second need was for potable water--for the children, as the mothers said. ADRA had installed a potable-water system in the community in 1990 but it had ceased to function. The system included a pump, pipes, an elevated holding tank, and ten spigots in local homes--those near the well and belonging to families that would care for them. Reports varied as to why the system did not work: the pipes were too small, the pipe leading to the holding tank was broken, and so on. We opened the spigot in one of the houses and found it dry. Residents were drawing water from an artificial pond near the highway.

Organizations in the community included the Mothers' Club, an Association of Family Fathers, a Health Committee, and a Sportsman's Association (*Asociacion de Deportistas*). The Mothers' Club was the most active, the mothers assured us, and its major concern was child health.

Several of the women interviewed had some experience cultivating onions (scallions, not bulb onions) and tomatoes before the project began. Five of them had participated in the project last year. They had cultivated the vegetables in a community garden, they said, but the effort had been a "failure," by one account, because of theft (by other residents) from the garden; for this reason, they had little to sell. They now favored individual gardens, which they could better supervise. CARITAS had provided them with seeds, pesticides, and fertilizers (urea), and each mother had since contributed two or three *bolivianos* toward their collective debt.

The agronomist had instructed them on how to apply the pesticides. They did three applications: one in the seedbed, a second when they transplanted, and a third when the vegetables began to flower (rather than to fruit). The women did not single out pests as a major problem, but did note that they had lost all of the cauliflower to pests;

cauliflower was the most pest-prone, they agreed. They also observed that it was necessary to weed the garden four times before harvest. They carried water from a nearby pond. Clearing the forest was probably the biggest job, they said, but the men did that.

We asked how they thought such a project might be improved in the future. "By guaranteeing them seeds," one said. The vegetables could be lost to cattle or some pest, and they would have no seed for the next season. We observed that several gardens in the community had been fenced to protect crops from marauding cattle from nearby ranches. Most farmers, however, cannot afford wire fencing. The women observed that marauding cattle were a serious problem for area farmers. Ranchers are a potent economic and political force in the Beni, and few of them have much sympathy for peasant farmers. As somebody had told us earlier, FEGABENI tried to channel emergency assistance to the evacuation of cattle rather than of peasant farmers during this year's severe flooding.

Several mothers were planting vegetables again this year--for consumption only, not for sale--but in family gardens. These mothers included ten of the fifteen who had participated in the communal effort last year; the five participating last year and present for the interview were among the ten. Again, CARITAS had supplied seed (a few of the women were experimenting with potatoes this year), and the mothers expected CARITAS to provide pesticides as it did last year. As one of the women noted, pesticides are necessary for vegetables. CARITAS had donated the seed in an effort to continue to promote vegetables, but there appeared to be no arrangement regarding pesticides at the time of our visit. This promotion is being conducted under the Alternative Foods component of CARITAS' Infant Survival Program.

IPDRE (a Swedish NGO, someone said) had also begun to promote vegetables in the community, giving seeds to those not belonging to the Mothers' Club. IPDRE promotes vegetables and works with health, we were told.

Before we left Casarabe, we visited a couple of family gardens. One, located beside a small pond and surrounded by barbed wire, measured about 1,600 square feet. The land had been cleared and the stumps removed. Its owner said she could plant here indefinitely if she occasionally fertilized the soil. (This may or may not mean chemical fertilizer; some of the women fertilized with manure mixed with crop residues.)

Sachojere (July 24)

About seventy families live in Sachojere, where we interviewed a group of thirteen women, several of whom belonged to the small, ten-member Mothers' Club. Most of the nearby forest belongs to local ranchers, and so is not available to community residents for gardens. Consequently, the men work largely as contract laborers rather

than as farmers, doing such as building and mending fences and corrals on local ranches. The daily wage is ten *bolivianos* ($2.57 U.S.) with food, fifteen without it. Families purchase most of their food, either in Trinidad or from traveling merchants. No more than a handful of families in the community own cattle, and then only a few head. The few gardens here have to be fenced because of marauding cattle. The women interviewed had some experience cultivating onions (scallions), peppers, and tomatoes when the project began.

The first need of the community, the women said, was for a new medical post to replace the present one, currently in great disrepair. The community also needed pipe to extend the potable-water system to more houses. (Built about ten years ago by CORDEBENI, this system had a pump and an overhead storage tank.) Among the community organizations in Sachojere was a Civic Committee, the Mothers' Club, and a Health Committee; the most active of the three was the Mothers' Club, the women said.

The mothers described the communal vegetable garden they planted as "for the betterment of our children." There were thirteen mothers in the club last year, and they planted 1.5 *tareas* (1 *tarea* = 100m. x 10m.). CARITAS provided them (on credit) seeds, pesticides, and soil disinfectants. The club had paid back the seed but still owed for the pesticides. By one account, the women had weeded six or seven times during the growing cycle (probably because of the garden's proximity to grasslands). They had applied foliar fertilizer (*abono foliar*) only once and only to lettuce; their fertilizer otherwise took the form of manure mixed with rice hulls and earth. They had no problems with theft, but had lost their cucumbers to rodents. They reported no pest problems that had not been controlled by pesticides, and noted that cabbage was the vegetable most prone to pests.

Producer families consumed almost all of the vegetables; only a small volume was sold, mostly in the community. These included tomatoes, peppers, and onions--the most marketable of the vegetables, the women said. They could not market in Trinidad because the rains made the road impassable.

All ten members of the club were again planting vegetables this year, in the same communal garden of last year. Sachojere was one of two communities among the twenty-one of last year that elected to continue planting communal gardens. Here, there was not enough available forest for individual gardens. The women planted for consumption, not for the market, and each worked a section of the garden, laboriously turning and mounding the earth to form elevated seedbeds (*tablones*). The women would use boiling water rather than chemicals to disinfect the seedbeds--a practice they had learned from the CARITAS agronomist. CARITAS had already provided the women with seeds, but they were unsure about arrangements for pesticides.

The women described a man in the community who had sown five hectares of tomatoes. Unlike other local men, he was a farmer rather than a contract laborer. He

also planted corn and rice, and had erected a fence to protect his garden from roaming cattle.

3.2.4.3 Discussion and Conclusions

The project planted a total of 9.83 hectares of vegetables in twenty-one communities, benefitting 321 families. Beneficiary families consumed ninety-one percent of total harvest and sold only nine percent (rather than the projected fifty percent). All of the training and technical assistance programmed by the project was delivered. Inclement weather, crop theft, a lack of viable marketing arrangements, poor roads, and limited labor help to explain project shortfalls in meeting goals and objectives (See Annex F for a summary of goals, objectives, and results. The evaluation team's agronomist prepared a technical report based on our visit, and this appears as Annex L.)

The project's final report cited its achievements (CARITAS/Beni 1991: 4-5). Participants learned to manage new vegetable varieties (onions--scallions--and tomatoes were grown when the project began) and diversified their family diet. Children, through their participation, learned to cultivate vegetables. This may prove to be a major achievement over the longer term. And the effort further strengthened the Mothers' Clubs. We agree with this assessment of achievements.

The terms of the credit program, which was to make the project sustainable, were very soft, yet evidence (no statistics available) points to widespread delinquency. In the two communities we visited, women had largely paid off that part of the loan covering seed, but they still owed for pesticides. In any case, the total per-capita amount of the loan did not exceed $5.00 U.S. The delinquency is explainable: the project intended for half of the vegetables to be sold, the other half to be consumed. But beneficiaries consumed instead more than ninety percent of the harvest (which was considerably less than projected for reasons given above).

The impediments to developing a viable agriculture-- certainly a commercial one--in much of the Beni are enormous. A fundamental problem derives from the department's official designation as a ranching zone, dating from the early 1950s and the inception of the Agrarian Reform. The reform itself favored local elites (and elites from outside the region, especially the military during the 1970s), who easily captured the reform machinery through political influence and graft. These elites have shown little concern historically for the region's numerous peasant farmers except as a source of cheap labor.

Today, few peasant farmers in the Beni have valid land titles. The destruction of gardens by marauding cattle continues to be a problem, as it has been for the past thirty years. When a small farmer loses his crop to these cattle, he has no recourse vis-a-vis the powerful ranchers. Any viable agriculture in the Beni thus awaits the prior resolution

of serious land-tenure and equity issues as well as the institution of rational land- and resource-use policies--and the political will (and strength) to enforce them. This fundamental problem must be resolved *before* there can be agricultural production in the ranching zones. The prior addressing of infrastructural and marketing constraints will avail little.

Many of the communities where CARITAS mounted the vegetable project have unstable populations: families drift in and drift out in response to natural and economic disasters and changing personal fortunes. There is little institutional continuity (the Mothers' Clubs may be the most stable institutions) and there is high personal insecurity--not an environment conducive to introducing change or sustaining project efforts. It is unrealistic to expect commercial vegetable production in this part of the Beni. Yet we are reluctant to pronounce the project a failure, especially given the small magnitude of resources expended.

The women who participated have learned to produce vegetables and continue to produce them; and although CARITAS continues to supply them with seed (donated; the arrangement for pesticides remains obscure), the women invest a considerable amount of labor to make and cultivate the gardens. This suggests their recognition of the value of vegetables, at least for the improved health of their children. The project's returns, we think, are intangible and lie largely in the future.

3.2.5 Small-Farm Milk Production (CARITAS/Beni)

3.2.5.1 Objectives, Organization Strategy

The goal of this small-farmer dairy project is to increase the income and improve the diet of small farmers in seven communities of Marban Province, Beni Department, through the production and consumption of milk products. The project will pursue this goal through the establishment of fifty small dairy farms, the training of beneficiaries in dairy management, the creation of an Agricultural and Livestock Committee in each community, and the strengthening of CARITAS/Beni so that it can formulate development strategies and implement and monitor project activities in the seven communities (see Annex F; see also Annex M for a technical report prepared by the evaluation team's agronomist). The two-year project began in October, 1991, and is to continue through September, 1993.

The project seeks to fill a nutritional as well as an economic void (half of the milk is to be sold, half to be consumed), in a zone where farmers produce and consume mostly rice, corn, and cassava. Households are unable to purchase foodstuffs, particularly meat (despite their proximity to a beef-cattle zone), with the result that malnutrition levels are high, especially among children under five. According to CARITAS' Infant Survival Program, malnutrition rates for this cohort are 39.5 percent in Marban Province.

Each participating family is to receive a pregnant cow three years old. But first, the family must establish one hectare of wire-fenced pasture (and 2.5 hectares later, to accommodate the cow and its offspring) and two stalls, one to shelter and milk the cow, the other to accommodate a brood bull during its visits. The project is to provide three brood bulls, each to be cared for by an experienced farmer who will be compensated in an amount adequate to cover maintenance costs.

[The dairy cows are to be the offspring of zebus crossed with Holsteins (this cross is called *Gyr-Holando* in the Beni). The Holstein, not well adapted to the lowland tropics, is an excellent dairy breed and provides the cross with milk capacity; the zebu, on the other hand, is a meat animal well adapted to the rigors of a tropical environment. *Gyr-Holando* cattle are really dual-purpose.]

The project is to be implemented through a revolving loan fund, which will cover materials such as wire fencing, staples, and veterinary products. The dollar-denominated loan will include the cost of the bulls as well as the transport of all animals to the project site. In payment for the pregnant cows, however, participants are to return the first offspring once it reaches three years of age; the females will then be impregnated and given to other farmers who wish to join the project.

The project is to create in each community an Agricultural and Livestock Committee to administer the revolving loan fund and provide follow-up and technical assistance to participants. The committees also are to coordinate milk marketing and the distribution and recovery of animals and other materials.

The project-design document (CRS/Bolivia 1991) also notes that CARITAS/Beni is in transition from a food-distribution entity (charity) to a development agency, and is thus trying to strengthen its administrative and technical capacity to that end. The project is to supply a technical person and is otherwise to enable CARITAS/Beni to broaden its institutional experience.

3.2.5.2 Observations

3.2.5.2.1 The Project Experience

Before we relate our observations from the two communities we visited, we first summarize the brief project experience using material from two project quarterly reports (CARITAS/Beni 1992a; 1992b) and from our talks with project implementation personnel.

By the end of its first trimester in early March (1992), the project had replaced three of the original seven communities with three more because of the prior presence of other development agencies. The project had completed its promotion phase in four of

the seven communities, where thirty-four persons had expressed an interest in the project. This modest interest, which CARITAS staff attribute to rural-urban migration, fell short of their expectations. Also, unusually heavy rains during the trimester slowed implementation, especially the planting of pasture grass.

In the second trimester, ending in early June, CARITAS/Beni promoted the project in the remaining three communities, and selected a total of forty-seven participants (rather than fifty; the remaining funds are to be kept in reserve for contingencies, such as the death of a cow) from the seven communities (see Annex F). To be selected, farmers had to be less than eighty years old, own their own land, have dependents, and desire to participate. The project began to organize the Agricultural and Livestock Committees during the period. Late rains continued to delay the planting of pastures.

The project staff includes a veterinarian (the only full-time project staff), who manages the project and is paid entirely from its budget. A promoter and an agronomist, both on the CARITAS staff, provide support and work part time on the project. Forty-five farmers participated at the time of our visit; forty of them, according to CARITAS/Beni, were active (the other five had no time to sow grass), and thirty-six had finished sowing pasture grass. The project is promoting *capin* (a portuguese generic term for "grass"), a grass (which grows taller than a man) that Beni ranchers commonly plant in their paddocks. *Capin* can be propagated either by seed or vegetatively; to save time, the project propagates it vegetatively.

The interest-free, dollar-denominated loans cover wire fencing, staples, veterinary products, and the costs of transferring pregnant cows and brood bulls. Farmers must repay the loans in cash--when the dairy operation comes into production, according to CARITAS staff, who say they have not yet decided on the loan's term. A couple of farmers we talked to, however, quoted a figure of two years. The grass farmers receive is to be returned in kind, and the first offspring of the pregnant cow must be returned to the project.

CARITAS/Beni must purchase pregnant cows for the project by the end of September at the latest. To purchase them later is to run the risk that the cows will not be pregnant, which would much delay the project. That MP might be late with its disbursement is a source of apprehension for CARITAS/Beni, which has already sent MP a letter of reminder.

There is an incipient Agricultural and Livestock Committee in each community, and the project plans in August to seek the creation of a Central Agricultural and Livestock Committee to serve as a nexus between CARITAS and the community committees. The idea is that the central committee will eventually assume the present role of CARITAS--and may also manage the loan fund, though much remains to be

worked out regarding the management of the fund; the project's main concern at present is production.

The community committees have three officers: a president, a secretary, and a treasurer. The committees' function is to plan activities and to coordinate collective work efforts--clearing lands for pasture, construction of stables. They will "guarantee the project's activities," as one CARITAS staffer said. Their precise role vis-a-vis the revolving loan fund remains unclear. CARITAS seeks to create a *mistica* that favors mutual help and collective effort in the project communities. Fifteen or so organizations work with farmers along the highway, we were told, usually with individuals; CARITAS, on the other hand, discourages *individualismo* and encourages farmers to work together.

According to CARITAS/Beni, Trinidad has a small dairy firm owned by the *Fondo Ganadero.* The firm, apparently organized along the lines of a cooperative, is said to operate well below capacity. This firm does not seem to figure in CARITAS' plan for the project. But again, the thrust of the project thus far has been on production; marketing has received less attention. Some of the farmers we talked to, though, had thought about marketing; we discuss their views below.

3.2.5.2.2 Community Visits

Six of the project communities lie on the Trinidad-Santa Cruz highway; the seventh, Poza Honda, lies on a secondary road five kilometers from the highway. The most distant from Trinidad is Sudamericano, at 120 kilometers; the closest is Nuevo Horizonte, at eighty-four kilometers. All lie in Marban Province.

This zone is a transition area between the *pampas* and the heavily forested zone of San Pablo to the south. (See Section 4.2.1.2.1 for a description of San Pablo, and Section 3.2.4.2.2 for a description of Beni physiography.) Although the zone is forested and removed from the *pampas*, much of the land is low (with *bajuras* and *curiches*) and flood-prone and thus unsuitable for agriculture. But *capin* grows well here, making the zone agroecologically well-suited for the project.

By one estimate, ninety-five percent of the farmers in the zone are lowlanders, or *cambas*, many of them refugees from flooding along the Mamore and other rivers during the 1980s, when most of the project communities were founded. Farmers in the zone typically have fifty hectares of land, in the form of piano keys along the highway or of recessed strips parallel to the highway and about five kilometers distant. Farmers do not live in nucleated settlements, but rather are dispersed on their properties, where they cultivate on average two hectares per year.

We conducted group interviews with farmers in two communities. We interviewed nine persons in Nueva Creacion de Cotoca, and twenty-one persons in Santa Rosa; both communities are about two hours by road from Trinidad.

Nueva Creacion de Cotoca (July 30)

Thirty-four families belong to Nueva Creacion de Cotoca, founded in 1981 and whose name until recently was Trigal. Most of the families are refugees from flooding along both banks of the River Mamore, where they planted sugarcane, cassava (*yuca*), rice, and plantains in alluvial soils. Each family has fifty hectares, but not all of the holdings are titled. The lands are adequate for corn, sugarcane, and rice, but are generally too low for cassava and plantains. They are ideal for pastures, however, as one farmer reminded us. Farmers sell mostly corn and rice, especially rice, which they market in Trinidad. We conducted a group interview with nine persons. Six families here participate in the project.

According to the farmers, the project had supplied participants with capin, fence wire, and staples. All participants had sown one hectare of *capin* (in May), which they were familiar with, and were now erecting fences. The grass would be ready before October. *Capin* required no maintenance once established (but had to be kept free of weeds until then), they said. One old man with considerable experience tending cattle said that you could also feed the cows sugarcane, corn stover, and other crop residues. "The cows will not suffer here," he assured us.

We asked farmers present what they liked about the project. One compared it to the state Agrarian Bank (now defunct), which he said charged ten percent interest; some of them had borrowed from this bank to produce traditional crops. Unlike the project, which charges no interest, "The bank was a business," he said. Another said that the project would provide milk in the morning for their children. Most families consume only wild meat from the forest--peccary, *jochi*, deer. When they first arrived, there were peccary herds in the area, they said, but the growing human population had since driven the herds deeper into the forest. Farmers now typically spent two days hunting, which disrupted agricultural routines.

The community had an Agricultural and Livestock Committee officered by a president and a secretary, we were told. The president organized and supervised group activities, and the secretary recorded the minutes of weekly meetings (on Saturday). The committee was responsible for the project--for the loans, someone said. The loans covered fence wire and staples, were interest-free, and had to be paid off within two years. The project did not channel these materials through the committee, but rather delivered them to each participant's house. The cost of the wire, the staples, and the delivery came to sixty-eight dollars.

We enquired of those present whether they planned to market milk. According to one man, they did not; they were too far from any market. Instead, they planned to make cheese, which could be kept for several days. They would gather milk in the late afternoon from participants, he said, and would make cheese collectively. They would sell the cheese in Trinidad, or anywhere there was a demand.

We asked farmers why there was not more interest in the project. Some families worked the land of others, we were told, and some had no title to the lands they occupied. Such families could not make commitments. One man estimated that five of the community's thirty-four families worked the lands of others.

We asked how the project might be improved. "By providing resources," came one vague reply. For some, this meant extending more credit. We heard complaints about the time farmers lost hunting for meat in the forests. We learned that heavy rains and flooding had destroyed much of this year's crop. The flooding had made insect pests worse (the insects took to high ground, where the crops were), especially the *petilla*, an insect that attacks rice.

Santa Rosa (July 30)

Founded in 1982, Santa Rosa has fifty-five families, almost all of them lowlanders. Many came as refugees from flooding elsewhere. Most families have fifty hectares of land, though a few have only twenty-five; lots were halved to make room for more families. None of the farmers have titles, though several have begun the application procedure. Farmers plant rice, corn, cassava, and plantains; rice is the major cash crop. Twenty-one persons (including several women) attended our group interview, including all of the community's fourteen project participants. Santa Rosa has the largest number of participants (see Annex F).

We asked farmers to compare the quality of the lands here with those near San Pablo, where we had visited previously (see Section 4.2.1). Santa Rosa's lands were average (*regulares*), we were told; there were lots of low areas (*bajuras* and *curiches*) here. There were extensive high areas in San Pablo, and the soils were soft; you could easily plant cassava and plantains there. Here, the soils were hard; a plantain grove would last only one year, after which the winds caused the plants to lodge.

Santa Rosa's first need, residents told us (the women were more vocal on this question), was for a *colegio* (high school). They had *basico* (primary) and *intermedio* (secondary), but students had to go to Trinidad to attend high school. The community also needed potable water; residents drew water from ponds along the road (made by highway equipment). And they needed health education and supplies, their children were malnourished; they had a medical post and a nurse, but there were no medicines.

All participants had sown pasture grass (*capin*) and were now, gradually (they had other things to do as well), erecting wire fences. The grass was growing slowly because there had been no rain for two months. They had received the fencing through a project loan, interest-free and to be paid back within two years. Like most Beni peasants, these had experience with cattle working as *peones* on local ranches, where they built and mended fences and corrals, castrated bulls, sowed paddock grass, and engaged in other sundry labor.

We asked participants what they most liked about the project. Their children were malnourished, they said, and the cow would provide them with daily milk. The project would help people in general to improve their diet, one woman said, and thus "to live better" (*vivir mas mejorcito*). (As in the previous community, farmers here depended on wild game for meat.) Respondents also noted that the project did not charge interest; other institutions came to the community, but they charged interest, leaving people worse off than they were before. PDAI entered the community in July of last year with a milk project, we learned, and had provided one family with a calf, which must have been in very poor condition--"It looked like a sheep," one woman said. But the receiving family had nurtured the young cow (called *moza*) to health and she was now pregnant. The owner showed her to us to prove that farmers there knew how to care for cattle. The animal had a fine appearance.

There was an Agricultural and Livestock Committee in the community, but it did not meet often because people were busy, farmers said. Officers included a president, a secretary, and a treasurer. The president's role was to see that everybody worked, we were told. But each beneficiary worked alone; farms were too dispersed to make collective efforts feasible, respondents said. And the committee had no role vis-a-vis the revolving loan fund.

We asked participants how they planned to market milk. They were too far from Trinidad to market it there, they said, so they would make cheese. And they hoped to sell (or barter) dairy products in the community.

We also asked why there was not more local interest in the project. Because many farmers had no time, respondents said. It took time to sow grass and erect fences, and farmers here had no machinery; they did everything by hand.

Last, we asked how farmers thought the project might be improved. By providing a chopping machine (*maquina picadora*) so that different grasses (including sugarcane) could be chopped and mixed, thereby enriching the cow's diet and improving its milk production. And if the cow ate a rich mixture of chopped grasses, they said, it would not have to roam the pasture, where tabanid flies would make it nervous and reduce milk production. Farmers also cited vampire bats as a cattle nuisance and thought the project should look for ways to deal with this problem.

3.2.5.3 Discussion and Conclusions

This project effectively began in January of this year and was slowed somewhat by prolonged and unusually heavy rains. Nonetheless, project staff are in place, including a veterinarian (and project leader), and forty-five farmers in seven communities are participating. Most participants have completed sowing pasture grass and are now erecting wire fencing (see Annex F for details; and see Annex M for a technical report prepared by the evaluation team's agronomist). The project plans to purchase the pregnant cows by the end of September at the latest, and has already alerted MP so that it can make a timely disbursement. The timing of this purchase is critical; a delayed disbursement would set the project back substantially.

The project squares especially well with the agroecology of its location and responds to a felt need of residents there. We found the participants whom we visited to be enthusiastic about the endeavor, and we were pleased to learn that they had pondered marketing issues as well as had some sound ideas about how the project might be improved. We think the project is well designed and that its staff are competent; we think the veterinarian, who is the project leader and key technical person, is especially good. CARITAS has not yet fully worked out all the details regarding the repayment of project loans, or considered in much depth the project's marketing aspect, but these concerns can come later; the emphasis now is on production, as it should be.

The duration of the project, which ends at the close of September, 1993, is only two years. If the three-month pregnant cows arrive on schedule in September, 1992, they will have given birth by the first of April, 1993. The project ends six months later. It will take longer than this for substantial results to be achieved. Marketing arrangements, on which loan repayment depends, will probably come about largely through trial and error, and this will take time.

We think this is a good project, one with the makings of success.

3.3 Discussion and Conclusions

All CARITAS (the Latin term for "charity") in Bolivia are now in transition from social-service agencies to development ones (CRS 1991: 9). CARITAS' prior *institutional* experience with "development" in the case of the five projects we evaluated was brief; in no case had it much exceeded two years. We think CARITAS' long use of food incentives, which lead farmers to expect free services, to some degree compromises its development efforts during this transitionary period.

We observed that the staffing on CARITAS projects tended to be "thin" relative to what the projects sought to accomplish. But we also observed that the funding level of

those projects tended to be modest--less than for the other projects we evaluated. We think there is a relation between staffing and funding levels.

We also found a tendency for agricultural production projects to be overly ambitious, certainly in relation to funding and staffing levels. Sometimes we found them to pursue unreasonable objectives, often among very poor people and in zones extremely refractory to agriculture. To stabilize agriculture by checking the pace at which farmers cut and burn the forest, an aim of two projects in Santa Cruz, is a formidable goal, one lying beyond the reach of an NGO. It is also unrealistic to expect farmers to grow vegetables (or anything else) for the market in the Beni's cattle zones, where suitable forest is limited--and in any case, already belongs to the ranchers--and marauding cattle enter the gardens. That project objectives did not always fit the setting is probably explained by CARITAS' mandate to help the poor.

Related to the matter of matching objectives to project setting is the length of life established for projects (at least for their funding). In none of the five projects we looked at did MP provide funding for more than two years. It is most difficult to achieve much in agriculture in only two years--even under ideal weather conditions, which have in no wise prevailed during the lives of these projects.

All but one of the five projects we evaluated employed revolving loan funds, and delinquency rates in three of the projects were high, ranging from thirty-three to forty-seven percent. Yet they were no higher than were the rates for other projects we looked at. Weather alone (which has been unusually severe over the past two years) would have make for high rates, though volatile market prices and poor transportation sometimes also played a part.

CARITAS prizes and promotes mutual help among project beneficiaries; individualism is unrewarded and discouraged. In each of the four agricultural production projects we visited, we observed this theme, which sets CARITAS apart from the other NGOs. It is the logic behind each project-sponsored beneficiary organization in the communities--and probably behind all Church-sponsored community-level organizations. CARITAS sometimes structures its projects around this ideal of mutual help. Communal credit guarantees, whereby all members are liable for the debt of each, is one instance.

Quite apart from the ideal's inherent value (and its importance to group survival), mutual help (or collective effort) enhances the efficiency of certain tasks--clearing forest, building houses, harvesting rice, to name a few. But its logistics must be feasible and must confer concrete advantages to each participant. If these conditions are not met, no amount of indoctrination regarding its virtues can make it a reality. The making of a communal vegetable garden, or the use of collective labor to sow pastures or build fences, may not be feasible from the point of view of project participants in a setting where households are highly dispersed. The logistics of mutual help must be carefully considered before it is advocated or designed into projects.

Given the presence of the Catholic Church throughout the country, and given its commitment to helping the poor and its marked influence at all levels of Bolivian society, we think CARITAS has an important role to play in development.

4. ADVENTIST DEVELOPMENT AND RELIEF AGENCY (ADRA)

4.1 Strategy and Organization

Founded by the Seventh Day Adventist Church to promote community (and individual) development and provide disaster relief, ADRA began working in Bolivia in 1964 as OFASA, distributing food, clothes, medicines, and other items to low-income peoples. The agency's fundamental objective and world mandate is "to develop the poor through physical, mental, social, and moral change" (ADRA 1991: 10).

ADRA has implemented activities in Bolivia since 1983 using "food-for-work" (PL-480, Title II). Agriculture and health have been key program areas since 1986, but ADRA did not implement agricultural production projects until 1987. For most of the period since 1983, the agency implemented an array of highly dispersed and unrelated activities, poorly monitored and little coordinated. This strategy yielded three years ago to an integrated approach, with interrelated and coordinated activities concentrated in a small geographical area (ADRA 1991: 2-3). In 1991, ADRA improved its planning, monitoring, and evaluation procedures (ADRA 1991: 2). The two projects we evaluated follow the new strategy, which, according to one staffer, marks the beginning of ADRA's "development" work.

ADRA has grown from a full-time staff of six in 1983 to one of 160 today. The institution works in four program "sectors" in Bolivia: Agriculture and Livestock, Health and Nutrition, Rural Infrastructure, and Urban Infrastructure. ADRA's organization chart (see Annex I) shows four program areas, which include the four sectors above as well as a Small-Enterprise program area.

4.2 Projects Evaluated

4.2.1 San Pablo Integrated Rural Development (ADRA/Trinidad)

4.2.1.1 Objectives, Organization, Strategy

The goal of the San Pablo Integrated Development Project, which began in October of 1991, is to increase agricultural production and income as well as to improve nutrition and reduce infant mortality among residents of seven communities (now expanded to twelve) of Marban Province, Beni Department. This is to be achieved through activities falling into five programs (which ADRA calls "projects"): Child Survival, Traditional Crops (rice production), Vegetable Production (both commercial and

family gardens), Tree Nurseries (citrus and hardwoods), and Infrastructure. Annex F contains numerical expressions of the project's goals and objectives as well as of the degree to which they were met as of September 30, 1991. Our evaluation team's agronomist prepared a technical report based on our visit, and this is included as Annex N.

ADRA sets objectives for each fiscal year, and in its annual reports provides comprehensive numerical data on the degree to which they have been met. There are no numerical objectives for the life of the project; indeed, the term of that life has remained open until recently. Project staff now talk casually of five years, but this does not seem to be a figure that much influences programming or planning. ADRA's avowed strategy is to withdraw gradually, in the measure that communities can continue project activities on their own.

The project promotes vegetable production at the home-garden and the commercial level. Home gardens are part of a health and nutrition thrust, whereas commercial production seeks to increase family incomes, which average about $260 U.S. per year and derive mostly from the sale of rice and corn (ADRA 1991: 15). (A few individuals work at a nearby sawmill owned by INMABOL.) The improvement of traditional rice cultivation and the introduction of citrus and hardwoods also seek to increase family incomes. Home vegetable gardens are intended to address chronic malnutrition and vitamin deficiencies, especially among young children, caused by a diet of mostly rice, corn, cassava, and bananas.

Health improvement is an important part of the project. Infant mortality rates are in the range of 160 per 1,000, and infant malnutrition rates approach forty percent. Only fifteen percent of children five years old or less have had vaccinations for preventable diseases. When the project began, there was no primary health post in the area. Residents did not know about oral rehydration therapy or the management of acute respiratory infections--in a region where diarrhea and respiratory infections are major causes of childhood morbidity and mortality (ADRA 1991: 13-16).

We had too little time to evaluate the health program, which has been active throughout the project zone. (We evaluated selected aspects of the health program in ADRA's Gonzalo Moreno project, however, and feel that some of the issues we raise in that chapter may have bearing here.) Its objectives and results for FY 1991, however, are summarized in Annex F. Nor did we look much at the project's infrastructural program. Statistics on that program are also included in Annex F. But the medical post has been completed and is in service, and staff quarters are nearing completion.

The project team--and they speak of themselves as a team--consists of a medical doctor, a nurse, a general promoter, a nutritionist, and an agronomist (who functions as team coordinator). These persons spend twenty-two days working in the project zone, followed by eight days of leave. Leaves are staggered so that somebody is always in the

zone; there is always a medical presence, we were told. Both the promoter and the nutritionist reside permanently in San Pablo. With the project's inception a year and a half ago, ADRA began to base staff in the zone rather than in a regional town like Trinidad, from which they would commute. This policy has made for a much more effective project, according to one staffer.

The ADRA team visits--as team--each community at least once per month (in accordance with monthly work plans), with each staffer attending to his own program. These visits typically last for a day, we were told. Visits can be made by any team member at any time, however, should the need arise. Health and nutrition efforts have focused on Mothers' Clubs; in each community, the project has trained one person (an "RPS), usually a woman, and made her responsible for health.

Like several of the other projects, this one has worked with revolving loan funds to enable the production of commercial crops. With the loans, made in kind rather than in cash, farmers acquire seeds, pesticides, backpack sprayers (and protective gear), and fertilizers to produce rice, beans (added to the project this year), and vegetables. The first loans were made in April, 1991, for vegetable production. The loans, which are interest-free and dollar-denominated, fall due upon harvest and must be repaid at constant dollar values. Loans for vegetables must be repaid in cash, but, as a result of a recent policy change, loans for rice can be repaid in rice or cash. Input prices do not include administrative or transportation costs.

The project lent $908 U.S. to produce vegetables in 1991. As of June 30, 1992 (seven to ten months after the 1991 vegetable harvests), farmers had repaid $485--a delinquency rate of forty-seven percent. This delinquency is attributable to heavy rains at the time of seed-bed preparation, to drought during the winter growing season, and to a drop in tomato prices (in Trinidad) caused by a market glut. The project lent $1,042 U.S. ($780 for improved seed, the rest for chemicals) to produce rice during the 1991-92 summer season. As of June 30, 1992 (three to four months after harvest), farmers had repaid $258--a delinquency rate of seventy-five percent.

The delinquency here is attributable to this year's heavy rains during the growing season; moreover, according to a project staffer, farmers were using their rice earnings to plant vegetables this year (gambling on a return sufficient to pay off both rice and vegetable loans, presumably). Farmers continue to pay on the loans, we were told; and delinquent farmers who received loans this year had to agree to pay off both loans.

The project has tried to reinforce pre-existing community organizations, bending them to its ends. These organizations typically take the form of a committee consisting of a president, a secretary, a treasurer, and two *vocales*.

As with other projects we observed, late disbursements from MP had interfered with project implementation. The project did not receive disbursements in time last year

to purchase rice seed, with the result that farmers planted late and thus missed the usual second harvest (the *soca*) when the rains stopped. Also, slow disbursements in FY 1991 delayed the construction of the medical post and of staff housing (ADRA 1991: 18). These late disbursements led MP to pressure the project to spend the funds before the end of the disbursement period.

4.2.1.2 Observations

4.2.1.2.1 Introduction

The project has worked to date in twelve communities (in Marban Province) on or near the Trinidad-Santa Cruz highway. San Pedro, largest of the twelve and the zone's hub, is 150 kilometers distant from Trinidad--a trip of about two hours and forty-five minutes in the winter dry season, when the road is good. Five of the twelve communities, including San Pablo, lie along the River San Pablo, which divides Beni and Santa Cruz Departments.

Unlike the central Beni to the north, the San Pablo zone is higher and extensively forested; there are no nearby *pampas*, no seasonal flooding, no cattle ranches or problems with marauding cattle plundering gardens. Soils tend to be more pliable than those near the *pampas*; cassava and plantains grow well here. (See Section 3.2.4.2.2. for a brief description of Beni physiography.) The zone is thus suited to slash-and-burn agriculture, which is the local production mode. Farmers typically clear forest--one and a half to two hectares--in June and July and burn in late September or early October.

The zone is new to settlement. San Pablo, oldest of the communities, was founded in 1982; most of the other communities were founded within the past five years. By one estimate, seventy percent of the zone's population is lowland, or *camba*, and twenty percent is highland, or *kolla*. Many of the lowlanders came as refugees from flooding along the Beni's rivers during the 1980s. The *kollas* came as refugees from severe drought in the uplands and to escape Bolivia's general economic debacle of the past decade. The Trinidad-Santa Cruz highway, which neared completion in the mid-1980s, further attracted settlers. Families here typically have fifty hectares of land; many of them have already obtained legal titles through *sindicatos* (which subsequently seem to have become defunct), but others have only applied for titles, which are said to be "in process."

One early lowland settler, a Trinitario Indian, arrived with his wife from San Lorenzo (Moxos Province) in 1981, when only a handful of families lived in what is now San Pablo. There was no road then, the Trinitario said, though the ride-of-way had been cleared. There was little forest near San Lorenzo, where he had no land and where cattle plundered the gardens. There, where he worked as a *peon*, the ranchers owned

everything. He preferred life in San Pablo, where he had land: "Here, one earns more," he said.

The zone exhibits the rude dynamism of a tropical frontier. Ramshackle plank stores and restaurants, operated mostly by highlanders, line the dusty road through San Pablo. Cargo trucks and night buses motor along this road on the thirteen-hour trip between Santa Cruz and Trinidad. There is *movimiento*, or bustle, in San Pedro, and a seeming air of hope among the zone's residents--as well as an apparent level of affluence that we did not observe in other areas of the Beni. ADRA chose this zone to mount a project because of its "potential," we were told.

The project has worked with nutritional gardens and health in all twelve communities, with rice (a new variety, *Cica 8*) in eight communities (those along the highway; a few river dwellers received pesticides for traditional rice), with beans in nine (on a small scale, to stimulate interest), and with commercial vegetables in two communities (San Pablo and Loma del Amor). On July 27th and 28th, we conducted individual interviews with eight farmers in three communities (San Pablo, Verano, Loma del Amor), and group interviews with five farmers in two communities (San Pablo, Loma del Amor).

We have organized the material below by program rather than by community visited. There are communities with only one or two programs (with rice, say, but no commercial vegetables), and a given farmer may participate in one program but not in another. And we have elected to consolidate the information we gathered from three sources: observations and interviews during site visits, talks with ADRA staff, and project reports.

4.2.1.2.2 Programs

4.2.1.2.2.1 Vegetables

Home Vegetable Gardens

The promotion of home vegetable gardens, cultivated during the winter dry season, has been part of the project's health and nutrition thrust. This promotion has focused on Mothers' Clubs, but participants have produced in individual gardens rather than in communal ones. The greatest concentration of these gardens is in and around San Pablo, where most of the people are.

According to ADRA's FY 1991 annual report, the major problem affecting vegetable production was drought. And this year (1992) a seed shortage (because of delayed disbursements) as well as seed-bed damage from heavy rains extending into the winter season had resulted in low production.

Seeds cost $1.50 to $2.00 per garden, an amount the project has extended to the women on credit. Rather than incur the risk of distributing pesticides to each family, the project has designated (and trained) a man in each community to apply them to the gardens as needed. Participants are charged about $0.13 for each application. Despite the small amount of the seed loan, the project has recovered about half of these loans made last year. ADRA staff speculate that because other institutions (IPDRE and CARITAS were mentioned) have distributed home-garden seeds free in the community, farmers do not feel obliged to return the money. In the interests of promoting home vegetable gardens and improved nutrition, the project has not aggressively pursued repayment.

Visit #1 (July 27)

We first interviewed a woman who (with her husband) had settled in San Pablo from rural Santa Cruz so her children could be near a school. She had prepared a garden this year, in the same place as she had last year, and had sown, among other things, cabbage, radishes, carrots, tomatoes, and lettuce--what the children most liked, she said. She had planted soybeans along one edge of the garden; the project nutritionist had taught her how to make soybean milk (*leche de soya*), she said. She also made soup from radish leaves.

The woman had fertilized this year with compost (*palos podridos*) rather than with chemicals. According to the project agronomist, these small gardens could be fertilized year after year in this way, without a need for commercial fertilizers. The woman had problems with worms attacking the cabbage last year; a project technician came to look at the problem, but there were no pesticides then available. Cabbage and tomatoes were the vegetables most attacked by pests, she said. But not everybody had trouble with pests, she added.

This woman laboriously carried water from the River San Pablo, at some distance from her garden. Onions required a lot of water for the heads to form, she noted.

Visit #2 (July 27)

We interviewed another woman who had settled in San Pablo four years ago with her parents; they were from Santa Ana (Yacuma Province), but had been living in Trinidad. They had come to San Pablo for want of "economic resources" in Trinidad, she said. She had since married and now had small children.

She had planted peppers, tomatoes, cabbage, lettuce, and onions last year. A pest (*pasmo*) attacked the peppers and the tomatoes, but she saved them by spraying pesticides. The man in her community charged by the project with this task had lent her the sprayer. She did not, she said, wear a mask or gloves.

This year she had planted carrots, radishes, leaf lettuce (*acelga*), beans, tomatoes, peppers, and onions. We asked her why she had not planted this same full array of vegetables last year. She did not know about some of them, and she was pregnant, and so had less time to garden, she said.

She had recently attended classes taught by the project nutritionist, and she talked about bean cakes (*tortas de frejol*), squash bread (*pan de joco*), and corn pizza (*pizza de maiz*). But she had not prepared any of the dishes. She also acknowledged the value of vegetables because of their "vitamins, protein, and calcium."

She complained about the labor involved in watering the vegetables. She carried water from the River San Pablo and from a pond near the highway that road-equipment operators had made for the community. She watered the garden in the afternoon so less water would evaporate; the task often took an entire afternoon, she said.

Commercial Gardens

Most of the project's commercial vegetable gardens are in or near San Pablo. And most of the commercial vegetable farmers are *kollas*, or highlanders, many of whom arrived with some experience in producing and marketing vegetables. Like home garden vegetables, commercial vegetables are grown during the winter dry season.

The major obstacle to commercial vegetable production last year was drought; tomato and watermelon yields suffered from a lack of irrigation (ADRA 1991: 16). Not all of the commercial gardens were near a stable water supply, one farmer told us. A few were near the river and their owners owned a pump. The drought, coupled with a drop in tomato prices in Trinidad caused by a market glut, led to a high delinquency rate on vegetable loans. The project granted loans to farmers again this year on condition that they agree to repay last year's loans soon. It also modified its repayment policy to allow payment in non-perishable produce as well as in cash. And to avoid another price drop, the project now advocates the staggered planting of vegetables, especially of tomatoes.

Before we visited the project zone, we took a quick spin through the market in Trinidad, the major market center for all of San Pablo's produce. One highland vendor had an especially attractive display of fresh vegetables. Upon inquiry, we learned that they had come from Cochabamba, via Santa Cruz. We asked if vegetables produced in the Beni were sold in the market and were told that tomatoes sometimes arrived from San Pablo. We later learned that San Pablo was recognized in the region as a tomato-producing zone.

Visit #1 (July 27)

In an interview with three farmers, we learned that an Association of Vegetable Producers had been established in San Pablo last year at the project's behest. Composed of fifteen members (all highlanders but one), the association is to regulate and coordinate the sale of vegetables in Trinidad, where farmers were selling peppers, tomatoes, green beans (*vainitas*), and cucumbers. One of these farmers had planted one hectare and a half of tomatoes and peppers (mostly tomatoes) last year, a half-hectare at a time. He had planted the first half-hectare in early March, the second in April, and the third in early August, harvesting the crops three months later. He had sold the first two batches for 10 Bs. (about $2.57 U.S.) per 20 kg. crate, and the third batch for 15-18 Bs. per crate. But his total earnings from the third batch had been less because early rains had diminished the harvest.

This same farmer typically cleared forest in June and sowed rice and corn in September. After these were harvested, he planted vegetables on the same land before turning it to fallow for three or four years. After a single vegetable cycle, the land is dry and hard and very susceptible to insect pests, and so will not support vegetables again before a fallow, he said.

Visit #2 (July 28)

For our next interview, we took a small launch down the River San Pablo along which several of San Pablo's vegetable farmers have their gardens (though the owners continue to reside in San Pablo). (These are not the river communities where the project has been active.) After a half-hour, we put in at a small landing, where we observed several empty tomato crates strewn on the ground. The farmer here is from Cochabamba and came to San Pedro three years ago from Trinidad, where he had worked as a petty trader. He bought the fifty unworked hectares along the river in 1990 for 400 Bs. (about $100 U.S.) from another *Cochabambino*, who had received the land free from the government. He estimates that the land is now worth $1,000 U.S. (The seller violated Agrarian Reform laws, which forbid the sale of unworked lands. Such lands are to revert to the State after two years.)

This farmer had parceled out half-hectare lots among four families, including his own. The other families, his landless relatives from Cochabamba, spent seven or eight months of the year in San Pablo working vegetables as *partidarios*, or sharecroppers. Each family received half of the vegetable harvest from its half-hectare, and the owner supplied food, seed, and chemicals (obtained on credit from the project). The families shared their labor.

Last year, this farmer planted 1.2 hectares of watermelon, tomatoes, and peppers for sale. He sold seventy-five percent of the produce in Trinidad, the remainder in Santa Cruz; the market becomes saturated in Trinidad, he said, and you have to take produce to

Santa Cruz. He still owed the project about half of the amount he had borrowed last year. His uncle across the river works closely with him and received seeds and chemicals through the same loan. But a costly illness then struck the uncle, who was unable to pay back his portion. The farmer hopes to pay everything back this year from the sale of tomatoes, watermelon, and peppers.

Last year, this man planted corn and yuca on the same land where he had recently harvested vegetables. Before he could plant vegetables again on the land, it would have to lie fallow for at least two years--and even then, he would have to use chemical fertilizers. (He had received fertilizers as part of the project loan.) Vegetables must be planted on fresh land every year, he said, gesturing to the nearby forest where he would clear for another round of vegetables. We asked him to estimate the minimum amount of total land he would have to have in order to produce vegetables commercially year after year. About three hectares, he replied, but using chemical fertilizers.

The vegetable most prone to pests was the tomato, he said, which was very delicate. But the most serious problem confronting vegetable producers was drought, followed by *surazos*, or strong southern winds which bring sudden temperature drops during the winter dry season. These cold winds "burn" the leaves (causing them to wilt), especially of tomatoes. The project plans, we learned from ADRA, to provide a total of five pumps, to be purchased by farmer groups on credit through a revolving fund. To reduce costs, *tacuara*, a local bamboo, could be used for pipe. (Later in the day, we saw such a pump in operation along the river.)

We saw a half-hectare planted in tomatoes and peppers (mostly tomato; only a *tarea*, or 0.1 ha. in peppers), and the farmer planned to sow another half-hectare of tomatoes this year, to sell in Trinidad. In a nearby area, he had also planted an extensive (0.9 has.) watermelon patch, which he watered, plant by plant, with large tins carried from the nearby river. Some of the leaves were wilting--from the recent *surazos*, he said.

Visit #3 (July 28)

Just across the River San Pablo, on the Santa Cruz side, lies the farm of the above farmer's uncle, who was not present at the time of our visit. Instead, we talked with a sharecropper (and with the nephew) who was tending the owner's extensive vegetable garden. In return for his labors, the sharecropper received half of the harvest, but also had to pay for half of all the chemicals used.

The *partidario*, or sharecropper, unrelated by kin to the owner, was a young man from Sucre. He had spent twelve years in the Chapare, where he worked coca and still owned five hectares of land near Isinuta. He had left the Chapare in 1986 and had worked in Sucre and Cochabamba until 1991, when he arrived in San Pablo. He was illiterate, spoke halting Spanish, and had worked in the upland cities as a brickmason and

vendor of coca leaves. He stopped selling the leaves when authorities told him he would have to pay $1,200 U.S. for a license, which would have to be renewed every two years. He had left the Chapare with his mother, after she was struck by a serious illness--and also because he was having domestic problems with his wife. His family did not want him to return to the Chapare, he said, so he came to San Pablo looking for work. He hopes to accumulate enough money to buy land in the area.

The owner of the land had planted 1.5 hectares of vegetables--all tomatoes and peppers (only 0.05 has. of peppers). He had planted only a hectare of tomatoes last year, which he sold in Trinidad. This year, he had stagger-planted the tomatoes and would harvest them six times as part of a strategy to obtain a good market price.

Visit #4 (July 28)

The highland owner of this garden, also near the river, was absent at the time of our visit, so we gathered information from a neighbor and close friend of many years. The salient feature of this garden was that all the felled debris had been removed, a most unusual state of affairs among peasant farmers. We soon learned that the man had a small tractor with which he had cleared the boles and stumps. And he also owned two trucks, which he had bought used over the years, and transported his own produce to market in Trinidad, Guarayos, and Santa Cruz. With the vehicles he worked as a *transportista* (and middleman, or *rescatador*), carrying the produce of other farmers to market. This man clearly had considerable capital by local standards.

From about 1978 to 1982, the farmer lived in Naranjito, near Trinidad, where he grew and sold vegetables. When he needed money, he worked in Trinidad as a brickmason and motorcycle taximan. But the lands in Naranjitos were dry and otherwise unsuitable for agriculture, so he left in about 1982 for the Chapare, where he worked for a year before settling in San Pablo in 1984.

He had paid off his loan from the project last year and had purchased inputs this year with cash. The project agreed to sell him enough inputs for one hectare of vegetables. But he had already sown two and a half hectares, and planned to sow another two and a half before the close of the season. This he could well do, for he had several *partidarios*, or sharecroppers working for him.

This farmer had reached a point that few peasant farmers reach: he had accumulated enough capital to break free of the poverty cycle and secure for himself a secure place in the market game. A truck alone gives him an enormous edge in marketing his own produce (to own a truck is a dream of many highland farmers), and lets him further increase his capital through haulage fees and through trading as a middleman.

Visit #5 (July 28)

This farmer, whose garden lay near the river, came to San Pablo about five years ago from Cochabamba, where he had grown tomatoes in Punata (in the High Valley). He left there because of severe drought. He had first grown commercial vegetables--tomatoes, potatoes, peppers, and green beans--in San Pablo in 1987, but only on a small scale; then, he had no capital to buy seeds or chemicals, he said.

Last year, he had sown three *tareas* (a *tarea* = 10 x 100 m., or 0.1 has.) of tomatoes, two of peppers, two of potatoes, and one of green beans. He had sold everything in Trinidad, but the price was low, he complained, because everybody sold at the same time. His potatoes had fetched him more than his tomatoes. He had purchased all of his seeds in Cochabamba, but had obtained pesticides from ADRA on credit, which he paid off last November. He noted with obvious satisfaction that the loan was interest-free.

This man had stagger-planted tomatoes this year: seven *tareas* in April and seven more in mid-June. He wanted to plant another five before the season ended (he wanted to make the seedbeds now, but complained that there was no seed). Tomatoes, he said, were his only source of income. He had obtained seed for the first planting from Cochabamba and for the second from ADRA. ADRA's seeds were cheaper, he said, and gave better yields. And they came from the United States, whereas those from Cochabamba came from Brazil. He had purchased chemicals this year in Cochabamba, except for a liter of foliar fertilizer (*abono foliar*), which he had bought (on credit) from ADRA.

This man had cleared for this year's vegetables an area that had lain fallow for three or four years, he said. He had not fertilized the soil, but rather was applying only foliar fertilizer. He would have to clear again to plant vegetables next year; one cannot plant vegetables twice in succession on the same land, he said. (ADRA's agronomist told us that the project wants to insert beans in the cycle in order to renew the soil.)

This farmer had planted *mukuna* on a small piece of land where *sujo* had invaded. (*Sujo* is a thick grass from the *pampas* that renders Beni gardens useless--until the forest regenerates and kills it--once it enters. It is *sujo* that causes many farmers to abandon a garden clearing.) *Mukuna* is a legume with a hard sheath and a white, non-edible bean. According to ADRA's agronomist, IBTA (through CIAT) had introduced the Australian legume (which can serve as a forage) in Santa Cruz five or six years ago to deal with the "fallow crisis." It quickly spreads over the ground, killing any grasses as well as keeping the forest back. And as a legume, it rejuvenates the soil. Another farmer had recommended that this man sow *mukuna*, and he had observed that tomatoes planted where the legume had grown gave good yields.

4.2.1.2.2.2 Traditional Crops

In communities along the highway, ADRA has worked to improve rice production through the introduction of a new variety, *Cica 8*, and the application of chemicals. Rice is a staple in the area, with production going mostly for consumption. Surpluses are usually taken to Trinidad for hulling and sale. *Cica 8*, which the project brought from Santa Cruz, is a higher-yielding variety [the traditional variety yields about 1,288 kgs./ha. (ADRA 1991: 15)] and is more suitable for the market. With *Cica 8*, the project seeks to increase household incomes. This year, ADRA also introduced beans (though not a "traditional" crop here) on a small scale, hoping to entice farmers to cultivate them to consume, to sell, and to improve local soils, thus checking the slash-and-burn cycle. The project works with the *carioca* bean from ASOPROF in Santa Cruz.

According to the FY 1991 annual report, PM's late disbursement of funds caused a seed shortage and affected rice promotion (ADRA 1991: 15). In the 1991-92 summer season, late disbursement reduced the number of rice farmers the project could work with. ADRA wound up using traditional seed and trying to increase yields only through the use of chemicals. Delayed disbursements also left the project without funds to purchase pesticides for beans during the winter dry season this year. Heavy rains also damaged the rice harvest, further contributing to a decline in yields. Since both rice and beans were promoted through a revolving loan fund, delinquency rates (see Section 4.2.1.1) for both crops are high this year.

According to ADRA staff, farmers have continued to use the traditional rice variety (*arroz dorado*) for home consumption, especially for the popular *locros* (rice gruels). And *dorado* is said to be easier to hull in the *tacu* (a wooden mortar used for hulling and grinding in rural households throughout the *oriente*). But farmers recognize the merits of *Cica 8* for the urban market. "In the city, people don't eat *locro*," as one farmer aptly said. *Cica 8* breeds true for three to four years, the project agronomist told us, after which a farmer must purchase new seed to obtain high yields. The native variety has been sown for many years and has already degenerated.

ADRA has promoted use of the *hoz*, or small hand scythe, among project rice farmers, who, like farmers throughout the *oriente*, harvest rice by cutting the panicle at its base with a small knife. This is a time-consuming process since each panicle must be individually cut. With the *hoz*, one cuts the stalk--several stalks at a time--near its base, just as one harvests barley. Since rice must be harvested quickly once it matures, the labor-saving *hoz* is intended to remove a major constraint to rice production. (It is likely that many farmers will not use the *hoz*, however, for reasons we reveal in our treatment of agricultural programs in the chapter on ADRA's Gonzalo Moreno project.)

In May of this year, ADRA/Canada agreed to furnish the project with 150 wooden grain silos, one for each project family. Holding grains off the market pending favorable

prices is part of the project's marketing strategy. ADRA plans to first introduce twenty of these silos as demonstrators before instructing local farmer-artisans in their manufacture.

As already noted, the project introduced beans this year on a small scale. Beans provide protein in a zone with limited meat (residents often hunt wild meat, still available in the forests), are a potential cash crop, and enrich the soil. According to ADRA staff, farmers at first rejected beans; they were not used to eating them and had no experience growing them. The project nutritionist has participated in bean promotion by teaching women how to prepare them. Beans, sown in April and harvested three months later, are a winter crop. According to the project agronomist, an ideal cycle would be rice, followed by beans, then vegetables (or corn)--all on the same land. A final crop might be a perennial like citrus, or perhaps grass (for livestock) on a small scale. But even with such a rotation, the agronomist said, farmers would need to fertilize to some degree if the same land was to be farmed without fallow.

We visited (on July 28) a large rice garden in Loma del Amor, a community on the highway with about fifty families. The lowland owner of this garden was working in Trinidad as a wood salesman, so we interviewed his two *partidarios*, both young farmers (and first cousins) who had come to the area from San Borja just before the rice harvest this year. They had received one *arroba* (about 25 lbs.) of rice for every five they harvested. During the forthcoming rice season, they would receive half of the harvest. The garden's owner supplied them with all foodstuffs except meat, which they hunted in nearby forests (this is a standard sharecropping arrangement in the lowlands).

The owner had sown last year a total of five hectares of rice, 0.4 has. *Cica 8* and 4.6 has. of *arroz dorado*, the traditional variety. He was experimenting with the new variety. According to the sharecroppers, *dorado* had yielded 1.5 *arrobas* per *huascada* (10m. x 10m.), whereas *Cica 8* had yielded 5 *arrobas*. The farmer had applied only foliar fertilizer to the new variety; he had not fertilized the ground. (While visiting vegetable gardens, we encountered a farmer who used foliar fertilizers on rice only if it had been sown in *barbecho*, or fallowed forest; he used no fertilizer on rice sown in high forest.) A clearing here could support only two successive rice plantings, the sharecroppers noted, after which one had to plant another crop or turn the land to fallow.

This year, the garden's owner planned to sow four hectares of *Cica 8*; he had kept only three *arrobas* of last year's harvest for seed, and so would have to get more seed from ADRA. He planned to sell the new variety in Trinidad, where it fetched a better price than *arroz dorado*. In about a week, the young sharecroppers would also sow a half-hectare of three-month rice, an early-maturing variety sometimes grown for consumption in addition to *arroz dorado* (which is planted in October or November).

The young sharecroppers talked about the *hoz*, or hand scythe, which the project has introduced to harvest rice. A farmer could harvest about four *arrobas* per day with a

knife, they said, whereas he could harvest thirteen *arrobas* using the *hoz*. (This is far from the whole story, however, as we seek to show in our treatment of agricultural programs in the chapter on ADRA's Gonzalo Moreno project.) ADRA also wants to introduce a simple mechanical seeder for rice and corn. At present, farmers seed with a dibble (*punzon*): one farmer punches (with the dibble) a hole in the earth, while a helper follows and drops the seeds in. It takes two persons about six days to seed one hectare in this fashion. With a seeder, one (practiced) person can seed the same hectare in a day, observed the project agronomist.

4.2.1.2.2.3 Tree Nurseries

The project seeks to introduce tree crops as a source of family income and to rehabilitate the forest. Tree crops add value to the land, stabilize farmers, and prompt them to think of the future. The project works with citrus, hardwoods, and fast-growing firewood legumes like leucaena.

According to the project's FY 1991 annual report, rats damaged seedlings and were a major problem in the nurseries; corrective measures had been taken, however (ADRA 1991: 17). The project aims to produce 20,000 citrus and forest seedlings in FY 1992, but a report on the period October-November cites a lack of grafting material owing to delayed disbursements from MP. Also, the project had no basic tools for grafting (none were budgeted for, it seems) and was improvising with pocket knives. The project had produced only half of the programmed 20,000 seedlings at the close of the first quarter of 1992; a report for that period cites seedbed plant losses due to heavy rains, and mistakes participating farmers had made in grafting citrus trees (the grafts did not take). Farmers needed more training, the report concluded.

At present, the project has established four farmer-operated nurseries in the San Pablo area, producing mainly citrus seedlings for sale. Hardwood trees come from a government nursery (belonging to CDF-RN) in Casarabe, on the Trinidad-Santa Cruz highway north of San Pablo. We visited that nursery and also two of the nurseries in the project zone.

Visit #1 (July 27)

On our trip from Trinidad to the project zone, we stopped off to see the government nursery near Casarabe. CDF-RN (administratively under MACA) operates the nursery, which is part of the government's effort to reforest parts of the Beni. Farmers, ranchers, and others can obtain trees here free of charge.

The Casarabe nursery was built last year through ADRA's Food-for-Work Program (part of PL480), and is today maintained by the same program. CDF-RN, however, pays the resident supervisor's salary. The nursery has 60,000 plants, we were

told, including coffee (from Santa Cruz), cacao, *urucu*, cedar, mahogany (from San Borja), leucaena, and *tajibo*; the nursery will soon begin raising citrus trees. For persons requesting trees from communities nearby, CDF-RN provides technical assistance, including spraying. But according to the supervisor, these communities have trouble maintaining seedlings because marauding cattle eat them.

ADRA has a formal agreement (*convenio*) with CDF-RN whereby the Casarabe nursery establishes seedlings and ADRA collects them as needed to take to the project zone. Cultivating these species requires considerable expertise and experience, which CDF-RN is said to have.

Whereas farmers are to pay for citrus trees received from the project, as explained below, hardwood trees are to be given free, following CDF-RN's policy. If farmers wish to replace trees they have received and lost, they must pay five *bolivianos* ($1.28 U.S.) per tree.

Visit #2 (July 27)

We visited a project citrus nursery in Loma del Amor, on the highway. Ten project participants from this community, paid by ADRA with foodstuffs (through its Food-for-Work Program) for their labor and for learning to graft, established the nursery last year. The project provided the group with seeds, pesticides, and grafting material (*yemas*) through a revolving loan fund (and also provided training). ADRA bought the seeds and grafting material in Santa Cruz. The grafted trees will be sold for five *bolivianos* each to farmers in the zone in order to pay back the credit.

Participating farmers had grafted Valencia oranges onto Cleopatra mandarin stocks grown from seed. Not all of the grafts took, the head of the participant group told us; participants were still learning the technique. He also observed that the grafted plants did not grow much during the winter dry season.

Visit #3 (July 28)

We visited a second nursery in San Pablo, with 3,000 Cleopatra mandarin seedlings; the seedbeds had been made last year and the stocks were to be grafted this year with Valencia, Ponkan, Thompson, and Washington-Navel material--two early-maturing varieties and two late-maturing ones, we were told.

ADRA had not set up a revolving fund here, but rather had given local participants (under the direction of one farmer) seed, pesticides, genetic material, and training. In return, participants had to supply the labor and return half of the grafted plants to the project. ADRA would later determine the sale price of the plants, after conducting a cost analysis. ADRA is experimenting with the best way to set up a

nursery--through a revolving fund (as in Visit #2) or through a shares arrangement (as just described).

4.2.1.3 Discussion and Conclusions

This multi-program integrated development project began in October of 1990 with no established ending date, though recently ADRA has established, however tentatively, a date of September 30, 1996. The programs are Vegetables, Traditional Crops (rice), Tree Nurseries, and Health and Nutrition. The project sets objectives for each year, and records do not provide cumulative data across years on the degree to which objectives have been met. A report for each fiscal year provides results for that year. Goals, the numerous objectives for each program, and the degree to which they were met in FY 1991 appear in abbreviated form in Annex F. Also, our evaluation team's agronomist prepared a technical report on the project, and this appears as Annex N. Because of our limited time (and expertise), we did not evaluate the health program but concentrated instead on agricultural programs. We did look at selected aspects of the health program in ADRA's Gonzalo Moreno project, however, and feel that some of the issues we raise in that chapter may also have bearing here.

The project has relied on revolving loan funds for the commercial production of rice and vegetables. As of June 30, 1992, seven to ten months after harvest, the delinquency rate on loans to produce vegetables during 1991 was forty-seven percent. Excessive rain and drought account for most of the delinquency. As of the same date, three to four months after harvest, the delinquency rate on rice loans was seventy-five percent. Heavy rains explain much of this delinquency.

MP's delayed disbursement of funds has created serious problems (and may account for some of the delinquency). Funds have not been available for the timely purchase of seeds, chemicals, and other supplies. Such delays are extremely harmful to agricultural projects and should be corrected.

In this integrated project, work has been conducted on several fronts, which appear to be mutually reinforcing. The technically-able staff see themselves as a team and seem to work as such. The health and agricultural programs have been quite active; the statistics regarding immunizations speak for themselves (these appear in summary form in Annex F). We think the project's design is adequate for pursuing its objectives in the San Pablo zone. And it is commendable that the staff, which we found capable and committed, live in the zone rather than serve it as commuters.

The San Pablo zone is unlike much of the rest of the Beni. Its higher elevation, ample forest, and location on the highway give to its settlers a dynamism rare for the department. San Pablo is a good place to mount an agricultural project: the setting lends

itself to results, for the zone is moving in a direction in which most projects would like to go.

But this very dynamism is not without perfidy if one seeks to address the needs of the truly poor. Our brief visit suggests to us a considerable economic disparity among residents; indeed, this frontier zone would probably make a good laboratory for the study of incipient class formation. The commercial vegetable farmers (not those with household vegetable gardens) are clearly riding this dynamic wave. Some of them are well off by regional standards; caretaker-sharecroppers work their vegetable gardens. And the owner of the rice garden we visited lived and worked in Trinidad; a couple of caretaker-sharecroppers worked his lands. The project must remain alert and not let itself be lured into furthering the ends of a select few to the detriment of those whose needs are greater. The subsidized credit program would be attractive to any farmer, but it should be reserved for those whose needs are greatest.

On the other hand, commercial vegetable production anywhere in the Beni is a high-risk endeavor. Vegetable production is labor intensive, and in the lowland tropics vegetables are peculiarly susceptible to pests, which must be controlled through the application of costly chemicals. Unstable market prices compound the risk; although the demand for vegetables is apparently on the rise in the Beni, it is still much below what it is in other parts of the country. It may be that only the better-off farmers can tolerate such risk. It is probably more than coincidental that all growers but one in San Pablo's vegetable-producer's association are highlanders, often with prior experience in growing and marketing vegetables.

There is yet another angle to the perfidy inherent in the region's dynamism. Projects can unintentionally fall into the trap of directing their efforts along the lines of least resistance--of assisting those already favored, that is. The trap is well bated by donors who place extreme emphasis on setting and meeting numerical objectives; numbers look good in reports, and busy bureaucrats can cite them and use them to make quick decisions. Working with those already favored is a quick way to generate numbers. The process by which this happens is infinitely subtle, and often occurs well below the level of consciousness.

4.2.2 Gonzalo Moreno Integrated Rural Development (ADRA/Riberalta)

4.2.2.1 Objectives, Organization, Strategy

The goal of the Gonzalo Moreno Integrated Development Project, which began in October of 1991, is to increase agricultural production and income as well as to improve nutrition and reduce infant mortality among residents of eight communities (recently expanded to nine; see Annex F) of Madre de Dios Province, Pando Department. This is to be achieved through activities falling into five programs: Child Survival, Traditional

Crops (rice and corn production), Vegetable Production (both commercial and family gardens), Tree Nurseries (fruit trees and hardwoods), and Infrastructure. Annex F (and Annex J) contains numerical expressions of the project's goals and objectives as well as of the degree to which they were met as of September 30, 1991. The agronomist on our evaluation team also prepared a technical report, which we include as Annex K.

ADRA sets objectives for each fiscal year, and in its annual reports provides comprehensive numerical data on the degree to which they have been met. There are no numerical objectives for the life of the project; indeed, the term of that life has remained open until recently. Now, ADRA staff talk in terms of five years, but this does not seem to be a figure that much influences programming or planning. ADRA's avowed strategy is to withdraw gradually, in the measure that communities can continue project activities on their own.

The project promotes vegetables, first to improve nutrition, especially among children, and second to increase family incomes. Forty-three percent of children under five are said to suffer from malnutrition. Diets in the project zone are based on rice, corn, cassava, banana, and sometimes fish in the dry season. Although a few families grew tomatoes and onions (scallions) for consumption when the project began, farmers in general have little knowledge of the nutritional value of vegetables (ADRA 1991: 6).

To increase family incomes, the project promotes the improved cultivation of rice and corn, both traditional crops in the zone, and also the production of fruit trees. The main source of household income, which is said to average about $300 U.S. per year (ADRA 1991: 6), derives from the sale of Brazil nuts (called both *castana*--chestnuts--and *almendra*--almonds--in Bolivia) which peasants gather in local forests. Rice and other products are sold sporadically and also contribute to income. Local varieties of rice and corn yield about 1,700 kg./ha. Since farmers lack storage silos, they also lack control over the prices they receive for these grains (ADRA 1991: 6).

The establishment of tree nurseries and the promotion of fruit trees seek to address the negative consequences of slash-and-burn agriculture, which depletes forest and soil resources and reduces income possibilities. The infrastructural part of the project, apart from the establishment of a nursery, includes the construction of a medical post (to replace one already in Gonzalo Moreno, but in a state of disrepair) and a training center.

Health improvement is an important part of the project; most of the activities are part of a Child Survival Program, whose objectives, detailed in Annex F, parallel those of the San Pablo project. According to the project doctor, malnutrition rates in the region reach fifty percent among children under five; seventy percent of these are female. (This higher percentage for females has been observed for the highlands, the doctor noted; a common explanation is that parents view females as less important to future household welfare, and so give them less attention.)

The health program has been active in all of the eight communities. We evaluated only selected aspects of this program, as time permitted. Its objectives and results for FY 1991, however, are summarized in Annex F. These statistics, certainly as regards immunizations, speak for themselves. Statistics on the infrastructural program are also included in Annex F. The medical post has been completed since the FY 1991 report and is now in service. The training center, still under construction, is said to be seventy to eighty percent complete, as are staff quarters (ADRA currently rents staff housing in Gonzalo Moreno).

The project technical team, based in Gonzalo Moreno, consists of a medical doctor (the team coordinator), a nutritionist (the doctor's wife), an agronomist, and a general promoter, all paid by the project. The team visits (at least in the winter of 1982) each community weekly, on the day pre-established for that community. The agronomist may conduct his activities in the morning, the health group in the afternoon, so that those persons in multiple programs can participate.

It is most unlikely, however, that the project has always maintained this schedule of community visits. From its beginnings in October, 1991, until April, 1992, only one motorcycle served the entire technical staff; three persons sometimes rode it to visit the communities. Staff say they complained to ADRA/La Paz (reports for the period register these complaints), through their Riberalta regional office, but the problem was never resolved. Regular and frequent visits are less likely during the summer rainy season (December through March), when flooding and muddy trails reduce access to the communities (regardless of transportation).

The project purchased an International truck (motor and chassis; the bed was made locally) in 1991 with Monetization funds. According to ADRA/Riberalta, the truck was to respond to several needs, including the regional office's need for a means of haulage. The truck was also to be used to transport farmer produce to market. Before it was purchased, CORDEPANDO talked about providing a ferry (*puente ponton*) to link Gonzalo Moreno to Riberalta. But the ferry never materialized. At present, the truck is located in Gonzalo Moreno, where it carries building materials (e.g., sand, bricks) from the port to project construction sites. When construction is competed, a ferry is to be hired to return the truck to Riberalta.

The project has experienced some staff turnover since its inception. The original agronomist resigned in November, 1990, about a month after entering, and the original doctor resigned in June, 1991, nine months after entering. The original promoter (a young American) left in February, 1992, and another entered; he resigned just before our visit. The current promoter, hired recently, is still learning about the zone. Also, ADRA's Riberalta office has a new director; the former director is now director of ADRA/ Trinidad.

The new director (who knows the area well), say staff, visits the project zone often. ADRA's national program coordinators in La Paz also visit about every two months to review project objectives and progress during the period. They sometimes interview beneficiaries in the communities, we were told.

The project has instituted a revolving loan fund to promote the production of commercial crops. The fund has been used mostly for vegetables (seeds and pesticides), but farmers producing any project crop can and have requested and received loans. Dollar-denominated loans are to be paid back upon harvest and may be returned in kind (even in chickens, we were told). In the case of rice, the loan includes seeds and pesticides, though not all farmers use pesticides because of their cost. There is no interest as such, but (with rice) farmers must return double the amount of seed they receive, and the price of pesticides is twenty percent above ADRA's cost. ADRA extends credit to individual farmers, not to groups, and each borrower is individually responsible for his loan; there is no "communal guarantee" (*garantia mancomunada*).

Delinquency rates have been high on these loans. As of June 30, 1992, the project had recovered only twenty-seven percent (a delinquency rate of seventy-three percent) of funds lent (for seeds and chemicals) to produce vegetables ("Demonstration Gardens") last year (harvested by November, 1991). Only sixteen percent (a delinquency rate of eighty-four percent) of funds lent to produce rice (harvested by February, 1992) had been recovered by the same date (from figures supplied by the project agronomist).

The health program also maintains a revolving loan fund for the purchase of medicines (services are free). As with the agricultural fund, the delinquency rate is reportedly high: peasants owed 1,077 Bs., or $275 U.S., at the time of our visit in August (figure on total amount loaned unavailable).

In some of the communities, the project has worked with Mothers' Clubs, created by ADRA before the inception of the project. In several communities, ADRA has organized participants into special groups for its health and agricultural programs. The groups do not appear to be strong, however, and sometimes have to be reorganized each year, with new officers. Each community we visited had a president, a vice-president, a secretary, a treasurer, and a couple of *vocales*. According to leaders in one community (Agua Dulce), this structure, charged with the "development of the community," had existed for "ten or fifteen years"; nobody knew its origins. The structure, however, is very like those we observed in areas of the *oriente* where the Catholic Church has been active, and so may date from a time when the Church maintained a larger presence here. (We encountered persons who described ADRA as part of the Pando Diocese.)

Like several others, this project has experienced late disbursements from MP, though ADRA personnel here were less vocal in their complaints (the director is new). Reports covering the period December, 1991, and January, 1992, as well as the first

trimester of the current calendar year, cite late disbursements for the purchase of bean seed to be planted in March and April.

4.2.2.2 Observations

4.2.2.2.1 Programs

Before we relate our observations from the four communities we visited, we will first summarize information about the programs--Vegetables, Traditional Crops, Tree Nurseries, and Health and Nutrition/Child Survival--using material from ADRA reports and from our talks with project implementation personnel. In presenting our community observations in the subsequent section, we follow these same program divisions for each community.

4.2.2.2.1.1 Vegetables

Last year, the project's first full year of operation, it promoted small "demonstration" vegetable gardens at the community level. The idea was to familiarize residents with vegetables, and reports suggest that the project worked mostly with women--probably because of their role in culinary matters and the role of vegetables in improving nutrition. This year, the gardens are referred to as "nutritional" gardens. But from the beginning, according to the agronomist, the project has promoted vegetables to sell as well as to eat. The project, he says, recognizes three kinds of vegetable gardens: communal gardens, private gardens, and school gardens. ADRA ultimately wants every household to have a vegetable garden, at least for improved nutrition, and to increase income where possible.

According to the FY 1991 report, households varied considerably as to volume of vegetables sold. The report cites losses from drought (one community), disease in radishes, a need for women to learn to use pesticides, and a lack of means to get vegetables to market in Riberalta. The need for a pontoon bridge across the River Beni is mentioned (ADRA 1991: 7). The first trimestral report for 1992 cites heavy rains and impassable roads, which kept ADRA staff from visiting communities to help participants prepare for the season's vegetable planting. The report also cites a transportation bottleneck: there was only one motorcycle for four professionals. (We later learned that the project had only one motorcycle for the entire professional staff until April, 1992.)

According to an external evaluation of the project's Health and Nutrition program conducted this year, fifty-four percent of forty-eight households surveyed (in six project communities) had family vegetable gardens. Thirty-six percent of these consumed little to none of what they produced. Vegetables most commonly produced were onions, cabbage, radishes, and cucumbers (Senate 1992: 9).

According to the project nutritionist, the vegetables local women preferred were onions, tomatoes, green beans, radishes, cabbage, cucumbers, sweet garlic, and *coli*. They had not been able to grow carrots successfully, she said. Women often exchanged vegetables among themselves, she added.

Vegetable production here, as elsewhere in the *oriente*, faces serious agroecological and marketing constraints. Vegetables are planted at the beginning of the winter dry season, with seedbeds prepared during March and April. Early August is the latest one can transplant in order to harvest before the onset of the summer rains. Winter drought is a constraint in communities far from the rivers. Pests are always a major threat to vegetables in the humid tropics; most project-supplied pesticides go to vegetable production. Marketing is a serious impediment to commercial production in all communities except those closest to Riberalta. Las Piedras, closest of all, is said to have produced vegetables--tomatoes, cucumbers, onions (scallions), watermelon--for sale in Riberalta for thirty or forty years.

4.2.2.2.1.2 Traditional Crops

The project has worked with rice (experimenting with several varieties, as it was designed to do) and corn, and began to work with beans (which are not "traditional" in the area) this year. The seven "improved" project rice varieties (all dwarf varieties) are *B-CH1*, *L3227*, *Cica 8*, and *Ir*, all from Brazil; and *The Chin*, *Kui Pi*, and *Chin Kui*, all from the Orient. The project has not only experimented with these, but has promoted some of them.

The FY 1991 report cited project work with rice varieties and noted that the major limiting factor was a lack of storage silos. Apparently for the first time, the project planted sixty hectares in rice and corn in October and November of 1991. The first trimestral report for 1992 (covering January through March) cited the following impediments to the "Traditional Crops" component: a lack of transportation to supervise programs and provide farmer training; heavy rains and flooding; no way to transport grains to market; and no beans or soybean seed (because of delayed disbursements from MP). Corn and rice were not specifically mentioned, perhaps because flooding and a lack of transportation had precluded supervision.

We later learned that project corn had failed agronomically; ADRA/La Paz had not supplied the variety the agronomist had requested for the zone, we were told.

The project only this year began to work with beans, which were planted in rice fields just after harvest. Beans must be planted no later than the end of May, the agronomist said. The project is working with two varieties, *carioca* and *mulatino*, both from Brazil. Beans are not traditionally sown in the zone, though farmers do plant *caupi* (cowpeas--which local farmers call beans), mostly for sale in Riberalta. Consumption

appears to be modest. The project promotes beans for consumption and for export to Brazil (there is said to be a market also in Guayaramerin).

4.2.2.2.1.3 Tree Nurseries

The project's single tree nursery is in Gonzalo Moreno, where it produces citrus, tamarind, *cayu*, Brazil nut (*castana*), mahogany, cacao, and rubber seedlings. According to the FY 1991 report, the nursery had 21,500 seedlings.

We visited this nursery, which the project began to establish in March of last year, using "food-for-work" (PL-480) to clear the land. According to the agronomist, school children and others nearby irregularly donated their time to maintain the facility. About a month and a half ago, the nursery's well caved in; since then, water had been carried in buckets to the young plants, a large number of which were dead and dying. All of the plants except the tamarind and the citrus had come from IBTA; the tamarind had come from Trinidad, and the citrus, *limon rugoso*, was local. Orange or mandarin were to be grafted onto *limon rugoso* stocks.

The project would begin selling seedlings to local farmers this year, just after the first rains, the agronomist said. Farmers are to pay twenty percent down and the remainder in installments (to replenish a revolving loan fund) adjusted to their economic means. The installments are to include a charge for technical assistance and pesticides during the first year. Farmers are to pay the credit within one or two years, before the trees come into production.

4.2.2.2.1.4 Health and Nutrition/Child Survival

The objectives for this substantial part of the project effort in FY 1991, and the degree to which they were achieved, are detailed in Annex F. As already noted, the project medical post in Gonzalo Moreno has been completed and is now in service. The new post, which replaced one badly deteriorated, has a full-time nurse, paid by the Ministry of Health.

According to the project doctor, there is now at least one project-trained RPS in each of the eight communities, and two in "eighty percent" of them. Some of these RPSs, however, have left for extended periods between November and March to collect Brazil nuts. Recognizing this to be a problem, the project is beginning to train more women--women who will not leave during the Brazil-nut season, he said. At present, five of the eighteen RPSs are women.

Beginning in January of this year (1992), the Ministry of Health ceased to provide free medicines in the rural areas. By one informed account, the head of the Ministry's

regional health unit (*Unidad Sanitaria*) explained the new policy by arguing that peasants had to learn "to value their health" (*valorizar su salud*). Oral rehydration powder (supplied by USAID throughout Bolivia), vaccines, vitamin A, and iron for pregnant women are still free, but all else now carries a charge. We asked the doctor for the prices he charged for some basic medicines. We then consulted a retail pharmacist in Riberalta for prices of the same items. The results appear in the table below. These items, along with the free ones enumerated above, are the basic medications for health work in the rural areas, the doctor said. As the interviews below reveal, these new charges have created a disturbance in the rural areas.

Medicine Costs
(August 12, 1992; 3.92 Bs. = $1 U.S.)

Item	Project	Riberalta
Baby aspirin	$ 0.05	0.04
Penicillin (*penicilina venzatinica*), 1,200,000 units	0.74	1.52
Gentamicina (an injectable antibiotic), 80 mg	0.26	0.76
Vermifuge (*antiparasitarios*), complete cycle	0.51	0.51

Note: Prices are in U.S. dollars. According to a pharmacist in Riberalta, vermifuge prices range from $0.51 to $2.81, depending on the brand. The lower price is for a Brazilian brand, the higher price for a Bolivian one. Brazilian drugs are cheaper than Bolivian ones, the pharmacist said.

ADRA/Bolivia commissioned an external evaluation of the project's Health and Nutrition Program for FY 1991. Conducted by a medical doctor in March and April of this year, the evaluation surveyed forty-eight families in six of the eight project communities (see Serrate 1992). Some of the findings, which we summarize below, are revealing and help to interpret the interview material to follow.

As a consequence of the new policy of charging for medicines, monthly visits to the doctor had dropped from an average of ninety last year to sixty this year (Serrate 1992: 4). The report notes that the project acquired medicines in Riberalta at retail prices, which residents in the zone were unable to pay. Moreover, because of these high prices and low turnover, project medicines were held beyond their expiration date and were deteriorating from humidity (Serrate 1992: 11). (According to ADRA/Riberalta, the project has purchased "ninety percent" of its medicines in La Paz, through bids, and only "ten percent" locally.) The report notes that only sixteen percent of surveyed families used an RPS as first recourse when ill; families relied instead on home remedies (there are no native healers here) (Serrate 1992: 3).

The RPS in most of the communities (Las Piedras and Agua Dulce are cited) did not promote the use of oral rehydration powder, which many residents were unaware of (Serrate 1992: 5). Gonzalo Moreno, with about a quarter of all families in the project communities, accounted for forty-seven percent (53 consults) of all respiratory-infection consults during FY 1991 (Serrate 1992: 11). Respiratory infections were in turn the major reason for consults project-wide (504 consults total for FY 1991), accounting for thirty percent; and sixty-one percent of these were in children under five (Serrate 1992: 2).

The report recommends, among other things, that the project seek the participation of community residents so they will feel a part of health-improvement efforts. And it recommends an immediate solution to the problem of high medicine costs, perhaps through purchasing generic medicines, which cost less (Serrate 1992: 14).

4.2.2.2.2 Community Visits

The project has worked to date in nine communities (see Annex F) of Madre de Dios Province, Pando Department. The communities are located near the apex of a wedge of dense tropical forest defined by the confluence of the Rivers Beni and Madre de Dios near Riberalta, capital of Vaca de Diez Province, Beni Department. Riberalta and nearby Guayaramerin, on the Bolivian side of the River Mamore and opposite the Brazilian river town of Guajara Mirim, are the major towns in the region. A paved highway connects Guajara Mirim to Brazil's interior. Riberalta is the major marketing center for communities in the project zone, which is much influenced economically by its proximity to Brazil.

This Amazonian region is well to the north of the *pampas* and the Beni cattle lands. Extractive forest industries, with their cyclical vibrance, have dominated the economy for more than a century. The rubber industry prevailed from about 1875 until 1912; during the Rubber Boom, the region was famous in the world for the high quality of its wild latex. The great rubber entrepreneur Nicolas Suarez (from Santa Cruz) ran

his empire from Cachuela Esperanza, near Guarayamerin. On a far smaller scale, both rubber and Brazil nuts have fitfully driven the economy since.

Until about four years ago, households in the project zone gathered rubber as well as Brazil nuts; then the price of rubber fell, leaving only Brazil nuts--whose international price also recently fell. In August of last year, Brazil nuts fetched between $8.00 U.S. and $8.50 U.S. per 23-kg. crate. The price had dropped to $4.60 U.S. per crate in January (a harvest month), and was at about $3.00 U.S. at the time of our visit. According to Madre de Dios's subprefect (a nut buyer), the price was not likely to rise; a couple of processors in Riberalta had already folded, he said.

The sale of Brazil nuts has been an important source of income in project communities. If the nut price is high, families devote considerable time to gathering; agriculture becomes secondary. Some families retreat to the forest in December and do not return until March. In one community, sixteen of the twenty-five families participating in the project's rice program left for three months to gather Brazil nuts. To the dismay of the agronomist, they left the rice unattended. Rice is planted in October and harvested in February; the summer agricultural season and the nut season thus overlap substantially.

In the forest, Brazil-nut buyers (who are middlemen, or *rescatistas*) typically advance the gatherers food and supplies at much-elevated prices in exchange for future payment in nuts. Unable to pay the debt with the nut harvest, many gatherers continue to gather, and so continue to receive supplies from the buyers, thus compounding the debt. There are gatherers who are hopelessly indebted to Brazil-nut buyers, who often hold rights to the nut trees. (These rights apparently assume a variety of forms: concessions, Agrarian Reform titles, and *uti possidetis*--right through possession, the usual form until recent times.) One *barraca* (the term refers to a forest extension held by a *patron*, with warehouses for the harvest and stores to supply the workers; many *patrones* no longer live on their *barracas*, but rather "sharecrop" with middlemen, who in turn hire and manage gatherers) is said to include 50,000 hectares of forest. This form of debt servitude, which the United Nations classifies as slavery, dates at least from the Rubber Boom.

Residents in the project zone are *cambas*, or lowlanders; few highlanders reside in the rural areas. The ancestors of most of them came to the region, often from Santa Cruz, to work during the Rubber Boom, which collapsed in 1912 and left them stranded. The zone is poor, and State institutions, as in all of sparsely-settled Pando, are either absent, or else have only a minimal presence. Households are highly dispersed, much more so than those of Beni communities we visited to the south. Port Gonzalo Moreno, which is provincial capital, project seat, and largest of the project communities, lies on a bend of the River Beni near Riberalta. In the dry season, the trip from Riberalta by trail bike takes about fifty minutes, including a ferry transit across the river. The town is

13.5 kilometers by dirt trail from the ferry landing on the river's far shore. The other project communities are reached by trail from Gonzalo Moreno.

Project communities closer to Riberalta depend more on agriculture for income and less on Brazil nuts. The most dependent on agriculture are Gonzalo Moreno and Las Piedras. Farmers in communities closer to Riberalta also tend to market their own produce there, whereas farmers in the remoter communities tend to sell to middlemen, or *rescatistas*. Residents in Libertad, Frontera, Buen Futuro, Agua Dulce, and Candelaria depend substantially on the sale of Brazil nuts and are more likely to sell produce (and nuts) to middlemen.

ADRA is well known among residents of this remote zone (ADRA was present before the project began) and is said to be the only NGO working there. Through its health program and its work at the clinic (*posta sanitaria*) in Gonzalo Moreno, ADRA represents GOB's Ministry of Health.

We conducted five group interviews (seventy-two persons attending) in four project communities: Gonzalo Moreno, Agua Dulce, Buen Futuro, and Libertad. For each community, we have organized and presented the material below along program lines: Vegetables, Traditional Crops, Tree Nurseries, and Health and Nutrition/Child Survival.

Gonzalo Moreno (August 9)

Gonzalo Moreno assumed its current name when it became capital of Madre de Dios Province in 1958 (replacing nearby Las Piedras). Before, it was called "Pekin," the name of a local *barraca* with which it was identified. Sixty families live in the community today. Most farmers had titles to their lands, we were told; only those recently arrived did not. Indeed, some held as many as three *parcelas*, yet worked only one; this was illegal, but an agrarian judge was soon to arrive and would deal with the matter. By one estimate, no more than half had lands with a few Brazil-nut trees; residents thus depended importantly on agriculture, selling mostly rice, though also plantains, cassava, and corn in small amounts.

We conducted a group interview with eleven women and six men on a Sunday morning. Among the men were the community's president and the subprefect of Madre de Dios, who is a long-time rice producer, Brazil-nut trader (*rescatista*), cargo-boat owner, and petty entrepreneur engaged in sundry activities.

After extending a public welcome to us, the subprefect talked about the zone: it was a very poor place, it had been neglected by Cobija (the department's capital), its people received no help from the government. He asked two things of ADRA. First, he asked for more resources for the health program. The elderly and the very poor had no

means to buy medicines; the medical post should have a special fund for indigents, he thought. Second, he asked for machinery to keep local roads (trails) free of vegetation. The zone was weedy, he said, and roads had to be cleared every three or four months. The people were very poor and could not do this. ADRA had built the roads, but the people had no resources to maintain them.

Vegetables

With project assistance, women in the Mothers' Club (with twenty-four members) planted a communal garden last year, each woman working her own parcel within the garden. Vegetables sown included cucumbers, peppers, garlic, onions, lettuce, cabbage, eggplant, and tomatoes. Several of the women sold cabbage, tomatoes, lettuce, peppers, and cucumbers in Riberalta, though the garden was primarily for family consumption. According to one woman, they purchased seeds and pesticides from the project; they did not obtain them on credit. According to project loan records, community residents borrowed 165 Bs. and had returned only 55 Bs. as of June 30, 1992--a delinquency rate of sixty-seven percent. Since ADRA did not restrict its loans to these women, we do not know the cohort represented by this delinquency. The project, for example, had also granted loans for seed and chemicals to a local school teacher, who this year had sown about two hectares of vegetables, mostly tomatoes (about eighty percent of the area planted), for sale in Riberalta.

Several women had made a communal garden this year, but fewer than last year participated; more women (fourteen of them) had individual family gardens instead. Because of household dispersion, many women preferred to cultivate individual gardens, we were told. Women this year had again obtained seeds from ADRA, but, according to one of them, they had not yet needed pesticides; if they needed them, she said, they would pay the agronomist (for the chemicals, that is), who would come and spray.

A woman with a family garden said she had obtained seeds and chemicals from ADRA this year, paying cash for a part; the rest (the credit) she would pay with the harvest. She had a pest problem, she said, and had called the agronomist, who had come and mixed the pesticides, which she applied. We asked whether she took precautions (e.g., gloves, mask) when she sprayed. There was a silence, then another woman replied laughingly that the agronomist used gloves when he mixed the chemicals, but that they, the women, did not use gloves. The women snickered.

The agronomist intervened to say that pests were especially troublesome to vegetables in the zone because of the heat and the damp.

Gardens are hand-watered, a laborious task. Several of the individual gardens had been made on alluvial soils near the river. Five women worked plots in the communal garden, where this year a well had been dug. If one watered morning and afternoon

during the driest period (in August), one could water only every other day, the women said. But if one watered only once per day, one had to water every day. Each watering required about two hours (for one-tenth of a hectare). The higher land away from the river was drier, and so vegetables there had to be watered until the time of harvest. But weeds were less of a problem on higher ground, the women said.

We visited the farm of the local school teacher (mentioned above), who with hired labor grew vegetables in alluvial soils along the river. He watered the large planted area by hand. A pest had attacked the tomatoes, he said, but he had responded with pesticides and resolved the problem. As already noted, he had obtained seeds and chemicals from ADRA, on credit.

Traditional Crops

The project has not formally worked with rice in Gonzalo Moreno. Last year, the agronomist gave interested farmers a few left-over seeds to plant experimentally. This year, he said, the project would work with rice here; the new promoter was already organizing work groups. We inquired about the purpose of these groups, which, we learned, were not for collective labors, but rather were to encourage farmers to analyze their problems together, to detect pests, and generally to share information and experiences. We decided to talk to the men present about their experiences with rice in general, hoping to learn how they cultivated it and how the crop fitted into the larger agricultural scheme.

Almost all farmers in the community sold rice, we learned. Several "traditional" varieties were present: *comino*, *piedrita*, *oro*, *nigua*, *cruzeno*, *peruano*, and *carolina*. *Oro* had appeared in recent times from a community nearby. Farmers sold mostly *oro* and *piedrita*, one man said; the other varieties, lighter and more flavorful, were for consumption. In this land of rivers, near Brazil and not so far from Peru, this richness in "local" varieties is not surprising. Farmers here had experimented with varieties and knew a lot about rice.

Farmers in the community hold forty to fifty hectares of land, most of it in fallow forest (*barbecho*) in the case of long-time residents. Farmers clear between two and three hectares per year, they told us. One can plant rice for three successive years in fields cut from high forest; the land must then be abandoned for at least five years. If one clears in five-year fallow forest, one can plant rice only once. If *yuca* (cassava) is planted as a phase-out crop, as many farmers do, the field must be fallowed for ten years; *yuca* tires the land. They abandon fields because of grass invasion, farmers said.

Rice is typically sown in November; rice sown after November yields less. A few farmers in Gonzalo Moreno had sown project rice; others had observed the results. Project varieties yielded well only on sandy or alluvial soils along the rivers, they said;

local varieties fared better on higher ground. One farmer, visiting in the community from Frontera, said he had sown 1.5 hectares of the *Chin Kui* variety, which had yielded a mere thirty *arrobas*. Fortunately, he had also sown (in the same field) a local variety, he said, which kept starvation at bay. Pests, especially the *petilla*, had attacked the *Chin Kui* but not the local variety.

Since this project, like ADRA's San Pablo project, was advocating the use of the *hoz* (small hand scythe) to harvest rice, we asked farmers to evaluate the tool. The subprefect, a rice farmer for thirty years, said the *hoz* was not feasible for most farmers. Since it cut the stalks well below the panicle, a helper had to follow the harvester to retrieve and carry them to a nearby shed for dry storage until they could be threshed; if they remained on the ground for three or four sunless days (worse still if it rained), the rice would be lost. Without both a storage shed (which few farmers have, and which would have to be large to hold a hectare of harvested rice stalks) and a carter, one could easily lose the rice. Although harvesting with a small knife was more time consuming, it was less risky for most farmers: the harvester immediately tossed the panicles into a sack, which was kept in the house until the rice could be threshed. A couple of other farmers agreed with this assessment.

We also asked farmers to comment on the feasibility of silos, which the project has identified as a need. One farmer (who had planted the *Chin Kui* rice, as described above) observed that farmers in the zone were too poor to hold their rice off the market; silos would be of little use, he thought.

Agua Dulce (August 9)

Twenty-five persons (eight women) attended our group interview in Agua Dulce, a community with forty-seven families founded about sixty years ago. Agua Dulce relocated to its present site, on the River Madre de Dios, after serious flooding in 1960. Its school and sports field are about twenty minutes by trail bike (dry season, at speeds reaching 55 km./hr.) from Gonzalo Moreno. These riverine households are highly dispersed; some lie on the river's far bank, and more than an hour's walk separates several of the houses on the near bank. Land holdings (*parcelas*), none of them titled, measure about eighty hectares; only twenty-three families are said to "own" lands, the others working lower, flood-prone lands along the river.

Residents rely importantly on agriculture for income, selling rice, corn, plantains, and beans. Plantains, sold to middlemen (*rescatistas*) in Riberalta for about $0.90 U.S. per raceme, have figured prominently in recent times, but flooding destroyed the groves this year and farmers were in crisis. The income from Brazil nuts is seasonal and limited, we were told. (Rubber was important until the price fell about four years ago; a few families still collected it in small amounts.) Residents begin to harvest Brazil nuts on their lands in November and continue sporadically through February; since the

holdings are small, the time spent is modest. Landless residents, by contrast, often leave for extended periods between December and April to harvest Brazil nuts on the *barracas*. But they have learned a lesson, said the community's president: they become indebted (for food and supplies), and their *patron*- creditors follow them back home to collect the debts.

Vegetables

Fourteen women worked collectively last year to make a vegetable garden. Unlike some of the other "communal" gardens we had visited, this one had not been divided into discrete parcels, with each woman working her own. The women had consumed most of the vegetables, few had been sold; and they complained of the little income they had received for all their work.

This year, only six women worked in last year's communal garden; others had left and formed another gardening group. And several women, because their households were dispersed, found working in a central place inconvenient, and so had made individual gardens. There was friction between the two gardening groups; indeed, the second group had been formed because its members found the others slow to grasp the agronomist's instructions, and thus a detriment to collective effort. Now belonging to the second group was last year's Mother's Club president, who when she left office had taken the backpack sprayer, which her group was now using and refused to share with the first group. This was further cause for friction.

Traditional Crops

Local rice varieties include *oro*, *piedrita*, *comino blanco*, and *cruzeno* (sometimes called *colorado*). All grew well in the area, farmers told us, and all fetched about the same market price--the buyers controlled the price, they said. *Piedrita* had the highest yields; *oro* and *piedrita* were the varieties most consumed and most sold. Several farmers had already sown rice in the lower areas, which they would harvest in December. They would sow again, in higher areas, in October, November, and December; by stagger-sowing, they could better meet labor demands at harvest. (The scheme is probably also designed to complement the practice of gathering Brazil nuts.)

The project has worked with three rice varieties here: *The Chin*, *Chin Kui*, and *Cica 8*. But the large areas farmers sowed suggest the work to have been more promotion than trial. Seven farmers had planted one or more of the varieties, and none of the seven had good results, we learned. One farmer had planted a half-hectare each of *Cica 8* and *Chin Kui* and had harvested a total of sixty *arrobas*--a very low yield. Another had sown two hectares of *Chin Kui* and had harvested nothing: the stalks reached about three feet, then stopped growing and died. A third had the same experience with

one and a half hectares; he was afraid to sow anything from the project this year, he said. Farmers had planted project corn, and that too had failed. One farmer, observing that they had also lost their plantains to flooding, said that only "the foodstuffs" (*los alimentos*) had saved them (a reference to a small ADRA "food-for-work" program in Gonzalo Moreno that had employed a few residents).

The community's president said that ADRA (the promoter who left in February, that is) had promised to provide them with a silo (*deposito*) and to help them form a marketing cooperative. But nothing had been done. He went on to say that farmers needed a better price for what they produced; they needed help from ADRA and USAID in finding markets. Seeds were not the answer, he said; even if they had improved seeds, the middlemen (*rescatistas*) would reap the gains. Another farmer said he thought they could produce cacao if they had hybrid plants. And someone observed that perhaps the project nursery in Gonzalo Moreno could be of use; farmers would like to plant grafted citrus varieties. Local varieties produced for a couple of years, then withered and died. Agriculture here needed to be "reformed," one man said; farmers needed help.

Health and Nutrition

The interview turned lively when we steered it to the topic of health. We, the doctor, the nutritionist, a local RPS, the community's president, several residents, and ADRA's regional director all participated. Several residents spoke with deep feeling. We try below to convey something of the tenor of the meeting.

The RPS spoke first and gave a critical summary of the project's health program in the community. The doctor visited Agua Dulce weekly; children were weighed, some of them were malnourished and did not gain weight. Few medicines were available, and residents had no money to buy them, no produce to sell. Medicines were expensive...

We asked about vaccinations. Yes, the doctor came and vaccinated, someone said. But if a child was malnourished and needed vitamins...families had no money to buy vitamins, and the doctor charged one *Boliviano* for them.

Another resident took the floor. The doctor did not come weekly, he said, but rather every eight days. The doctor refused to visit the sick except on those days. And he made them come to Agua Dulce, he would not visit them in their homes.

The RPS rose to say that he had no medicines to help people; and furthermore, the doctor had said that ADRA had instructed him, the doctor, to charge for medicines.

The president of the community, an articulate young man with a commanding presence that belied his small stature, entered the discussion. ADRA had agreed (*compromiso*) to provide Agua Dulce with free health care, he said. The doctor was to

provide this. ADRA (through its promoter who left in February) had promised the community a health post (*posta sanitaria*), but had not honored the promise. Residents wanted more attention from the doctor, the president said. They wanted him to come when people got sick. The president's sister had died last year; he had gone to Gonzalo Moreno to seek help, he said, but the doctor was absent.

The doctor then spoke in his defense to explain that he had to share a single motorcycle with other technical staff until April of this year. And he had not charged them for vitamins, but rather for an anti-parasite drug; local residents did not know about medications, he politely said.

ADRA's regional director reminded the group that the doctor had to serve eight communities, and could not be everywhere at once.

Then why do we have an RPS if he has no medicines? the president inquired.

But an RPS knows how to use only basic medicines, the nutritionist responded. She further noted that residents had received medications on credit, which they had not paid; money in the medications revolving loan fund was low.

When we asked the RPS what medications he had, we learned that he had only oral rehydration powder. He had no antibiotics; he did not have so much as a *mejoral* (aspirin) to control headaches and fever, he complained. He said he knew how to give oral rehydration therapy, and he knew how to give injections, which he had learned several years ago.

As several of us discussed the problem of the high cost of medications, the president observed that the RPS was from the community and knew its residents. He could collect for medicines, but in kind--a chicken, say--rather than in cash; the doctor insisted on cash, the president complained. The president again insisted that the doctor visit the sick in their homes; often they were too ill to come to Agua Dulce, and it would be risky to move them. He pleaded rhetorically with the doctor to be more understanding.

We steered talk back to the doctor's weekly visits. He arrived on Thursday afternoon, we were told, sometimes around 3:00, but often later--after patients had tired of waiting and returned to their homes. The doctor responded that he had to visit another community, Candelaria, on Thursday morning, and sometimes got delayed. He further those present that he was entitled to eight days leave every month, but often worked instead of taking the leave.

The president again took the floor and said that residents lost an entire day coming to see the doctor. And again he issued a rhetorical plea: the doctor must be more human,

must have a bigger heart, must feel for those who suffered...It is with the health program that residents had the most complaints, he said.

The nutritionist gave courses in Agua Dulce about every two weeks, we learned. The courses had dealt with the cooking of vegetables--the preparation of vegetable soups and salads. We heard no complaints about the nutrition program.

Buen Futuro (August 10)

Twelve families belong to Buen Futuro, located thirteen kilometers from Gonzalo Moreno--about a half-hour by trail bike. Newest of the project's eight communities, it was founded four years ago by families from the region wanting to live in a less remote area and to establish a school for their children. Families typically hold about eighty hectares of land; one family is said to have only twenty-five hectares. Farmers market (in Riberalta) rice, corn, some Brazil nuts, and a little bit of rubber, each in its season. The prices they receive are low; some of them were buying rice at the time of our visit--perhaps the very rice they had sold a few months ago.

We spent most of the morning at this community, where we first interviewed (in the company of the project agronomist, the doctor, the nutritionist, ADRA's promoter, and its regional director) three men and three women in the small school. As we left about noon, we stopped to talk to six men who were clearing the trail to the community with machetes. The atmosphere for the interviews, especially in the school, was very different from what we had found in the two communities of the day before. It was stiff, formal; people were less spontaneous and measured their words carefully. A highlander (the only in the community), who was the local RPS and president of the community, served as spokesman and provided nearly all of the responses. We have reason to doubt some of the information he supplied, especially as regards local experience with project rice. Our team agronomist prepared a technical report on this visit, which we include as Annex K.

Of the six men clearing the trail, only one had sown project rice (and beans); our information comes entirely from him. And he, too, was guarded in his responses.

Vegetables

See the section below on Health and Nutrition.

Traditional Crops

According to ADRA's agronomist, seven farmers here had grown project rice, and nine had planted project beans this year. Among them was the highlander, who had sown one *tarea* each of six project rice varieties. The varieties and the per-*tarea* yields he reported are as follows: *The Chin* (30 *arrobas*), *Ir* (20 *arrobas*), *Cica 8* (23 *arrobas*), *B-CH-1* (22 *arrobas*), *L3227* (25 *arrobas*), and *Chin Kui* (15 *arrobas*). He had also grown one *tarea* of *piedrita*, which had yielded 15 *arrobas*. This farmer brought to the interview a piece of paper on which he had recorded these yields. He had never measured yields before, he said. But he was unable to explain how these measurements had been made (see Annex K for a technical analysis of the project).

Another farmer, an older man who had been sick and was still weak (and who offered unsolicited praise of the doctor), said he had planted *B-CH-1*, which yielded 20 *arrobas/tarea*, and *piedrita*, which yielded 10-15 *arrobas/tarea*.

The highlander had harvested project rice with a machete; the rice (dwarf rice) was shorter and denser, and would have been hard to harvest with a small knife, he said. Because it was shorter, it did not lodge, he added.

The man in the work party clearing the trail had sown *The Chin* (nine *tareas*) and *IR*. *The Chin*, which he had sown in virgin forest, yielded thirty *arrobas* per *tarea*--a good yield. *IR* he had planted in fallow forest, where the land was tired. He had also sown local varieties--eight *tareas* of *oro* and seven of *piedrita*. The *oro*, which he had planted in virgin forest, yielded only twelve *arrobas* because of birds. The *piedrita*, sown in seven-year fallow, had yielded a respectable twenty-five *arrobas* per *tarea*. He had tried to sell the *The Chin*, but it was rejected in the market because of the grains' dark color (*negruzco*). Instead, he used the rice to pay off a debt (he had borrowed money to hire *peones* to gather Brazil nuts, but then the nut price fell, leaving him in debt).

As a dwarf rice, *The Chin* did not lodge, he said. But when it began to mature, one had to harvest it quickly (delays may explain the dark color described above). Traditional varieties like *piedrita*, on the other hand, gave one more time. (The traditional varieties would thus mesh better with the Brazil-nut harvest, one observes.) Both *The Chin* and *piedrita* expanded (*se hinchan*) when cooked, he said. He planned to sow a half-hectare of each this year, and another half-hectare of a Chilean rice (another "local" variety).

This farmer had also planted beans (*caupi*, or cowpeas), which were ripening during our visit. Beans were for consumption, and for sale when the price was right. All farmers planted beans on a small scale, he said; beans fetched a better price than rice, and they required less work.

According to the highlander, farmers were not planting project bean varieties (from Brazil) because the beans had no local market. ADRA had also supplied farmers with *caupi* seed, which it had bought in Riberalta and in the project communities. The seeds were given on credit and were to be returned in a measure double the amount received.

We asked the farmer clearing the trail how he thought the agricultural part of the project might be improved. By helping farmers buy pesticides, he said, which were expensive. Pests had been especially damaging to vegetables--tomatoes and watermelon--this year. Farmers also needed help with citrus: disease killed their mandarins after two years, and oranges did not last much longer, he said.

Health and Nutrition

According to the RPS (and president of the community), who lived about an hour's walk from the school where we conducted the interview, acute respiratory infections (ARIs), diarrhea, and parasites were the major health problems of the community. The doctor, we were told, arrived on Tuesdays, around 10:00 of the morning, and stayed as long as necessary; he went to the homes if needed. The doctor vaccinated, trained the RPS, and weighed children.

We asked the RPS what he did. He gave talks to the people, he said, noting that he was a promoter for everything (the agricultural program has also relied on this man for its work in the community). He had been trained to give "initial treatments," he said--to help until the doctor could intervene if necessary. For an ARI, he recommended herb teas. (Most ARIs here are viral in origin and run their course after a few days. Those that are bacterial can be treated with antibiotics, which only the doctor has. The challenge is to discern the origin in time to provide effective treatment.) The RPS observed that he had no medicines to work with. Medicines were free until recently, he said, but now people had to pay for them, especially for vermifuges (*antiparasitarios*). And this was difficult for many.

People in Buen Futuro, as in rural communities over much of the *oriente*, rely on wild meat. Local families often lacked meat, one woman said, but had learned to prepare (as meat substitutes) lentils, peanuts, and beans from the project nutritionist. Seven or eight families sowed vegetables for consumption, said the woman. These included cabbage, scallions, tomatoes, chili peppers, radishes, green beans, and lettuce. ADRA's agronomist had worked with a couple of womens' groups, encouraging them to grow vegetables.

We asked how the Health and Nutrition Program might be improved. By providing medicines, said the RPS--if not free, at least at lower cost. People die because they have no medications, he said. And he also suggested that the project promote dairy

production, so families could have milk to drink (this highlander was the only villager with a cow).

Libertad (August 10)

Twenty-five families, all lowlanders, belong to Libertad, founded in 1932 and lying seven kilometers from Gonzalo Moreno--fifteen minutes on a trail bike. Fourteen women and four men were present for our interview. Project programs in the community include Health and Nutrition, Traditional Crops, and Vegetables. Rice, corn, and beans were the community's major crops, according to its president, and all families had a few Brazil-nut trees.

We again found the interview atmosphere tense, even more so than in the community we had visited in the morning. The community president, an extremely articulate man whose suave mien, lighter skin, and urban dress (with cap supporting a Bolivian political party) distinguished him from others present, supplied most of the responses to our questions from his seat in the rear of a small classroom. The others showed him much deference. Another man, sitting in front of the president, made an occasional comment, often with our prompting, but he was clearly uncomfortable and was very cautious. The women talked only with much prodding.

In his opening remarks of welcome, the president said that despite the failings of "the seeds from Santa Cruz" (a reference to the rice and corn seeds the project had introduced), the project would continue to search (for seeds, presumably).

Vegetables

At the time of our visit, nine women were working a garden collectively and planned to divide the produce. The garden was mostly for consumption, but they hoped to sell any surplus; ADRA had provided them with seeds through a revolving loan fund. Other women did not join the group of nine, one said, because there were no "foodstuffs" (free PL-480 food, that is, was no longer available as an inducement).

Several women in the community also had individual gardens, we were told. One woman, not part of the grower group mentioned above, said she had an individual garden because she wanted to sell vegetables. "If you're part of a group, you never see the money," she said.

Traditional Crops

Fifteen local farmers had participated in the project's rice and corn program. Most of them, we were told, were traveling (in Riberalta) or hunting, and so could not be present for the interview. Local rice varieties included *nigua*, *comino*, *chileno*, *piedrita*, *oro*, *blanco*, and *peruano* (sometimes called "*Endara*," after a family numerously represented in the community. The president was an Endara).

Participating rice farmers had among them planted seven varieties of rice, only two of which had given reasonable results. The others had germinated, but their panicles were small, their grains often dark (*negruzco*). *B-CH-1* and *Ir* were the varieties that had given the best results. The project agronomist was now working with the *chileno* (from Valparaiso) local variety and thought it might be the most suitable rice for the zone.

The varieties most consumed in the community, according to one of the women, were *oro*, *comino*, and *piedrita*. *Piedrita* was also the variety most sold--and most resistant to pests, one of the men observed. Of the local varieties, *oro* and *chileno* were the most affected by pests, he added. *Piedrita* and *blanco* were the varieties that stored better.

We asked whether any farmers had harvested rice with the *hoz* (hand scythe) or with a machete, and how they rated those tools for the job. An advantage of the *hoz*, noted one farmer, was that one could cut a large area quickly. But the cut stalks then had to be carried to a storage shed, and then the panicles removed. And this meant more work-- farmers there worked individually, he reminded us. The new varieties were especially unsuitable for the hoz, we were told: they were short and the stalks were uneven (one had to stoop low to cut them), and they were dense, so one would have to have a very large shed to store them--a single *tarea* would fill the room where we were gathered, he said.

This same man went on to say that raising chickens paid more than raising corn or rice; one could sell eggs every now and then. And one could sell plantains; their price never dropped, and they sold quickly in Riberalta. He also thought local farmers could perhaps grow coffee; nobody in the area was growing that, he said.

Health and Nutrition

The community had two RPSs (both women), one who had assumed the position only recently. We asked the original RPS (a very young woman with a baby) what her training had been. She had received a three-day short course, she said, and had learned how to treat diarrhea, coughs and colds (which one treated with aspirin, or with menthol in the nose), and how to give injections. "But the training is useless if not put into practice," protested another woman. "But I have no medicines," the RPS replied. The

new RPS said she would ask the doctor to teach her these skills so she could *put them into practice*. Tension filled the room, and the women began to chatter among themselves. It was clear that several of them were not happy with the original RPS. Finally, the president intervened to say that an RPS could not practice without medicines.

During the commotion, the doctor turned to us and said that before, he had trained the RPSs as a group in Gonzalo Moreno. But now his approach had changed: he was now giving short courses directly to the mothers, thus relying less on the RPSs. Talking to the mothers, he said, was more effective than working through the RPSs.

We asked about the doctor's visits. He came on Tuesdays, the women said, on his way back from Frontera and Buen Futuro. He arrived in the afternoon, about 3:00, and remained until 6:00--or longer if he was giving vaccinations. The most common illnesses were vomit and diarrhea, and colds (i.e., respiratory infections).

We asked what had been the major benefits of the health program. Vaccinations, medical consults, and medicines, was the reply. If people had no money, the doctor provided the medicines on credit; nobody owed for the medicines, we were told (the doctor's statistics do not support this assertion). One woman said that the doctor had come to see her sick child at 10:00 of the evening, after she went to Gonzalo Moreno to fetch him.

The project nutritionist, who came on Tuesday afternoons, had cooked with the women and had shown them how to prepare lentils, beans, vegetable soups, and deserts. She had also instructed them in the making of garbage pits and in personal hygiene. And she had given them courses in weaving.

We asked those present which program had been most beneficial to the community, agriculture, health, or nutrition. Two men (the president among them) and one woman agreed that the health program had been the most beneficial, the agricultural the least.

As we prepared to adjourn the meeting, the original RPS said that the women wanted to replace her with another. She asked us if they could do that.

4.2.2.3 Discussion and Conclusions

This multi-program integrated development project began in October of 1990 with no established ending date, though recently ADRA has established, however tentatively, a date of September 30, 1996. The programs are Vegetables, Traditional Crops (rice and corn), Tree Nurseries, and Health and Nutrition. The project sets objectives for each year, and records do not provide cumulative data across years on the degree to which objectives have been met. A report for each fiscal year provides results for that year.

Goals, the numerous objectives for each program, and the degree to which they were met in FY 1991 appear in abbreviated form in Annex F. The agronomist on our evaluation team prepared a technical report based on our visit, and this we include as Annex K.

The project has relied on revolving loan funds for the promotion of rice and vegetables. Delinquency rates have been high. As of June 30, 1992, the project had recovered only twenty-seven percent (a delinquency rate of seventy-three percent) of funds lent (for seeds and chemicals) to produce vegetables in 1991, and only sixteen percent (a delinquency rate of eighty-four percent) of funds lent to produce rice (harvested by February, 1992).

The health program also maintains a revolving loan fund for the purchase of medicines (services are free). As with the agricultural fund, the delinquency rate is reportedly high: peasants owed 1,077 Bs., or $275 U.S., at the time of our visit in August (no figure available on total amount loaned).

There are several issues that ADRA needs to address. In the area of management and administration, we think the project has received less than adequate supervision at all levels. The four-person technical team, for example, had only one motorcycle until April of this year (1992). Nonetheless, the project acquired funds from MP to buy a truck last year. Frequent communication between project technical staff and beneficiaries is very important and should receive priority at all times.

The agricultural program appears to be achieving a modest success with household vegetable gardens tended by women; the work of the nutritionist, who has shown the women how to prepare vegetable salads and soups has reinforced this effort. The project has not been successful in promoting commercial vegetable production. The high cost of pesticides, labor requirements (especially for gardens away from the rivers), and transportation to market have been important constraints. We found evidence that some of the women were not exercising caution in the application of pesticides. Although the cost of pesticides will discourage their use at the home-garden level, the project should search for techniques to produce home vegetables without using pesticides--using boiling water to disinfect seedbeds, for example.

Vegetables are seasonal, and so are the vitamins they provide. There is probably some latitude to exploit wild fruits in this heavily forested area, and thus supplement the vitamins from vegetables. Residents in this zone have collected forest products for over a century.

The project's work with corn has not been successful. The seed brought in was not adapted and did not produce. By one account, the variety recommended by the project agronomist was not the variety purchased by ADRA/La Paz. The project has introduced seven rice varieties, four from Brazil and three from the Orient. Although the original idea was to experiment with varieties in order to find those suitable to the area,

the project has been operating in both a promotional and an experimental mode. No basis has been established for promoting anything. The new varieties have not demonstrated much success (or commanded much farmer enthusiasm); indeed, they have not been able to match the traditional ones in the complex of attributes important to local farmers: yield, marketability, household gustatory and culinary qualities, resistance to pests, and adaptability to variable terrain. *Piedrita*, the preferred local variety, scores high along all these dimensions.

The problem of agriculture here is not primarily one of production, but rather one of marketing. Yet the solution to the marketing problem does not necessarily lie with silos, which the project wants to introduce. Silos may help some farmers, but they will not do much for those whose cash flow is so low that they cannot hold produce off the market. And these farmers are legion. Farmers here need help in marketing traditional crops and forest products.

The cost of medicines, which were free until the Ministry of Health initiated a new policy in January of this year whereby all but a small number of medicines (vaccinations, for example) carry a charge, has created problems for the project. We heard complaints in all the communities we visited. As a consequence of this policy, monthly visits to the doctor had dropped from an average of ninety last year to sixty this year (Serrate 1992: 4). If there must be charges, then there should be a means for residents to pay in kind; little cash circulates in these isolated communities. We also think the doctor should arrange to spend more time in the less-accessible communities as well as in those whose households are highly dispersed. But we understand that a single doctor can only do so much in serving eight dispersed communities, each with dispersed households.

The RPSs have only oral rehydration mix (donated by USAID); they have no other medicines--another complaint we often heard. We did not get much feel for the training of the RPSs (or what they could do without medicines), but we sense that it is quite limited--and that they are very limited in what they can do. The project now seems to be depending less on the RPSs and to be training the mothers directly. We could not get a clear sense of what the intended role of the RPS was. We think the project needs to clarify its health strategy and to define more clearly the roles of the RPSs and the doctor.

It is difficult to see how any health program can be sustained without training local people. And not everybody can be trained to a level sufficient to deal effectively with the more serious local health problems. It is our sense that much more can be done with RPSs than has been to date. If trained carefully and creatively, they can take much of the load off of the doctor. They live in the communities and can make "house calls" at odd hours. But it may be necessary to provide them with medicines such as antibiotics, and to train them in their use.

We think the project generally needs to look more at strategy and method. It was designed without a good understanding of the milieu. Before intervening with new agricultural technologies, for example, one should have a good understanding of current agricultural practices (cultivation, harvesting, storage, processing) and product uses (culinary, marketing) --not just a knowledge of what the practices and uses are, but rather of farmers' reasoning behind them. Proposed technologies violate this reasoning at their peril. The goal of "income generation" can lead one blindly to promote new technologies ("superior" varieties, say) without considering how those technologies affect farmers' use of time for other things (to harvest Brazil nuts, say), or of whether the technologies, if new varieties, satisfy culinary demands (taste, food preparation). The farmer's point of view must guide the technology generation or adaptation process, not the technician's. These same principles, we might add, apply to the health program.

The project staff is very young and hard-working. The agronomist, from Pando, is only two years out of school. The zone is remote, and otherwise a difficult one in which to live and work. In the rainy season, mobility is much reduced. Occasional flooding of some of the trails renders the motorbikes useless. The first agronomist remained with the project little more than a month before leaving, and the first doctor stayed about eight months. We think the present staff are to be commended for their dedication and perseverance. We also think ADRA should recognize the conditions under which they labor. This recognition might take the form of further training--sending them to seminars and congresses dealing with topics of interest to them and to the project. And ADRA could help them secure professional literature relevant to their work. There is a considerable literature on health care among peoples (indigenous and otherwise) of Amazonia. These measures would also reduce the sense of professional isolation induced by the area's remoteness.

4.2.2.4 Recommendations

Since the project is long-term, we take the liberty of making the following recommendations, which we think will improve it:

(1) ADRA should provide better administrative support and supervision at both the regional and national levels.

(2) ADRA should provide opportunities for the technical staff to maintain their professional identities through attending workshops, seminars, and short courses. And ADRA should help them secure professional literature relevant to their work. This would lessen the staff's sense of isolation.

(3) For the agricultural program:

(a) The problem in the zone appears to be one of marketing rather than of production. The project should search for ways to facilitate the marketing of crops and forest products.

(b) The project should seek greater farmer involvement in evaluating technologies and looking for solutions to problems. New technologies should not be promoted unless there is a sound basis for them and unless they mesh well with current agricultural practices and household economic routines (Brazil-nut gathering, for example).

(4) For the health program:

(a) The project should elaborate a well-defined strategy for health delivery, and should better define the roles of RPSs and the doctor.

(b) The doctor should arrange to spend more time in less-accessible communities, and in those communities with highly dispersed households.

(c) The project should train and work more closely with the RPSs, giving them more responsibility.

4.3 Discussion and Conclusions

Both of the ADRA projects we visited are multi-program integrated development projects. They work on a broad front that embraces agriculture (including tree nurseries), health, and nutrition. The projects, which until recently had no planned ending dates, establish objectives for each fiscal year and report on progress through year-end reports. Both have been well funded, and their personnel, who to their credit reside in the project zones, are technically competent and enthusiastic. In the case of the Gonzalo Moreno project, however, we observed a need for better administrative support and better supervision at both the regional and national levels.

Both projects have relied on revolving loan funds, but delinquency rates have been high, ranging from forty-seven percent to eighty-four percent. The projects have enjoyed some success in promoting home vegetable gardens, tended by women, but production depends on the use of pesticides. Apart from pesticide costs, we noted that some of the women failed to exercise precautions in their application. For this effort to be sustainable, ways must be found to produce vegetables with minimal to no use of pesticides.

We looked at a health program only in Gonzalo Moreno. The Ministry of Health's recent (as of Jan. 1, 1992) policy of charging for all but a few medicines in the rural areas has created tensions in the countryside and problems for the project, including a thirty percent decline in the average number of monthly visits to the doctor. If there must be charges, then there should also be a way for peasants to pay in kind; little cash circulates in these poor communities. We also observed that the project's health program lacked a clear strategy, and that the roles of the doctor and the community health specialists (created and trained by the project) were not well defined.

In the agricultural area, ADRA pursues the "income generation" goal with a vigor that sometimes blinds it to the project milieu. We saw several cases (of commercial vegetable production, a high-risk venture) in San Pablo where the project was working with the economically favored. This is an easy trap to fall into since one gets results quicker--gets the all-important numbers that busy donors can understand and act upon. There is also a tendency, marked in the Gonzalo Moreno project, to promote technologies without a good understanding of the agroecological milieu, or of current farmer practices, especially of the logic underlying those practices. This lack of prior understanding leads to the introduction of inappropriate technologies, which farmers ultimately reject.

5. GENERAL CONCLUSIONS

This document reports on an evaluation, the first since 1989, of the Rural Development component of Bolivia's PL-480 Title II program. The evaluation assesses the impact on rural peoples of development projects and programs mounted by three NGOs as well as evaluates the soundness of those projects and programs in their human and physical settings. The NGOs are Food for the Hungry International (FHI), CARITAS (part of the Catholic Church), and Adventist Development and Relief Agency (ADRA).

We (two persons) conducted the evaluation between June 12 and August 22, 1992, drawing on numerous project reports, but relying mostly on information obtained from interviews (group and individual) with local farmers (311) as well as with USAID and NGO administrative and technical staff (61). We evaluated a total of eight projects or programs in the Departments of Potosi, Oruro, La Paz, Chuquisaca, Santa Cruz, Beni, and Pando.

For most of its thirty-year history in Bolivia, PL-480 Title II donated food to the poor; only recently did the program assume a development character. Today, it is part of USAID's mainstream development agenda, where it links closely with Alternative Development, which is part of the U.S. Government's anti-narcotics strategy and one of USAID's six development objectives for Bolivia. Title II's Rural Development component "will include investments that are geared toward increasing rural productivity,...toward generating sustainable income opportunities in rural areas" (USAID 1991: 9).

The Rural Development component is entirely "monetized" and is funded through the sale of donated wheat flour in Bolivia. A Monetization Program, which is a separate unit within Title II, acts as broker in the sale of the flour, screens and selects NGO projects, monitors their implementation, and provides technical assistance to projects when needed.

Annex F summarizes the goals and objectives for each project or program, and the degree to which they had been met as of the indicated date. Financial and sundry other data are also included. To make information in the report more accessible, the chapter on each project closes with a "Discussion and Conclusions" section.

Food for the Hungry International (FHI)

FHI works only on the *altiplano*, where it emphasizes long-term development among the extremely poor in the departments of La Paz, Oruro, and Potosi. Its three-pronged rural-development thrust includes provision of drinking and irrigation

water, improvement of family nutrition, and development and extension of improved agricultural technologies. Family wells and communal water systems furnish potable water; the wells, always situated next to FHI-built greenhouses, serve to irrigate vegetables, which are key to improving family nutrition. FHI's simple communal irrigation systems have improved open-field crop production on tiny plots in areas of uncertain rainfall. And FHI has worked to improve technologies for producing maize, potatoes, barley, apples, and outdoor vegetables (onions, carrots, lettuce). In our evaluation, we thus visited households with wells and greenhouses, and communities with irrigation and potable water systems; and we talked with farmers who were using new or improved technologies.

Through these technologies and other innovations, FHI seeks to improve the quantity and quality of food for household consumption; income generation is not an objective. FHI promotes integrated rural development, or the development of different aspects of a community in a coordinated fashion. Household wells, for example, furnish drinking water as well as water for greenhouse vegetables; the wells and the vegetables work together to improve nutrition and health. FHI's Infant Survival Program (not evaluated here), headed by a nutritionist, reinforces the other programs by teaching mothers home hygiene as well as new and improved culinary practices. The institution does not mount "projects," but rather activities, each with a beginning date but no ending date. FHI withdraws from a community when certain development criteria (see Section 2.1) have been met. Objectives and budgets are prepared for each fiscal year.

We think FHI is having a substantial impact among beneficiaries in some of Bolivia's more challenging regions for development. Its strategy, project and program designs, and monitoring are commendable--the more so given its austere operating milieu. At the operations level, FHI employs sound principles from applied social science: changes are introduced incrementally, and technologies accommodate recipients' economic capacity as well as the milieu's agroecology--they square with current farming systems, that is.

FHI's staff, which engages periodically in self-criticism and self-evaluation, is well qualified and dedicated. We were especially impressed with the commitment of some of the promoters, who often labor under extremely adverse conditions. Several staff have been with FHI for many years, and have played a key role in incorporating the institution's experience in its evolving programs.

FHI seeks to make its activities sustainable over the long term, as can be seen by its work with technologies that are within farmers' management capacity and economic means, and that harmonize with local agroecology. The planned introduction of stores (ultimately to be villager-managed) in the rural areas to supply well-pump parts and items such as plastic greenhouse roofing is further evidence. We do not think FHI is fomenting a sense of dependency among beneficiaries. Because of their extreme poverty, the

institution cannot expect to recover all of its initial costs from them--costs for seeds and pumps, for example. Without these "priming" costs, nothing can happen.

CARITAS

An institution of the Catholic Church, CARITAS (meaning "charity" in Latin) has long provided an array of social services to the poor. It is organized at the diocese level, where it has much autonomy. Since the needs of diocese populations vary across regions, the organization and programs of CARITAS also vary by diocese. All CARITAS in Bolivia are now in transition from social-service agencies to development ones. CARITAS' prior *institutional* experience with "development" in the case of the five projects we evaluated was brief, and in no case much exceeded two years. Probably because CARITAS is a newcomer, it has no well-defined development strategy. But it does have, as has the Catholic Church in general, considerable experience in developing and working with community organizations (the spirit of the Mass is communal). This emphasis on *community* sets CARITAS apart from most other NGOs.

In the Buena Vista/Huaytu area of Ichilo Province, CARITAS/Santa Cruz mounted a project, supported by a revolving loan fund, to increase farmer incomes through introducing beans and improving rice and corn production. Beans were to be a rotational crop for the winter dry season, and would retard the rate at which farmers cut and burn the forest. The project was also to build two bulking centers to aid marketing. But foul weather, especially heavy rains this year, and volatile market prices compromised results. For other reasons, the bulking centers were never built. Delinquency rates on the revolving loan funds reached forty-seven percent.

In the San Julian zone of Nuflo de Chavez Province (Santa Cruz), CARITAS/Nuflo de Chavez mounted a two-year project (with revolving loan fund) to increase incomes through peanut, cotton, and potato production. A further aim was to recover forest fallow (and retard the swidden cycle) by removing boles and stumps, and then planting cotton, peanuts, and beans in the summer, followed by potatoes in the winter. But drought reduced potato yields in the first year, while uncertified seed rotted in the ground the second year. Hail destroyed the beans, and heavy rains this year destroyed the cotton. Peanuts were never planted because of scarce seed. And the task of removing stumps and debris daunted farmers. The loan delinquency rate on first-year potatoes was thirty-three percent; rates on other crops were unavailable.

CARITAS/Sucre initiated the construction of micro-irrigation systems in several provinces of Chuquisaca Department in order to increase crop production on 140 hectares in a drought-prone region. The systems will have irrigated 180 hectares by November, 1992, and there are early indications of production increases. Whether these translate into substantially higher incomes may depend on follow-up agronomic and marketing support. The system in one community, however, had already kept farmers from

migrating seasonally to Santa Cruz to harvest sugar. Almost any water project in this drought-stricken region will have high social and economic returns.

CARITAS/Beni mounted a one-year project (through Mothers' Clubs) to establish communal vegetable gardens in Marban and Cercado Provinces. The gardens were to improve household nutrition and incomes; half of the vegetables was to be sold, half consumed. Only about half of the planned number of hectares was planted, however, and households consumed more than ninety percent of the harvest. The project used a revolving loan fund, but data on delinquency rates (quite high) were unavailable.

Only this year, CARITAS/Beni initiated a two-year project in Marban Province to increase incomes and improve household diets through the establishment of fifty small dairy farms. The project hired a veterinarian, and forty farmers have sown pasture and are now (late July) building fences and stables to receive a pregnant cow each in September. Fencing and veterinary supplies are furnished through a revolving loan fund, and farmers must return the cow's first offspring. The project is promising: it is well conceived, its agroecological setting is congenial, its staff are competent, and its beneficiaries are enthusiastic.

We think CARITAS' long use of food incentives, which lead farmers to expect free services, to some degree compromises its development efforts during this transitionary period. We further observed that project staffing (staff is generally of high quality) tended to be "thin" relative to project objectives. On the other hand, project funding levels have tended to be low; there is probably some relation between the two.

We also observed a tendency for agricultural production projects to be overly ambitious, or sometimes to pursue unrealistic objectives. To stabilize slash-and-burn agriculture, for example, is a major challenge for an NGO, certainly in zones like the Yapacani (Buena Vista/Huaytu), with its undulating terrain and erosion-prone soils. And it is unrealistic to expect farmers to grow vegetables (or anything else) for the market in the Beni's cattle zones, where suitable forest is limited--and in any case, already belongs to the ranchers--and marauding cattle destroy the gardens. There can be no commercial agriculture in these zones pending the advent of rational government policies--and the political will and strength to enforce them--regarding land tenure and resource use.

CARITAS prizes and promotes mutual help among project beneficiaries; individualism is unrewarded and discouraged. In each of the four agricultural production projects we visited, we observed this theme, which sets CARITAS apart from other NGOs. It is the logic behind each project-sponsored beneficiary organization in the communities--and probably behind all Church-sponsored community-level organizations. CARITAS sometimes structures its projects around this ideal of mutual help. Communal credit guarantees, whereby all members are liable for the debt of each, is one instance. The emphasis on community is a CARITAS strength.

Adventist Relief and Development Agency (ADRA)

Founded by the Seventh Day Adventist Church to promote community (and individual) development and provide disaster relief, ADRA began working in Bolivia in 1964 as OFASA, distributing food, clothes, medicines, and other items to low-income peoples. The agency's fundamental objective and world mandate is "to develop the poor through physical, mental, social, and moral change" (ADRA 1991: 10).

ADRA has implemented "food-for-work" (PL-480) activities in Bolivia since 1983. Agriculture and health have been key program areas since 1986, but ADRA did not implement agricultural production projects until 1987. For most of the period since 1983, the agency implemented an array of highly dispersed and unrelated activities, poorly monitored and little coordinated. This strategy yielded three years ago to an integrated approach, with interrelated and coordinated activities concentrated in a small geographical area. In 1991, ADRA improved its planning, monitoring, and evaluation procedures. The two projects we evaluated follow the new strategy, which, according to one staffer, marks the beginning of ADRA's "development" work.

Both projects are multi-program integrated development efforts that operate on a broad front embracing agriculture (including tree nurseries), health, and nutrition. They establish objectives for each fiscal year and report on progress through year-end reports. They had no specified ending dates until recently. Both have been well funded, and to their credit their personnel reside, often at considerable sacrifice, in the project zones.

The San Pablo Project, mounted in communities along the Trinidad-Santa Cruz highway, near the Santa Cruz border, seeks to increase agricultural production and income and to improve nutrition and reduce infant mortality. The project has introduced a new rice variety, has promoted commercial and household vegetable gardens, and has established two tree nurseries. (We did not evaluate the project's substantial health component.) Heavy rains this year damaged the rice harvest; drought last year diminished vegetable yields, and a price drop in tomatoes caused by a market glut further reduced earnings. Most of the commercial vegetable farms we visited were owned by highlanders well off by regional standards. Drought and rains had also lowered production on household vegetable gardens. Current delinquency rates on revolving loan funds are seventy-five percent for rice and forty-seven percent for vegetables.

Well to the north, between the Rivers Beni and Madre de Dios in Pando Department, is the Gonzalo Moreno Project, which seeks to increase agricultural production and income and to improve nutrition and reduce infant mortality. The project was to introduce new varieties of corn and rice, and was to promote both commercial and household vegetable gardens. The health component was to immunize children and to institute programs to monitor nutritional status, to provide oral rehydration, to treat acute respiratory infections, and to provide health care to the general population.

The new corn variety failed agronomically because of ill-adapted seed, and the new rice varieties (which too often failed agronomically) are not appropriate for the zone. Marketing constraints compromised commercial vegetable production, but home vegetable gardens have enjoyed a modest success. Current delinquency rates on revolving loan funds are seventy-three percent for vegetables harvested last year, eighty-four percent for rice harvested this year.

The Ministry of Health's new policy, effective January 1, 1992, of charging peasants for all but a few medications has cast a pall on the health program. Monthly visits to the project doctor have dropped thirty percent since last year. Poverty puts medicines, including antibiotics and vermifuges (acute respiratory infections--viral and bacterial--and parasitosis are major ailments), beyond the reach of the sick; moreover, little cash circulates in these remote communities, and there is no provision to pay in kind. Vaccinations, however, are free; the health program renders a valuable service here. Beyond this, the program lacks a clear strategy for health-care delivery; the roles of the doctor and community health specialists (trained by the project) are ill-defined. The specialists seem little effective, and in any case lack medications (except for oral rehydration powder donated by USAID).

In the agricultural area, ADRA pursues the goal of "income generation" with a vigor that sometimes blinds it to the project milieu. As already noted, we saw several cases (of commercial vegetable production, a high-risk venture) in San Pablo where ADRA was working with the economically favored. This is an easy trap to fall into since one gets results quicker--gets the all-important numbers that busy donors value and act upon. There is also a tendency, marked in the Gonzalo Moreno project, to promote technologies without adequate prior understanding of either the agroecological milieu or of current farmer needs and practices, especially of the logic underlying those practices. This lack of understanding leads to the introduction of inappropriate technologies. Traditional rice varieties satisfy farmer requirements in the Gonzalo Moreno zone, for example; production is not the problem, but rather marketing--of both crops and forest products such as Brazil nuts.

Conclusions

The impact *at the beneficiary level* of the projects we visited can only in part be measured by numbers, whether of hectares planted, or hectares harvested, or yield per hectare, or income generated. In many cases, we found the numbers misleading, or of dubious validity. This is often explained, we think, by donor pressure to express results numerically. Numbers make for concise reports, and are easy for busy donors to comprehend. Nonetheless, to the extent that numbers exist, and for what they are worth, we have included them in several annexes keyed to the text. Information in the body of the report is based on visits to project sites and on interviews with beneficiaries. Therein, we think, lies the projects' real story.

The impact *at the regional level* of the projects is in all cases minimal. Strong exogenous forces have made this so. These forces include adverse weather and climate, but they also include ill-defined agricultural policies, or policies unconducive to small-farm agriculture. They include land-tenure and resource-use policies that disfavor small farmers. And they include a weak national research capacity, despite enormous needs for it. NGOs can achieve but little in the face of such opposing forces. Indeed, the latitude for "income generation" itself is circumscribed.

There are those who would question the wisdom of funding these projects, which, unlike many USAID-funded projects of the past decade or so, seek to address the needs of the "poorest of the poor." To address these needs responds unequivocally to PL-480's food-security mandate as embodied in the Agricultural Trade Development and Assistance Act of 1954 and subsequent legislation. According to Section 2 of that Act (as amended in 1990): "It is the policy of the United States to use its abundant agricultural productivity to promote the foreign policy of the United States by enhancing the food security of the developing world through the use of agricultural commodities and local currencies accruing under this Act to--(1) combat world hunger and malnutrition and their causes; (2) promote broad-based, equitable, and sustainable development, including agricultural development;..." (United States Government n.d.).

USAID has incorporated this legislation into its definition of the state of "food security": "When all people at all times have both physical and economic access to sufficient food to meet their dietary needs for a productive and healthy life" (USAID 1992: 1). The projects discussed in this report, therefore, comply with legislative mandates; and to use PL-480 Title II funds to address the needs of other than "the poorest of the poor" would be a violation of United States law. Apart from the projects' legal justification, many would argue that they are also justified on ethical and humanitarian grounds.

Delinquency rates on project loan programs have been high. Rates in three of the CARITAS projects ranged from thirty-three to forty-seven percent; in the two ADRA projects, from forty-seven to eighty-four percent. Weather alone (which has been unusually severe over the past two years) would have made for high rates, though volatile market prices and poor transportation have also played a part. With short loan terms, a single bad harvest can make delinquents of these marginal farmers. Given their general poverty and low cash flow, recovering from a failed harvest (or market-price drop) and paying back a loan can require much time and enormous effort.

It may occasionally be true that economically marginal debtors make less effort to repay loans to NGO creditors; and conversely, that NGOs make less effort to collect from highly marginal debtors. As part of the Catholic Church, CARITAS finds itself in the position of collecting debts from some of Bolivia's poorest peoples (a matter of concern to elements within the Church). But we do not think that such debtor-creditor accommodation accounts for more than a small part of the high delinquency rates. To

reason that it does obscures their fundamental cause, which is social and economic marginality.

Because of this marginality, it is doubtful that any proposed credit scheme based on real-cost recovery from recipients could be viable in the Bolivian setting. It is difficult to imagine that Bolivian commercial banks would lend (short of external guarantees) to farmers as marginal as most of those participating in these projects. From the point of view of the banks, there is no adequate way to secure the loans (many farmers do not have *legal* titles to land), and the costs of monitoring in remote areas would be high. The banks would at least demand that the risk be covered by interest rates. In general, the socioeconomic and geographical gap between Bolivia's commercial bankers and its marginal farmers is enormous.

Any loan program must work in tandem with a marketing program. Bulking centers (*centros de acopio*--these are not for storage), operating in conjunction with some sort of marketing cooperative, would give farmers a measure of control over the price paid them by farm-gate intermediaries. But to the extent that product prices are set by forces beyond the immediate region, severe price drops can paralyze marginal farmers, who must sell at *any* price because of limited cash flow. Storage facilities alone are not the answer, and any loan program would still face high delinquency rates under these conditions.

Four of the projects have promoted home vegetable gardens (to improve nutrition), either in open fields or in greenhouses (FHI), and three of the four, all in the lowlands, have promoted commercial vegetable gardens. We question the wisdom of promoting commercial vegetable production among marginal lowland farmers in remote areas. Vegetables in the humid tropics are especially susceptible to pests; production costs are high because of the need for pesticides. The labor demands to weed and water (vegetables in the Bolivian lowlands are grown in the winter dry season) are also high. Markets are limited, prices are volatile, and roads are poor to non-existent. Commercial efforts in two of the projects have been unsuccessful. ADRA's efforts among farmers in San Pablo have been only modestly successful, but participating farmers there are highlanders who are prosperous by local standards, and so can tolerate the risks. Several work their gardens with sharecropper-caretakers (*partidarios*).

Home vegetable gardens have enjoyed some success in the four projects. Seeds have sometimes been supplied free, sometimes through loans (often delinquent). Given the country's high malnutrition rates, especially among young children, one could argue that free vegetable seeds are a reasonable social cost.

Home gardens as well as commercial ones have relied on inorganic pesticides. This is cause for concern. Women make and tend these home gardens, often with young children at their side. Despite project training in pesticide handling, we encountered cases of women applying these toxic chemicals without taking the prescribed precautions.

The dangers of pesticide poisoning are especially great for pregnant and lactating women. Yet no project can train enough, or monitor enough, to insure safe pesticide use among dispersed and poorly educated peoples in remote areas.

One might argue that the pesticide problem in home gardens is ultimately self-correcting since pesticides are costly, and poor farmers tend to reserve scarce cash for the production of commercial rather than household crops. However, knowing well the susceptibility of vegetables to pests, especially in the humid tropics, and now knowing the effectiveness of pesticides in combatting them, many farmers may elect to quit making home gardens if pesticides are unavailable. Furthermore, one must recall that vegetables are new to many households, whose members are not fully convinced of their nutritional value. It becomes imperative, therefore, that all projects strive to provide appropriate technologies to produce home vegetables without the use of inorganic pesticides.

Three projects have sought in some measure to stabilize shifting cultivation and retard the pace at which farmers cut and burn the forest. The strategy in each case has been to initiate a crop-rotation scheme and introduce beans. It is unlikely that such a strategy would much affect the slash-and-burn cycle. To stabilize shifting cultivation among marginal farmers is a major challenge for an NGO, certainly in zones like the Yapacani, with its undulating terrain and erosion-prone soils. Highland settlers there and elsewhere in the lowlands are very market oriented and seek to exercise a wide range of consumer demands. To develop a stable production regime that responds to those demands and that also harmonizes with local agroecology--as it must if it is to be sustainable--requires major research. It is beyond the capacity of an NGO to conduct this kind of research. This is a role for the State.

The pernicious effects of widespread shifting cultivation and of inorganic pesticide use in home vegetable gardens point to the need for research--and to the limits of NGOs, which are not research entities. It is easy to forget this and to treat them as if they were, and so to make unrealistic demands of them. NGOs know the rural areas where they work and can serve as technology transfer agents, or can even conduct adaptive research on a limited scale, as FHI does. But this role presupposes a source for viable technologies--and linkages between the source and the NGOs. In Bolivia, this source is weak to non-existent.

We were struck by the enormous and ubiquitous obstacles to marketing in all of these "income generation" projects. The tendency has been to seek income gains through improved production technologies, especially through new crop varieties. But substantial gains could often be achieved, we think, by ignoring production and eliminating marketing constraints. (Bolivia is the land *par excellence* of the *rescatador*, or middleman.) ADRA's Gonzalo Moreno project is especially instructive here.

Delayed disbursements from MP have caused serious problems for agricultural programs. Since the seasons govern agricultural activities, late disbursements can delay them until the following season, or else compromise the results of activities begun late. And we note that four of the five CARITAS projects seek to increase agricultural production, yet the (modest) funding for none exceeds two years. Little can be achieved in agriculture in only two years.

Of the three NGOs, FHI has the most development experience as an institution. Activities tend to be well focused and closely monitored; self-criticism has been institutionalized. Method makes technologies appropriate to both the agroecological and the socioeconomic milieu. All of this is made somewhat easier, one might argue, because "income generation" is not an objective. We found the technical staff to be competent; indeed, in none of the NGO projects we visited did we find a technical staff we would characterize as incompetent.

ADRA has had fewer years of institutional experience with development than FHI. Their programs are conceptually good, their integrated approach theoretically sound. But the concepts and the theory do not always transfer well to the operations level. (It takes time for this to happen.) Whereas the design of the agricultural component of the San Pablo project seems adequate for San Pablo, that of the Gonzalo Moreno project is inadequate. Unlike CARITAS, ADRA gives less emphasis to conducting *ex ante* diagnostic surveys of an area to learn community needs and points of "development" leverage. This results in projects that tend to be imposed from "above" rather than those that rise naturally from "below." There is also a need for closer project monitoring and more self-criticism; this need is acute in the case of Gonzalo Moreno.

CARITAS is a newcomer to development. In two of the five CARITAS projects (both in Santa Cruz), we found a lack of congruence between project design and project funding (including staffing) levels. In the case of CARITAS/Beni's Nutritional Vegetable Gardens project, the design did not square with either the agroecological or the socioeconomic milieu. In less degree, this was also true of CARITAS/Nuflo de Chavez's Peanut, Potato, and Coton project. In four of the five CARITAS projects, staffing levels were inadequate to effectively monitor activities. But again, this problem cannot be divorced from funding levels.

CARITAS is part of the Catholic Church, which has years of experience--more experience than the NGOs above--at working at the community level, developing and supporting grassroots organizations. As part of the Church, CARITAS enjoys an advantage denied to other NGOs, who are "guests" in Bolivia and can be dismissed at the pleasure of the government of the moment. They are thus more susceptible to political and other pressures that would distort a development agenda.

Both CARITAS and ADRA are church-affiliated NGOs, whereas FHI is non-denominational Protestant. In no instance did we observe religious or political

discrimination in the selection or treatment of project participants. Rapid visits of a kind we made, however, do not lend themselves to such observations except in the most egregious cases. There are subtle ways to use development projects to leverage other ends.

6. RECOMMENDATIONS

We make the following recommendations for USAID, for PL-480 Title II's Monetization Program (MP), and for the NGOs:

(1) MP's delays in disbursing funds are causing substantial harm to projects with agricultural activities. These activities must be synchronized with the seasons, and so cannot be delayed. This problem needs urgent attention.

(2) Agricultural production projects should be designed and funded for a period exceeding two years, and their funding level should bear a reasonable correspondence to planned project life and to project objectives.

(3) MP should not fund NGO-implemented projects to stabilize slash-and-burn agriculture, or projects to produce *commercial* vegetables among poor farmers in the humid tropics. As regards vegetables, production costs are high because of the need for pesticides; demand is limited, markets are remote, and prices are volatile; and roads are poor to non-existent.

(4) It is imperative that *all* NGOs promoting household vegetable gardens, whether in greenhouses or open fields, search for technologies that do not require the use of inorganic pesticides. The use of such pesticides poses enormous health risks; yet without some form of pest control, households, especially in the humid tropics, cannot produce vegetables, and so cannot derive the intended nutritional benefits.

(5) Notwithstanding the recent unusually adverse weather, there is little evidence that revolving loan funds established by these projects are otherwise sustainable. They should be discontinued. If income generation is to be a goal, these loan funds should be replaced by a scheme comparable to that FHI uses, whereby the NGO and recipients share in the costs, with the NGO's share considered a donation necessary to "prime" the development effort.

(6) Regarding CARITAS, we recommend the following:

(a) That CARITAS, because of its comparative advantage in working with community organizations and promoting mutual help and solidarity, focus its efforts on agricultural marketing rather than on production (with the exception of home vegetable gardens). Income gains can often be achieved by removing marketing obstacles.

(b) CARITAS' micro-irrigation project in Chuquisaca should be continued. Because of the devastating consequences of chronic drought in recent years, all such low-cost projects have high social and economic returns.

(c) CARITAS/Beni's small-farmer milk project shows much promise and should receive full support; it is most important that MP disburse funds in time for the project to buy pregnant cows before mid-September, 1992.

(7) Regarding ADRA, we recommend the following:

(a) That ADRA scrutinize more closely the socioeconomic level of participants in its agricultural programs.

(b) That ADRA further "tighten" the scope of its projects, in response to participant-defined needs. This "tightening" implies fewer interventions, both less complex and better focused.

(c) That Gonzalo Moreno receive more administrative support and better supervision at both the regional and national levels.

(d) That Gonzalo Moreno's agricultural program cease efforts to increase production and focus instead on removing constraints to the marketing of existing crops and forest products.

(e) That Gonzalo Moreno's health program find a way to enable patients to pay for medications in kind rather than in cash.

(f) That Gonzalo Moreno's health program elaborate a well-defined strategy for rural health delivery and better define the roles of rural health specialists (RPSs) and the doctor. If necessary, MP should make funds available to hire a qualified health consultant to assist with this strengthening effort. Since we did not evaluate San Pablo's health program, we suggest a review of that program as well.

(8) Regarding FHI, we recommend that they give more attention to the role of women in agriculture, especially their role in tending the greenhouses.

(9) MP should bring the different NGOs together periodically to discuss their mutual successes, problems, and how they have addressed those problems. There are three areas where we think such gatherings, which should take the form of workshops, would be useful:

(a) Greenhouse vegetable production: FHI and ADRA have experience, and CARITAS/Sucre plans to introduce greenhouses. A workshop might deal with several topics, including pest control without the use of inorganic pesticides.

(b) Household vegetable gardens in the humid tropics: ADRA and CARITAS have experience here. A major topic of any workshop should be pests, and how to combat them without using inorganic pesticides.

(c) Micro-irrigation systems: FHI, ADRA, and CARITAS have experience with these.

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Villavicencio, Raquel	Farmer, San Pablo (Beni)
Yujo, Abelina	Farmer, San Pablo (Beni)

Group interview with 3 farmers, San Pablo (Marban Province, Beni Department)

Group interview with 2 farmers, Loma del Amor (Marban Province, Beni Department)

Interview with 1 farmer, Verano (Marban Province, Beni Department)

Group interview with 17 persons, Gonzalo Moreno (Madre de Dios Province, Pando Department)

Group interview with 25 persons, Agua Dulce (Madre de Dios Province, Pando Department)

Group interview with 6 persons, Buen Futuro (Madre de Dios Province, Pando Department)

Group interview with 6 farmers, Buen Futuro (Madre de Dios Province, Pando Department)

Group interview with 18 persons, Libertad (Madre de Dios Province, Pando Department)

<u>CRS/CARITAS</u>

Alvarez, Digno	Veterinarian (Milk Production Project, CARITAS/Beni)

Ayllon, Jorge	Engineer, CARITAS/Sucre
Calizaya, Enrique	Agronomist (Responsible for Huaytu zone, Traditional Crops Project, CARITAS/Santa Cruz)
Cazon, Nelson	Agronomist (Manager, Traditional Crops Project, CARITAS/Santa Cruz)
Costedo, Javier	Projects Coordinator, CARITAS/Beni
Diez, Ruben	Agronomist, CARITAS/Nuflo de Chavez
Flores, Hector	Veterinarian, CARITAS/Nuflo de Chavez
Flores, Maria Luisa	Agronomist (Extensionist, Nutritional Gardens Project (CARITAS/Beni)
Flores, Mario	Head, Monetization Projects, CRS
Gomez R., Walter	Projects Office, CARITAS
Hernandez, Josefa	Interim Director, CARITAS/Santa Cruz
Higa, Yoshie	Head of Administration, CARITAS/Santa Cruz
Komarek de Perez, Eva	Executive Secretary, CARITAS/Sucre
Kurka, Froelan	Director, CARITAS/Nuflo de Chavez
Masapaija, Carlos	Accountant, CARITAS/Beni
Mazueto, Enrique	Agronomist (Manager, Nutritional Gardens Project, CARITAS/Beni)
Mazueto, Enrique	Manager, Nutritional Gardens Project, CARITAS/Beni
Montano, Miriam	Coordinator, Department of Coordination, CARITAS/Santa Cruz
Paco, Maximo	Farmer, Quiscoli (Chuquisaca)
Ramirez, Cansio	Farmer, Pampas Abajo (Chuquisaca)
Ramirez, Felix	Executive Secretary, CARITAS/Nuflo de Chavez

Solares, Gonzalo	Rural Projects Manager, CRS
Takata, Juan Ramon	Executive Secretary, CARITAS/Beni
Torrico, Alfonso	Executive Secretary/Food Manager, CARITAS/Bolivia
Torrico, Juan	Director, CARITAS/Sucre
Vargas, Antonio	Manager, Small Enterprise Project, CARITAS/Santa Cruz
Villaroel, Justo	Farmer, Santa Barbara (Santa Cruz)
Viviani, Jose Luis	Promoter, CARITAS/Beni
Wittkowski, R. Dieter	Interim Director of Projects and Material Resources, CRS

Group interview with 22 farmers, El Carmen (Ichilo Province, Santa Cruz Department)

Group interview with 16 farmers, Monte Rico (Ichilo Province, Santa Cruz Department)

Group interview with 7 farmers, Caranda (Ichilo Province, Santa Cruz Department)

Group interview with 18 farmers, Villa Alto Peru (Nuflo de Chavez Province, Santa Cruz Department)

Group interview with 17 farmers, Colonia Independencia (Nuflo de Chavez Province, Santa Cruz Department)

Group interview with 25 farmers, Belen (Nuflo de Chavez Province, Santa Cruz Department)

Group interview with 6 farmers, Pupa Huayco (Zudanez Province, Chuquisaca Department)

Group interview with 3 farmers, Quiscoli (Zudanez Province, Chuquisaca Department)

Group interview with 12 vegetable farmers (women), Casarabe (Cercado Province, Beni Department)

Group interview with 13 vegetable farmers (women), Sachojere (Cercado Province, Beni Department)

Group interview with 9 farmers, Nueva Creacion de Cotoca (Marban Province, Beni Department)

Group interview with 21 farmers, Santa Rosa (Marban Province, Beni Department)

FHI

Bautista, Eloy	Farmer, Jarana Alta (Potosi)
Bernal, Victor	Departmental Administrator, La Paz
Carpio, Ramiro	Departmental Administrator, Oruro
Gomez, Luis	Promoter, Chayanta Province, Potosi
Guerra, Jorge	Assistant to the Country Director
Guerrero, Remberto	Projects Chief, Potosi Department
Gutierrez, Eliseo	Promoter, Alonso de Ibanez Province, Potosi
Molino, Claudio	Promoter, Chayanta Province, Potosi
Morales, David	Promoter, Alonso de Ibanez Province, Potosi
Morquez, Eulogio	Farmer, Ayoma (Potosi)
Pacheco, Damaso	Promoter, Pacajes Province, La Paz
Padilla, Felix	Farmer, Churicala (Potosi)
Padilla, Genaro	Farmer, Churicala (Potosi)
Paichu, Agustin	Farmer, Huancarani (Potosi)
Pando, Villal	Farmer, Centro Esquena (Potosi)
Rodriguez, Francisco	Country Director, Bolivia
Romero, Maria	Farmer, Calacoto (La Paz)
Saldi, Bruce	Projects Chief, La Paz Department

Soto, Ms. Zacarias	Farmer, Centro Esquena (Potosi)
Sotomayor, Eduardo	Technical Supervisor, Oruro
Terrazas, Carmelo	Promoter, Pacajes Province, La Paz
Urquieta, Carlos	Promoter, Chayanta Province, Potosi
Villafuerte, David	Promoter, Chayanta Province, Potosi
Waywar, Gerardo	Departmental Administrator, Potosi

Interview with a woman farmer, near Caripuyo (Potosi)

Group interview with 8 farmers, Ayoma (Potosi)

Group interview with 8 farmers, Juntavi (Potosi)

Group interview with 12 farmers (5 women), Caripuyo (Potosi)

Group interview with 17 farmers, Ulloma (La Paz)

ANNEXES

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Annex B Organization Charts and Materials Pertinent to FHI

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Annex J Statistics on Gonzalo Moreno Integrated Project, ADRA/Riberalta

Annex K Technical Report: Gonzalo Moreno Integrated Project, ADRA/Riberalta

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Annex N Technical Report: San Pablo Integrated Rural Development, ADRA/Trinidad

ANNEX A

Evaluation Scope of Work

ANNEX A

Scope of Work

1. Summary

The contractor will provide technical assistance services to the Agriculture and Rural Development Office of USAID/Bolivia for the evaluation of selected rural development activities carried out by the cooperating sponsors of the PL-480 Title II Food for Peace program.

2. Background

The PL-480 Title II program in Bolivia is implemented through three voluntary agencies (cooperating sponsors): Catholic Relief Services/CARITAS; Adventist Development and Relief Agency (ADRA); and Food for the Hungry (FHI). These agencies use food and funds donated by the U.S.G. to carry out rural development programs, build urban infrastructure and improve health, education and housing conditions of Bolivia's poor.

Beginning in 1991, the program has been operating under a new strategy which provides assistance in five areas:

Humanitarian assistance (distribution of food to asylums, orphanages, hospitals, women in poor health and children under six years, and other poor people;

School feeding (provision of school meals to increase attendance and improve nutritional levels in schools, mostly in rural areas);

Women in development (provided as an alternative to the gradual elimination of mother's clubs under the new strategy, this component seeks to offer alternative economic opportunities to women);

Urban infrastructure, under which the agencies pay workers with food for paving, construction of canals, etc. in poor barrios of the major cities). This food for work program is the most important component of the Title II portfolio, uses the most food and directly supports USAID objectives of employment creation and municipal development.

Rural development (support to production and marketing projects in rural areas, productive infrastructure--irrigation, silos, greenhouses, corals, etc., technology transfer and reforestation. Most of the rural development programs under the new strategy are heavily monetized.

The annual amount of food imported under the Title II program is about 54,000 MT, valued at about $14.0 million. Of this amount, about 18,000 MT is sold on the local market, and the monies are used under the Title II monetization program to buy local products and fund development activities.

3. Purpose and Scope

The purpose of the technical services is to write an evaluation of the Title II rural development activities funded by the monetization program. It is not the purpose of the technical services to provide a general picture of the rural development problems in Bolivia, nor describe in a general manner what is wrong with Bolivia's current agricultural or food distribution policies, except insofar as they directly relates to the success or failure of a specific Title II rural development project activity which is being evaluated by the contractor.

In close consultation with the cooperating sponsors, the consultant will: review the project information available from the cooperating sponsors and USAID/B; using the list of projects given to the evaluator by USAID/B, establish a matrix of each rural development project activity (date began, amount committed, amount spent, pipeline, etc); interview key persons in government or other organizations involved with the particular activity; establish impact or success indicators for selected activities, where feasible (and noting whether the cooperating sponsor or project entity has established any); make selected site visits, interviewing people in the field; and objectively write up the analysis in prose, table and (if appropriate) graphic form.

The following projects will be examined:

<u>Trinidad</u>

(total: thirteen working days)

1. ADRA - Integrated project "Gonzalo Moreno" - Riberalta, Beni (5 working days): Nursery with 21,500 plants; Rice production (harvesting time: March 1992); Demonstration gardens (8); Immunization and health care; and Construction of health post.

2. ADRA - Integrated project "San Pablo" - Beni (five working days): Rice production (49 Has.); Production of vegetables (15 Has.); and Nursery (7,000 fruit plants).

124

3. CRS/CARITAS - Nutritional Vegetable Gardens - Beni (three working days): Gardens in 21 communities through Mothers' Clubs, along the Trinidad-Santa Cruz road; Total of 303 beneficiaries.

Santa Cruz

(Total: five working days)

1. CRS/CARITAS - Development of traditional crops - Santa Cruz - Production of 226 Has. of rice and 383 Has. of corn; 332 beneficiaries from 20 communities; and 360 Has. of beans planted by 282 beneficiaries.

2. CRS/CARITAS - Peanut, Cotton and Potato production - Ñuflo de Chavez (Santa Cruz) - 137 beneficiaries in the colonization area of San Julian.

3. CRS/CARITAS - Support for Agricultural Production - Chiquitos, Santa Cruz - Production of 120 Has. of coffee, associated with annual crops in a colonization area of Santa Cruz; Number of beneficiaries: 122 people.

Tarija

(total: three working days)

School gardens and animal raising - Vegetable production and poultry raising in community schools; Number of beneficiaries: 1,142 children; 3.2 Has. planted (corn, potato and amaranth).

Sucre

(total: five working days)

CRS/CARITAS - Micro-irrigation systems; 7 micro-irrigation systems in 7 communities; 138 small farmers benefitted.

Oruro and Potosi

(total: eight working days)

Food for the Hungry, International (FHI) - Rural development projects in La Paz, Oruro and Potosi: 362 new greenhouses built, benefitting 1,810 people; 135 greenhouses renovated, benefitting 675 people; 15 greenhouses spontaneously constructed, 75 people;

233 family wells, benefitting 3,495 people; 1 potable water system: 97 families benefitted; 1 small irrigation system, benefitting 264 families; 1 animal dipping campaign, benefitting 74,326 sheeps owned by 1,573 families; some of the 505 assorted infrastructure projects (fences, corrals, farm ponds, animal dip baths, etc.), time permitting.

La Paz

(total: ten working days)

1. ADRA - Integrated project "Cohoni" - Rio Abajo, La Paz (five working days): Production of vegetables (25 Has.); Production of potatoes (24 Has.); Irrigation canals in Chotocollo (1,200 mts and 80 Has. irrigated); and Potable Water in Kapi (834 mts. and 14,500 liters tank capacity); and Terracing and Potable water in Cotaña (8,000 m2 of land improved).

2. CRS/CARITAS - Micro-irrigation systems - Province of Omasuyos and Muñecas, La Paz: Construction of 8,950 mts of irrigation canals; 105 Has. of land irrigated in 5 communities (Inca Katurati, Socoponi, Monterojo, Catluni and Pantisamanya).

3. ADRA - Rural infrastructure in La Paz Department- Irrigation canals (25 has.); forestation (78,260 plants); 42 greenhouses in different locations; three cattle barns; and five animal dips.

General (Applies to all three cooperating sponsors)

What is the effectiveness of cooperating sponsors and/or project implementation organizations as development agencies? Is the technical capability (eg., field staff) of the implementing organizations adequate? Is project design sound from a technical point of view? Is the technical monitoring by the organization adequate and pro-active? Are the project activities self-sustaining? If not self-sustaining, do they help contribute to a sense of dependency or entitlement? Is promised funding for project activities provided in a timely manner (this could be a function of how well responsibility is delegated to the field)? Are any religious activities with which the cooperating sponsor may be concerned kept appropriately separate from project activities--eg., are project beneficiaries determined by appropriate developmental criteria? (In accordance with AID Handbook 9, AID funds may not be used for the purpose of religious proselytism).

The contractor will review the list or matrix of projects, and Title II rural development activities selected for field evaluation, with USAID/Bolivia before visiting the field. The services described above are to be analytical in nature--under no circumstances will USAID accept purely anecdotal material, or material not substantiated by actual observation, objective interviews with project participants or review (and citation) of project publications and reports.

4. Team Composition and Qualifications

This evaluation will be carried out by a U.S.-based report writer/evaluation specialist, who will be the team leader, with at least ten years working experience in developing countries in rural development projects, preferably AID agriculture and/or Title II cooperating sponsor projects in Latin America. Experience in the agricultural sector of Bolivia would be a plus, as would experience working with AID Title II cooperating sponsors. Experience with working in programs to assist small farmers is required. An M.S. degree is required, preferably in agriculture (agronomy, natural resources, animal science, agricultural economics). Proven expository writing abilities, including conceptual and organizational skills required for report-writing, native English speaking and writing ability, Spanish speaking skill at FSI-3 level, and good project evaluation and analysis skills are necessary. Contractor must be willing to travel for three to ten day periods in Bolivia. Computer abilities (word-processing and, preferably, diagram/chart design) would be a plus. Since the team leader will be responsible for managing the output of one or two local agronomists (see below), and working with the staff of project organizations in possibly difficult field circumstances, effective interpersonal and management skills will be required.

The technical aspect of this evaluation--whether or not the projects are designed and carried out in a technically solid manner within the local agroclimatic conditions and socioeconomic characteristics--is the most important part of this exercise. Therefore, the team leader will be accompanied by one or two agronomists, available locally if possible. These individuals should have a minimum degree level of "ingeniero agronomo," have at least five years working experience in grass-roots rural development and demonstrated evidence of mature professional development. Knowledge of the field areas (eg., Riberalta, La Paz Department, Santa Cruz, etc.) and familiarity with the work of the particular cooperating sponsors would be a plus. Some English language capability would be preferred.

5. Period of Services

The length of services is 62 working days for two to three individuals (124 person days total). Period of services for the local agronomists will be 35 and 27 days, respectively, (or one local agronomist for the full 62-working day period, depending upon availability and familiarity with the field sites). A six-day work week is authorized. It will be the responsibility of the contractor to translate the scope of work into Spanish for the local agronomists, if necessary.

The approximate schedule will be: three working days familiarization and information gathering in La Paz; 52 working days information-gathering on six field trips (including La Paz Department); four working days to write the report; and three working days to incorporate editorial comments, for a total of 62 working days (124 person days). Services are to begin no later than May 30th.

Contractor will complete a draft of the required report in 59 working days and submit it to USAID/Bolivia ARD Office for review. For draft review purposes, the text of this report will be in English, although the tables and annexes may be in Spanish. Upon final approval of the draft by USAID/Bolivia, and incorporation of any additional editorial comments, the contractor will submit ten (10) copies of the report in English and ten (10) copies of the report in Spanish no later than fifteen working days after the team leader departs Bolivia. Six-day work week is authorized.

6. Relationships and Responsibilities

Contractor will report to the Director, Agriculture and Rural Development Office, or his designee. The staff of the this office will provide relevant information (reports, etc.) during the information-gathering phase in La Paz. The contractor will work very closely with the staff of the respective cooperating agencies, in a collegial and professional fashion.

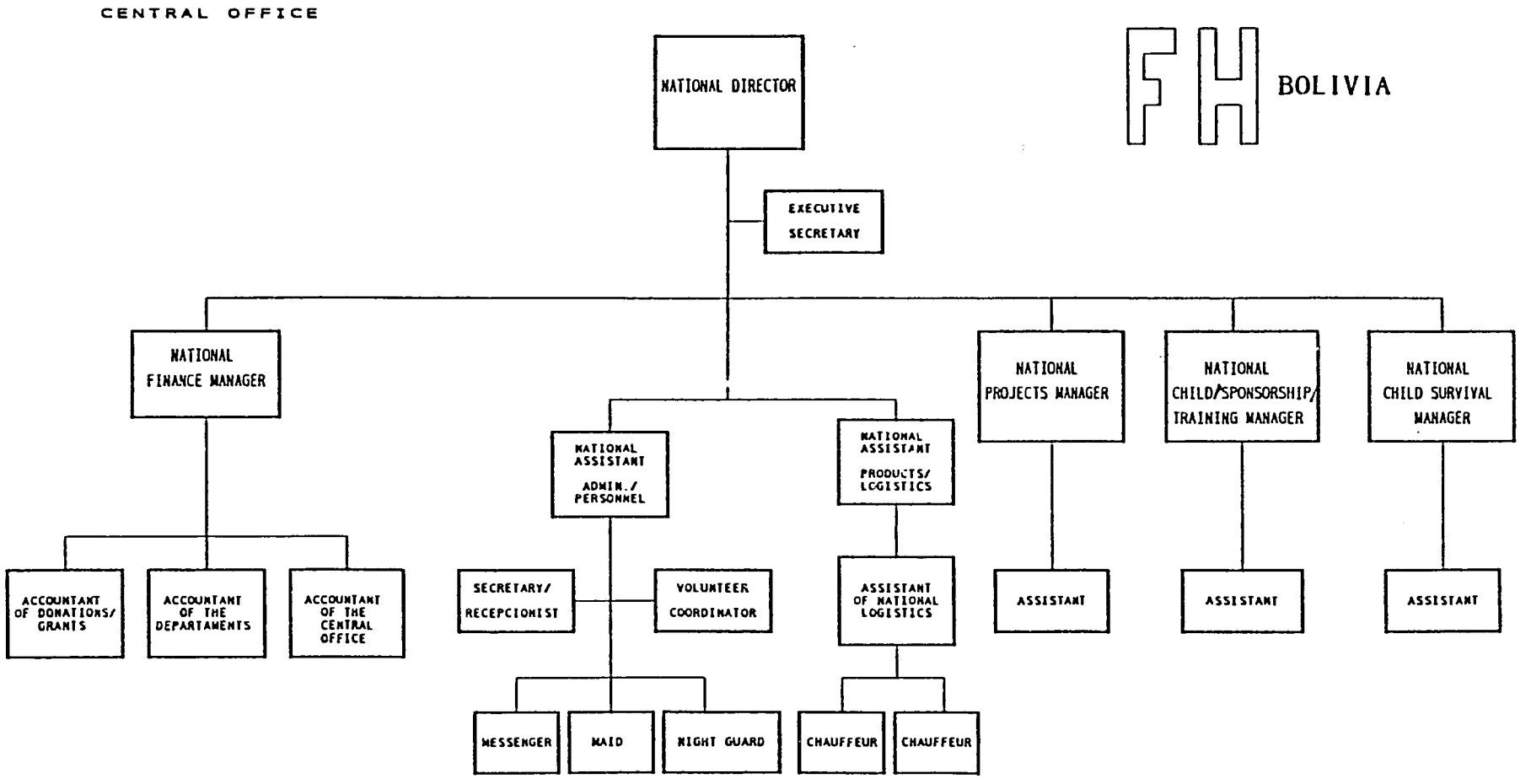
7. Health

The altitude of La Paz (12,000 feet above sea level) can have a deleterious effect on the health of persons with pre-existing medical problems and/or respiratory infections. Individuals with hypertension, diabetes, angina pectoris, coronary heart disease, asthma, emphysema, chronic bronchitis, or any history of heart attack, heart disease or lung disease, should have a thorough evaluation by their physician prior to traveling to La Paz.

ANNEX B

Organization Charts and Materials Pertinent to FHI

FH/B ORGANIZATION CHART OF AUTHORITY AND COMMUNICATION



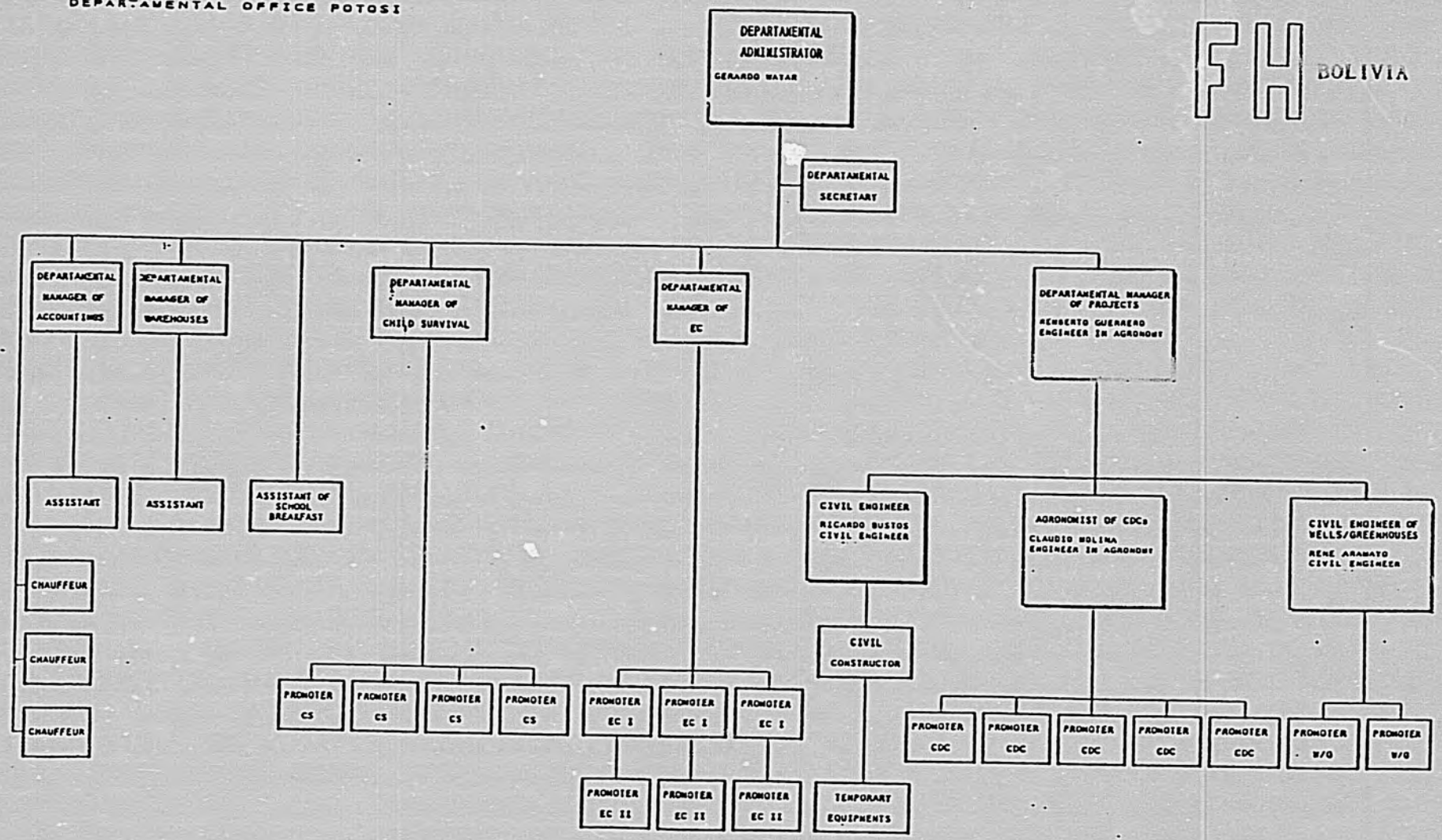
FH BOLIVIA

ANNEX B

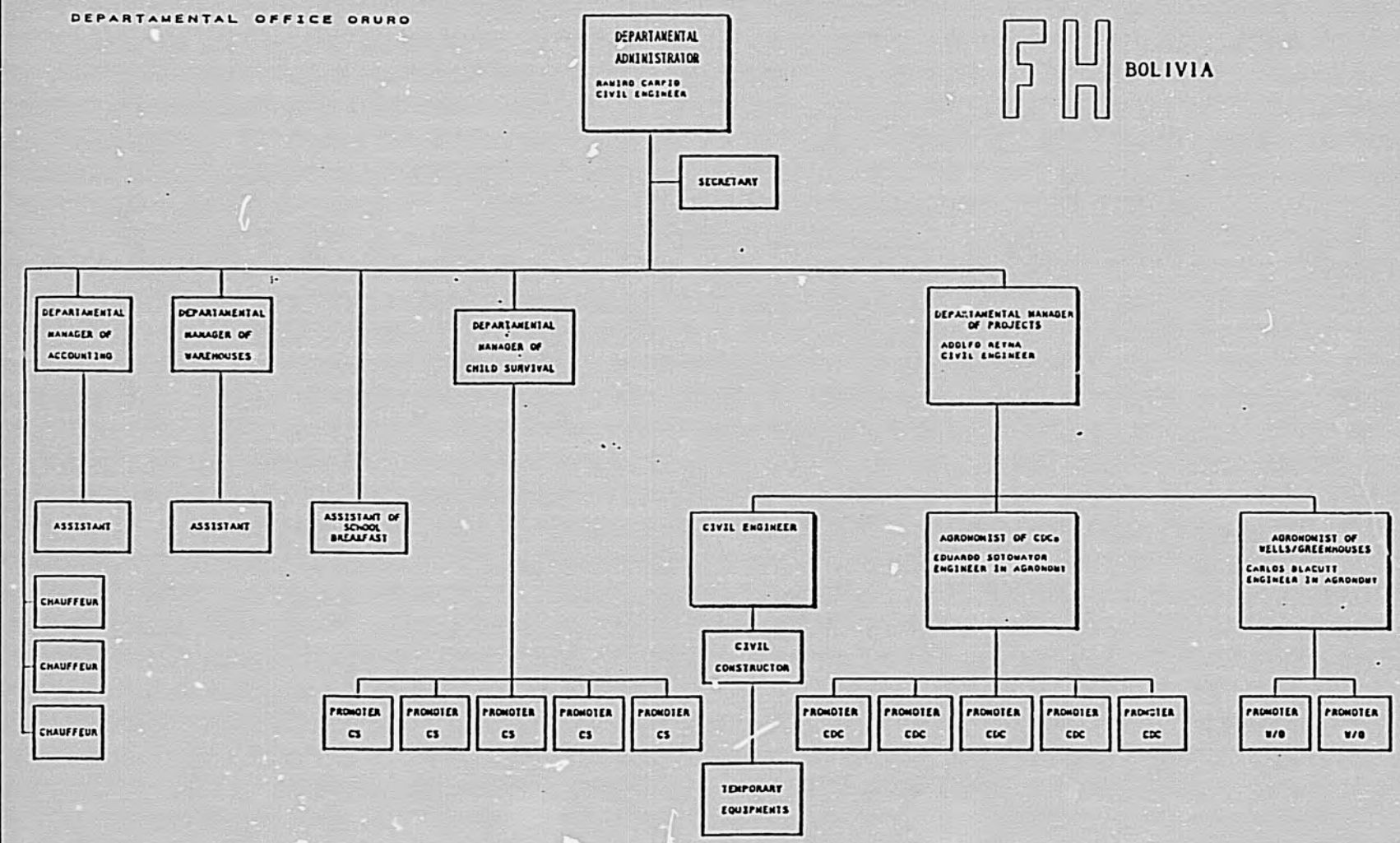
FH/B ORGANIZATION CHART OF AUTHORITY AND COMMUNICATION

DEPARTAMENTAL OFFICE POTOSI

FH BOLIVIA



FH/B ORGANIZATION CHART OF AUTHORITY AND COMMUNICATION



FH BOLIVIA

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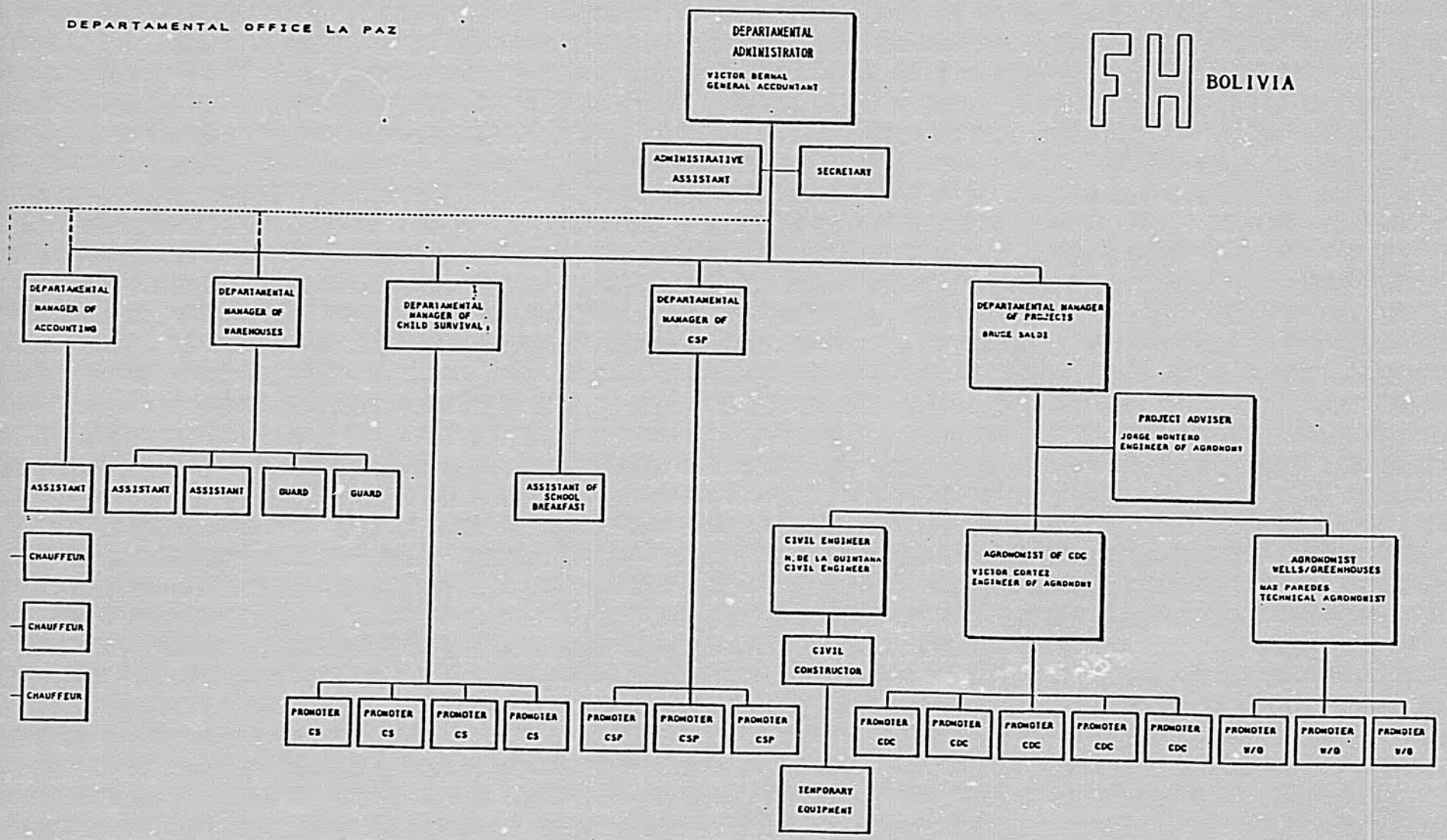
FH/B ORGANIZATION CHART OF AUTHORITY AND COMMUNICATION



POLITICAS DE PROYECTOS / CDCs

FECHA DE ELAB.: 30/04/92

PROYECTO	APORTE FH/B	APORTE BENEFICIARIO
INVERNADEROS	- Materiales no locales: Agrofilm, fierro, callapos. - Apoyo con fondo rotativo para la provision de materiales no locales. - Transporte de todos los materiales no locales. - Asistencia Técnica y Capacitación. - Semilla para la primera siembra.	- Materiales locales. - Materiales no locales con apoyo del fondo rotativo. - Mano de Obra. - Operación y mantenimiento. - 2 bolsas de cemento
POZOS	- 1 Bomba manual de agua: • Hasta 10 m: Yaku • Más de 10 m: Bola - 70 % del cemento para la fabricación de anillas. • Fierro de ϕ ¼" para la armadura • Alambre de amarre - Peldaños de ϕ 3/8". - Equipo de apoyo: encofrados, motobombas, trípode, etc. - Apoyo para la desinfección de pozos. - Asistencia técnica y capacitación. - Apoyo del Fondo Rotativo. - Transporte de todos los materiales no locales.	- 30% del cemento para la fabricación de anillas. - Fierro para la tapa. - Cemento para la tapa y acera: 3 bolsas. - Todos los materiales locales. - Mano de obra. - Operación y Mantenimiento.

SISTEMAS DE ABASTECIMIENTO DE AGUA	- Elaboración del proyecto. - 90% de materiales no locales. - Mano de obra calificada. - Transporte de materiales no locales. - Asistencia técnica y capacitación.	- Materiales locales. - Mano de obra no calificada. - Transporte de materiales locales. - 10% de los materiales no locales. - Operación y mantenimiento del sistema.
SISTEMAS DE RIEGO	- Elaboración del proyecto. - Materiales no locales. - Mano de obra calificada. - Transporte de materiales no locales y hasta 50% de locales. - Aporte porcentual en semillas y/u otros insumos agrícolas. - Asistencia técnica y capacitación. - Apoyo en la comercialización de productos.	- Materiales locales. - Mano de obra no calificada. - Por lo menos 50% del transporte de materiales locales. - Operación y mantenimiento del sistema.
PROYECTOS PEQUEÑOS	- Elaboración del proyecto (verificado por el Ing. Civil). - 50% de materiales no locales, hasta $300 (incluyendo transporte). - Asistencia técnica y capacitación.	- 50% de materiales no locales, hasta $300, incluyendo transporte y mano de obra calificada. - Materiales locales. - Operación y mantenimiento.
CULTIVOS EN CDCs	- Elaboración del proyecto. - 50% de semillas en el 1er y 2do año. - Porcentaje de otros productos agrícolas (fitosanitarios, fertilizantes, etc.). - Asistencia técnica y capacitación	- 50% de semillas en el 1er y 2do año. - Abonos naturales. - Porcentaje de otros productos agrícolas (fitosanitarios, etc.).

FH/B - POLITICAS PROYECTOS / CDCs 1992

FUNDACION CONTRA EL HAMBRE
BOLIVIA

PY-06

CONTROL GENERAL DE AVANCE DE INVERNADEROS

DEPARTAMENTO:

MES: E.F.M.A.M.J.J.A.S.O.N.D. AÑO: 199

EQUIPO	SUPERVISOR TECNICO	REGION	PROMOTOR	META	SUMA DE ETAPAS CUMPLIDAS														OBS.
					VISITA/REPLANTEO DEL INVERNADERO	FIRMA DEL CONTRATO	FABRICACION DE ADOBES	CAPACITACION GENERAL	CONSTRUCCION DE LA ESTRUCTURA	ENTREGA DE MATERIALES	EJECUCION DEL PASILLO/PREPARACION DEL SUELO	EJECUCION DE LA CUBIERTA	FABRICACION/ COLOCACION DE PUERTA Y VENTANAS	CONCLUSION DE REBOQUES/PLAQUETA	CAPACITACION EN HORTICULTURA	VERIFICACION DE PRODUCCION			
EQUIPO PY																			
			SUB TOTALES																
EQUIPO CDCs																			
			SUB TOTALES																
			TOTALES																

JEFE DEPTAL. DE PROYECTOS

ADMINISTRADOR DEPTAL.

FUNDACION CONTRA EL HAMBRE
BOLIVIA

PY-05

CONTROL DE AVANCE DE INVERNADEROS

DEPARTAMENTO:

PROVINCIA:

PROMOTOR:

MES CUMPLIDO: E.F.M.A.M.J.J.A.S.O.N.D. AÑO 199

				SUMA DE ETAPAS CUMPLIDAS														OBS.
No.	BENEFICIARIO	COMUNIDAD	INDICADOR	VISITA/REPLANTEO DEL INVERNADERO	FIRMA DEL CONTRATO	FABRICACION DE ADOBES	CAPACITACION GENERAL	CONSTRUCCION DE LA ESTRUCTURA	ENTREGA DE MATERIALES	EJECUCION DEL PASILLO/PREPARACION DEL SUELO	CAPACITACION EN HORTICULTURA	FABRICACION/ COLOCACION DE PUERTA Y VENTANAS	CONCLUSION DE REBOQUES/PLAQUETA	EJECUCION DE LA CUBIERTA	VERIFICACION DE PRODUCCION	TIPO DE INVERNADERO		
META: INVERNADEROS			TOTALES															

FUNDACION CONTRA EL HAMBRE
BOLIVIA

FECHAS DE INICIO Y CONCLUSION DE PROGRAMAS

PROGRAMA: Pozos
Fecha de Inicio: Marzo/1989
Fecha de Conclusión: (ver NOTA abajo).

PROGRAMA: Invernaderos
Fecha de Inicio: Marzo/1989
Fecha de Conclusión: (ver NOTA abajo).

PROGRAMA: CDC's
Fecha de Inicio: Septiembre/1990
Fecha de Conclusión: (ver NOTA abajo).

PROGRAMA: Abastecimiento de Agua y Micro-Riego
(Proyectos Especiales)
Fecha de Inicio: Marzo/1991
Fecha de Conclusión: (ver NOTA abajo).

NOTA La conclusión de los programas está en función a la superación de los deficits existentes en las zonas de trabajo, incluso a nivel nacional. Cuando FH/B considere que tal logro ha sido alcanzado, se procederá a la conclusión del programa en dicha zona de trabajo.

FUNDACION CONTRA EL HAMBRE
BOLIVIA

RESUMEN DE PROYECTOS CONCLUIDOS EN LAS GESTIONES 89-90-91

FECHA DE ELAB.: 28/04/92

PROYECTO: Pozos

DEPARTAMENTO	GESTION 89	GESTION 90	GESTION 91	TOTAL PROV.
LA PAZ				
Pacajes	71	211	90	372
Omasuyos	16	35	40	91
Subtotal	87	246	130	463
ORURO				
Cercado	16	31	46	93
Subtotal	16	31	46	93
POTOSI				
A. de Ibañez	30	22	34	86
Bustillos	17	10	55	82
T. Frías	62	74	62	198
Chayanta	36	54	42	132
Subtotal	145	160	193	498
TOTAL GEST.	*248*	*437*	*369*	*1054*

PROYECTO: Invernaderos

DEPARTAMENTO	GESTION 89	GESTION 90	GESTION 91	TOTAL PROV.
LA PAZ				
Pacajes	104	136	83	323
Omasuyos	46	30	--	76
Subtotal	150	166	83	399
ORURO				
Cercado	6	54	77	137
Subtotal	6	54	77	137
POTOSI				
A. de Ibañez	13	56	72	141
Bustillos	7	22	51	80
T. Frías	65	89	56	210
Chayanta	47	76	35	158
Subtotal	132	243	214	589
TOTAL GEST.	*288*	463	374	1125

FUNDACION CONTRA EL HAMBRE
BOLIVIA

BENEFICIARIOS DE LAS GESTIONES 89-90-91

FECHA DE ELAB.: 22/06/92

PROYECTO: Pozos

DEPARTAMENTO	GESTION 89	GESTION 90	GESTION 91	TOTAL PROV.
LA PAZ				
Pacajes	355	1055	450	1860
Omasuyos	80	175	200	455
Subtotal	435	1230	650	2315
ORURO				
Cercado	80	155	230	465
Subtotal	80	155	230	465
POTOSI				
A. de Ibañez	150	110	170	430
Bustillos	85	50	275	410
T. Frias	310	370	310	990
Chayanta	180	270	210	660
Subtotal	725	800	965	2490
TOTAL GEST.	*1240*	*2185*	*1845*	*5270*

PROYECTO: Invernaderos

DEPARTAMENTO	GESTION 89	GESTION 90	GESTION 91	TOTAL PROV.
LA PAZ				
Pacajes	520	680	415	1615
Omasuyos	230	150	---	380
Subtotal	750	830	415	1995
ORURO				
Cercado	30	270	385	685
Subtotal	30	270	385	685
POTOSI				
A. de Ibañez	65	280	360	705
Bustillos	35	110	255	400
T. Frias	325	445	280	1050
Chayanta	235	380	175	790
Subtotal	660	1215	1070	2945
TOTAL GEST.	*1440*	*2315*	*1870*	*5625*

FOOD FOR THE HUNGRY
BOLIVIA

ANNUAL RESULTS FOR THE AGRICULTURAL YEAR 90-91 BY BENEFICIARIES

DEPT.: La Paz

CROP	TRADITIONAL	W/TECHNICAL ASSISTANCE
Crop (1)		
Barley	90 g/m^2	158 g/m^2
Oat	Not normally cultivated	163 g/m^2
Crop (3)		
Onion	Not normally cultivated	3.0 kg/m^2
Carrot	Not normally cultivated	4.0 kg.m^2
Lettuce	Not normally cultivated	12 u/m^2

# of Beneficiaries: 14
Total m^2 under cultivation: Crop (1) = 26966
Crop (3) = 579

NOTE: The 2nd crop (native grasses) is developed at the TDC.

DEPT.: Oruro

CROP	TRADITIONAL	W/TECHNICAL ASSISTANCE
Crop (1)		
Onion	Not normally cultivated	3.2 kg/m^2
Crop (2)		
Apple Tree	Introduced	Introduced

# of Beneficiaries: 15
Total m^2 under cultivation: Crop (1) = 125
Crop (2) = ---

NOTE: The 3rd agricultural technology corresponds to greenhouses.

DEPT.: Potosi

CROP	TRADITIONAL	W/TECHNICAL ASSISTANCE
Crop (1)		
Potatoe "Desiré"	Not sown	2.06 Ton/Ha
Potatoe "Huaycha"	1.23 Ton/Ha	3.71 Ton/Ha

# of Beneficiaries: 14
Total m^2 under cultivation: Crop (1) = 4760

NOTE: The crop 2 (Barley) and 3 (Vegetables) are developed at the TDC.

FOOD FOR THE HUNGRY/BOLIVIA
FY 1992 UPDATE TO MYOP

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I. INTRODUCTION

This document is an update to Food for the Hungry/Bolivia's (FH/B) FY1990-92 Multi-year Operational Plan (MYOP).

FY92 will be a transitional year between the established plan and the yet-to-be prepared FY 1993-95 MYOP. The program changes are explained in the following sections.

In addition to FH/B's FY92 update, FH/B has agreed to sponsor a business skills and credit project being proposed by the organization "Pro-Mujer" (Pro-Women). The detailed project is contained in addendum C of this document.

II. PROGRAM CHANGES

A. PROJECTS OF INFRASTRUCTURE AND PRODUCTION

The following changes are proposed for FY92:

Activity	Outputs per MYOP	Adjusted Outputs	Justification for change
Rural FFW projects	210	0	USAID's new strategy for Bolivia emphasizes urban FFW and calls for a phase-out of rural FFW.

Family-level wells	210	240	Increased demand by peasants.
Family-level greenhouses	420	240	As part of transition to FY93-95 plan, increased emphasis will be given to development modules. Also, with over 1,000 greenhouses constructed, emphasis needs to be given to community organization and training.
Intensive training and community organization for well and greenhouse owners.	0	1,000 (owners)	Necessity for long-range sustainability.
Sheep treated for parasites	250,000	125,000	Due to FH/B's policy of recuperating 100% of costs, outputs have been reduced. Nevertheless, project and capital is virtually self-sustaining.
Monetization funded irrigation and potable water systems	0	14	In addition to wells and greenhouses, this is becoming one of FH/B's new specialties and responds to communities' no. 1 need.

B. CHILD SURVIVAL (MCH)

The only change is to reduce rations of food from 15,000 to 10,000. This amounts to approximately 130 mothers clubs x 75 rations per club. This change is in compliance with USAID's strategy to reduce rations destined for rural mothers' clubs.

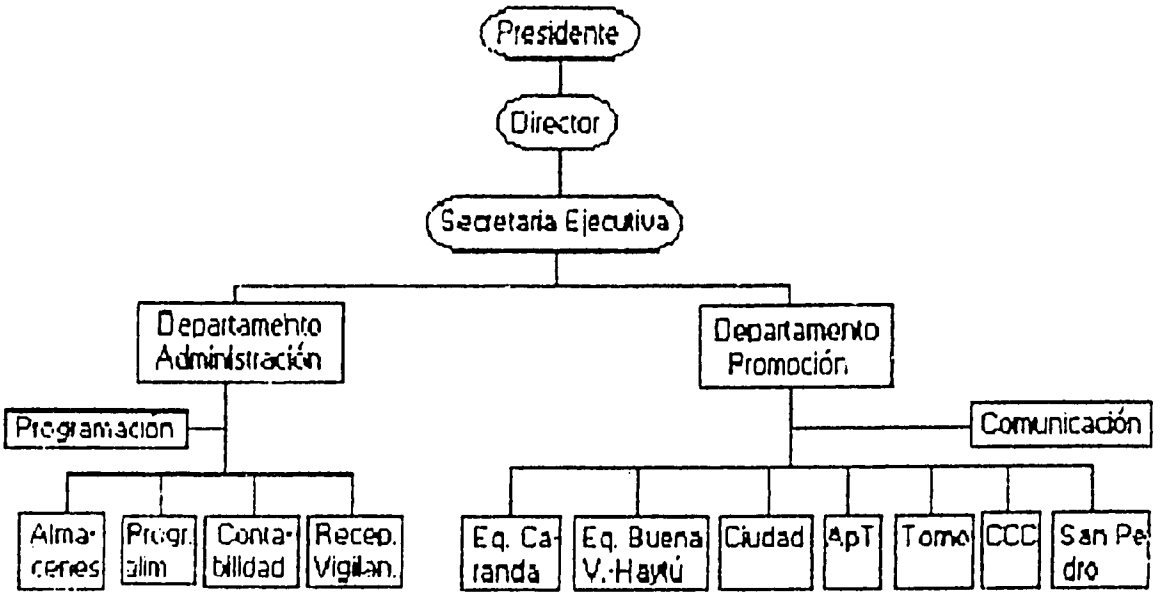
FH/B does not desire to reduce further because the 130 remaining mothers clubs are clubs complemented by an A.I.D./W Child Survival Grant. These clubs are of high quality with interventions such as immunizations, height-weight control, intensive training, and close coordination with Bolivia's Ministry of Health. It would destabilize their progress if we were to abruptly end the food rations.

ANNEX C

Organization Charts and Materials Pertinent to CARITAS/Santa Cruz

ANNEX C

ORGANIGRAMA DE CARITAS-SANTA CRUZ



DEPARTAMENTO DE SANTA CRUZ

PROVINCIA ICHILO

ZONA DE BUENA VISTA Y HUAYTU

Mayor información con respecto a los objetivos del proyecto.

Beneficiarios de PROICAL

COMUNIDAD	SOCIOS (No)
Potreritos 24 de Septiembre	21
Candelaria	11
Santa Barbara	10
Potrero SR.	14
El Carmen	32
San Pedro Palillo	11
Huaytu 1ra y 2da	28
Huaytu 3ra.	13
Recompensa 1ra.	10
Espejitos.	28
Santa Rosa	16
San Juán	19
Total	212

Fuente.- Informe del 24 de abril de 1992.

PRODUCION POR CAMPAÑA AGRICOLA APOYADO CON CREDITO

Campaña agricola	90/91		91/92	
	Verano (Ha)	Invierno (Ha)	Verano (Ha)	Invierno (Ha)
Arroz	137		215	
Maiz	233.7		102	
Frijol		150		Solo para el auto-consumo, con aporte propio.

RENDIMIENTO DEL PRODUCTO Y PRECIO

Rendimiento	Campaña	Epoca	Precio Bs/Fan	Precio Bs/qq	Mercado
	90/91	Veran/Invier			
Arroz 10.3 Fan/Ha			110-120		Montero
Maiz 60.5 qq/Ha.				20-14	Montero
	91/92	Verano			
Arroz 11.0 Fan/Ha			200-170		Montero Prov. comer.
Maiz 40 qq/ha.				27-30	Montero

DEPARTAMENTO DE SANTA CRUZ

PROVINCIA NUEVO DE CHAVEZ

ZONA DE CARANDA

CULTIVOS	CAPAÑAS			
	88/89	89/90	90/91	91/92
Arroz				
Fan/Ha	6.61	7.16	10.07	10.63
% Incre.	0.00	8.32	52.34	60.81
Maiz				
QQ/Ha.	44.00	52.80	50.90	33.70
% Icre.	0.00	20.00	15.70	-23.00

NUMERO DE SOCIOS PARTICIPANTES POR COMUNIDAD
(ZONA DE CARANDA)

COMUNIDAD	SOCIOS PROGRAMADOS	SOCIOS POR CAMPAÑAS 89-90	90-91	91-92
San Miguel Rincon	13	14	11	10
San Miguel Afuera	18	19	15	13
San Isidro	7	11	10	12
Caranda	5	-	15	17
Santa Barbara	15	14	-	-
Monte Rico	7	6	10	12
Rio Colorado	11	17	15	14
Aguas Calientes	21	7	28	17
Villa Diego	17	8	16	12
Quebrada Leon	5	-	-	-
Salitral	5	-	-	-
Total	124	96	120	107

DEPARTAMENTO DE SANTA CRUZ

PROVINCIA NUEVO DE CHAVEZ

NUMERO DE SOCIOS PARTICIPANTES EN LA ZONA DE CARANDA

Y LA SUPERFICIE CULTIVADA POR COMUNIDAD

CAMPANA DE INVIERNO 1991 FRIJOL (January 1992)

COMUNIDAD	SOCIOS PARTICIPANTES (No)	SUP.CULTIVADA (Ha)
San Miguel Rincon	5	4.00
San Miguel Afuera	16	23.00
San Isidro	9	8.00
Caranda	36	73.00
Monte Rico	12	14.50
Villa Diego	13	20.00
Santa Barbara	9	8.00
Rio Colorado	13	13.50
Aguas Calientes	30	41.00
Total	143	210.00

DEPARTAMENTO DE SANTA CRUZ

PROVINCIA ICHILO

SOCIOS PARTICIPANTES Y SUPERFICIE CULTIVADA

CULTIVADA POR COMUNIDAD

ZONA BUENA VISTA Y HUAYTU

CULTIVO DE FRIJOL 1991

COMUNIDAD	SOCIOS PARTICIPANTES (No)	SUPERFICIE (Ha)
Potreritos 24 de Sep.	7	7.00
Candelaria	7	7.00
Santa Barbara	10	14.00
Potrero San Rafael	11	11.00
El Carmen	25	19.00
San Pedro Palillo	10	8.00
Huaytu 1ra y 2da	27	38.00
Huaytu 3ra	13	20.00
Recompensa 1ra	10	10.00
Espejitos	18	16.00
Total	138	150.00

Cuadro 4 RENDIMIENTO MEDIO ESTIMADO POR COMUNIDAD Y DE LA ZONA EN LOS MESES QUE SE REALIZO LA SIEMBRA DE LAS 210 ha DE FREJOL Y LA CANTIDAD MEDIA DE FREJOL GUARDADO PARA CONSUMO DE LA CAMPAÑA DE INVIERNO DE 1991 ZONA DE CARANDA.

COMUNIDAD	RENDIMIENTO qq/ha POR MES DE SIEMBRA				PROMEDIO/qq P/COMUNIDAD	FREJOL PARA CONSUMO qq
	ABRIL	MAYO	JUNIO	JULIO		
San Miguel Rincon	20	12	6	-	12.66	0.31
San Miguel Añera	27	19	7	-	17.66	0.42
San Isidro	23	18	10	6	14.25	0.46
Caranda	19	20	13	3	13.75	0.53
Monte Rico	21	12	4	-	12.33	0.60
Villa Diego	20	15	5	-	13.33	0.67
Santa Barbara	20	16	7	-	13.33	0.67
Rio Colorado	20	18	10	-	16.00	0.64
Aguas Calientes	19	16	5	-	13.33	0.67
-PROMEDIO RENDIMIENTO MES.	21	16.22	7.44	4.5		
-% EN SUPERFICIE DE FREJOL SEMBRADO POR MES	10	44	43	3		
-SUPERFICIE SIEMBRA POR MES.	21 ha	92.4 ha	90.3 ha	6.3 ha	Total hectareas 210	
-RENDIMIENTO TOTAL/MES qq.	441	1498.73	671.83	28.35	Total qq 2639.91	

-Rendimiento medio estimado para la zona de Caranda es de 12.57 qq/ha.

NOTA.- Los resultados estan referidos al 81.3 % de los socios participantes.

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ANNEX D

Revolving Loan Fund Data, CARITAS/Santa Cruz

ANNEX D

CUADRO DE ENTREGA DE CREDITOS POR CAMPAÑA

ZONA: CARANDA

INSUMOS EQUIPOS	VERANO 89/90 CANTIDAD	VERANO 89/90 $us	INVIERNO 90 CANTIDAD	INVIERNO 90 $us	VERANO 90 CANTIDAD	VERANO 90 $us	INVIERNO 91 CANTIDAD	INVIERNO 91 $us	VERANO 91/92 CANTIDAD	VERANO 91/92 $us	TOTAL $us
SEMILLAS											
ARROS	1225.00	808.50									808.50
MAIZ	1470.00	1058.25			1400.00	738.00			520.00	364.00	2178.25
FREJOL			100.00	2900.00			210.00	4958.10			7858.10
INSUMOS											
INSECTICIDA	68.00	578.00	118.00	1021.80	80.00	528.20	70.00	510.00	40.00	344.00	2980.00
HERBICIDA	250.00	1225.00			250.00	1215.00			255.00	1449.50	3889.50
FUNGICIDA			248.00	1118.00			185.00	1073.00			2189.00
EQUIPOS											
MOCHILAS	19.00	848.00			7.00	301.00			8.00	369.00	1318.00
TRILLADORA					1.00	4380.31					4380.31
TOTAL		4313.75		4937.80		7140.51		6541.10		2548.50	25479.88

TOTAL CREDITO ENTREGADO SIN CONSIDERARA TRILLADORA			21119.35
TOTAL CREDITO RECUPERADO HASTA LA FECHA	52.55%		11097.75
SALDO A RECUPERAR INCLUIDO CREDITO VERANO 91/92	47.45%		10021.80

DEPARTAMENTO DE SANTA CRUZ

PROVINCIA ICHILO

ZONA DE HUAYTU

COMUNIDAD	EPOCA	SOCIO (No)	CREDITO ($US)	AMORTIZADO ($US)	SALDO ($US)
Santa Barbara	Verano/90	12	303.50	272.00	31.50
	Invierno/91	10	447.60	167.00	280.00
	Verano/91	17	476.95	-	-
El Carmen	Verano/90	33	1216.80	90 % pagado	
	Invierno/91	25	589.00	20 % pagado	
	Verano/91	18	873.60	se encuentra en mora.	

ANNEX E

Statistics on Micro-Irrigation Systems, CARITAS/Sucre

ANNEX E

a) Obras concluídas durante el periodo:

COMUNIDAD BENEFICI.	PROVINCIA	No. BENEFI.	HECTAREAS A IRRIGAR	COSTO DE CONSTRUCC.	COSTO POR HECTAREA
-Sajtreyoj	Nor Cinti	19 Fam.	4 Has.	Bs 13.524	Bs 3.381
-Quiscoli	Zudañez	14 Fam.	19 Has.	Bs 10.133	Bs 533
-Pampas Abajo	Tomina	7 Fam.	13 Has.	Bs 6.199	Bs 476
-Limabamba	Tomina	12 Fam.	11 Has.	Bs 21.025	Bs 1.911
-Santa Rosa	Nor Cinti	15 Fam.	12 Has.	Bs 8.400	Bs 400
		67 Fam.	59 Has.	Bs 59.281	

b) Obras en ejecución:

COMUNIDAD BENEFICI.	PROVINCIA	No. BENEFI.	HECTAREAS A IRRIGAR	COSTO DE CONSTRUCC.	COSTO POR HECTAREA
-Mandinga	Zudañez	30 Fam.	12 Has.	Bs 6.366	Bs 530
-PupaHuayco	Zudañez	21 Fam.	28 Has.	Bs 12.632	Bs 452
-CollpaPampa	Zudañez	6 Fam.	9 Has.	Bs 7.100	Bs 789
-ThuruMayu	Tomina	9 Fam.	14 Has.	Bs 13.062	Bs 933
-ThakhakamayuTomina		12 Fam.	15 Has.	Bs 11.194	Bs 746
-Chaco-Pampa	Zudañez	10 Fam.	18 Has.	Bs 17.604	Bs 978
-Zundu-Huasi	Zudañez	10 Fam.	8 Has.	Bs 7.000	Bs 875
-Palqui-PampaNor Cinti		12 Fam.	10 Has.	Bs 5.400	Bs 540
-Chiri-Jakhu	Nor Cinti	8 Fam.	7 Has.	Bs 4.800	Bs 686
		118 Fam.	121 Has.	Bs 85.158	

CARITAS SUCRE : PROGRAMA MONETIZACION : USAID BOLIVIA

PROYECTO DE MICRO-RIEGO

FAMILIAS BENEFICIARIAS Y SUPERFICIE DE CULTIVO BAJO RIEGO

No.	COMUNIDAD BENEFICIARIA	PROVINCIA DE CHUQUISACA	FAMILIAS BENEFICIARIAS	SUPERFICIE DE CULTIVO [Has]
1.-	SAJTREYOJ	NOR CINTI	19.00	4.00
2.-	QUISCOLI	YAMPARAEZ	14.00	19.00
3.-	PAMPAS ABAJO	TOMINA	12.00	13.00
4.-	LIMA BAMBA	TOMINA	12.00	11.00
5.-	SANTA ROSA	NOR CINTI	15.00	12.00
6.-	PALQUI PAMPA	NOR CINTI	12.00	10.00
7.-	CHIRI-JAKHU	NOR CINTI	8.00	7.00
8.-	THURU-MAYU	TOMINA	9.00	14.00
9.-	THAKHOS-KHAKAMAYU	TOMINA	12.00	15.00
10.-	MANDINGA	ZUDAÑEZ	30.00	12.00
11.-	COLLPA-PAMPA	ZUDAÑEZ	6.00	9.00
12.-	CHACO-PAMPA (Alto y	ZUDAÑEZ	10.00	12.00
13.-	PUPA-HUAYCO	ZUDAÑEZ	21.00	28.00
14.-	ZUNDUR-HUASI	ZUDAÑEZ	10.00	8.00
15.-	V.SERRANO	B.BOETO	4.00	8.00
	SUMATORIAS		194.00	182.00

Ing.Jorge Ayllón N.
Micro-riego

CUADRO DE RENDIMIENTOS COSTOS Y UTILIDADES SIN PROYECTO

	CEDULA DE CULTIVOS SIN RIEGO		PRODUCCION [TONELADAS]		COSTO PRODUCCION [$us]		COMERCIALIZACION	
CULTIVO	SUPERFICIE [1]	SUPERFICIE[2]	POR HECTAREA	T O T A L	POR HECTAREA	TOTAL [$us]	P.U.[$us]	TOTAL [$us]
PAPA	60.00		4.10	246.00	421.50	25,290.00	200.00	49,200.00
MAIZ CHOCLO	60.00		2.00	120.00	117.00	7,020.00	120.00	14,400.00
TRIGO		40.00	0.80	32.00	116.00	4,640.00	240.00	7,680.00
CEBADA		30.00	0.80	24.00	116.00	3,480.00	200.00	4,800.00
MAIZ GRANO	40.00		1.10	44.00	117.00	4,680.00	100.00	4,400.00
DURAZNERO[3]	12.00		4.00	48.00	50.00	600.00	120.00	5,760.00
MANZANOS [3]	10.00		4.00	40.00	50.00	500.00	120.00	4,800.00
TOTALES	182.00	70.00		554.00		46,210.00		91,040.00

[1] Corresponde al primer cultivo
[2] Corresponde al segundo cultivo
[3] Corresponde a cultivos permanentes

Ing.Jorge Ayllón N.
Micro-riego

CUADRO DE RENDIMIENTOS COSTOS Y UTILIDADES CON PROYECTO

	CEDULA DE CULTIVOS CON RIEGO		PRODUCCION [TONELADAS]		COSTO PRODUCCION [$us]		COMERCIALIZACION	
CULTIVO	SUPERFICIE [1]	SUPERFICIE[2]	POR HECTAREA	T O T A L	POR HECTAREA	TOTAL [$us]	P.U.[$us]	TOTAL [$us]
PAPA	80.00		8.00	640.00	648.00	51,840.00	200.00	128,000.00
MAIZ CHOCLO	60.00		3.00	180.00	140.00	8,400.00	120.00	21,600.00
TRIGO		40.00	1.50	60.00	135.00	5,400.00	240.00	14,400.00
CEBADA		30.00	1.50	45.00	135.00	4,050.00	200.00	9,000.00
ARVEJA		10.00	4.00	40.00	185.00	1,850.00	150.00	6,000.00
CEBOLLA		10.00	12.00	120.00	120.00	1,200.00	150.00	18,000.00
ZANAHORIA		10.00	8.00	80.00	120.00	1,200.00	150.00	12,000.00
MAIZ GRANO		40.00	2.50	100.00	240.00	9,600.00	100.00	10,000.00
DURAZNERO[3]	12.00		7.00	84.00	60.00	720.00	120.00	10,080.00
MANZANOS [3]	10.00		7.00	70.00	60.00	600.00	120.00	8,400.00
HIGUERA [3]	10.00		6.00	60.00	60.00	600.00	100.00	6,000.00
VID [3]	10.00		6.00	60.00	30.00	300.00	100.00	6,000.00
TOTALES	182.00	140.00		1,539.00		85,760.00		249,480.00

[1] Corresponde al primer cultivo
[2] Corresponde al segundo cultivo
[3] Corresponde a cultivos permanentes

Ing.Jorge Ayllón N.
Micro-riego

REQUERIMIENTO DE JORNALES POR CULTIVO/ HECTAREA sin PROYECTO				
D e s c r i p c i o n	MAIZ	TRIGO	PAPA	CEBADA
Preparar Tierra	3	3	6	3
Siembra	6	6	12	6
Aporques	2		2	
Aplic.Insecticida			1	
Deshierbe	12	12	8	12
Cosecha	15	15	12	15
TOTALES	38	36	41	36

	REQUERIMIENTO DE JORNALES POR CULTIVO Y HECTAREA CON PROYECTO								
D e s c r i p c i o n	MAIZ/CHO	MAIZ/GRA	TRIGO	PAPA	CEBADA	ARVEJA	HABA VER	CEBOLLA	ZANAHORI
Preparar Tierra	3	3	3	6	3	3	3	9	6
Siembra Y Fertilizacion	12	12	6	12	6	11	6	30	15
Riego	8	8	8	10	6	8	8	14	8
Aplic.Insecticida			1	2	1	1	1	1	1
Aporque y deshierbe	14	12	12	10	10	10	12	15	15
Cosecha	20	25	15	20	10	25	20	20	20
TOTALES	57	60	45	60	36	58	50	89	65

RELACION DE PRODUCCION

ZONA TOMINA PROMEDIO

PERIODO 1981 AL 1990

PAPA:

RENDIMIENTOS	CON RIEGO	SIN RIEGO
	450 Quintales/Ha. 125% mayor en producion.	200 Quintales/Ha.
Niveles de fertilidad	123-138-00	73-60-00

Relacion de ingreso

La utilidad es de 50% bajo riego por la relacion de costos de inversion aproximado.

TRIGO:

RENDIMIENTOS	CON RIEGO	SIN RIEGO
	50 Quintales/Ha. 130% mayor en produccion.	21 Quintales/Ha.
Niveles de fertilidad	41-60-00	41-60-00

Relacion de Ingreso

La utilidad es de 60 % bajo riego por la relacion de costos de inversion aproximado.

MAIZ:

RENDIMIENTOS	CON RIEGO	SIN RIEGO
	95 Quintales/Ha.	50 Quintales/Ha.
Nineles de fertilidad	no existe	no existe

Relacion de Ingreso

La utilidad es de 40 % bajo riego por la relacion de costos de inversion aproximado y alternativa de otro cultivo que puede cubrir un 30 % mas de ingresos al primer cultivo.

AN

Summary Profile of Projects/Programs Evaluated

ANNEX F

Summary Profile of Projects Evaluated

Project/Program	Page
FHI--Greenhouses, Family Wells, Agricultural Innovations, Potable Water Systems, Irrigation Systems	1
CARITAS/Santa Cruz--Development of Traditional Crops	5
CARITAS/Nuflo de Chavez--PROMAPA	9
CARITAS/Sucre--Micro-Irrigation Systems	10
CARITAS/Beni--Nutritional Vegetable Gardens	12
ADRA/Trinidad--San Pablo Integrated Rural Development	13
CARITAS/Beni--Small-Farm Milk Production	17
ADRA/Riberalta--Gonzalo Moreno Integrated Rural Development	19

ANNEX F

Summary Profile of Projects Evaluated

FHI--Greenhouses, Family Wells, Agricultural Innovations, Potable Water Systems, Irrigation Systems

Unlike the work of other NGOs summarized in this section, FHI's work does not constitute "a project," but rather consists of activities (not all beginning at the same time, or that will end at the same time). For this reason, the format used below to summarize the activities varies from that used to summarize the "projects" implemented by, say, CARITAS. Furthermore, the activities have beginning dates but no ending dates; objectives and budgets are prepared for each fiscal year. FHI withdraws from a community when certain development criteria have been met (see Section 2.1. for these criteria). Also, FHI does not work primarily to generate income. This further distinguishes its activities from those of the projects. The activities summarized below belong either to FHI's Agricultural Infrastructure and Production Program or to its Demonstration and Training Centers Program (these are two of six FHI programs).

Principal Objectives, Agricultural Infrastructure and Production Program (greenhouses, family wells, potable water systems, small-scale irrigation systems, animal dipping campaigns) (for FY 1991; taken from FHI 1991: 5):

1. Increase yields of traditional agricultural produce amongst participating families via improved irrigation, conservation, and farming practices.

2. Provide durable drinking water supply for 210 families (in FY 1991).

3. Improve the survival rate of sheep through parasite control (not evaluated).

Principal Objectives, Demonstration and Training Centers Program (CDCs): agricultural innovations (for FY 1991; taken from FHI 1991: 9):

1. Train farmers in a process of agricultural innovation so that they learn to develop themselves.

2. Develop appropriate, replicable, family-level technologies that complement family wells and/or greenhouses (not evaluated).

3. Form community organizations for each of the 7 demonstration and training centers (CDCs) that control 100% of the center maintenance, experimentation, and use of production (not evaluated).

4. Work each year with at least one project that will benefit the children of the community (not evaluated).

##################

Activity Dates:

Agricultural Infrastructure and Production Program:

Greenhouses: Begins March, 1989

Family Wells: Begins March, 1989

Potable Water Systems: Begins March, 1991

Small-scale Irrigation Systems: Begins March, 1991

Demonstration and Training Centers Program (CDCs):

Agricultural Innovations: Begins September, 1990

Note: Conclusion dates for each of the above activities depend on specified (by FHI) development criteria having been met. For these criteria, see Section 2.1.

Financial Data (all figures in *bolivianos*):

<u>1989</u>

Amount Budgeted: 892,816.64 Bs. (Ex. Rate: 2.59)

Amount Spent (as of 2/28/91): 891,568.38 Bs. (=99.86% of budget)

<u>1990</u>

Amount Budgeted: 1,623,709.23 Bs. (Ex. Rate: 2.11)

Amount Spent (as of 12/31/91): 1,549,747.51 Bs. (=95% of budget)

<u>1991</u>

Amount Budgeted: 2,000,882.70 Bs. (Ex. Rate: 3.45)

Amount Spent (as of 5/31/92): 2,137,123.94 (=107% of budget)

1992

Amount Budgeted: 2,185,681.25 Bs. (Ex. Rate: 3.45)

Amount spent (as of 4/30/92): 567,039.64 (=26% of budget)

Note: The figures above are for Monetization Program funds handled by FHI; FHI activities are part of a long-term program, they do not represent a "project," as is the case with the other NGOs evaluated here. It is not feasible to impute administrative and other costs to each of the subprograms here evaluated.

Status of Objectives:

Family Greenhouses:

1,365 constructed; 6,825 beneficiaries (FY 1989-FY 1992).

According to FHI's 1991 annual report (FHI 1991: 5), "Production levels in greenhouses match international standards (difference in varieties accounts for some variation)." FHI reports the following beneficiary production levels (FHI 1991: 5):

Vegetable	Int'l Standard ($kg/m^2/yr$)	FHI Farmers ($kg/m^2/yr$)
Tomato	18.0	9.3
Lettuce	10.0	24.0
Radish	12.0	11.3
Swiss Chard	4.0	2.4

Family Wells:

1,294 constructed; 6,470 beneficiaries (FY 1989-FY 1992).

Potable Water Systems:

System in Ulloma (Pacajes Province, La Paz) has benefitted 32 families (spigot in each house) as well as has placed one public spigot (in the square), delivered water to the *colegio* and *escuela* (a total of 90 students between the two). This is the only system completed during FY 1991.

Fourteen more systems to be completed during FY 1992, reflecting an urgent need of communities.

Small-scale Irrigation Systems:

System in Ulloma (Pacajes Province, La Paz) has rehabilitated a total of 1.6 has., benefitting 23 families (a part of each family holding is now under irrigation).

Fourteen more systems to be completed during FY 1992, reflecting an urgent need of communities.

Agricultural Innovations (CDCs):

La Paz Department (agricultural year 1990-91):

Crop	Traditional	w/TA
Barley	90g/m^2	158 g/m^2
Oat	Not normally cultivated	163 g/m^2
Onion	Not normally cultivated	3 kg/m^2
Carrot	Not normally cultivated	4 kg/m^2
Lettuce	Not normally cultivated	12 u/m^2

Total m^2 of barley and oats under cultivation: 26,966.

Total m^2 of onions, carrots, and lettuce under cultivation: 579.

Work with native grasses at CDC.

Number of beneficiary families: 14.

Oruro Department (agricultural year 1990-91):

Crop	Traditional	w/TA
Onion	Not normally cultivated	3.2 kg/m^2
Apple	Introduced	Introduced

Total m^2 of onions under cultivation: 125.

Number of beneficiary families: 15.

FHI is also introducing greenhouses to new areas here.

Potosi Department (agricultural year 1990-91):

Crop	Traditional	w/TA
Potato "Desire"	Not sown	2.06 Ton/Ha
Potato "Huaycha"	1.23 Ton/Ha	3.71 Ton/Ha

Total m^2 under potato cultivation: 4,760

Number of beneficiary families: 14.

Barley and vegetables under development at CDC.

CARITAS/Santa Cruz--Development of Traditional Crops (714-89-101)

Goals:

To generate income increases among 350 families living in 25 communities of the zones Caranda and Buena Vista/Huaytu, Ichilo Province of Santa Cruz Department. This will be done through the production of rice, corn, and beans.

Objectives:

1. To increase the yields of 210 has. of rice and 280 has. of corn by 50% the second year of implementation.

2. To introduce 350 has. of beans into the winter cycle as part of the summer/winter rotation system.

3. To establish 2 bulking/marketing centers for rice, corn, and beans.

4. To provide training and technical assistance to communities and participating farmers.

##################

Project Dates: Caranda: Sept., 1989--Aug. 31, 1992; Buena Vista/Huaytu: Sept., 1990--Aug. 31, 1992

Financial Data:

Amount Budgeted: 194,475.77 Bs. (Ex. Rate = 3.11)

Amount Spent (as of 12/31/91): 161,492.45 Bs. (=83% of budget)

Note: MP begins funding Sept., 1990; goals and objectives apply to this date for the Buena Vista/Huaytu area, but to a date of Sept., 1989 for Caranda, where the project began a year earlier as a pilot effort. Information on expenditures after 12/31/91 not available.

Status of Goals:

Caranda:

Project has worked in 11 communities with 225 beneficiary families.

Little data on income increases, but farmers are in debt· Delinquency rate (from 1989-90 agricultural cycle through 1991-92): 47.45% (see Annex D).

Buena Vista/Huaytu:

Project has worked in 12 communities with 212 beneficiary families.

No data on income increases, but farmers are in debt: Delinquency rate (from 1990-91 agricultural cycle through 1991 winter cycle): 41.5%.

Summary: Project has worked in 23 communities with 437 beneficiary families. Little data on income increases; farmers are in debt.

Status of Objectives:

1. Caranda:

Rice:

141 has. planted, 1991-92 summer cycle.

Average yields over three cycles (1989-90, 1990-91, 9991-92): 9.29 fanegas/ha. (1 fanega = 6 arrobas; 1 arroba = 25 lbs.)

Increase in yields: 41%

Corn:

140.5 has. planted, 1991-92 summer cycle.

Average yields over three cycles (1989-90, 1990-91, 1991-92: 45.80 qq/ha.

Increase in yields: 4%

Note: CARITAS staff collected yield data for each cycle through observation and farmer interviews in order to obtain an average for the cycle. We then averaged those averages to obtain the above figures. A diagnostic survey conducted on the eve of project inception (1988-89) provided baseline yield data for rice (6.61 fanegas/ha.) and corn (44 qq/ha.).

Buena Vista/Huaytu:

Rice:

215 has. planted, 1991-92 summer cycle.

Average yields for cycles 1990-91 and 1991-92: 10.6 fan./ha.

Increase in yields: 60.3% (using same base as that for Caranda--see above note).

Corn:

102 has. planted, 1991-92 summer cycle.

Average yields for cycles 1990-91 and 1991-92: 50.25 qq/ha.

Increase in yields: 14.2% (using same base as that for Caranda--see above note).

Summary:

Rice:

356 hectares planted (third year in Caranda, second year in Buena Vista/Huayty)

Average yields for all cycles: 9.9 fan./ha.

Increase in yields: 50%

Corn:

242.5 hectares planted (third year in Caranda, second year in Buena Vista/Huaytu)

Average yields for all cycles: 48.1 qq/ha.

Increase in yields: 9.3%

2. Caranda: 210 ha. beans planted, 1991 winter cycle.

Yields: 422 kg/ha., 1990 winter cycle; 659 kg/ha., 1991 winter cycle. (Note: It was hoped that bean yields would reach 1,000 kg/ha. Because of irrregular weather, however, farmers did not plant at the ideal times (see Cazon 1992: 5).

Buena Vista/Huaytu: 150 ha. beans planted, 1991 winter cycle.

Summary: 360 hectares of beans planted.

3. No bulking/marketing centers were established in either Caranda or Buena Vista/Huaytu.

4. Training and technical assistance conducted, but project time too short for local organizations to sustain project activities. Unusually bad weather demoralized farmers.

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CARITAS/Nuflo de Chavez--PROMAPA (BO-9D-006-"C")

Goals:

To increase the income of 100 small farmers in five spontaneous colonization communities in the San Julian zone of Nuflo de Chavez Province, Santa Cruz Department, through recovery of forest fallow, crop diversification, and rational land use.

Objectives:

1. To diversify the production of 100 small farmers and recover 300 hectares of unproductive forest fallow.

2. To increase production through training and technical assistance as well as communal work and solidarity.

3. To rationalize the exploitation, management, and preservation of renewable natural resources through training and technical assistance in crop rotation and the recovery of fallow land.

##################

Project Dates: Dec., 1990--Dec. 31, 1992

Financial Data:

Amount Budgeted: 153,478.50 Bs. (Ex. Rate = 3.11)

Amount Spent (as of 12/31/91): 125,346.35 (= 82% of budget)

Note: Information on expenditures after 12/31/91 not available.

Status of Goals:

No data on income increases, but farmers will be heavily in debt (from failure of last potato and cotton crops) at close of project (no summary data on delinquency rates, but the delinquency rate on the 1991 winter potato cycle as of early March, 1992, was 33%).

Status of Objectives:

1. Project currently working with 107 small farmers in the five designated communities. No data on number of hectares recovered, but number is clearly less than

300--and recovery is usually only partial since farmers have no way to completely remove trunks and stumps.

2. Inclement weather (mostly), no seed (peanuts) or poor seed (1992 winter potatoes), and administrative problems have precluded production increases, despite conscientious training and technical assistance.

3. Any such rationalization has been precluded by a lack of means to clear areas to be recovered and by inclement weather, which has limited production in rehabilitated (or partially rehabilitated) areas.

CARITAS/Sucre--Micro-Irrigation Systems (BO-9D-006-"D")

Goals:

The project seeks to increase the incomes of small farmers through the construction of irrigation systems in several provinces of Chuquisaca Department. These systems will improve agricultural production by reducing the risk associated with drought.

Objectives:

1. To irrigate 140 has. in seven proposed communities, benefitting 138 familias and increasing agricultural production among beneficiaries by 50%.

2. To achieve the organization of beneficiaries around their natural leaders in order to administer and maintain the irrigation works.

##################

Project Dates: June, 1990--Nov. 30, 1992

Financial Data:

Amount Budgeted: 199,475.40 Bs. (Ex. Rate = 3.11)

Amount Spent (as of 12/31/91): 128,116.27 Bs. (= 64% of budget)

Note: Information on expenditures after 12/31/91 not available.

Status of Goals:

The data below are approximations of potential income increases among project beneficiaries. Sustainability

will depend on establishment of effective maintenance training as well as of a fund to cover material costs.

Status of Objectives:

1. By close of November, 1992: 180 hectares irrigated, 185 families benefitted. The following net-income figures are calculated from approximate yield and cost data (using current prices) for project beneficiaries. The data were assembled by CARITAS/Sucre (see Annex E).

Total Net Income ($ U.S.)
(Assuming 182 Hectares Rehabilitated)

Crop	Without Project	With Project	% Increase
Potatoes	23,900	76,160	218%
Corn (*choclo*)	7,380	13,200	79
Corn (*grano*)	-280	400	243
Wheat	3,040	9,000	196
Barley	1,320	4,950	275
Beans (*arbeja*)	---	4,150	--
Onions	---	16,800	--
Carrots	---	10,800	--
Peaches	5,160	9,360	81
Apples	4,300	7,800	81
Figs	---	5,400	--
Grapes	---	5,700	--
Total:	44,830	163,720	265

2. Organizations formed, but instruction in system maintenance only recently begun.

##################

CARITAS/Beni--Nutritional Vegetable Gardens (BO-9D-006 "B")

Goal:

To improve the nutrition and income levels of 379 families in 21 communities in Marban and Cercado Provinces, Beni Department, through the promotion (using Mothers' Clubs) of community vegetable gardens and provision of training courses and technical assistance.

Objectives:

1. To implement communal vegetable gardens in 21 communities.

2. To plant a total of 16.4 has. (representing a 30% increase in vegetable production) of vegetables.

3. To benefit 379 families. Direct beneficiaries to be the mothers of the Mothers' Clubs and their children. Total number of beneficiaries to be 1,122. Indirect beneficiaries to be those community members who will buy vegetables from those producing them (and urban persons in Trinidad).

4. To consume 50% of total production.

5. To market 50% of total production.

6. To provide technical assistance and training courses.

##################

Project Dates: Sept., 1990--Dec., 1991

Financial Data:

Amount Budgeted: 46,301.68 Bs. (Ex. Rate = 3.11)

Amount Spent (as of 11/30/91): 36,516.51 (= 79% of budget)

Status of Goals:

The small volume of vegetables marketed suggests little project effect on incomes. And since beneficiaries consumed over 90% of total harvest, there has been high delinquency (no figures available) on pay back of the small (about $5.00 U.S./person) production loans.

Status of Objectives:

1. Communal gardens planted in 21 communities.

2. Vegetables planted: 9.83 has.

3. Families benefitted: 321.

4. 90.91% of vegetable production consumed.

5. 9.07 of vegetable production marketed.

6. All of the training and technical assistance programmed was delivered.

ADRA/Trinidad--San Pablo Integrated Rural Development

Note: When this project began, it had no fixed termination date; recently, ADRA fixed a date of Sept. 30, 1996. Goals and objectives (quantitative), however, are set for each fiscal year (beginning Oct. 1) rather than for project life; the degree to which they are met is included in an annual report filed at the close of that year. Reports do not include cumulative data from one year to the next. The goals and the project's programs, however, remain basically the same across the years. These programs are: Child Survival, Traditional Crops (in San Pablo, rice production), Vegetable Production, Tree Nurseries, and Infrastructure.

Goals:

To increase agricultural production and income as well as improve nutrition and reduce infant mortality among residents of seven communities (total population: 1,565) of Marban Province, Beni Department.

Objectives (for FY 1991):

Rice Production:

Improve rice production by 40% through improved cultivation techniques in order to increase family incomes.

To plant 50 has. of rice with 50 families in five communities.

Vegetable Production:

To promote vegetable consumption, increase vegetable production of 42 families, and decrease prevalence of malnutrition.

To cultivate 1 ha. of nutritional gardens with 42 families in 4 communities.

To cultivate 15 has. of commercial vegetable gardens with 30 families in 4 communities.

Tree Nurseries:

To construct one tree nursery and cultivate 8,000 citrus seedlings.

Child Survival:

Train 7 village health workers (RPSs) in nutrition and growth monitoring.

Monitor growth of 210 children under five years old in seven communities.

Consolidate work of 5 Mothers' Clubs and organize two others.

Vaccinate 190 children under 5 years of age for BCG and Polio, 170 for DPT, and 120 for measles.

Vaccinate 300 women of child-bearing age (15-44) with 2 doses of tetanus toxoid.

Provide ORT to 130 children under 5 years of age identified as having diarrhea (to reduce the mortality rate)

Establish one institutional ORU and 6 community ORUs.

Treat 110 children (0-5 years) for ARI (to reduce the mortality rate)

Provide medical attention to 300 families in 7 communities.

Reduce the child mortality (mainly from diarrhea and ARI) rate of 160/1,000 by 20%.

Infrastructure:

To complete construction of Medical Post and living quarters for staff personnel.

Construct 100 latrines and one green house in seven communities.

Build 2 access roads of 6 km. each.

Build 3 wooden bridges.

Build a roof-tile factory.

In Loma del Amor, build 7 classrooms and make available 2 soccer fields and 75 has. for agricultural purposes.

##################

Project Dates:

Begins: Oct. 1, 1990

Ends: Sept. 30, 1996 (This date has only recently been fixed; the date was indeterminate when the project began.)

Financial Data:

FY 1991:

Amount Budgeted: $68,455 U.S. (Ex. Rate = ?)

Amount Spent: $57,707 U.S. (Ex. Rate = 3.45 Bs./$1 U.S.) (84.3% of budget spent)

FY 1992:

Amount Budgeted: $70,777 (Ex. Rate = 3.45 Bs./$1 U.S.)

Amount Spent to Date: ?

Status of Goals:

Project working toward goals as measured by objectives below. Delinquency rates (as of June 30, 1992) on revolving fund loans:

Commercial vegetable production in 1991: 47% (7-10 mos. after harvest). Problems: excessive rain and drought.

Commercial rice production in 1991-92: 75% (3-4 mos. after harvest). Problems: excessive rain; and farmers using earnings to plant commercial vegetables in 1992.

Status of Objectives (close of FY 1991):

Rice Production:

50 has. of rice cultivated in 4 of 5 targeted communities, working with 56 families. Participants increased annual incomes by 28% (based on a mean annual family income of about 1,000 Bs.). (See Annex I for production and marketing statistics.)

Vegetable Production:

.67 has. nutritional gardens established in 4 communities, working with 47 families.

15 has. of commercial vegetable gardens established in 4 communities, working with 31 families.

Average annual income among participating families increased from 1,000 Bs. to 2,600 Bs. (ADRA 1991: 16). (See Annex I for production and marketing statistics.)

Tree Nurseries:

One tree nursery established in Loma del Amor and 7,000 citrus seedlings ready for grafting. Another tree nursery under construction in San Pablo.

Child Survival (see statistics in Annex I):

7 village health workers (RPSs) trained in nutrition, growth monitoring, ORT, and ARI management.

214 children under 5 years of age were monitored for proper growth and nutrition.

No information on Mothers' Clubs.

Vaccinated 223 children under five years of age with BCG (1 dose); 133 children with polio (3 doses); 119 children with DPT (3 doses); and 190 children with measles (1 dose).

Vaccinated 280 women of child-bearing age with tetanus toxoid (2 doses).

Provided ORT to 102 children under 5 years of age with diarrhea (110 children identified with diarrhea).

No information on establishment of ORUs.

No information on ARI treatments; only 1 death from ARI reported during period, compared to 4 the previous year.

310 adults received medical services in a medical post built and equipped with Monetization funding.

No civil registry in the project area to record deaths; nonetheless, see Annex I for indicators supplied by project.

Infrastructure:

Medical post 75% complete; construction of staff housing 40% complete.

132 latrines constructed in 9 communities (no information on greenhouse).

2 access roads of 8 km. each.

1 wooden bridge.

1 roof-tile factory.

7 classrooms, a soccer field, 75 has. of land for agricultural purposes.

CARITAS/Beni--Small-Farm Milk Production (714-90-007/BO-OD-007-F)

Goals:

To increase the income and improve the diet of small farmers in seven communities of Marban Province, Beni Department, through the production and consumption of milk products. The seven communities are: Santa Rosa, Union y Fe, Nueva Creacion de Cotoca (formerly Trigal), and Sudamericano.

Objectives:

1. To establish 50 small dairy farms, each with an annual production capacity of 1,512 liters.

2. To train beneficiaries in dairy-farm management.

3. To promote in each community the creation of an Agricultural and Livestock Committee, to be made up of three persons.

4. To strengthen CARITAS/Beni, enabling it to formulate development strategies and implement and monitor project activities in the five communities.

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Project Dates: Nov., 1991--Oct., 1993

Financial Data:

Amount Budgeted: 177,623.25 Bs. (Ex. Rate = 3.45)

Amount Spent (as of 3/31/92): 0 Bs. (= 0% of budget)

Status of Goals:

The communities of Caimanes, Loma del Amor, y Primavera were eliminated from the project since other institutions were addressing needs there (see names of 7 original communities under "Goals" above). CARITAS replaced these with three other communities: Nueva Palestina, Poza Honda, and Nuevo Horizonte. Since the project only recently began, few data are available.

Status of Objectives (as of July 31, 1992):

Staff in place: a veterinarian (and project leader, paid entirely by the project), a promoter (working on other projects as well), and CARITAS support staff.

47 farmers in 7 communities participating at close of May (CARITAS/Beni 1992a):

Santa Rosa	17	36.10%
Union y Fe	8	17.00%
Nueva Creacion de Cotoca	6	12.70%
Sudamericano	4	8.50%
Nueva Palestina	5	10.60%
Nuevo Horizonte	4	8.50%
Poza Honda	3	6.30%
Total:	47	99.70%

Note: Only 47 selected so project would have a reserve fund to deal with the contingencies--e.g., loss of a cow.

45 farmers now participating, 40 of them working actively (5 have had no time to sow grass); total of 36 have completed sowing grass, most of these now erecting fences and building stables.

ADRA/Riberalta--Gonzalo Moreno Integrated Rural Development

Note: When the project began, it had no fixed termination date; recently, ADRA fixed a date of Sept. 30, 1996. Goals and objectives (quantitative), however, are set for each fiscal year (beginning Oct. 1) rather than for project life; the degree to which they are met is included in an annual report filed at the close of that year. Reports do not include cumulative data from one year to the next. The goals and the project's programs, however, remain basically the same across the years. These programs are: Child Survival, Traditional Crops (rice and corn, here), Demonstration Vegetable Gardens, Tree Nurseries, and Infrastructure.

Goals:

To increase agricultural production and income as well as to improve nutrition and reduce infant mortality among residents of eight communities (total population: 1,325) of Madre de Dios Province, Pando Department.

Objectives (for FY 1991):

Rice and Corn Production:

To increase rice production from 1,700 kg./ha. to 4,400 kg./ha.

To cultivate 40 has. of rice in four communities.

To increase corn production from 1,700 kg./ha. to 4,400 kg./ha.

To cultivate 20 has. of corn in four communities.

To train 4 farmers in each of the four communities (in cultivation of rice and corn), and to conduct 2 training programs for 60 families in four communities.

Demonstration Vegetable Gardens:

To increase vegetable production and consumption, and thus decrease malnutrition rate (= 43% at inception of project) among children under 5 yrs. of age.

To implement 3.31 has. of community vegetable gardens in 8 communities.

To organize 4 training sessions to teach 172 women horticultural practices.

Tree Nurseries:

To construct one tree nursery on 2 has. of land to produce 6,000 cacao, 6,250 citrus, 4,000 fruit, and 9,400 rubber seedlings.

To conduct two training courses on cultivation practices and nursery maintenance.

To establish a cooperative business for nursery management and marketing production.

Child Survival:

Train 7 village health workers (RPSs) in nutrition and growth monitoring.

Monitor growth of 150 children under five years old.

Vaccinate 114 children under 5 years of age for BCG and Polio, 97 for DPT, and 77 for measles.

Vaccinate 116 women of child-bearing age (15-44) with 2 doses of tetanus toxoid.

Vaccinate 835 persons against yellow fever.

Provide ORT to 130 children under 5 years of age identified as having diarrhea (to reduce the mortality rate).

Establish one institutional ORU and 7 community ORUs.

Treat 105 children (0-5 years) for ARI (to reduce the mortality rate) in 8 communities.

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Provide medical attention to 240 families in 8 communities.

Reduce the child mortality (mainly from diarrhea and ARI) rate of 160/1,000 by 20%.

Infrastructure:

To establish a medical post.

To establish a training center for community women and farmers.

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Project Dates:

Begins: Oct. 1, 1990

Ends: Sept. 30, 1996 (This date has only recently been fixed; the date was indeterminate when the project began.)

Financial Data:

FY 1991:

Amount Budgeted: $70,483 U.S. (Ex. Rate = ?)

Amount Spent: $60,020 U.S. (Ex. Rate = 3.45 Bs./$1 U.S.) (= 85.2% of budget)

FY 1992:

Amount Budgeted: $60,390 U.S. (Ex. Rate = 3.45 Bs./$1 U.S.)

Amount Spent to Date: ?

Status of Goals:

Project working toward goals in eight communities (a ninth has just been added), as measured by objectives below. The communities are: Gonzalo Moreno (project base and major community in the zone), Las Piedras, Buen Futuro, Agua Dulce, Frontera, Lago Victoria, Libertad, Candelaria, and San Jose (project recently entered community).

Delinquency rates (as of June 30, 1992) on revolving fund loans:

Vegetable production in 1991: 73% (7-10 mos. after harvest).

Commercial rice production in 1991-92: 84% (3-4 mos. after harvest).

Status of Objectives (close of FY 1991):

Rice and Corn Production:

59.5 has. of rice and corn planted in October and November of 1991, with projected harvests in March, 1992 (this is not FY 1991, but rather FY 1992; no statistics on rice and corn planted in FY 1991--if any was planted) (see Annex J).

Current Project experimenting with 7 different varieties of rice (see Annex J).

2 training sessions conducted with 47 families from 4 communities.

Demonstration Vegetable Gardens:

2.4 has. of community demonstration vegetable gardens established in 7 of the 8 communities.

114 persons participated; 106 of the women prefered to work in home gardens, but did receive technical assistance from ADRA (see Annex J for statistics on production and income).

Incomes produced by vegetable gardens amounted to 8,000 Bs. for 70 families. 114 families have increased their average incomes from 1,200 Bs. to 1,270 Bs. through sale of vegetables. Sale of excess vegetables amounts to about 5% of each family's total income (ADRA 1991: 7).

Tree Nurseries:

One tree nursery established, with 21,500 seedlings (see Annex J).

One training course held on cultivation practices and nursery management.

71 families will plant (rather than have already planted) 1 ha./family in the same land where they had previously produced annual crops (see Annex J).

Child Survival

7 village health workers (RPSs) trained in nutrition, growth monitoring, ORT, and ARI management.

130 children under 5 years of age were monitored for proper growth and nutrition (43% found to be malnourished, indicating that nutritional status had not improved).

Vaccinated 114 children under five years of age with BCG (1 dose) and polio (3 doses); 97 children with DPT (3 doses); and 77 children with measles (1 dose).

Vaccinated 115 women of child-bearing age with tetanus toxoid (2 doses).

596 persons vaccinated for yellow fever (see Annex J for a summary of immunization data).

Provided ORT to 91 children under 5 years of age with diarrhea (99 children identified with diarrhea; see Annex J for statistics).

One institutional ORU and 7 community ORUs have been established.

148 cases of ARI detected and treated in children under 5 (only 1 death reported during the year, whereas there were 3 the year before).

500 children under 5 received anti-parasitic medication. (Infant mortality is due mainly to ARI, diarrhea, and parasite infections.)

520 persons received medical attention.

Infrastructure:

Medical post 50% complete; completion expected at end of 1991.

Training center 50% complete.

ANNEX G

Information on Crop Pests from Areas Served by FHI in Potosi, Oruro, and La Paz Departments

ANNEX G

RESUMEN GENERAL DE PLAGAS EXISTENTES EN INVERNADEROS Y CAMPO ABIERTO EN LAS ZONAS DE CHAYANTA Y PACAJES DEPARTAMENTO DE POTOSI Y LA PAZ

La información recogida de los beneficiarios con relación a las plagas que afectan a sus cultivos, se hizo en la forma que ellos conocen y en muchos casos en su lengua nativa. Tuvimos la oportunidad de visitar algunos invernaderos para detectar la presencia de plagas y por ultimo nos basamos en los informes que nos han facilitado, que en realidad no existe mucho material tecnico con respecto a plagas. Dado a la época de invierno no se pudo observar las plagas debido a que el año agricola estaba en su última face de terminación, es decir no había cultivos de produccion a campo abierto. En base a estas fuentes nos permitimos hacer un resumen general de las plagas que afectan a los productores.

INVERNADEROS:

Tomate (Solanum Lycopersicum)

En nuestras visitas se ha detectado síntomas de color blanquesino sobre todo en las hojas que tiene una textura de polvo, que se trata de una enfermedad fungosa conocida con el nombre de (Oidium erysiphoides) en su forma técnica y en aymara JULLUTAWA. Los medios favorables son excesiva humedad y altas temperaturas.

Existe la presencia de ciertos pulgones en los tomates unos de color verde y otros de color negrusco, perteneciente a la familia de los Aphidos.

Cebolla (Allium Cepa)

En su etapa de germinación es atacado por un enfermedad que provoca la caida de las plantulas a nivel de la raiz debido a que se encuentran podridas, esto es segun los comentarios de los beneficiarios y que al momento de la visita no se tuvo la oportunidad de observar por que no habia almacigueras, posiblemente se trate de una enfermedad fungosa conocido con el nombre de (Dumping Off).

Las hojas presentaron sintomas de haber sido devorados por gusanos que ellos conocen con el nombre KURUS, en su estado larval para luego ser transformados en insectos, posiblemente se trata de la mosca de la cebolla que se conoce con el nombre de (Anthomya Phorbia Ceparum) en su lenguaje técnico y se caracteriza por depositar sus huevos en la formación de los bulbos.

Repollo (Family Brassicae)

Acelga (Beta Vulgaris)

Perejil (Petroselinum Sativum).

Las hortalizas anteriormente nombradas estaban con presencia de insectos, pulgon lanígero (Schizoneura lanigera) y atacados por el pulgon verde (Aphis mali).

Pepino (Cucumis Sativus)

Zanahoria (Daucus Carota)

En estas hortalizas no se presento niguna infestacion en el momento de las visitas.

Entre otras plagas que afecta a la economía del campesino son las hormigas y los ratones que se encuentran en la zona de Caripuyo.

CULTIVOS A CAMPO ABIERTO

PAPA (Solanum Tuberosum)

La enfermedad que mas preocupa a los productores es el Tizon Tardio causado por un hongo.

Los insectos que mencionan los productores son la LLAJA, que es un insecto chupador y el KUTI-KUTI que se refieren a los pulgones de tipo chupador, luego se tiene el CHALLU de tipo masticador (Bicho Moro) y finalmente el Kaspi Kuru (polilla) que se alimenta de hojas.

TRIGO (Triticun Vulgare)

Es atacado por el polvillo negro, que se caracteriza por atacar a los granos en su estado tierno. Esta enfermedad es fungosa (Rhizoctonia Triticun).

MAIZ (Zea Maiz)

Los productores explican la presencia de un polvo negro en las mazorcas, posiblemente se trata del Carbon Negro (Ustilago Zeae) causado por un hongo. En su estado tierno los granos son masticados por larvas y orugas que corresponden a la familia de los Lepidopteros.

DURAZNO (Prunus Persica)

El tratamiento fitosanitario realizado por los tecnicos en la zona de Caripuyo fue contra la arañuela (Hyponomeuta malinella) que se refiere a la polilla que se caracteriza por realizar galerias en los árboles frutales en su estado larval y la mosca de la fruta se caracteriza por depositar sus huevos por debajo de la epidermis de la fruta.

SUGERENCIAS:

En anteriores comentarios se ha sugerido el uso de los insecticidas organicos como el caso del piretro que es una planta herbacea, perenne que de sus flores se obtiene la piretrina que es un insecticida inofensivo para las personas y animales de sangre caliente.

El piretro puede ser cultivado en invernaderos a manera de sanitizar los suelos o para el preparado del insecticida, que puede ser de facil alcance para los productores. Segun los comentarios de los beneficiarios indican que la ultimo tratamiento se realiza cuando el tomate esta en fruto verde y pequeño, esto es lo que nos preocupa sobre todo en los niños cuando ellos consumen directamente de la planta o en muchos casos cuando se realiza la cosecha al igual que los demas hortalizas.

Felizmente, hasta el presente no se ha registrado casos de intoxicacion debido a que los técnicos estan capacitando a los productores en el manejo e uso de los pesticidas inorganicos, sin embrago seria necesario recalcar a los técnicos que recomienden a los productores con relacion al ultimo tratamiento que debe ser realizado de 40 a 50 dias antes del consumo de cualquier vegetal para evitar consecuencias del mismo.

Los invernaderos parabolicos familiares tienen una dimension de 8.8 x 3.30 ms y restando el espacio que ocupa la zanja logitudinal, cuenta con una superficie cultivable de 25 metros cuadrados que es razon suficiente para el uso de insecticidas orgánicos que a manera de orientación podemos sugerir otro preparado a base de nicotina mezclado con alcohol y jabon.

Las plantas infectadas pueden ser quemadas o enterradas para combatir las plagas como una medida preventiva o en su caso si los suelos estan infectados se puede cambiar por otro capa de suelo fresco desinfectado. Asi mismo, se puede alterar alterar el P.H. de los suelos con la finalidad de romper el ciclo biológico de la población de las plagas.

El sistema de micro-riegos es otro factor importante para el control y reducción de las plagas en los invernaderos. No se debe olvidar que la execiva humedad mas la temperatuta favorece la proliferación de los insectos al igual que las enfermedades. Para esto es necesarios que los técnicos encargados de la transferencia capaciten a los productores sobre la frecuencia de riegos por dia o por semana y para cada uno de los cultivos.

ANNEX H

Statistics on Vegetable Cultivation, CARITAS/Beni

ANNEX H

CUADRO CONSOLIDADO COMPARATIVO DE PRODUCCION
321 BENEFICIARIOS
DICIEMBRE/91

PRODUCCION AGRICOLA CONSOLIDADO

CULTIVOS	SUPERF. CUL. HAS.	REND.(*) KG.	CONSUMO KG.	CONSUMO %	VENTA KG.	VENTA %	
Tomate	3,84	109.929	91.503	83,24	18.426	16,74	28.6 t/ha 4.
Zanahoria	0,79	19.453	18.473	94,96	980	05,04	24.6 t/ha 2
Rabano	0,10	2.600	2.541	97,73	59	02,27	26 t/ha 16
Lechuga	0,35	3.646	3.511	96,30	135	03,70	10.4 t/ha 1.9
Cebolla	1.30	30.928	28.270	91.40	2.658	08.59	23,8 t/ha 14
Pimenton	0,94	12.842	8.580	66,81	4.262	33,19	14 t/ha 16
Coliflor	0,47	9.231	9.130	98,90	101	01,09	19.6 t/ha 11
Sandia	0,66	14.877	11.947	80,30	2.930	19,60	22,5 t/ha 22
Repollo	0,39	13.113	11.286	86,07	1.827	13,93	33,6 t/ha 8
Pepino	0,72	18.896	17.999	95,25	897	04,75	26,2 t/ha 16
Berenjena	0,10	3.304	3.304	100,00	-	-	33. t/ha 12
Ajo	0,08	974	974	100,00	-	-	12,2 t/ha 12
TOTAL	9,83			90,91		09,09	

INGRESO POR VENTA CONSOLIDADO
EN U$$

CULTIVOS	CANTIDAD DE VENTA (KG.)	PRECIO DE VENTA	TOTAL INGRESOS
Tomate	18.426,00	0,20	3.685,20
Zanahoria	1.980,00	0,40	792,00
Rabano	59,00	0,40	23,60
Lechuga	135,00	0,21	28,35
Cebolla	2.658,00	0,48	1.275,24
Pimenton	4.262,00	0,23	980,26
Coliflor	101,00	0,25	25,25
Sandia	2.930,00	0,20	586,00
Repollo	1.827,00	0,25	456,75
Pepino	867,00	0,20	173,40
TOTAL			8.026,65

El tipo de cambio: B$. 3,70 / U$$. 1.-
(*) El rendimiento es de la superficie cultivada.

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TOTAL DE INSUMOS ENTREGADOS A LAS COMUNIDADES

PROYECTO : HUERTOS NUTRICIONALES

NO. PARTICIPANTES: 321

FECHA : MARZO A AGOSTO DE 1.991

NO.	HERRAMIENTAS	CANTIDAD	COSTO UNITARIO	T O T A L
1.-	Rastrillos	17	3.38	57.46
2.-	Carretillas	10	42.25	422.50
3.-	Palas	13	6.47	184.11
4.-	Hachas	12	9.01	108.12
5.-	Azadón	17	5.91	100.47
6.-	Machete	15	4.78	71.70
7.-	Mochila Fumigadora	13	73.23	951.99
8.-	Picotas	12	7.32	87.84
9.-	Lampas	16	6.76	108.16
	T O T A L E S			1.992.35

S E M I L L A S

No.	DETALLES	CANTIDAD	COSTO UNITARIO	T O T A L
1.-	Tomate	2.20	49.77	109.49
2.-	Cebolla	1.39	50.70	70.47
3.-	Pimenton	1.08	67.60	73.01
4.-	Pepino	2.47	27.04	66.79
5.-	Zanahoria	1.05	37.18	39.04
6.-	Repollo	0.48	27.04	12.98
7.-	Sandía	2.70	23.32	62.96
8.-	Coliflor	0.46	34.92	16.06
9.-	Rábano	0.20	22.57	4.51
10.-	Lechuga	—	—	—
11.-	Berenjena	0.20	30.89	6.18
12.-	Ajo	2.-	2.25	4.50
	T O T A L			465.99

A G R O Q U I M I C O S

NO.	DETALLE	CANTIDAD	COSTO UNITARIO	T O T A L
1.-	PERFEKTHION	10 Lt.	11.83	118.30
2.-	SEVIN 80	5 kg.	13.52	67.60
3.-	FOLIDOL	4 Lt.	11.26	45.04
4.-	NUVACRON	3 "	12.95	38.85
5.-	TAMARON	4 "	16.33	65.32
6.-	MIREX	2.5 kg.	3.66	9.15
7.-	DITHANE	1 "	7.88	7.88
8.-	CURATER	2 "	22.53	45.06
9.-	FURADAN	5.2 "	19.71	102.49
10.-	RIDOMIL	4 "	24.50	98.00
11.-	CUPRAVIT	7 "	7.26	50.82
12.-	BASAMID	3 "	9.57	28.71
13.-	ANTRACOL	5 "	9.01	45.05
	T O T A L E S			722.27

T O T A L C O S T O S

NO.	D E T A L L E	T O T A L
1.-	HERRAMIENTAS	1.992.35
2.-	SEMILLAS	465.99
3.-	AGROQUIMICOS	722.27
	T O T A L E S	3.180.61

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PROYECTO: HUERTOS NUTRICIONALES

SUPERFICIE CULTIVADA Y PRODUCCION

COMUNIDADES	Nº FAMILIAS BENEFIC.	SUPERF. CULTIVADA P/FAMILIA Has.	SUPERF. CULTIVADA COMUNIDAD Has.	PRODUCCION P/FAMILIA Kgs.	PRODUCCION TOTAL (Kgs)
Sachojere	13	----	0,15	264	3432
Somopae	10	0,04	----	845	8450
Naranjito	[illegible]	0,05	----	1192	10725
Las Mercedes	10	0,07	----	308	3080
San Lorenzo	13	0,03	----	1210	15730
San Andrés	9	0,10	----	3330	29970
Villa Alba	13	0,03	----	717	9320
Loreto	24	----	0,20	177	4430
Villa Cruz	13	----	0,20	326	4244
Cacarabe	15	----	0,40	[illegible]	[illegible]
Villa Barzer	30	----	1,50	329	9850
Buen Jesus	10	----	0,40	599	5990
Estrella de Belén	13	----	0,30	436	5675
Abacuya	24	0,03	----	716	17181
Nueva Betania	15	----	0,40	573	8597
Nueva Alianza	12	----	0,40	643	7723
Nuevo Horizonte	16	----	0,50	713	11411
S.Juán de Mocovi	14	0,02	----	504	9069
Nueva Palestina	9	0,05	----	1163	10468
Santa Rosa	25	0,03	----	740	18514
Unión y Fé	17	0,05	----	1125	14632
TOTAL	321				

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PROYECTO: HUERTOS NUTRICIONALES

CANTIDAD DE HORTALIZAS CONSUMIDAS POR FAMILIA

COMUNIDADES	Nº DEMEF.	CONSUMO FLIAR/MES*	TOTAL CONS. P/ FLIA	TOTAL CONS. P/COMUNIDAD
Lachojere	13	36 Kg.	250 Kg.	3255 Kg.
Somopne	10	102 "	714 "	7140 "
Naranjito	9	156 "	1091 "	9824 "
Las Mercedes	10	93 "	654 "	6545 "
San Lorenzo	13	14[illegible] "	1041 "	13523 "
San Andrés	9	391 "	2735 "	24167 "
Villa Alba	13	89 "	624 "	8108 "
Loreto	25	24 "	172 "	4297 "
Villa Cruz	13	44 "	310 "	4027 "
Cacarabe	15	82 "	573 "	8670 "
Villa Benzer	30	46 "	320 "	9615 "
Buen Jesús	15	93 "	651 "	9[illegible]2 "
Estrella de Belén	13	81 "	42[illegible] "	5577 "
Bueyo	24	97 "	679 "	16[illegible]6 "
Nuevo Betania	11	82 "	573 "	[illegible] "
Nueva Alianza	12	87 "	610 "	7324 "
Nuevo Horizonte	15	97 "	680 "	10[illegible] "
Belén de Moscoví	13	67 "	473 "	6510 "
Nueva Palestina	9	153 "	1075 "	9673 "
Santa Rosa	25	99 "	695 "	17375 "
Unión y Fé	13	161 "	1025 "	14[illegible] "

* Se contempla 7 meses durante el período de producción.

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Calle Isiboro s/n
Tel. 2-4135 - Casilla 207
Trinidad - Beni - Bolivia

PROYECTO: HUERTOS NUTRICIONALES

DESTINO DE LA PRODUCCION*
(En Kgs)

	PRODUCCION	PROD. DEST. AL CONSUMO	%	PROD. DEST. A LA VENTA	%
Sachojere	3431	3255	95	176	05
Somopae	8450	7140	84	1309	16
Naranjito	10725	9824	92	901	08
Las Mercedes	8080	6545	81	1535	13
San Lorenzo	15730	13528	86	2202	14
San Andrés	29970	24617	82	5353	18
Villa Alba	9320	8108	87	1212	13
Loreto	4430	4297	97	133	03
Villa Cruz	4244	4027	95	217	05
Casarabe	3959	3670	97	289	03
Villa Benzer	9858	9615	97	243	03
Buen Jesús	9590	9302	97	288	03
Estrella de Belén	5575	5575	100	——	—
Abacuya	17181	16306	95	875	05
Nueva Betania	8595	8595	100	——	—
Nueva Alianza	7723	7324	95	399	05
Nuevo Horizonte	11411	10889	95	522	05
S.Juán de Mocovi	9065	8510	94	555	06
Nueva Palestina	10488	9693	92	795	08
Santa Rosa	18514	17375	94	1139	06
Unión y Pó	14632	14632	100	——	—

* Se contempla en aproximadamente 7 meses el periodo de producción, de acuerdo a calendario agrícola.

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UBICACION DE COMUNIDADES QUE PARTICIPARON EN EL PROYECTO HUERTO NUTRICIONALES.

BLOQUE # 1 CARRETERA TRINIDAD - LORETO.

COMUNIDADES	DISTANCIA		TOTAL
	A OBRA CARRETERA	CAMINO FRONTERIZO	
+1.- Unión y Fé	110 Km	———	110 Km.
2.- Santa rosa	100 "	———	100 " .
3.- Nueva Palestina	92 "	———	92 " .
4.- San Juan de Locavi	89 Km	7Km	96 ".
5.- Nuevo Horizonte	80 "	———	[illegible] .
6.- Nueva Alianza	86 "	5Km	86 " .
+ 7.- Nueva Betania	84 "	———	84 " .
8.- Abacuya	72 "	3Km	81 " .
9.- Estrella de Belen	77 "	5 "	82 .
10.- Buen Jesús	75 "	———	75 " .
11.- Villa Banzer	70 "	4 m	74 " .
+12.- Casarube	54 "	———	54 " .
+13.- Villa Cruz	34 "	1Km	35 " .

BLOQUE # 2 CARRETERA TRINIDAD - LORETO.

14.- Loreto	55 "	———	55 " .
15.- Villa Alba	42 "	———	42 "..
+16.- San Andres	35 "	7Km	42 " .
17.- San Lorenzo	35 "	———	35 " .
18.- Las Mercedes	25 "	7Km	32 " .
19.- Naranjito	25 "	5Km	30 ".
20.- Somopae	32 "	———	32 " .
+21.- Macojere	25 "	———	25 " .

+ COMUNIDADES A LAS QUE SE LES DIO AVISO PARA LA VISITA DE LA COMISION DE EVALUACION.

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ANNEX I

ADRA's Organization Chart and Statistics on San Pablo Integrated Project, ADRA/Trinidad

ANNEX I

TABLE [illegible]

TARGET AREA AND POPULATION

SAN PABLO

COMMUNITY	POPULATION
SAN PABLO	[illegible]
[illegible]	140
[illegible]	140
[illegible]	160
[illegible]	140
[illegible]	170
[illegible]	130
TOTALS	[illegible]

TABLE [illegible]

[illegible] COVERAGE

SAN PABLO, SEDS PROJECT

VACCINE AND DOSAGE	PLANNED	COMPLETED	%
CHILDREN 0-6 YEARS			
BCG - 1 DOSE	160	[illegible]	117
POLIO - 3 DOSES	160	120	70
DPT - 3 DOSES	170	134	79
MEASLES - 1 DOSE	130	165	120
WOMEN 15-44 YEARS			
TETANUS TOXOID 2 DOSES	[illegible]	[illegible]	[illegible]

TABLE [illegible] & [illegible]

DIARRHEA CONTROL, CHILD, 0-6 YEARS

SAN PABLO, SEDS PROJECT

INTERVENTIONS	PLANNED	COMPLETED	%	DEHYDRATION LEVEL		
				MILD	MOD	SEV
IDENTIFIED CASES	130	110	[illegible]			
TREATED CASES	130	102	79	[illegible]	[illegible]	0
TRAINED VHW'S	7	7	100			
ORT UNITS	6	6	100			
NO. ORS DISTRIBUTED	[illegible]	[illegible]	77			
MOTHERS TRAINED IN ORT	120	[illegible]	[illegible]			
INFANT DEATHS DUE TO DIARRHEA	0	1				

TABLE [illegible]

ARI, CHILD, 0-6 YEARS

SAN PABLO, SEDS PROJECT

INTERVENTIONS	PLANNED	COMPLETED	%	CLASSIFICATION	
				SEV	MILD
IDENTIFIED ARI CASES	110	[illegible]	[illegible]		
TREATED ARI CASES	110	[illegible]	[illegible]	10	[illegible]
VHW'S TRAINED	7	7	100		
ACET. SALIC. ACID USED	[illegible]	[illegible]	[illegible]		
COTRIMOXAZOLE USED	[illegible]	[illegible]	[illegible]		
INFANT DEATHS DUE TO ARI		1			

* WITH PNEUMONIA

TABLE [illegible] DELETED DUE TO REPETION OF INFORMATION

TABLE [illegible]

GROWTH MONITORING, CHILD, 0-6 YEARS

SAN PABLO, SEDS PROJECT

INTERVENTIONS	PLANNED	COMPLETED	ACCUMULATED %	%
TRAINED VHW'S	7	5	71	71
GROWTH MONITOR, IND. CHILD, WEIGHED	210	210	100	100
ORGANIZED MOTHER'S GROUPS	7	5	71	71
MONITORED VHW'S	7	5	71	71

TABLE [illegible]

MALNUTRITION PREVELANCE

SAN PABLO, SEDS PROJECT

MEASUREMENT PERIOD	% MALNUTRITION
FIRST CONTROL	[illegible]
SECOND CONTROL	[illegible]

TABLE [illegible]

MORBIDITY CHART

SAN PABLO, SEDS PROJECT

CAUSE	0-5	6-10	11-14	15-44	45+	TOT	%
DIARRHEA	[illegible]	1	0	4	0	107	[illegible]
ARI	[illegible]	0	0	4	0	[illegible]	[illegible]
PREGNANCY	0	0	0	14	0	14	[illegible]
EYE INFECT.	2	0	3	0	0	10	[illegible]
WOUNDS	1	1	0	0	1	9	[illegible]
PARASITOSIS	2	0	1	0	0	6	[illegible]
BLADDER INFECT.	0	0	1	3	3	7	[illegible]
ABSCESS	2	1	0	1	1	6	[illegible]
INTESTINAL DISORDERS	3	0	0	0	2	5	[illegible]
OTHER	10	2	1	[illegible]	2	41	[illegible]
TOTALS	[illegible]	17	6	[illegible]	9	[illegible]	

TABLE [illegible]

IMPACT INDICATORS

SAN PABLO, SEDS PROJECT

INTERVENTIONS	% DECREASE
INFANT MORTALITY	[illegible]
PREVENTABLE DISEASES	[illegible]
INFANT DEATHS DUE TO DIARRHEA	[illegible]
INFANT DEATHS DUE TO ARI	[illegible]
INFANT MALNUTRITION	[illegible]

TABLE [illegible] DELETED DUE TO REPETITION OF INFORMATION

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TABLE 34

RICE PRODUCTION PROJECT OBJECTIVES

SAN PABLO, BENI PROJECT

PLANNED ACTIVITIES	COMPLETED	%
CULTIVATE 50 HAS. OF RICE	49	98
AGRICULTURE PROJECTS IN 5 COMMUNITIES	4	80
PARTICIPATION OF 50 FAMILIES	56	112

TABLE 35

RICE PRODUCTION CHART

SAN PABLO, BENI PROJECT

SEED TYPE	HAS.	YIELD (KG/HA.)	COST PER HA.	INCOME PER HA.	PROFIT	
					BS.	US
SITKA-6	5	2750	968	1430	462	128
WHITE-GOLD	40	1760	938	919	-19	-5.3
STONNY	5	1320	938	686	-252	-70
TOTAL	50	1821	941	947	6	--

TABLE 36

VEGETABLE PRODUCTION PROJECT OBJECTIVES

SAN PABLO, BENI PROJECT

PLANNED ACTIVITIES	COMPLETED	%
ESTABLISH 1 HA. FAMILY GARDENS	0.67	67
INVOLVE 4 COMMUNITIES	4	100
PARTICIPATION OF 42 FAMILIES	47	112
ESTABLISH COMMERCIAL VEG. GARDENS OF 15 HAS.	15	100
ESTABLISH COMMERCIAL VEG. GARDENS IN 4 COMMUNITIES	4	100
INVOLVE 30 FAMILIES WITH COMMERCIAL VEG. GARDENS	31	103

TABLE 37

VEGETABLE PRODUCTION

SAN PABLO, BENI PROJECT

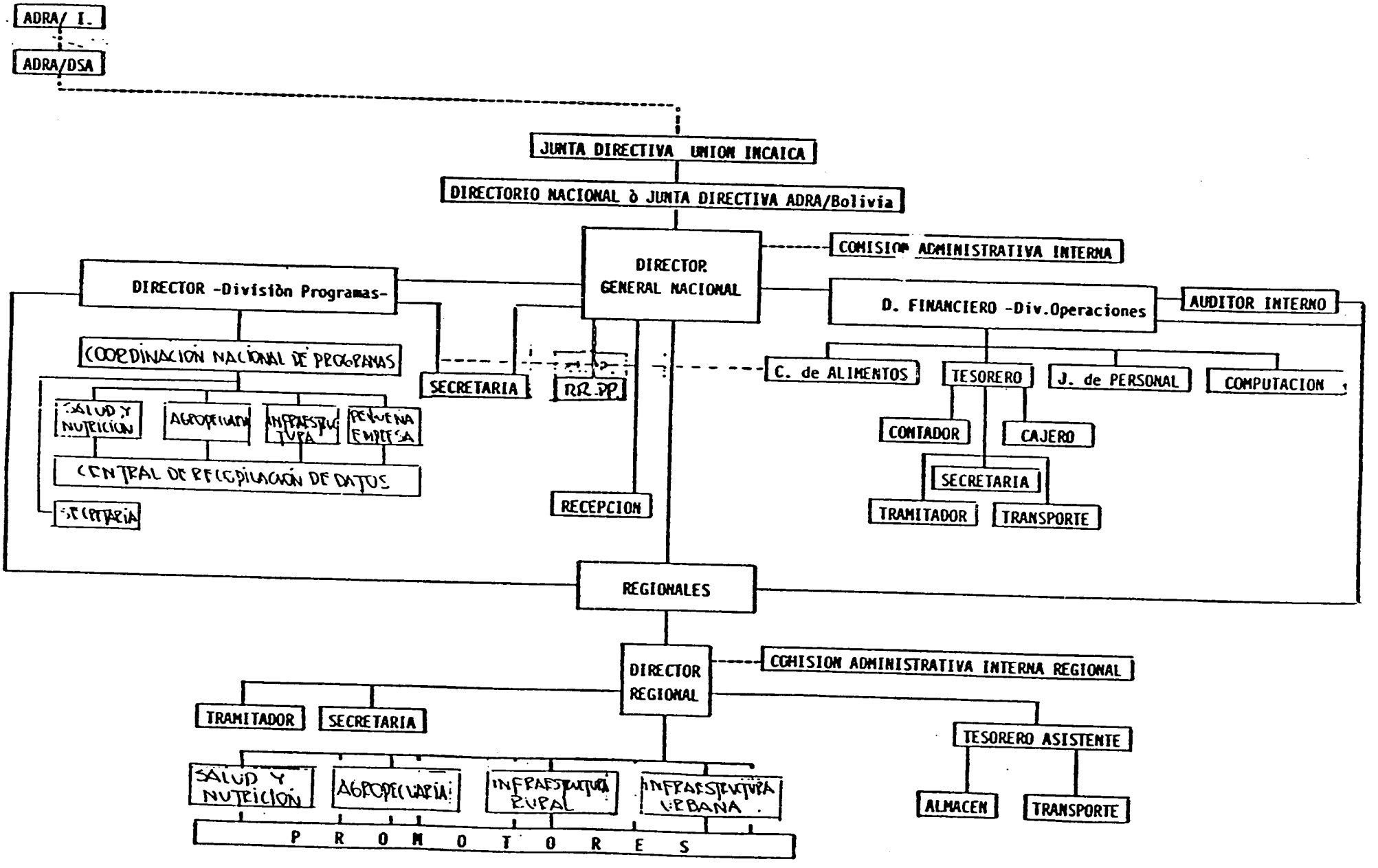
VEGETABLE	NO. HAS.	PLANNED SEEDS (KG)	COST BS/HA	EST. YIELD KG/HA	ACT. YIELD KG/HA.	%	INCOME BS/HA	PROFITS	
								BS	US
TOMATO	8.8	6	3268	12960	12000	93	5400	2132	592
PEPPERS	0.45	1.2	3300	5100	6900	135	13200	9900	2750
CABBAGE	0.47	2	1565	6400	8050	128	5600	4031	1120
CUCUMBER	0.6	3	1356	5980	6380	107	4438	3082	856
ONIONS	0.56	3	2125	6900	10350	150	13172	11047	3066
WATERMELON	4.8	8	2245	8280	25000	302	12500	10255	2849
RADISHES	0.02	3		10000					
CHARD	0.02	2		8000					
TOTALS	15.72		2791			152	6044	5253	1459

TABLE 38

TREE NURSERY PROJECT OBJECTIVES

SAN PABLO, BENI

PLANNED ACTIVITIES	COMPLETED	%
CONSTRUCT ONE TREE NURSERY	2	200
CULTIVATE 6,000 CITROUS SEEDLINGS	7000	67


ADRA/ I.
ADRA/DSA
JUNTA DIRECTIVA UNION INCAICA
DIRECTORIO NACIONAL ò JUNTA DIRECTIVA ADRA/Bolivia
DIRECTOR GENERAL NACIONAL
COMISION ADMINISTRATIVA INTERNA
DIRECTOR -División Programas-
D. FINANCIERO -Div.Operaciones
AUDITOR INTERNO
COORDINACION NACIONAL DE PROGRAMAS
SECRETARIA
RR.PP.
C. de ALIMENTOS
TESORERO
J. de PERSONAL
COMPUTACION
SALUD Y NUTRICION
AGROPECUARIA
INFRAESTRUCTURA
PEQUEÑA EMPRESA
CONTADOR
CAJERO
CENTRAL DE RECOPILACIÓN DE DATOS
SECRETARIA
SECRETARIA
RECEPCION
TRAMITADOR
TRANSPORTE
REGIONALES
DIRECTOR REGIONAL
COMISION ADMINISTRATIVA INTERNA REGIONAL
TRAMITADOR
SECRETARIA
TESORERO ASISTENTE
SALUD Y NUTRICION
AGROPECUARIA
INFRAESTRUCTURA RURAL
INFRAESTRUCTURA URBANA
ALMACEN
TRANSPORTE
P R O M O T O R E S

ANNEX J

Statistics on Gonzalo Moreno Integrated Project, ADRA/Riberalta

ANNEX J

GONZALO MORENO CHILD SURVIVAL PROJECT

TABLE 1
COMMUNITIES AND POPULATIONS
GONZALO MORENO - RISERALTA

COMMUNITY	POPULATION
GONZALO MORENO	360
LAS PIEDRAS	300
AGUA DULCE	75
CANOELARIA	125
LIBERTAD	70
FRONTERA	210
BUEN FUTURO	80
LAGO VICTORIA	105
TOTALS	1325

TABLE 2
DIARRHEAL DISEASE CONTROL
GONZALO MORENO - RISERALTA

GOALS	TARGET	ACTUAL	%	MILD DEHYD.	MOD. DEHYD.	SEVERE DEHYD
DETECTED DIARRHEAL CASES	130	90	70			
TREATED DIARRHEAL CASES	130	91	70	40	34	0
TRAINED RPS'S	7	7	100			
MONITORED RPS'S	7	7	100			
DOSES OF ORS'S USED	200	200	100			
ORU'S COMPLETED	0	0	100			
MOTHER EDUCATION CLASSES	0	0	100			
DEATHS DUE TO DIARRHEA	1000	1001				
	4	2	-50%			

TABLE 3
ACUTE RESPIRATORY INFECTIONS (ARI)
GONZALO MORENO - RISERALTO

GOALS	TARGET	ACTUAL	%	ARI (-)	%	ARI (+)	%
ARI CASES DETECTED	165	140	140				
ARI CASES TREATED	165	140	140	131	80	17	11
DOSES OF COTRIMOXAZOLE	2100	2000	140				
DOSES OF ASA	525	470	90				
RPS'S TRAINED	7	7	100				
ARI EDUCATION SESSIONS FOR MOTHERS	0	0					
ARI CAUSED DEATHS	1000	1001	-67				
	3	1					

TABLE 4
IMMUNIZATIONS
GONZALO MORENO - RISERALTO

VACCINE	CHILDREN 0-5 YEARS			WOMEN (15-44 YRS)			GENERAL POPULATION		
	TARGET	ACTUAL	%	TARGET	ACTUAL	%	TARGET	ACTUAL	%
BCG, 1 dose	114	114	100						
Polio, 3 doses	114	114	100						
DPT, 3 doses	97	97	100						
Measles, 3 doses	77	77	100						
T.T.				116	115	99			
Yellow Fever, 1 dose							726	665	91

TABLE 5
MEDICAL SERVICES
GONZALO MORENO - RISERALTO

GOALS	TARGETED	ACTUAL	%
Outpatient Services	600	530	88
Children 0-5 years	330	180	61
Women 15-44 years	200	92	46
Prenatal Control	50	46	92
Anti-Parasitic treatment -Children 1-5 years	500	500	100
Administration of VIT. A -Children 1-5 years	500	480	96
Administration of Iron Sulfate - Pregnant Women	60	56	93

TABLE 6
1991 MORBIDITY BY AGE GROUP
GONZALO MORENO - RISERALTA

NO	CAUSES	0-4	5-9	10-14	15-44	45+	TOT	%
1	ARI	102	18	5	9	12	146	31%
2	Diarrhea	46	6	1	1	3	57	12%
3	Parasitic Infection	18	10	7	0	0	44	9%
4	Digestive Problems	0	0	0	11	6	17	4%
5	Dermatological Problems	11	1	1	5	2	20	4%
6	Wounds	2	5	0	8	2	18	4%
7	Gynecological			0	12	3	15	3%
8	Neurological	0	0	0	8	6	14	3%
9	Bladder Infection	0	0	1	6	4	11	2%
10	Other	24	5	6	54	37	126	27%
	TOTALS	203	54	21	115	75	468	100%

GONZALO MORENO CHILD SURVIVAL PROJECT
HEALTH AND NUTRITION PROGRAM EVALUATION

TABLE 7
IMPACT INDICATORS:

INTERVENTIONS	% DECREASE
INFANT MORTALITY	20
PREVENTABLE DISEASES	100
INFANT MORTALITY DUE TO DIARRHEA (0-5)	75
INFANT MORTALITY DUE TO ARI (0-5)	30
INFANT MALNUTRITION	0.4

PERFORMANCE INDICATORS

INTERVENTIONS	COMPLETED	% OF TARGET
DIARRHEAL DISEASE CONTROL		
NO OF COMMUNITY ORT UNITS INSTALLED	6	100
NO OF CHILDREN TREATED FOR DIARRHEA	130	94
% OF MOTHERS WHO LEARNED TO USE ORT		90
NO OF CHILDREN TREATED FOR ARI	140	140
IMMUNIZATIONS		
BCG, CHILDREN (0-5)	114	100
POLIO, CHILDREN (0-5)	114	100
DPT, CHILDREN (0-5)	97	100
MEASLES, CHILDREN (0-5)	77	100
TETANUS TOXOID, WOMEN (15-44)	115	100
YELLOW FEVER, GENERAL POP.	665	90
GROWTH MONITORING		61
NO OF CHILDREN WEIGHED	130	
NO OF GENERAL MEDICAL CONSULTATIONS	530	73
		88

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GONZALO MORENO AGRICULTURAL PROJECTS

TABLE 8
CURRENT SEEDLING PRODUCTION CHART
GONZALO MORENO – RIBERALTO

SPECIES	QUANTITY	HECTARES
Rubber Trees	5000	10
Tamarind	6000	30
Biblanco (sown)	2500	6
Pitango (sown)	2000	5
Citrus (seed beds)	6000	20
Totals	21500	71

TABLE 9
TRADITIONAL CROPS PROJECT
GONZALO MORENO – RIBERALTA

TARGET GOALS	ACHIEVED	%
Benefit 60 families	47	78
Participation of 4 communities	4	100
Conduct 2 training programs	2	100
Cultivate 60 has. of rice and corn	59.5	99

TABLE 10
RICE AND CORN PRODUCTION CHART
GONZALO MORENO – RIBERALTA

RICE VARIETY	CORN VARIETY	HECTARES	COST/HA. (Bs.)
B-CH-1		6.5	950
CHIN-KUI		13.5	950
IR-2053-208-1		7.0	950
L3827		7.0	950
THE CHIN		6.0	950
SITKA-8		1.5	950
KUI PI		1.5	950
	CUSQUENO	12.5	960
TOTALS		59.5	

TABLE 11
DEMONSTRATIVE VEGETABLE GARDEN PROJECT
GONZALO MORENO – RIBERALTO

PROJECT GOALS	ACTUAL	%
Establish demonstrative gardens in 8 communities	7	88
Cultivate 3.31 has.	2.4	72
Train 172 mothers in horticulture	114	66

TABLE 12
VEGETABLE PRODUCTION CHART
DEMONSTRATIVE VEG. GARDEN PROJ.
GONZALO MORENO

VEGETABLE	AREA (MT2)	COST/HA./Bs	YIELD (KG/HA)			CONSUMPTION	SALES
			ESTIM	ACT	%	%	INCOME
Radishes	500	2500	15000	15000	100	70	1125
Lettuce	1965	2500	10000	10000	100	90	491
Eggplant	500	2500	16000	16000	100	80	480
Onions	1100	2000	12000	10000	83	90	275
Tomatoes	12370	3700	12000	15000	125	90	3711
Cabbage	4000	3000	20000	20000	100	90	1600
Chard	2010	3000	8000	12000	150	90	482
Peppers	1590	3300	5100	7000	137	90	223

ANNEX K

Technical Report: Gonzalo Moreno Integrated Project, ADRA/Riberalta

ANNEX K

ADRA - GONZALO MORENO

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ADRA - GONZALO MORENO

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ADRA - GONZALO MORENO

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DEPARTAMENTO DE PANDO
PROVINCIA MADRE DE DIOS
COMUNIDAD GONZALO MORENO

Gonzalo Moreno tiene 60 familias
Huerto colectivo 7 mujeres
Huerto familiar 15 mujeres
Huertos comerciales 12 beneficiarios (hombres)
Entrevistados 23 participantes, incluyendo a profesores, alcalde, prefecto y presidente de la comunidad.

Del total de los entrevistados se hicieron presentes 6 mujeres y el resto se encontraban en la Iglesia (Católica), un solo beneficiario a nivel comercial en hortaliza que es el profesor y 5 productores de arroz y frijol que trabajan con el proyecto.

El proyecto ADRA Riberalta esta trabajando con nueve comunidades distribuida de la siguiente manera:

Río Madre de Dios.	Río Beni
Agua Dulce	Las Piedras
Candelaria	Gonzalo Moreno
	Libertad
	Frontera
	Buen Futuro

Las comunidades San José y Lago Victoria se encuentran en reciente promoción.

El proyecto ADRA Riberalta Integrado se compone de tres servicios importantes para la región. Entre estos tenemos la Agricultura, Salud y Nutrición.

PROYECTO AGRICOLA

HUERTOS FAMILIARES Y COMERCIALES

La promoción se empezó con las Clubes de Madres, encontrando resistencia en el cultivo del tomate, sin embargo el proyecto empezó con demostraciones colectivas y escolares. En esta comunidad trabajaron con seis mujeres al principio y cada uno de ellas tenía la responsabilidad de cuidar sus tablones desde el almácigo hasta la siembra. En el presente período trabajan 7 mujeres con carácter colectivo y 15 mujeres en forma individual.

Las hortalizas que fueron cultivadas por las mujeres son el tomate, repollo, lechuga, zanahoria, rabanito, pepino, ajice y cebolla de hoja.

FONDO ROTATORIO

ADRA les entrega las semillas a las mujeres en carácter de venta, estas semillas son comprados de las tiendas de Riberalta y Trinidad, las mismas que proceden de Brasil y U.S.A.

El proyecto tiene una cuenta agrícola para los huertos, cultivos tradicionales y para el vivero. Las semillas de hortalizas pueden ser recuperados en especies como ser gallina o semilla de hortalizas. La semilla se recupera al doble de la cantidad entregada, mientras en los agroquímicos se recarga un 20 % mas al precio inicial.

Las mujeres también pueden obtener plantitas de tomate de los huertos escolares para el trasplante respectivo. Este sistema se debe a que algunas madres todavía no lo entienden la desinfección de los suelos y el preparado de los almágigos. Las madres compran al contado por 25 plantitas a un boliviano.

Para el tratamiento de plagas el técnico hace el control, cobrándose el uso de los insecticidas en huerto comunal, en cambio con huertos familiares unos pagan al instante y otras reciben en forma de préstamo que luego es cancelado a la venta de sus productos.

A nivel comercial el crédito es mayor, los beneficiarios reciben semillas, tales como el tomate, sandía, pepino, melones, pesticidas, fertilizante foliar (15-19-9), que empezaron a partir de este período agrícola. Este préstamo es pagado con la venta de sus productos sin recargo de intereses. El control de plagas lo hacen ellos mismos.

COMERCIALIZACION

La producción de hortalizas es consumida por la familia en su mayor parte, los excedentes fueron vendidos a la ciudad de Riberalta y el dinero fue repartida entre todas las participantes.

Las huertas familiares y comerciales empezaran a cosechar este año sus frutos que serán consumidas y venderán lo necesario para cancelar la deuda contraída con el ADRA.

A nivel comunal y en forma tradicional la gente vende sus cultivos de arroz, maíz, frijol, yuca, plátano y cítricos. En esta comunidad la mitad de la población tiene CATAÑA en sus

propias parcelas en pequeña cantidad y es por esta razón la gente vive mas de la agricultura.

ORGANIZACION

Las mujeres trabajan juntas en la parcela colectiva para realizar las labores culturales. El mayor sacrificio es el riego que se realiza dos veces al día, uno en la mañana y otro en la tarde con una duración de cuatro horas en total por día por medio. Otras mujeres aplican el riego solo en las tardes con una duración de dos en forma diaria. La distancia para traer el agua del río a la parcela dista 100 ms.

En una visita que se hizo a uno de los beneficiarios que trabaja a nivel comercial fue en la parcela del profesor. En su parcela se observó las plagas mas comunes que atacan a las hortalizas. El mayor cultivo es el tomate, unos con frutos que recién fueron pulverizados con insecticidas, otras están en trasplante, y el resto se encuentra en plena floración. Del total de la superficie (2 Ha), se calcula un 80 % de tomate y el resto es cultivado en pequeñas parcelas como el repollo, lechuga, cebolla y el pimentón.

El profesor contrata peones para el riego, tres personas se encargan de regar las hortalizas uno en la mañana y otro en la tarde con una duración de cuatro horas día por medio. El agua es traído del río en baldes.

CULTIVO DEL ARROZ

VARIEDADES MEJORADAS

A través de agrónomo y el promotor se esta introduciendo las siguientes semillas que fueron compradas de las tiendas:

Características agronómicas de las siete variedades de arroz introducido. Proyect. Int. G. Moreno. 1992.

SEMILLAS	MACOLLAMIENTO (Grado)	ALTURA (Cms.)	GRANO (Tamaño)	COSECHA (Días)
Variedades Chinas				
Chin Kui	Muy Buena	0.90	corto	97
Kui Pi	Mediana	1.00	corto	160
The Chin	Mediana	0.85	corto	158
Variedades Brasil y otros.				
Cica-8	Muy Buena	1.00	largo	152
I R	Mediana	1.00	largo	158
L 3227	Macolladora	0.90	largo	162
B-CH-1	Muy Buena	0.90	mediano	167

Según las experiencias de los productores indican que las variedades introducidas no se adoptaron a la región. Sin embargo, las variedades Cica-8, L 3227 y B-CH-1 tuvieron un ligero incremento con relación a las variedades locales.

FACTORES DE REQUERIMIENTO

Las variedades mejoradas requieren las siguientes condiciones:

a.- Son exigentes al agua
b.- Necesitan suelos livianos en lo posible arenosos.
c.- En suelos de ribera producen mejor
d.- Se puede emplear la HOZ para la cosecha por su talla ananá y crecimiento uniforme.
e.- Susceptible al ataque de la plaga PETILLA (Var Chin-Kui).

VARIEDADES LOCALES

- Comino grano para consumo
- Piedrita o nigua, grano pequeño y pesado
- Oro, apareció el año pasado, se trajo de la comunidad de
- las Piedritas.
- Cruceño blanco es de buen rendimiento.
- Peruano es igual a la nigua.
- Carolina se usa mas para comer.
- Colorado tiene la chala (cáscara colorada)
- Agujita es de grano liviano.

FACTORES DE REQUERIMIENTO

a.- Se puede cultivar en suelos húmedos y secos
b.- Se cultivan en tierras de ribera y tierras altas (duras y secas).
c.- Los tallos son mas largos que las mejoradas y que son susceptibles a la encamada por los fuertes vientos.
d.- El crecimiento es desuniforme y la cosecha se hace con cuchillo.
e.- Resistente a la plaga PETILLA (Var Jendara).

COSECHA CON EL HOZ

En la cosecha de las variedades mejoradas se esta introduciendo la HOZ, por que la talla es pequeña e uniforme. Por tanto el corte se realiza a una altura de 20 cms del suelo que permite cosechar en menor tiempo. Sin embargo, la cosecha no termina aquí, por que se crea más trabajo en:

1.- Construir un galpón en la misma parcela para el secado del arroz. La cosecha coincide con las últimas lluvias que se registran en la región, es por esta razón no se puede dejar secar el arroz en la misma parcela, caso contrario se malogra el grano que le da una textura quebradizo.

2. Se necesita una persona quien traslade esta planta a medida que se vaya cortando con el Hoz.

3.- Si el arroz se deja secar hasta medio día y le coge una lluvia, entonces el grano ya no sirve ni siquiera para semilla.

4.- El grano de arroz cosechado con los tallos y hojas tarda mucho en secar, por lo menos se debe dejar 2 días para el secado.

COSECHA CON CUCHILLO

La desventaja es que se tarda demasiado en la recolección de las espigas. La recolección de la espiga se hace cuando se muerde con los dientes se parte en dos y se coloca directamente a la bolsa para luego ser almacenado en la casa.

El transporte de la espiga es menos costoso por que no se necesita llevar mucha agua que contiene los tallos y las hojas.

El secado de las espigas se hace en el menor tiempo con relación al otro sistema.

COMERCIO

Entre las variedades mas comerciables tenemos el Oro y la Piedrita. El oro es llevado hasta La Paz y la piedrita se vende en Riberalta. El resto de las variedades se utilizan para el consumo familiar.

CULTIVO DEL FRIJOL

La variedad local es muy conocido por los productores con el nombre de CAUPI, en forma tradicional es cultivado para el consumo de la familia y para la venta. El proyecto esta tratando de introducir una variedad de tipo comercial proveniente del Brasil. Esta variedad es nueva para muchos y los precios son mayores con relación a las variedades locales.

Las variedades mejoradas son el CARIOCA y el MULATINO, cuya promoción se basa en el precio. La variedad local cuesta 1.50 Bs/kilo, mientras el carioca 2.50 Bs/kilo. Los precios de la variedad mejorada se mantienen constantes durante todo el año, en cambio el precio de las variedades locales suben y bajan en todo el período del año.

CULTIVO DEL MAIZ

Paz. Estas variedades no se comportaron bien en esta región por que las plantas murieron a la altura de 60 cms. En consecuencia, no se tiene experiencia con este cultivo, según comentarios del técnico.

PROYECTO NUTRICION

Las actividades de Nutricionista con las mujeres son las siguientes:

ASPECTOS CULINARIOS

Las mujeres aprendieron el preparado de las comidas con el uso de hortalizas y el frijol. Como ejemplo se puede citar lo siguiente:

Escabeche de pollo
Chanka de pollo
Albondiga de lentejas
Sopa de maní
Ensalada de frijol.

Los días lunes se reúnen para asistir a las prácticas preparadas por el calendario de la Nutricionista.

ASPECTOS ARTESANALES

En el programa de la nutricionista también contempla las actividades de enseñanza sobre los tejidos y costurar prendas de vestir para sus hijos y por ultimo se tiene bordados. Las mujeres se sienten satisfechos y contentos con esta clase de trabajos.

CAPACITACION

El técnico es el encargado de capacitar a las mujeres en los cultivos de las hortalizas, mediante los cursos y las prácticas que se realizan en los huertos comunales. Las prácticas consiste en la preparación de almacigos, distancia entre plantas, desinfección de suelos. En los huertos escolares se realiza parcelas demostrativos para mostrar y enseñar a los alumnos sobre el uso de pesticidas en el control de plagas, desinfección del suelo (Furadan) y labores culturales.

Dado a la dispersión de las viviendas el técnico se ve incapacitado de realizar visitas domiciliares. En los huertos comerciales se capacita a los beneficiarios en el uso y manejo de los insecticidas para el control de las plagas.

De igual manera la nutricionista da cursos sobre la nutrición y como los niños deben ser alimentados. Las madres aprendieron como sustituir la carne con el consumo del frijol y la soya por ser ricas en proteína vegetal. La conjunción de estos dos programas ha dado lugar la comprensión de las mujeres y de los beneficiarios de que los cultivos demostrativos cambien el significado a huertos nutricionales.

VIVERO FORESTAL

El vivero se ha instalado con el presupuesto que tenía ADRA para el alambrado, techado y la construcción del pozo. La mano de obra fue cancelada con los alimentos para el trabajo.

En el vivero se tiene arbolitos de castaña, cacao, Cayú, goma y mara. El vivero empezó desde el marzo del año pasado. Las semillas fueron comprados del IBTA. Con excepción del Tamarindo se trajo de Trinidad y los citros fueron adquiridos de las comunidades del lugar. También se esta empleando el sistema de los INJERTOS, para esto se esta utilizando como pie de injerto el limón rugoso que es bastante resistente a la plagas y como injerto se piensa utilizar ya sea la naranja o la mandarina de variedades dulces y comerciables.

El vivero también esta contemplando la propagación de especies nativas para los terrenos en barbecho.

FONDO ROTATORIO

La estrategia que se planea por parte del técnico consiste en entregar las plantitas a las comunidades que soliciten con una cuota inicial de 20 % en momento del recojo y el resto será cancelado de acuerdo a las posibilidades del beneficiario en un tiempo no menor de un año. Esto es con el objetivo de dar funcionamiento en la mantención del vivero y continuidad del mismo. La entrega de las arbolitos empezará en las épocas de lluvias que comienza a partir del mes de diciembre.

PROBLEMAS

El pozo tiene una profundidad de 11 metros, que sufre constantes desmoronamiento por ser un suelo arenoso en las partes laterales del pozo y a consecuencia de esto le obstruye el filtrado del agua, por que se necesita limpiar la base del pozo constantemente. El agua se saca en baldes mediante una polea.

En el momento de nuestra visita se ha observado que el pozo no tiene agua desde hace un mes y medio y mientras tanto se arbolitos de diferente especie secos y amarillos por falta de agua, pese al gran sacrificio que realiza el técnico en traer el agua desde el río en su motoneta. La distancia entre el río y el vivero es de medio kilómetro.

DEPARTAMENTO DE PANDO
PROVINCIA MADRE DE DIOS
COMUNIDAD AGUA DULCE

Comunidad	47 familias
Beneficiarios	16 familias
Participantes	30 personas

La fundación de esta comunidad se hizo hace 60 años. La mayor parte de la gente salieron de las riberas de río debido a las inundaciones en 1960 hacia las partes altas. De las 47 familias solo 23 tienen parcelas propias con 80 Has/familia. El resto de la gente trata de alquilarse terrenos en los bajios (ribera de ríos) bajo el riesgo de las inundaciones. Esta comunidad se localiza en el lado del Río Madre de Dios.

El proyecto ADRA ha promocionado los cultivos de hortalizas, y cultivos tradicionales como el arroz, frijol y el maíz. También se tiene los servicios de la Nutrición y la salud para la atención de los comunarios.

HUERTOS FAMILIARES

La promoción se empezó con las clubs de madres el año pasado, estableciendo parcelas demostrativas a nivel colectivo. Para las parcelas demostrativas los insumos, semillas tales como el tomate, pepino, repollo, pimentón, zanahoria y otros materiales de carácter gratuito. El año pasado empezaron con 14 mujeres que participaron en forma colectiva. La asistencia del técnico se realiza semanalmente los días martes.

VENTA DE LAS HORTALIZAS

Las hortalizas fueron cosechados en grupo y la venta se hizo mediante el comite de las madres. La venta de las hortalizas se hizo en Riberalta y el reparto de las ganancias no ha sido en forma equitativa, por el contrario ha causado cierto discrepancia entre ellas. Así mismo en el reparto de las hortalizas entre las trabajadoras fue de un modo desequilibrado.

ORGANIZACION

La parcela demostrativa no tenía trazado los tablones para cada una de las madres, por el contrario todos participaron en los trabajos, prácticas y otros en los días en que venía el técnico. La rotación de la mano de obra se hace especialmente para el riego que es el trabajo mas sacrificado de traer agua desde el río. Los riegos fueron aplicados día por medio, vale decir un día con riego y otro día sin riego realizado en dos períodos uno en la mañana y otro por la tarde. El otro trabajo

que sigue al riego son los deshierbes, que también se hacía turnos entre las mujeres.

Actualmente, las mujeres son cinco que siguen trabajando con la parcela colectiva y para esta gestión se aumentaron 14 mujeres que trabajan en forma individual creándose un DIVISIONISMO entre las mujeres por las siguientes causas que a continuación se detallan:

1.- La presidenta del club de madres tiene la mochila que ADRA les ha prestado para el control de plagas. La presidenta no quiere prestar a las mujeres de esta gestión.

2.- Las mujeres que fueron capacitadas por el técnico en la gestión anterior no quieren enseñar a las mujeres nuevas que se han incorporado en esta gestión.

3.- Las ganancias fueron muy poco en la parcela colectiva, por tanto las mujeres nuevas piensan que es mucho mejor trabajar individualmente y así uno mismo puede vender o comer por el trabajo que invierten.

4.- Los alimentos que entregan al proyecto madre-niño están siendo reducidos y cambiados con otros productos. Esta escasez de alimentos ha causado el desaliento de trabajar en forma colectiva.

CULTIVO DE ARROZ

El técnico del proyecto ADRA introdujo variedades que no se adaptaron en estas comunidades según las observaciones de los beneficiarios, como ejemplo podemos citar los siguientes casos:

Un beneficiario sembró media hectárea de CICA-8 y media hectárea de del CHIN-KUI y la cosecha de ambos fue de 60 arrobas.

Otro beneficiario indica que sembró dos hectáreas de las variedades chinas CHIN-KUI y el THE CHIN que son de talla enana. Estas variedades cuando se encontraron en le crecimiento las plantas se tornaron a un color morado las espigas, por tanto la cosecha fue totalmente negativo y ni siquiera ha cosechado la semilla que ADRA le entregó 1 lata de 11 kilos para dos hectáreas en carácter de préstamo.

Los productores que participaron con la introducción de estas variedades fueron un total de siete y todos fracasaron. Los productores opinan que estas variedades no son adecuados para el tipo de suelos que disponen.

VARIEDADES LOCALES

Los productores tienen variedades locales que son utilizados a nivel de consumo y de tipo comercial, entre ellas se citan lo siguiente:

A nivel de consumo se tiene las variedades de Oro, Piedrita, Comino, El blanco, Colorado.
A nivel de venta se prefiere las variedades de la Piedrita y el Oro por que tienen un grano mas pesado en relación a las demás variedades.

Estas variedades son cultivados en bajios (laderas de río) con semillas precoces que ellos conocen. las siembras se empieza en junio y la cosecha comienza a partir de noviembre. En tierras altas (suelos secos y duros), se empieza desde octubre, noviembre y diciembre que la última época de acuerdo al tamaño de sus parcelas y según las variedades conocidas para cada mes.

El deshierbe con las variedades locales en monte alto es una sola ves y en tierras de barbecho se realizar hasta dos veces. El deshierbe con las variedades mejoradas según el técnico requiere dos veces en monte alto y tres veces en barbecho por tener talla pequeña.

En muchos casos los productores que no tienen tierras, se alquilan de los propietarios que tienen tierras sobre todo en terrenos altos que coincide la siembra del arroz con la cosecha de la CASTAÑA.Debido a esta coincidencia los productores le dejan sus arrosales y no tienen tiempo de realizar dos o tres deshierbes que exige las variedades mejoradas.

La cosecha de la Castaña empieza desde el mes de diciembre hasta marzo en muchos casos. Los productores entienden que el trabajo en la cosecha de la Castaña no genera ganancias, por el contrario salen debiendo a los propietarios de las BARRACAS por el dinero adelantado y por los precios de los víveres que son demasiado elevado en relación a los precios que existe en las tiendas de los pueblos. Para el regreso de la ZAFRA de la castaña todavía los productores pueden cosechar el arroz aunque en pequeña cantidad.

SUGERENCIAS

Los productores sugieren que la introducción de semillas no es de mucha importancia en esta comunidad. Por el contrario ellos solicitan la cooperación de ADRA en buscar MERCADOS para sus productos.

El mayor ingreso que entra a la familia es por la venta de sus productos agrícolas tales como el arroz, frijol, maíz, yuca y

plátano. El plátano es el rubro mas rentable que genera para la familia cuando no hay inundación y el comercio se hace en la ciudad de Riberalta.

El productor solicita herramientas para la agricultura para reducir el tiempo de trabajo y facilitar un mejor manejo. Con el anterior promotor Philips se tuvo el ofrecimiento de cooperarnos con trabajos anteriormente nombrados mas la construcción para un depósito del arroz. La comunidad ha proporcionado los materiales locales pero la oferta de adra queda pendiente y esperan que se haga realidad lo mas antes posible.

También solicitan que se les proporcione arbolitos de cacao y los citros de tipo comerciable como el naranjo y la mandarina.

OTROS CULTIVOS

Los cultivos de maíz no se adaptaron a la región conforme se ha explicado para las otras comunidades. En cuanto se refiere al cultivo del frijol los productores cultivan para el consumo de la familia y para la venta a los mercados. El cultivo del frijol es mucho mas fácil en la siembra y en la cosecha comparando con el arroz que demanda un mayor trabajo.

NUTRICION FAMILIAR

ASPECTOS CULINARIOS

Las mujeres aprendieron el preparado de las comidas, para darle uso los alimentos que recibe las club de madres, como la lenteja, porotos, triguillo y otros cereales molidos.

Las comidas más sobre-salientes y apetecidos por los niños, mujeres y los hombres fueron el preparado de guisos con lenteja, los frijoles y las ensaladas de hortalizas

ASPECTOS ARTESANALES

En el plan de la nutricionista esta contemplado las enseñanzas de los tejidos con lana de oveja. En este aspecto nos permitimos sugerir que los tejidos también puede ser hechos de ALGODON por la producción que existe en la comunidad. Luego se tiene previsto los bordados y costura para el confeccionamiento de las prendas de vestir.

CAPACITACION

El técnico les capacita a las club de madres que están trabajando en forma colectiva sobre el preparado de almácigos, desinfección de las semillas y del suelo, uso y preparado de las insecticidas para el control de plagas. Las mujeres en su mayor

parte son analfabetas, otros tienen niños en lactación, otras en gestación. En este sentido no se esta tomando la PRECAUCION necesaria en las medidas preventivas y aspectos de higiene después del manejo de estos venenos.

La nutricionista también realiza cursos de capacitación sobre la alimentación de la gente. Las mujeres entienden sobre el caso de vitaminas y proteínas que se encuentran en los alimentos y consecuentemente coadyuva en la promoción de las hortalizas.

DEPARTAMENTO DE PANDO
PROVINCIA MADRE DE DIOS
COMUNIDAD BUEN FUTURO

Comunidad	12 familias
Arroz	7 personas
Frijol	9 personas
Participantes	7 personas

Tiempo de Gonzalo M. a la comunidad de futuro es 8-10 minutos.

La comunidad fue fundada hace cuatro años, la gente viene de Riberalta y otros son provenientes de la comunidad de Frontera. Esta comunidad ha sido creado por razones Escolares, para sus hijos era muy lejos para llegar a la escuela, se necesitaba un tiempo aproximado de dos horas.

El tamaño de la parcela varia de 25 hasta 150 Has/familia. En esta comunidad ADRA ha promocionado los huertos familiares, cultivos tradicionales, salud humana y la nutrición familiar.

HUERTOS FAMILIARES

El huerto es colectivo y la semilla es entregada por el técnico con carácter demostrativo en un principio, ahora las mujeres compran las semillas de tomate, repollo, rábanitos, vainitas, lechuga y el ají verde. El agua para el riego se trae del río que se encuentra a una distancia alejada, al igual que los demás, la frecuencia de riego se hace dos veces por día alternada por tres años consecutivos. En número de siete mujeres tienen huertos individuales y muchos de ellas tenían conocimientos sobre el cultivo de hortalizas.

Todas las mujeres trabajan en grupo, no tienen tablones separados. Las prácticas se realiza semanalmente los días martes bajo la asistencia del técnico de ADRA.

CULTIVO DE ARROZ

El presidente de la comunidad tiene múltiples funciones como promotor de agricultura y de salud. El presidente indica haber registrado los rendimientos de las variedades mejoradas que ADRA le entregó con carácter de producción. Los resultados son los siguientes:

THE-CHIN	30	arrobas/Tarea
IR	20	"
CICA-8	23	"
BCH-1	22	"
L 3227	25	"
CHIN-KUI	15	"

Otro beneficiario que ha usado las variedades mejoradas explica que el THE-CHIN arrojó un rendimiento de 29 a 30 arrobas/tarea en monte virgen, mientras la variedad IR no ha respondido por haber sido sembrado en barbecho muy bajo (terreno muy cansado). Este beneficiario sembró 9 tareas de la variedad THE-CHIN, 8 tareas Var. Oro, 7 tareas Var. Piedrita.

Para el siguiente año el esta planeando sembrar las siguientes variedades de arroz:

Piedrita	0.5 Ha.
The-Chin	0.5 Ha.
Chilena	0.5 Ha.
No sabe	0.5 Ha.

Los rendimientos de la variedad Oro, pese de haber sido comido la semilla por los pájaros se cosechó 12 arrobas/tarea sembrado en suelo virgen. Los rendimientos de la variedad Piedrita es 25 arrobas/tarea, sembrado en barbecho alto.

La diferencia de rendimientos entre el THE-CHIN sembrado en monte virgen es 30 arrobas/tarea y la piedrita sembrado en barbecho alto es 25 arrobas/tarea, resulta de 5 arrobas. Cabe hacer notar que el monte virgen se refiere al DESMONTE y barbecho alto que ya había sido desmontado.

Un aspecto que nos sorprende es que en nuestras visitas del día anterior a dos comunidades nos informaron que las variedades CHINAS especialmente fracasaron en su adaptación.

En cuanto se refiere a las variedades locales resulta que el Piedrita es la que menos rendimiento ha dado de 10 a 15 arrobas/tarea según el Presidente. A nivel tradicional en las demás comunidades indican que la piedrita tiene grano pesado y es la que mas se vende seguido de la variedad Oro.

La gente de la comunidad se interesa por las variedades mejoradas por las siguientes razones:

1.- Las mejoradas tienen talla enana y son resistentes a los vientos que originan la encamada.

2.- El crecimiento de las espigas son uniformes que permite el uso del MACHETE para el cegado del arroz.

3.- Después del corte se deja secar de 1 a 2 días apoyados en un palo. Luego se despica el grano golpeando con palo las espigas para su almacenamiento.

DESVENTAJAS

- la variedad mejorada tiene que ser cosechado antes de la madurez del grano.

- El grano no sirve cuando es afectado por la lluvia, las espigas se doblan.

- El grano de la variedad TRE-CHIN tiene una coloración negruzca que provoca al comprador un rechazo o una rebaja en el precio.

VENTAJAS

- Las variedades locales pueden ser sembrados en suelos altos (secos) o en suelos de bajío.

- Con las variedades locales se puede esperar hasta que los granos estén completamente maduros.

- A las variedades locales no le afecta mucho las lluvias, las espigas se mantienen colgadas.

- La resistencia a las plagas sobre todo la PETILLA en ambos variedades son iguales.

- Las mujeres explican que los granos nativos son grandes y los mejorados tienen granos delgados. Las variedades locales serán para la venta y las mejoradas para el consumo.

CULTIVO DEL FRIJOL

Sembraron la variedad NATIVO en marzo, ahora están por cosechar. En el mercado es conocido con el nombre de CAUPI. En forma tradicional todos siembran sobre las cercanías de los ríos. El proyecto esta promocionando la siembra en terrenos altos. Esta semilla fue comprada de las tiendas de Riberalta por ADRA. La densidad de semilla por hectárea es de 12 kilos por hectárea. En esta comunidad trabaja con siete beneficiarios con el frijol. La semilla será devuelto al doble después de la cosecha.

El beneficiario prefiere almacenar el frijol para vender en un precio elevado, que llega hasta 70 Bs/arroba que es por los meses de enero y febrero. El precio durante la cosecha es 12 Bs/arroba. Pese a los precios elevados del frijol y al fácil almacenaje de los granos, los productores no prefieren sembrar en grandes extensiones por que primero esta la dieta principal que es el arroz aunque su precio sea muy bajo.

COMERCIALIZACION

El mayor ingreso que beneficia a la familia viene de la venta de sus cultivos tradicionales como el arroz y el maíz principalmente. Todos los productores de arroz salen de la comunidad para ir a trabajar en la zafra de la castaña para obtener un ingreso adicional, pero esto es en forma temporal. El precio del arroz en tiempo de la cosecha se vende a 5 Bs/arroba y en esta época (agosto) sube el precio hasta 7 Bs/arroba. La variedad mejorada THE-CHIN se vendió a 5 Bs/arroba por la coloración negruzca que tiene el grano.

A manera de ejemplo podemos citar el caso de un beneficiario que emigra temporalmente a la zafra de la castaña. Recibe un adelanto del dueño de la zafra y este a su ves tiene que contratar a otras personas como ayudantes de trabajo. El paga a sus ayudantes 8 Bs/caja de 25 kilos de castaña recogido y llevado al lugar de control y como resultado a esta actividad el beneficiario de ADRA salió de la zafra saldo en contra. Es por esta razón se vio obligado a cancelar su deuda con la venta de la variedad THE-CHIN al propietario y este lo rechazó de plano por que el grano tiene color negruzco.

NUTRICION FAMILIAR

ASPECTOS CULINARIOS

Las mujeres se muestran satisfechas de haber aprendido diferentes clases de comida. Las madres que recibían los alimentos no sabían como emplearlos, ahora ellas están usando en sus casas por que existe una demanda de parte de los esposos y de los niños que se cocine para una mejor nutrición de familias. Entre las comidas mas deliciosas para ellas están lo siguiente:

- Sopa de verduras en reemplazo de las carne
- Preparado de guisos a base de la lenteja y del frijol por ricos en proteínas, que fácilmente pueden reemplazar al huevo, leche y carne.
- También se esta enseñando el consumo del maní que no existe en la región en las prácticas de cocina.

ASPECTOS ARTESANALES

- En las actividades de la nutricionista se considera los trabajos de sobre costura para la confección de prendas tanto para niños como para adultos. Además se tiene otras actividades de bordados y tejidos con el uso de la lana de oveja.

CAPACITACION

Las mujeres se capacitaron en la preparación de almacigueras, trasplante de las plantitas al lugar de producción, deshierbes, control de plagas y otros labores culturales mediante los cursillos y prácticas en la parcela demostrativa.

El comentario que recogimos de un de los beneficiarios es que el no tenía conocimientos en la preparación del concentrado para combatir las plagas con las plantitas recién trasplantadas y al aplicar la pulverización les quemó a todas. Un caso notable que se observa con la aplicación de los insecticidas TOXICOS es que el técnico no les explica la clase de venenos que el productor esta utilizando o el técnico no tiene conocimientos sobre QUIMICA, sin embargo lo cierto es que estos venenos son utilizados por las indicaciones que tiene la ETIQUETA en los envases para eliminar bichos, insectos y otros plagas.

En nuestro concepto es necesario que los responsables sobre la transferencia técnica se concentren en lo futuro en las prevenciones, precauciones y la higiene después del uso de estos compuestos Colorados o Fosforados especialmente para las madres que están lactando a sus niños y madres gestantes.

DEPARTAMENTO DE PANDO
PROVINCIA MADRE DE DIOS
COMUNIDAD LIBERTAD

Comunidad 26 familias
Beneficiarios 15 personas
Participantes 17 personas

La comunidad se fundó el año 1932 y todos son del oriente con lenguaje Español.

El proyecto ADRA a través de sus promotores y el técnico incentivaron la producción de arroz, frijol y hortalizas en base a la introducción de semillas comprado de las tiendas a las comunidades.

HUERTOS FAMILIARES

Los huertos colectivos empezaron con 18 mujeres el año pasado en diciembre del 91. Actualmente las mujeres que trabajan con la parcela colectiva son 9 mujeres. ADRA les proporciona semillas en carácter de venta y ellas pagan con la venta de los productos. Entre las semillas que conocen las mujeres son el tomate, repollo, pepino, pimentón, lechuga y rabanitos.

Las mujeres que trabajaron en años anteriores en la parcela colectiva, ahora ellas tienen su propia parcela individual y la semilla es adquirida muchas veces al contado.

ORGANIZACION

Las prácticas que se realiza con el técnico es semanalmente los días lunes en la tarde. El técnico atiende solo al grupo de mujeres que trabajan en colectivo y no así con las mujeres que viven distantes y dispersas. La mujeres que trabajan individualmente compran las semillas de Riberalta.

La cosecha y venta de las hortalizas en principio se hacía en forma colectiva. La venta de las hortalizas se hizo en los mercados de Riberalta y también fueron usados para el consumo de la familia.

No existe una participación integral de las mujeres en las labores hortícolas. Las mujeres entienden que al trabajar juntos en una parcela colectiva, la dotación de alimentos por ADRA debía ser para todas las participantes y no así que solo reciben las mujeres que tienen niños.

CULTIVO DE ARROZ

En esta comunidad no estaban presentes todos los beneficiarios que trabajan con el arroz, con excepción del presidente de la comunidad y un solo beneficiario. El presidente comenta que el proyecto ADRA trajo siete variedades de arroz, de las cuales resultaron dos los mas sobre-salientes en los rendimientos. Las demás variedades macollaron mucho, los granos fueron negros y se amarillaron las plantas.

Las variedades con mejores rendimientos que se ha observado son el BCH-1 y el IR . Continuando con los comentarios del presidente afirma que en una reunión de diez personas acordaron sembrar las variedades anteriormente indicadas mas otras variedades que todavía piensa traer el técnico.

VARIEDADES LOCALES

Los informes extractados se debe a la aportación de un beneficiario productor que estuvo presente en la reunión. las variedades locales son Piedrita, Colorado, Chileno (grano grande), Peruano (espiga grande) color colorado y el Endara que se debe al apellido del presidente y el lo trajo del Perú, según el comentario de una de las mujeres.

ASPECTOS FISIOLOGICOS DE LAS VARIEDADES LOCALES

Consumo

Las variedades que mas se consumen en la comunidad son el arroz oro, comino, piedrita, colorado y el peruano.

Antigüedad

Todas las variedades anteriormente mencionadas son antiguas y muchos lo conocen desde que eran niños. Estas variedades son adaptados en esta comunidad.

Plagas

Las variedades mas afectadas son el Oro y el Chileno.

Las variedades mas resistentes son el Piedrita, Colorado, y el Blanco.

Precocidad

Las variedades Oro y Chileno se pueden cosechar a los 90 días.

Las variedades que mas tardan en su desarrollo vegetativo son el Piedrita, Peruano y el Blanco.

Suelos

Las variedades Oro, Chileno y Blanco por ser las mas precoces se prefieren cultivar en suelos de bajío (ribera de ríos).

Las variedades que son cultivados en terrenos altos, donde los suelos son duros y secos son Piedrita y Peruano.

Venta

La piedrita por tener un grano pesado es la mas comerciable seguido del Oro.

En cambio las variedades Peruano y el Chileno tienen granos livianos que generalmente se usa para el consumo.

Almacenaje

Las variedades Piedrita y Blanco tiene la capacidad de resistir al ataque del GORGOJO en estado de grano por un período de siete meses.

Cosecha

La variedad piedrita por tener el grano pesado y las espigas son compactadas, demora mas tiempo durante la cosecha con cuchillo.

La variedad Peruana por tener grano liviano se realiza en menor tiempo, durante la recolección de las espigas con cuchillo.

Viento

Las variedades de la Piedrita que también lo conocen con el nombre de Nigua seguido del Oro son resistentes a los fuertes vientos que se registran en la comunidad.

El Blanco Y el Chileno no son resistentes al viento, estos tienden a tenderse por la debilidad de sus tallos.

CULTIVOS DE MAIZ

El proyecto ha introducido variedades de maíz que fueron traídos de la ciudad de La Paz a esta comunidad con carácter demostrativo. Estas variedades no se adaptaron a la región, por que no terminaron de desarrollar y las plantas se marchitaron.

La comunidad tiene variedades locales como el Colorado y el amarillo con rendimientos satisfactorios para la comunidad. Estas variedades son adaptadas a la comunidad.

CULTIVOS DE FRIJOL

En forma tradicional el frijol es cultivado en la comunidad. La variedad que mas se usa es el frijol blanco CAUPI que no es solo para el consumo pero también para la venta. El proyecto todavía no ha traído las semillas mejoradas hasta el presente.

COMERCIALIZACION

La gente vive mas de la agricultura en esta comunidad. Ellos venden arroz, maíz, frijol y frutas. La gente recibe ingresos mayores por la venta de HUEVOS, AVES y las HORTALIZAS por que se puede vender en cualquier momento, mientras el arroz y los otros granos tienen que ser almacenados hasta que los precios sean favorables.

El plátano también es rentable para la familia. El precio nunca rebaja de 5 Bs por racimo, mas al contrario tiende a subir hasta 8 Bs/racimo.

NUTRICION FAMILIAR

ASPECTOS CULINARIOS

La asistencia se realiza los días martes en la mañana para los cursos sobre la alimentación de la familia. Las mujeres conocen sobre vitaminas, proteínas y carbohidratos existentes en las hortalizas, cereales y frutas. Los hombres manifiestan que los platos preparados durante la práctica son apetecidos por ellos mismos y sus hijos.

POZOS BASUREROS

En esta comunidad trabajaron con pozos basureros para el control de las enfermedades. Las mujeres explican que todas las basuras de desecho, papeles, hortalizas, frutas podridas y todo lo que se barre de la casa son depositados en este pozo.

ASPECTOS ARTESANALES

Las mujeres se muestran entusiastas en aprender los tejidos a mano, costura para el confeccionado de prendas y muchas de ellas dijeron que pueden enviar a sus hijas mayores para este aprendizaje.

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CAPACITACION

El técnico admite que existe una gran apatía entre las mujeres y sugiere que se debe concientizar a las mujeres en el consumo de las hortalizas. Este caso se debe a que en esta comunidad al igual que en las demás se observa el DIVISIONISMO. No existe la participación integral en las prácticas que se realiza en la parcela colectiva. Las mujeres que tienen sus parcelas particulares no vienen a participara a la parcela colectiva. Los factores que originaron son los mismos a los casos que se explicaron en los informes de las otras comunidades.

SERVICIOS SOBRE-SALIENTES

Los participantes manifestaron que los servicios mas sobre-salientes en esta comunidad fueron los siguientes:

La asistencia médica tuvo un gran impacto en la atención de la comunidad y por el gran interés que ejerce sus funciones.

El programa que menos beneficio a traído a la comunidad es la agricultura por el fracaso de las semillas.

El programa de nutrición por los informes de las mujeres es bien acogido en la comunidad, por que les gusta mas que todo las prácticas.

DEPARTAMENTO DE PANDO
PROVINCIA MADRE DE DIOS
PLAGAS MAS COMUNES DE LAS COMUNIDADES DE
GONZALO. M. AGUA DULCE. BUEN FUTURO Y LIBERTAD

Tomate (Solanum Lycopersicum)

Tucura (bicho negro), es un insecto de la familia de los coleopteros.

Petilla (pequeño de color verde y negro), familia de los Aphidos (Aphis mali).

Heliothis zea (gusano elotero), ataca al fruto y es del tipo masticador.

Phythoptera infestans (enfermedad), ataca a las hojas y el fruto.

Turiro es una termita de color blanco que perfora el tallo.

Fusarium Oxysporium-Rhyzoctonia solani (marchitamiento brusco o dumping off). Ataca a todas las hortalizas en estado de almácigo. Favorecida por una humedad alta y elevada temperatura ambiental.

Repollo (Brasica Oleracea)

Tucura (bicho negro), es un insecto de la familia de los coleopteros.

Petilla (pequeño de color verde y negro), familia de los Aphidos (Aphis mali), lo seca y mata a la planta (insecto chupador)

Turiro es una termita de color blanco que perfora el tallo.

Trips (Thysanoptera) se ha observado la presencia de esta plagas por dentro de las hojas de color negro, verde y plomo. Se caracteriza por que no deja desarrollar la planta.

Pimentón (Capsicum annum. L)

Trips (Thysanoptera) se ha observado la presencia de esta plagas por dentro de las hojas de color negro, verde y plomo. Se caracteriza por que no deja desarrollar la planta.

También se observó la presencia de insectos grandes con alas negras jaspeadas con blanco que pertenece a la familia de los Helmintos de tipo chupador.

Cebolla (Alliun Sativa)

No se ha registrado la presencia de ambos insectos y enfermedades.

Lechuga (Lactuca sativa)

Se observó la presencia de pequeños insectos de color negro dentro las hojas.

Zanahoria (Daucus carota)

Es la única hortaliza que no ha dado producción en esta región. Los tubérculos fueron demasiados pequeños.

Sadía (Citrullus lanatus)

Petilla (rayas blancas), posiblemente es otra especie de la familia Alcanzana Thiumei. Es un insecto chupador que ataca a la hoja y el tallo.

Ratones (Familia Roedor), ataca a la fruta.

Maíz (Zea maíz)

Gusano Cogollero (Spodoptera Frugiperda), ataca a la mazorca cuando los granos están en leche.

Ratones (Familia Roedor), ataca a los granos en planta como almacenados.

Arroz (Oriza sativa)

Los pájaros se lo comen la semilla en el momento de la siembra. El arroz almacenado es atacado por el gorgojo (Sitophilos oryzae) al igual que los ratones (familia de los roedores). Como una medida de protección se utiliza el kerosen para mezclar la semilla.

Petilla (Alcanzana Thiumei), insecto chupador de la savia de las hojas.

Osito (Insecto chupador), se mete en el polen de la flor y la espiga se chalea.

Perrito (Neocurtilla Hexadactila), es un grillo topo que pertenece al orden de los orthopteros. Chupa la savia del tallo, seca la planta y ya no desarrolla la espiga.

Chinche (Tibraca Limbativentris), es un ácaro chupador que ataca a las partes tiernas de la planta.

Falso carbón (Ustilagoidea Virens), es una enfermedad fungosa que ataca a los granos.

Leguminosas

Entre las plagas mas importantes que ataca a este cultivo podemos señalar lo siguiente:

Falso medidor (Pesudoplusia Includens), es un gusano masticador que ataca al follaje.

Gusano elotero (Heliothis zea), también ataca al follaje.

Petillas (Diabrótica Bolteata), es otra especie de la familia de las petillas. Insecto chupador que ataca al follaje.

Mancha angular (Antracnosis), es una enfermedad que se observa en las hojas.

Cítricos

Gomosis (enfermedad), ataca al naranjo y la mandarina. Esta enfermedad se caracteriza por exudamiento de un líquido viscoso a través de los tallos.

Tristeza (Enfermedad), se caracteriza por el amarillamiento de la parte apical de los árboles, cuyas síntomas se parece a la clorosis.

RENDIMIENTOS EN KILOGRAMOS DE LAS PRINCIPALES HORTALIZAS CULTIVADAS EN LA ZONA DEL PROYECTO DEL PROYECTO GONZALO MORENO PANDO. 1991.

Cultivos	Comunidades				Rendto. $\bar{X}$
	G.Moreno	Libertad	Frontera	A. Dulce	(Kgms/ha.)
Tomate	20.000	20.000	14.000	20.000	18.500
Repollo	30.000	25.000	30.000	30.000	28.750
Rábano	16.000	16.000	16.000	16.000	16.000
	(o su rendimiento en atados de 8 unidades que son aproximadamente 50 mil atados por hectárea)				
Lechuga	13.000	13.000	13.000	14.000	13.750
	(o su rendimiento expresados en kilogramos por hectárea que es aproximadamente 16440).				

Elaborado por: Jorge Becerra M.

G. Moreno, 14 de junio de 1992.

HUERTOS NUTRICIONALES GEST./1992

SUPERFICIE CULTIVADA EN (M2)

(Datos aproximados)

COMUNIDAD	H.C.	H.E.	H.P.	TOTAL
G. Moreno	2000	3000	14000	19.000
Frontera	1500	—	2000	3.500
Libertad	1000	—	1000	2.000
A. Dulce	10000	—	5000	15.000
B. Futuro	1000	—	—	1.000
L. Victoria	2000	—	—	2.000
L. Piedras	—	—	5000	5.000
Candelaria	—	—	—	—
Totales	12500	3000	23500	47.500

Son en hectáreas 4.75 cultivadas

No incluye otros beneficiarios participantes.

H.C Huertos Comunales

H.E. Huertos Escolares

H.P. Huertos Particulares

Elaborado por Ing. Agr. J. Becerra M.

G. Moreno, 24 de julio de 1992.

RENDIMIENTO DE VARIEDADES INTRODUCIDAS DE ARROZ (TN/HA.)
DEL AÑO AGRICOLA 1991- PROYECTO INTEGRADO G. MORENO

VARIEDADES	I	II	III	IV	V	VI	RENDTO $\bar{X}$
B-CH-1	2.64	--	--	--	2.70	2.87	2.74
THE-CHIN	0.92	--	--	3.68	--	3.45	2.68
L-3227	1.92	--	--	--	--	2.87	2.39
CICA-8	2.30	1.50	2.87	--	--	2.76	2.37
KUI-PI	2.10	--	--	--	--	--	2.10
IR	2.30	--	--	1.38	--	2.49	2.05
CHIN-KUI	1.84	0.69	2.00	0.86	1.60	1.72	1.45
TOTALES	2.00	1.12	2.43	1.97	2.13	2.89	2.25

RENDIMIENTO EN ARROBAS/HA.

B-CH-1	238.00
THE-CHIN	233.00
L-3227	208.00
CICA-8	206.00
KUI-PI	183.00
I R	178.00
CHIN-KUI	126.00

COMUNIDADES PARTICIPANTES:

I.- GONZALO MORENO

II.- AGUA DULCE

III.- LAS PIEDRAS

IV.- FRONTERA

V.- LIBERTAD

VI.- BUEN FUTURO

Elaborado por Ing. Agr. J. Becerra M.

ANNEX L

Technical Report: Nutritional Vegetable Gardens, CARITAS/Beni

ANNEX L

CARITAS- HUERTOS NUTRICIONALES

CONTENIDO

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ANNEX L

DEPARTAMENTO DEL BENI

PROVINCIA CERCADO

COMUNIDAD CASARABE Y SACHOJERE

CARITAS- HUERTOS NUTRICIONALES

COMUNIDAD	FAMILIA (No)	CLUB.MADRES Anterior	Actual	ENTREVISTADO (No)
Casarabe	82	15	16	14
Sachojere	70	13	10	7

Caritas-Beni empezó hace dos años con la campaña de HUERTOS NUTRICIONALES y con la participación de las clubes de madres que ya existían como base de promoción para el resto de la comunidad.

Actualmente las madres continúan con los cultivos de huertos a pesar de que el proyecto feneció en diciembre del año pasado. Las madres que participan como beneficiarias son de origen ORIENTAL que todos ellas hablan el ESPAÑOL, sin embargo existe dentro de este grupo de mujeres un analfabetismo de 60% y solo las madres jóvenes saben leer y escribir.

La participación de los maridos en los huertos nutricionales es muy poco, limitándose a cooperar a sus mujeres en los trabajos duros tales como el destroncado, limpieza del terreno y chaqueo de arbustos. Las madres se encargan de cultivar las hortalizas en cooperación de sus hijos mayores.

La razón fundamental para elaborar el proyecto fue para mejorar la dieta de la familia. Los técnicos de CARITAS-BENI insinúan que la familia se alimenta solo de arroz y yuca. Sin embargo, en nuestras entrevistas la mayoría de ellas respondieron que antes del proyecto ya sabían cultivar hortalizas, principalmente el tomate y la cebolla en su forma tradicional para ambos el consumo familiar y venta de sus productos. Además la familia se alimenta de otros rubros como el maíz, frijol, frutas y carne proveniente de las aves, cerdos, vacunos, peces no en forma cotidiana pero con un promedio semanal de alimentación.

TRANSFERENCIA TECNICA:

Los Ing. Enrique Mazuelo y María Luisa fueron los encargados a promover los cultivos de las hortalizas y transferir los trabajos técnicos a los clubes de madres empleando parcelas demostrativas en forma colectiva y a campo abierto.

PREPACION DE SUELOS

Las actividades que se realizan en la preparación de suelos son de dos maneras.

a.- Cuando los suelos tienen troncos y mucha maleza, el hombre le coopera a la mujer en el limpiado y destroncado de la parcela a ser cultivado, seguidamente se cava el suelo con pico a una profundidad de 20-30 cms, luego se desterrona la textura arcillosa golpeando con el pico o la pala hasta que el suelo este completamente suelto, luego se procede al mezclado de la tierra con el estiércol con pala para poder elevar la platabamba a una altura de 20 cms sobre el nivel del suelo, y finalmente se hace el nivelado quedando lista para la siembra de las semillas.

b.- Por efecto de la lluvia los suelos cultivados vuelven a compactarse en las parcelas que fueron cultivados y para remover el suelo nuevamente las mujeres tienen que cavar la tierra a las profundidades anteriormente indicadas, desterronar o mullir la tierra y luego el nivelado como en el caso de la comunidad de Sachojere.

SEMILLAS

Las semillas de tomate, cebolla, lechuga, repollo exigen la preparación de platabandas para su germinación. La desinfección del suelo se hizo con un funiguicida para eliminar ciertas plagas que puedan existir o mediante la aplicación de agua hervida.

PLAGUICIDAS

Los insecticidas se aplicaron en los huertos para el control de las insectos, pulgones, gusanos y otros con el objeto de controlar el ataque de estos. Entre los cultivos mas importantes para el control de las plagas podemos indicar las hortalizas que se adjunta en el anexo 1.

ABONOS QUIMICOS

Entre los abonos químicos que se utilizaron fueron la urea (46%) y el liquido foliar (Bayfoliar) para la hoja de la lechuga.

Los abonos que se utilizaron en el suelo fue el ESTIERCOL (guano de caballo, aves, cerdos, vacas, etc.).

SOMBREADO

Una ves que las semillas son sembradas en las platabandas, se protegen a los semilleros que recién están saliendo (seedlings) contra los rayos solares por que son sensibles a la luz directa. Este trabajo se pudo observar en la visita familiar que se hizo en la comunidad de Casarabi.

TUTORAJE

Exclusivamente en el tomate se les enseño la aplicación del tutoraje para evitar las perdidas que se registran durante la maduración del fruto.

LABORES CULTURALES

Entre estos tenemos la distancia entre semillas, distancia entre plantas, densidad de semillas sobre todo en los trasplantes y finalmente los deshierbes.

RIEGOS

Claramente en esta parte los técnicos no prestaron atención en el manejo de agua, como ser la cantidad de agua que necesita un cultivo y frecuencia de riegos para cada cultivo. El agua que es utilizado para el riego de las hortalizas proviene de las aguas estancadas en los charcos, lagunas y cunetas de caminos.

Las mujeres sacan el agua con baldes de plástico o latas de aceite de cinco litros para echar el agua sobre el surco de las plantas con la TUTUMA que es una cucurbitacea y al mismo tiempo con la mano echan el agua a la planta para humedecer las hojas, esto en la comunidad de CASARABI y en caso de SACHOJERE el riego consiste en que las mujeres hacen agujeros en los envases y lo echan el agua sobre las plantas en dirección al surco que se parece a una regadera.

Durante el almácigo las mujeres riegan dos veces al día, uno en la mañana y otro en la tarde. Una ves que se trasplantan los riegos se reducen a una sola ves por día que se hace solo en las tardes. Esta operación es la mas costosa en términos de trabajo para la producción de las hortalizas.

DESHIERBES

Las mujeres realizan los deshierbes en forma manual, cuya operación se repite hasta seis veces para controlar la competencia de agua, luz, y los nutrientes del suelo que son elementos que benefician a las hortalizas.

APORQUES O CARPIDAS

Esta operación se realiza con pala ambos lados del surco para darle una soltura suelta a fin de que las raíces se alimenten de oxígeno y se mejore el valor biológico del suelo para su descomposición de los elementos minerales. Desde la germinación hasta la cosecha se realiza tres operaciones.

COSECHA

Esta operación se realiza tres veces a medida que los frutos van madurando cada 10 a 15 días. La cosecha se realiza a mano recogiendo uno por uno que se va colocando en una canasta o bolsa. En el caso de la lechuga se arranca con toda la raíz o se corta con cuchillo a raíz de la hoja. En cambio la cebolla, zanahoria, nabo se cosechan al igual que la papa empleando picos para sacar todo la mata con los tubérculos para ser recogido los frutos. Las madres que sabían leer y escribir llevaron registros de siembra, rendimientos sobre la cosecha de frutos especialmente en el tomate que se observa en el anexo 2.

CREDITO AGRICOLA

CARITAS-BENI entregó a las clubes de madres los insumos (semillas, insecticidas, desinfectantes) en carácter de préstamo para ser devueltos en semilla o en su valor cotizado en dolar americano. El proyecto se encargo de entregar todos los insumos al comite de las clubes de madre en forma colectiva con un valor total de 25.50 bolivianos como en el caso de SOCHOJERE, las mujeres pagaron el valor de la semilla de 20 Bs. quedando en morosidad el resto.

ORGANIZACION

La alcaldía de la comunidad de Sachojere le facilitó un terreno baldío a las clubes de madres para que utilicen como una parcela demostrativa del pueblo. Cada una de las mujeres estaba encargada de atender tres tablones y cada tablón tiene una medida de 10 x 1 mts. Sin embargo, algunas de las madres que contaron con mas ayuda o que son mas fuertes que otras podían obtener cuatro a cinco tablones como por ejemplo la presidente del comité, quien se encarga de preparar el tablón para el semillero. Una ves que se encuentran listas para el trasplante cada una de las mujeres pueden usar las plantitas de acuerdo a la necesidad que tengan.

En la comunidad de Casarabi las clubes de madres también utilizaron una parcela demostrativa en forma colectiva. Según las versiones de las mujeres los frutos fueron robados por la comunidad, a pesar de esto ellas cancelaron su préstamo a Caritas-Beni. A pesar de haber sufrido este fraude las mujeres no se desalentaron, mas por el contrario ahora ellas hacen sus

cultivos en forma familiar. Tuvimos la oportunidad de visitar a dos huertos familiares. Una de ellas tiene una almaciguera de lechuga, zanahoria y rabanitos con una superficie de cuatro m2 y otra de cebolla de 3 m2 que tiene el sombreado y atiende a 40 plantas de tomate.

En nuestra segunda visita familiar (Carmen Terrasas), observamos las hortalizas de zanahoria, lechuga, pimentón y rábanos trasplantados. La mujer esta tratando de observar los resultados de tomate cultivados en dos sistemas. Uno que el tomate fue trasplantado y el otro sistema es siembra directa. La superficie total que atiende es de 100 m2.

COMERCIALIZACION

La venta del tomate se realiza en dos maneras:

a.- Después de la cosecha se puede vender en el mismo pueblo, el precio de 1.0 Bs/kilo (tomate grande).

b.- Las mujeres no pueden extender sus productos para el comercio por varios factores tales como:

1.- La excesiva precipitación no les coopera en el cultivo, por que a consecuencia de esto se produce las inundaciones.

2.- No pueden trasladar a grandes distancias para la venta de sus productos. La distancia mas cercana esta a 50 Kms, cuyo pasaje es de 8 Bs por persona y el flete por cada caja de tomate cuesta 3 Bs. Cada caja contiene 10 kilos. Además, los compradores les ofrecen precios por debajo de la comunidad que fluctúa entre 0.50 y 0.80 centavos por kilo.

CAPACITACION

La mujeres se encuentran felices de haber aprendido las prácticas sobre el cultivo de hortalizas, control de insectos, desinfección del suelo y el preparado de la mezcla. Los técnicos de CARITAS-BENI estaban presente en las comunidades por 20 días haciendo visitas domiciliarias al igual que las parcelas colectivas mediante cursos y demostraciones.

Posiblemente, dado al corto período de duración que tenía el proyecto aun las mujeres no estaban seguros en el manejo de los pesticidas en cuanto se refiere a las concentraciones de las dosis y el saber distinguir entre un fertilizante foliar con un insecticida foliar. En la reunión que tuvimos se pudo observar la presencia de madres en lactación. Para las mujeres que no entienden, los técnicos utilizaron medidas rústicas que ellas conocen como ser la cuchara y las jeringas desechables para tener una idea entre la cantidad del concentrado y el agua.

anexo 1.

DEPARTAMENTO DEL BENI

PROVINCIA CERCADO

PRINCIPALES PLAGAS QUE AFECTAN EN LAS

COMUNIDADES DE CASARABI Y SACHOJERE

Las hortalizas mas afectadas por las plagas son el repollo, el tomate y el coliflor según las observaciones de las clubes de madres.

REPOLLO Y COLIFLOR (Familia Brasicae)

Estos cultivos son atacados por el pulgón negro que ataca a las hojas y sobre todo al fruto del coliflor. Pertenece a la familia de los APHIDOS (Myzus Persicae). El pulmón verde (Aphis mali) también ataca al repollo, que son insectos de tipo chupador y que se alimentan de la savia cuando las hojas esta tiernas.

TOMATE (Solanum Lycopersicun)

La plaga que mas afecta a este cultivo es la TUCURA conocida vulgarmente por la comunidad. Este se parece a una mariposa que pertenece a la familia de los COLEOPTEROS de tipo masticador. La tucura se alimenta de hojas tiernas y del fruto cuando esta en plena maduración.

Los gusanos también atacan al tomate, principalmente ataca al cogollo de la planta (peciolo tierno), que muchos le conocen con el nombre de gusano cogollero (Spodoptera). Esta plaga aparece en dos épocas. Primero aparece cuando la planta esta de entre 10 a 15 cms de altura y generalmente antes del trasplante y el segundo ataque se produce antes de la floración.

En cuanto se refiere a las enfermedades tenemos el color blanquecino que se presenta en las hojas. Esta enfermedad se refiere al TIZON tardío y temprano. Esta enfermedad se caracteriza por que los frutos presentas manchas negras que le dan el aspecto de ser quemados. Así mismo, se presentaron los síntomas sobre el marchitamiento brusco del tomate que se refiere a la (Pheudomona Solanasearun), que es causado por una enfermedad fungosa.

CEBOLLA (Alliun Cepa)

La presencia de insectos y pulgones es poco en relación al tomate, sin embargo se ha podido detectar la podredumbre blanca

(Esclerotiun Cepivorum) que se refiere a una enfermedad fungosa. En algunos casos la semilla de la cebolla es recogido por los CEPES (hormigas), y como una medida de prevención los técnicos de caritas recomiendan el uso desinfectante para la semilla o desinfectando el suelo con agua hervida.

PEPINO (Cucumis Sativus)

El pepino fue atacado no por una plaga, pero por un roedor llamado TAPITI, que se lo comió todo su sembradío. Entre las enfermedades que se observaron en la región se tiene el MILDIUM del pepino (Erysiphe Cichoracearum), que se refiere a una enfermedad fungosa.

PIMENTON (Familia Lycopersicum)

En este cultivo también se presento el TIZON (Phytoptora Caspsici) que se caracterizan por tener las hojas de color blanquesino. Luego se presento los gusanos verdes que pertenece a la familia de los (Spodoptera).

OTRAS PLAGAS

Entre otras plagas que mencionan las club de madres son el QUEMA-QUEMA que se refiere al cien pies. El daño que realiza es que perfora el suelo y al hacer esto van rompiendo las raíces tiernas de las hortalizas, así mismo se tienen bichitos pequeñitos de color negro, que posiblemente se debe a los TRIPS (Thysanopteras). Por último se ve en las hortalizas pequeñas langostas de la familia de los COLEOPTEROS. A continuación tenemos otra plagas comunes de la región:

Plutella Xylostella	Plutelidar (gusano) en el repollo.
Alcalzmna Thiumei	Chrysomchidae (petillas) del pimenton y el tomate.
Diabrotica Bolteata	Chrysomchidae (petillas) del pimenton.
Schistocerca Nitems	Orthoptera (ticura) tomate, repollo y el pepino.
Hyadaphis Erysimi	Aphidiclia (Pulgon verde) repollos.
Aphis Croccivora	Aphidas (pulgon blanco) tomate.
Ephilachna Varivestis	Coccinellidar (Petilla) ataca a todo cultivo.

Fuente: Nombre de los diferentes tipos de plagas que atacaron al cultivo Pág. 12. (informe).

anexo 2.

COSTOS DE PRODUCION PARA EL CULTIVO DEL TOMATE (100 M2)
TERRENO EN BARBECHO

FECHA	ACTIVIDAD	DETALLE	TRABAJO MUJER	TRABAJO No	TIEMPO Hora	TOTAL Hora
4/2/92	Almácigo (Var. Río de fuego)	Rosar, quemar, cavar, limpiar nivelar el suelo.	1	1	4.0	4.0
4/5/92	Siembra	Esparcir la semilla, tapar con tierra y paja.	1	1	2.0	2.0
	Riego	Desde la siembra hasta el trasplante (mañana y tarde)	1	20	0.5	10.0
	Sombreado	Protección de las semillas contra el sol.	1	1	8.0	8.0
4/25/92	Trasplante.	Llevar las plantitas al terreno de producción.	1	1	8.0	8.0
	Riego	Desde el trasplante hasta la cosecha (tardes).	1	80	1.0	80.0
	Deshierbe	Desde el trasplante hasta la cosecha.	1	6	1.0	6.0
	Carpida	Trasplante, a 30 cm de altura, antes de la floración y después de la floración.	1	4	1.0	4.0
	Plagas	control de insectos.	1	3	1.0	3.0
	Tutoraje	Construcción de espaldar para evitar que los frutos estén en el suelo.	1	1	8.0	8.0
9/5/92	Cosecha	Recolección de frutos en tres partidas.	1	3	1.0	3.0

La mano de obra empleada por la mujer hacen un total de 136 horas para la producción del tomate. En este estudio no se ha considerado la mano de obra de los hijos que ayudan a la madre.

Tomando los siguientes parámetros podemos determinar los costos de producción para el cultivo del tomate.

Mano de obra

Jornal = 8 horas

Jornal = 10 bolivianos con comida se paga en la misma comunidad por ambos sexos

15 bolivianos sin comida se paga en la misma comunidad por ambos sexos.

Jornal = 136 horas/8 horas = 17.0

Valor trabajo de la mujer = 17 jornales x 10 Bs = 170 Bs.= $U.S 45.94

INSUMOS AGRICOLAS

ENTREGADOS A LAS CLUBES DE MADRES

POR CARITAS-BENI (1500 M2)

DETALLES	TOTAL $U.S.
Herramientas	34.62
Semillas	7.99
Agroquímicos	30.54
Totales	73.15

Fuente.- Informe de diciembre 1991.

RENDIMIENTOS

Los rendimientos de tomate obtenidos por los técnicos en la comunidad de Sachojere son los siguientes.

610 M2 = 1708.00 Kls

1 M2 = 2.80 Kls (informe técnico)

1 M2 = 3.00 Kls en mala cosecha (informe de la mujer).

1 M2 = 4.50 Kls en buena cosecha (informe de la mujer).

1 M2 = Ocupa una planta de tomate aproximadamente.

VENTA

1 Kilo =	tomate grande	1.0 Bs	
	tomate mediano	0.60 Bs	
	tomate chico	0.40 Bs	
	Promedio ($\bar{X}$)	0.70 Bs	aproximadamente

1 caja = 10 kilos

1 caja = 3 Bs/flete por transporte

Pasaje = 8 Bs/persona.

Para nuestro estudio se ha considerado la venta del tomate en el pueblo.

DEPRECIACION

Los precios fueron extractados de los informes preparados por los encargados de CARITA-BENI.

En este caso se considera una duración de tres años para las herramientas agrícola mas importantes que utilizan en sus cultivos, envases (canastas, bolsas) y el sombreado que se usa en la cubierta del vivero.

HERRAMIENTAS

ITEM	DURACION	COSTO $U.S.	DEPRECIACION $U.S.
Rastrillo	3	3.38	1.12
Pala	3	6.47	2.16
Azadón	3	5.91	1.97
Machete	3	4.78	1.57
Envases	-	-	-
Sombrilla	2	3.03	1.51
Total			8.33

Los cálculos se hicieron a los precios valorizadas para las herramientas nuevas, sin embargo las herramientas actuales son usadas y por tanto se considera un 30 % menos del total de la depreciación.

BALANCE GENERAL DE PRODUCCION

DETALLE	INVERSIONES VALOR $U.S.	COSECHA KILOS	COSECHA $U.S.
Trabajo de la mujer	45.94		
Depreciación	2.50		
Semilla	0.32		
Agroquímicos	0.50		
Total	49.26		
Rendimientos			
Técnico		280.00	50.40
Mujer (mala cosecha) (1)		300.00	54.00
Mujer (Buena cosecha)		450.00	81.00
Ingreso neto			
Técnicamente	1.14		
Con mala cosecha	4.74		
Con buena cosecha	31.74		

[1]Los datos corresponden a la mujer durante su cosecha de tomates.

Nota.- En este estudio no se ha considerado los impuestos a la tierra.

3.70 Bs = 1.0 U.S. En base a este cambio se hizo los cálculos.

Los anteriores resultados nos muestran claramente que los rendimientos obtenidos por cada planta de tomate por debajo de 3.0 kilos son antieconómicos, en cambio los rendimientos mayores a 3.0 kilos son rentables.

Como podrá observarse en el cuadro anterior, que el mayor trabajo y esfuerzo que realizan las mujeres en la producción del tomate es el RIEGO, con 66 % en relación a las otras actividades.

ANNEX M

Technical Report: Small-Farm Milk Production, CARITAS/Beni

ANNEX M

CARITAS-PROYECTO LECHERO

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DEPARTAMENTO DEL BENI
PROVINCIA MARBAN
PROYECTO LECHERO A NIVEL DE PEQUEÑO AGRICULTOR
CARITAS - PROYECTO LECHE

COMUNIDAD	FAMILIA (No)	BENEFICIARIOS (No)	ENTREVISTADOS (No)
Nueva Creación de Cotoca.	34	6	12
Santa Rosa	55	14	20

ACTIVIDADES DE OFICINA

El primer desembolso recibieron en diciembre del año 1991 la suma de 37000 dólares. Este desembolso vino después de la época de compra del ganado que es la mas aconsejable para comprar las vacas, por que para esta fecha las vacas tienen una gestación de siete meses. Por no llevarse a cabo este objetivo se tuvo que revertir el dinero a MONETIZACION 115.000 bs.

El segundo desembolso se hizo en junio de este año un equivalente a 60.000 Bs, que sirvieron para pagar sueldos, viáticos, preparación de boletines, alambre y grapas para el cercado. El saldo que tienen actualmente solo alcanza para comprar 10 vacas. En el momento de la preparación del proyecto las vacas fueron presupuestados por cabeza la suma de 400 dólares, ahora las vacas gestantes cuestan 600 dólares.

El tercer desembolso se espera para el mes de septiembre, a fin de entregar a los beneficiarios y que a partir de fines de noviembre o comienzos de diciembre tengan la cría recién nacida. Para entonces los pastos estarán listos para su alimentación los que fueron sembrados y dado a la época de lluvias los pastos nativos también estará ofreciendo rebrotes tiernos para la vaca en lactación. Pasada esta época puede que no se cumpla otro año de producción para los beneficiarios, conforme fueron trazados por el proyecto.

ACTIVIDADES DE CAMPO

PROMOCION

La promoción se hizo durante los meses de enero, febrero y marzo de este período. Los requisitos para ser beneficiario de este proyecto es que no tengan vacunos, que tengan sembrado una

hectárea de pasto antes de recibir las vacas gestantes, construyan sus galpones para dar abrigo a los animales, uno para la vaca y otro para el toro cuando sea trasladado para su monta de la vaca y finalmente beben tener listo el cerco alambrado respectivamente.

La mayor aceptación a este proyecto fueron los propietarios que tienen extensiones de 50 hectáreas. El resto de la gente no puso mucha atención en este proyecto por que trabajan de arrendatarios o cuidadores de los dueños que no viven en sus parcelas y otros por que no tienen sus títulos saneados. Otros vieron el abandono de sus comunidades por trasladarse a la ciudad y finalmente se tiene el caso de que algunas están fraccionando sus tierras de 50 a 25 hectáreas y cuyos trámites se encuentran en proceso.

La gente que vive en estas comunidades son la mayor parte Orientales que fluctúa entre 95 % y 5 % son Collas, como ejemplo podemos citar la comunidad de Santa Rosa, que vinieron de otras lugares con conocimientos en la crianza del ganado. De acuerdo a nuestras entrevistas la mayor parte de los beneficiarios responden que el proyecto de leche es de gran importancia para la nutrición de sus hijos. En la comunidad de Santa Rosa manifestaron de que al año solo tienen acceso de una tasa de leche para darles a sus hijos. Por otra parte se puede generar un empleo mas para la familia para la obtención de ingresos adicionales por medio la venta de quesos.

CREDITO GANADERO

El proyecto entregó el alambre de púa, grapas para el cercado de sus corrales con un lapso de dos años sin recargo de intereses. En este crédito esta incluido el costo del transporte cuyo préstamo varía de 65 a 68 dólares percápita. Los técnicos del proyecto se encargaron de entregar los materiales en forma personal bajo un recibo debidamente firmado por ambas partes (beneficiario y proyecto). En cambio el beneficiario aporta su mano de obra en la construcción de corrales, corte de postes, cavar hoyos para la plantación de postes, alambramiento de los cercos y materiales locales como la madera.

El crédito que viene ofreciendo el proyecto a la comunidad es de gran necesidad para el desarrollo del hato lechero, por que no esta recargando INTERESES como hacen el Banco Agrícola y otras instituciones con el consiguiente perjuicio económico para los ganaderos.

El forraje fue comprado de la misma comunidad en materia vegetativa para su propagación por medio de stolones y entregado a cada uno de los beneficiarios para el cultivo de una hectárea. Este crédito será devuelto en la misma especie una ves que su pradera este en condiciones aptas para el pastoreo.

En cuanto se refiere a las vacas para el proyecto lechero todavía no fueron entregados por las causas anteriormente explicadas. Sin embargo, se plantea pagar el semoviente con la primera cría obtenida en el primer parto y a la edad de un año, para poder entregarles a otros beneficiarios que soliciten la obtención de los animales de producción.

ORGANIZACION

La finalidad del proyecto es formar comites con los beneficiarios que figuran en la lista en cada comunidad. El comite esta compuesto por un presidente que se encarga de hacer cumplir las actividades de los beneficiarios en coordinación con el proyecto. El Secretario de Hacienda que tiene un papel de tesorero se encarga de llevar un control de los aportes que realizan los beneficiarios para la compra o gestiones importantes que tenga ellos mismos y a través de reuniones el tesorero hace la rendición de cuentas a los beneficiarios para darles a entender los gastos erogados.

En el futuro se piensa CENTRALIZAR estos comites comunales para formar un comite central y sean ellos que administren por su propia cuenta y al mismo tiempo serán responsables de la selección de los beneficiarios en caso de que no cumplan sus obligaciones. Naturalmente estos comites no tendrán la potestad de contradecir o alterar los reglamentos originarios que vienen desarrollando los Sindicatos Comunales.

El establecimiento de las pradera y la construcción de los cercos esta realizado en forma individual. Los beneficiarios manifiestan que no pueden cooperarse entre ellos por la lejanía en que viven. Las viviendas son bastante dispersas y no están nucleados en forma comunal. Dado a estas circunstancias el trabajo esta marchando lentamente para cumplir con el proyecto lechero.

CAPACITACION

Desde el comienzo del proyecto hasta la fecha presente, los beneficiarios no han sido capacitados en el campo de la veterinaria que es un factor fundamental para el manejo de los hatos lecheros. Sin embargo, el veterinario tiene planes de capacitar a los beneficiarios desde el mes de septiembre, mientras tanto, su tiempo fue consumido en la elaboración del proyecto, preparación de boletines para la siembra de forrajes y en la elaboración de una manual para el manejo de las vacas lecheras.

El entrenamiento y la capacitación de `los beneficiarios empiece con la entrega de los semovientes (vacas en gestación), a partir del mes de septiembre de este período. En cuanto se refiere a la implantación de forrajes se esta empezando con la

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siembra de forrajes, utilizando medios de comunicación como ser el boletín preparado para los beneficiarios y en forma práctica por intermedio del agrónomo que dispone el proyecto.

ASPECTOS TECNICOS

Los beneficiarios conocen el pasto que están sembrando en sus parcelas, por que la materia vegetativa es del lugar. Para tener una idea mas clara nos permitimos a describir en forma botánica y fisiológicamente.

DESCRIPCION BOTANICA

El forraje que se esta empleando es una graminea conocido por los comunarios con el nombre de CAPIN (Brachiaria mutica). Las raíces son dispersas que se originan de los nudos del tallo, alcanzan una altura de 12 a 15 cms de longitud que se encuentra bajo la capa cultivable. Las hojas son lanceoladas con una longitud que varia entre 15 a 20 cms y el ancho de las hojas varía de 1.5 a 2.0 cms. Los tallos son leñosos en la parte central y tiernos en la parte apical, la longitud entre cada nudo varía entre 25 a 30 cms. El diámetro del tallo es parecido a la cebada y por cada nudo se observa una sola hoja. El tallo es del tipo rastrero y a medida que se extiende por el suelo se observa nuevos brotes de macollaje que se produce por los nudos del tallo. La inflorescencia es alternada y filiforme. la coloración es de color morado con tonos rojizos (guindo) en su estado tierno y se tornan amarillas a medida que va madurando. Como en toda graminea una ves que las glumas se encuentran secas los frutos son dehicentes, o sea que se derraman por si solas.

FORRAJE CULTIVADO

El proyecto ha utilizado la materia vegetativa para su propagación. La siembra se hizo en el mes de mayo y el tamaño para la siembra era con tres yemas o nudos. Esta yemas fueron plantados en hoyos hechos por una pala, no se observa surcos. la distancia entre planta y planta varía de 1.0 a 1.50 ms. Desde la fecha de siembra hasta el momento de la observación tiene una altura de 1.0 a 1.50 ms cuando se hizo parar los tallos. Por cada yema plantada rebrotaron en un promedio de 24 macollos que es de gran espectativa para una propagación precoz.

La siembra del CAPIN se ha realizado en terrenos de BARBECHO y para esto tenían que hacer la rosada (limpieza). Este sistema es muy beneficioso para el productor que realiza el desmonte para la siembra de arroz, en otras palabras tiene que deforestar para exponer los suelos a la erosión y romper el control biológico de las plagas.Después de la cosecha del arroz que se realiza por dos veces consecutivos en la misma parcela ellos por costumbre tradicional lo abandonan el terreno por tres a cuatro años.

Con la siembra de pastos permanentes como el CAPIN o los citros se puede hacer que esos suelos abandonados sean mas rentables con este sistema de trabajo y al mismo tiempo se puede evitar la excesiva DEFORESTACION que se realiza anualmente. Por otra parte el sembrado de pastos evita la erosión de los suelos contra el agua y el viento (eólica e hidráulica). Los suelos que están cultivados con pastos tienen la propiedad de conservar la humedad por períodos mas largos que los suelos descubiertos.

FORRAJES NATIVOS

Entre los forrajes nativos que existe en la región podemos indicar lo siguiente:

NOMBRE COMUN	NOMBRE CIENTIFICO
Pánico Azul	Panicum antidotale
Pánico Verde	Panicum maximun
Bambatsi	Panicum colaratum
Pasto Gordura	Melinis minutiflora
Buffel	Cenchrus siliaris
Braquiaria	Braquiaria decumbes
Dallis	Paspalum dilatatum
Yaraguúa	Hypharrehenia rufa
Merkeron	
Yerba Guinea	

SUELOS

Cada familia tiene una extensión de 50 hectáreas entre barbecho y monte alto. La preparación de suelos para la siembra del forraje se hizo en barbechos que fueron cultivados arroz como última cosecha. Tradicionalmente, los productores después de cultivar dos veces en la misma parcela como en el caso del arroz, ellos lo dejan para el descanso o para tipo de barbecho. Los suelos son compactos, es decir tienen mas arcilla que arena, dándose una textura de arcillo-limoso de color plomo negruzco que es muy apropiado para la siembra de cereales y gramineas.

La siembra del CAPIN se hizo en terrenos altos y bajos. Los terrenos altos son aquellos que no son afectados por las inundaciones y viceversa. El capin tiene la particularidad de

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comportarse mejor en terrenos con bastante agua, no solo en el rebrote de los macollos si no también en la preservación de las hojas verdes durante las épocas de sequía.

PALATABILIDAD

El pasto que se lo ofrece a los rumiantes y animales menores son bastante apetecidos. Estos animales mastican mayormente las hojas y las partes tiernas de la planta (parte apical). El sistema y la forma de masticación que realizan los animales en el pastoreo es de mucha importancia para la conservación de la pradera, caso contrario si los pastos son arrancados con toda la raíz o que los tallos sean triturados al nivel del cuello de la planta, entonces se provoca el desmedro de la pradera.

En el boletín preparado para la siembra del forraje indica que el CAPIN tiene un alto valor nutritivo que alcanza de 9 a 12 % de proteína cruda. Esta cifra es bastante buena para una alimentación de una vaca lechera, sin embargo es suficiente recomendar que la alimentación se haga en base a una pradera que contiene solamente GRAMINEA, por que esto nos indica que es mas rico en CARBOHIDRATOS. Para un buen equilibrio de proteínas y carbohidratos es importante considerar una pradera mixta entra gramineas y leguminosas. Mediante la implantación de una pradera mixta se puede obtener otras ventajas, tales como las leguminosas cuadyuven a las gramineas en el abonamiento del nitrógeno.

PASTOREO

Una ves que el forraje este completamente establecido, se planea mantener el ganado en la pastura para su alimentación. Según las experiencias de los beneficiarios explican que el CAPIN es bastante resistente al pisoteo de los animales. Como se había explicado anteriormente que los tallos de este forraje son bastante leñosos, es decir que tiene mucha lignina.

La siembra del Capin se hizo en los suelos altos y bajos. Por tanto la rotación de pastos se hará entre estos dos lugares. Otro aspecto importante para el pastoreo es el descanso necesario que se le da a las praderas, por que el excesivo continuo de pastoreo, generalmente acarrea consecuencias por el pisoteo de los animales.

Los beneficiarios sugieren una máquina picadora para cortar el forraje en tamaños pequeños y con este sistema alimentar a las vacas en calidad de SEMI INTENSIVO, que quiere decir que los ganados pueden pastar un tiempo en la pradera y el resto del tiempo puede ser alimentado en los cercos o establos a construirse. Con este sistema se aminora el pisoteo de los animales a fin de precautelar el buen cuidado del forraje.

De acuerdo al manual indica que el sistema de pastoreo debe ser realizado en lo posible en las noches con el objeto de aprovechar las bajas temperaturas y al contrario de esta recomendaciones los beneficiarios que tienen experiencia indican que no se debe dejar el animal sobre el pasto toda la noche, por que lo arruina el pasto. Nos parece que este último detalle debe ser observado cuando el animal este pastando.

CAPACIDAD DE CAMPO

La capacidad de campo en su forma tradicional es de cuatro hectáreas por vaca lechera, mientras que el proyecto esta considerando una hectárea de pasto sembrado por unidad de cabeza. El consumo de la materia verde y fresco, se considera de 50 kilos por vaca para una producción de 8 litros de leche por día. La relación de pasto a leche es de 6 a 1 aproximadamente, esto significa que la producción anual de pasto sea de 18 toneladas métricas por hectárea tan solo para la vaca sin tomar en cuenta la alimentación de la ternera que comienza a consumir pasto a partir de los dos meses de edad.

Según los datos proporcionados por el responsable del proyecto indica que la producción de esta graminea es 130 Toneladas en materia verde por Hectárea/año. Esta producción se obtiene sin la aplicación de fertilizantes químicos. Esta cifra nos muestra que la capacidad de campo en una pradera establecida con esta variedad puede sostener 7 vacas por hectárea/año.

VACAS GESTANTES

El proyecto tiene diseñado de entregar a los beneficiarios vacas gestantes de siete meses a partir del mes de septiembre de este año. Para esto el veterinario tiene que ir hacer la compra bajo una revisión que garantice las cualidades de una buena vaca lechera. Un detalle que nosotros vemos es el transporte de estos animales gestantes, por que a esta etapa las vacas son muy delicadas para el abuso y manipuleo y como consecuencia a esto puede provocarse el aborto. En este aspecto es necesario que revisen el proyecto para ver la época mas oportuna para el traslado de las vacas desde la comunidades compradas al camino y de aquí se tiene que llevar en camiones y nuevamente descargar para la respectiva entrega.

SANIDAD ANIMAL

Los beneficiarios antiguos tienen conocimientos sobre las enfermedades del ganado vacuno tales como la CADERA (pierna negra) y la UÑETA (Rot foot). A continuación damos a conocer sobre las enfermedades mas comunes de la región:

ENFERMEDADES BACTERIANAS

Carbunclo Sintomático
Diarrea blanca de los terneros
Disentería de los recién nacidos
Artritis de los terneros
Mastitis
Anthrax
Brucelosis

ENFERMEDADES VIRICAS

Rabia
Fiebre Aftosa

ENFERMEDADES PARASITARIAS

Piroplasmosis
Anaplasmosis

ENFERMEDADES METABOLICAS

Hipocalcemia.

La lista de estas enfermedades fueron extractados del manual preparado por el veterinario.

ALIMENTO BALANCEADO

El proyecto recomienda comprar alimentos concentrados de los comercios existentes en la ciudad para complementar las deficiencias alimenticias del ganado lechero. A manera de ejemplo podemos hacer un relato de la visita que se hizo a una de las mujeres que tiene una vaca en gestación. Como alimento concentrado la vaca come los desechos de las frutas, tales como el plátano, papaya, toronja, yuca y otros vegetales. Por el momento se trata de una sola vaca en que los beneficiarios tendrán en sus parcelas, por tanto para esta vaquilla es suficiente el sustituto del alimento balanceado que se quiere comprar.

Cada beneficiario tiene árboles frutales y vegetales, que a veces se observa en el suelo los desechos de estos productos, por que no disponen de una vaquilla, al contrario nos parece que el consumo de estos desechos no solo ahorra el alimento concentrado que se quiere comprar pero también estos deshechos se convierten en otro ingreso para la familia.

PRODUCCION DE LA LECHE

Los beneficiarios esperan obtener dos ordeños al día. El ordeño de la mañana se destina para la alimentación de sus hijos y para la alimentación de la ternera. El ordeño de la tarde esta destinado para la transformación de la leche en queso. El almacenaje de la leche no tiene la capacidad de durar hasta doce horas por que se descompone por el calor, en cambio el queso puede ser almacenado el tiempo necesario para ser vendido en el mejor precio.

La finalidad del proyecto es de afiliarse a la planta industrializadora de la leche para que se encargue de proveer el transporte y los tachos de aluminio a los beneficiarios. Con este sistema el beneficiario tiene que llevar la leche de la tarde a los centros de acopio para luego ser transportado en las horas de la madrugada siguiente.

INGRESOS ECONOMICOS

El mayor ingreso que los beneficiarios perciben vienen de las ventas de arroz, plátano, yuca y maíz. La venta de estos productos se realiza en la ciudad por sus mejores preciosa que ofrece el comprador, mientras la venta en la misma comunidad son desventajosa por sus bajos precios que ofrecen los rescatistas o los transportistas. Por el momento la venta se realiza en forma individual y generalmente lo hace el hombre y no así la mujer.

COMENTARIOS DE LOS BENEFICIARIOS

- Cuando el ganado duerme en el pasto, el animal lo arruina el pasto y es por esta razón prefieren sacar al establo u otro lugar para evitar ciertas pérdidas.

- El TAPITI es un roedor que le gusta comer el pasto Capin desde la raíz y en consecuencia el pasto va marchitándose.

- El CAPIGUARA es otro animal que le gusta el pasto Capin, cinco animales de estos pueden ser igual a una vaca en pastoreo. Este animal consume toda la planta y no deja ni siquiera los tallos.

- El TABANO es otro insecto que no le deja comer en tranquilidad a la vaca y como una medida de control la gente utiliza el humo para reducir el ataque de estos insectos.

- Donde existe la vaca aparece el murciélago que lo ataca durante las noches. Es el principal transmisor de la enfermedad conocida con el nombre de RABIA.

ANNEX N

Technical Report: San Pablo Integrated Rural Development, ADRA/Trinidad

ANNEX N

ADRA SAN PABLO

CONTENIDO

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ANNEX N

DEPARTAMENTO DEL BENI
PROVINCIA CERCADO
COMUNIDAD PUENTE SAN PABLO
ADRA SAN PABLO

En el área del proyecto, ADRA esta trabajando con huertos familiares y comerciales que se detallan a continuación.

FORESTACION

El vivero se encuentra en la comunidad de Casarabe dirigido por el Centro de Desarrollo Forestal. ADRA esta coordinando con esta institución con el aporte de alimentos para pagar el jornal de los contratados. En el presente vivero se ha constatado las especies siguientes, café, mara, cedro, cacao, leocaena, tajibos y otros que están en proceso de trasplante.

Las comunidades que trabajan con ADRA solicitan mediante un lista de pedidos para la forestación de sus montes altos y tierras de barbecho. El convenio que tiene ADRA es de recibir las plantas para los beneficiarios que desean plantar árboles maderables de gran valor para el futuro con el consiguiente resguardo y protección de las tierras que están expuestas a la erosión.

HUERTOS COMERCIALES

CITRICOS

En la comunidad de Loma del Amor se ha constatado la existencia de un vivero de citros en la parcela de Hernan Rivero. El sistema de trabajo consiste en que ADRA asesore en la parte técnica sobre la propagación de plantas mediante los injertos y técnica sobre el mejoramiento de los almácigos.

ALMACIGOS

El sistema que se aplica es casi similar al cultivo del tomate, sobre todo cuando se refiere en la preparación de suelos, riegos, deshierbes y el uso de coberturas para el sombreado de las platabamdas. El almácigo se hizo en el mes de diciembre de 1990 y el trasplante en el mes de febrero de 1991. Actualmente las plantas tienen una altura que fluctúa entre 1.0 a 1.50 ms, que se conocen con el nombre de planta de pie.

La variedad de semilla que se esta utilizando es la mandarina CLEOPATRA, que es propia del lugar y otra parte fue entregado por ADRA. Esta semilla se caracteriza por ser agria, resistente a las plagas y otros factores climatológicos.

INJERTO

Las yemas fueron comprados de las tiendas de Santa Cruz que se conocen con el nombre de BARETAS. El precio de las yemas esta a razón de 1000 yemas por 35 dólares. El injerto es un naranjo de la variedad VALENCIA, es una variedad bastante dulce y comerciable.

El injerto se procede cuando la planta en pie este en condiciones de recibir la yema, generalmente se aconseja cuando la planta tiene una edad de 1.5 a 2.0 años. ADRA compró alrededor de 7000 injertos y de las cuales solo se prendieron 600 plantas. En térmicos numéricos puede traducirse una cifra muy baja, sin embargo el propósito fue que los beneficiarios sean los que practiquen y aprendan los métodos del injerto para que ellos mismos hagan la transferencia de este sistema a sus propios comunarios en el futuro.

CREDITO

ADRA entregó los siguientes insumos, tales como la semilla, injerto y herramientas. El préstamo será cancelado con la venta de las plantas que pertenecen al beneficiario para cancelar la deuda que ADRA invirtió y que pertenece al FONDO ROTATORIO. Las plantas tienen un valor de 5 Bs. por cada planta injertada que se encuentran listas para el trasplante. Los obreros trabajaron con el APT como un incentivo para la promoción de los árboles frutales que fueron en núm ro de diez jornaleros que trabajaron de dos a tres veces por mes.

En la comunidad San Pablo, en la parcela de Clemente Higuera no se ha utilizado el APT. El dueño personalmente contrato los obreros y pago por su cuenta. En este caso con la venta de las plantas cubrirá el préstamo, que pertenece al fondo rotatorio del ADRA y gran parte de las plantas serán utilizadas en su parcela. En esta parcela todavía no se hizo la compra de injertos por parte de ADRA, por lo tanto se tiene plantas en pie que alcanzan una altura de 30 cms. Actualmente se tiene 3000 plantas que fueron almacigados el año pasado. El kilo de semilla cuesta 27 dólares. El convenio establecido con este beneficiario es de repartirse las plantas en un 50 % para el benefic ario y el resto para ADRA.

FRIJOL

Este rubro esta siendo promocionado como un cultivo de invierno. El componente de Nutrición hizo cursos y prácticas sobre el preparado del pan de frijol a nivel familiar. Las clubes de madre están entusiasmados en producir este alimento para sus hijos por su gran valor nutritivo que tiene en proteína.

Dado a este impacto las madres están cultivando el frijol en sus parcelas como una hortaliza mas para sus huertos. A nivel comercial también se esta cultivando el frijol en grandes extensiones como el caso de Alberto Mayda. Es muy importante mencionar las experiencias que este productor esta realizando en su cultivo. En primer lugar la siembra se hizo en un terreno de barbecho y al ver que tenía mucha hierba mala, no hizo la rosada o corte de hierba como se suele hacer por costumbre. Con el objeto de eliminar la hierba (Sujo) se sembró una leguminosa que es conocida por la comunidad con el nombre MUCUNA, que según indica de que esta planta ya había sido utilizado por el IBTA en campañas anteriores.

Esta es una planta enredadera, que va trepando a los árboles y plantas mayores en altura. Las hojas son grandes que quitan la luz del sol de la hierba mala (sujo) y como consecuencia a esto, el sujo no puede competir con el Mucuna. El fruto de las vainas se parecen al poroto blanco. La semilla se encuentra en una vaina de color negro en estado seco y que puede ser sembrado al igual que el frijol.

Las bondades que ofrece este producto no solo es para el control del SUJO pero también para fertilizar el suelo con nitrógeno por sus propiedades de nitrificación. Naturalmente, nuestro experimentador observa que el tomate sembrado después de la limpieza del suelo que contenía el MUCUNA, se encuentra en mejores condiciones que otro cultivo que no ha sido utilizado este HERBICIDA NATURAL.

ARROZ

La variedad CICA-8 fue introducido por EL Agrónomo del ADRA desde la anterior campaña en algunas comunidades como una muestra de DEMOSTRACION. Los rendimientos alcanzados con esta variedad parecen ser el doble con relación a las variedades locales tales como el Dorado, Estaquilla, y la variedad 90 días.

El consumo de la variedad CICA-8 Es apetecido por la gente que vive en la ciudad que se vende en los restaurantes y hoteles, mientras que la variedades locales son consumidos por la gente que vive en la comunidad en sus diferentes variados de comida que las mujeres preparan.

La cosecha de arroz se realiza con el cuchillo, cortando las espigas del arroz. Ahora se ha introducido una herramienta que no ha sido utilizado en el lugar, sin embargo en otras regiones como en los ANDES y los VALLES es muy conocido y utilizado con el nombre de HOZ (sirve para cosechar cebada, avena, centeno, trigo y otros cereales). Con esta herramienta se corta no solo la espiga pero también toda la mata (parva mas la espiga con granos) a nivel del suelo. Con este sistema se ahorra la mano de obra.

Así por ejemplo, con el cuchillo se puede cosechar cuatro arrobas por día, mientras con el hoz se puede cortar hasta 13 arrobas por día, empezando a las 6.a.m. hasta las 6.p.m, que hace un total de 12 horas, algunas veces en tiempo de cosecha se necesita hasta 14 horas de trabajo por día.

La variedad CICA-8 pierde su vigor de rendimiento con el transcurso del tiempo, así por ejemplo el Ingeniero de Caritas explica que a partir de tres a cuatro años es necesario cambiar por otra variedad que tenga mayor vigor de rendimiento, o de lo contrario llega a convertirse como una variedad local de bajos rendimientos. Con el objeto de conocer las labores prácticas en la producción del arroz, se ha preparado los costos que se detallan en el anexo 2.

TOMATE

Los beneficiarios de esta región son emigrantes de los valles de Cochabamba y Sucre que tienen conocimientos de sobre el cultivo de hortalizas. El cultivo del tomate es de tipo comercial y generalmente son atendidos por los hombres. La superficie de cultivo varia entre una a dos hectáreas. El trasplante se realiza por medio de hoyos que fluctúa entre un m2 por planta.

Se observa en una parcela la mecanización para este cultivo, por que las plantas están sembradas en línea o en surco. El cultivo del tomate se realiza en suelos descansados que varía entre dos a tres años y para esto se utiliza abono foliar y fertilizantes. Los riegos son utilizados por medio de MOTOBOMBAS para sacar el agua del río San Pablo que cruza por las cercanías de sus parcelas.

El riego utilizado para los huertos nutricionales es traído desde los pozos, ríos o lagunas que distan 200 a 300 ms de lejanía. El agua se trae de los pozos, lagunas o ríos mediante los baldes, envases de plásticos. El riego se realiza por las tardes con una duración de dos horas diarias. La atención de los huertos esta dirigida exclusivamente por las madres y mujeres de la comunidad.

El control de plagas se realiza mediante el uso de mochilas con una capacidad de 20 litros que fueron comprados por ellos mismos y otros beneficiarios recibieron de ADRA en carácter de credito. La frecuencia para el control de plagas desde la el almácigo hasta la cosecha es de ocho veces. Las plagas mas comunes de la región son detallados en el anexo 1. Con excepción de una parcela se ha constatado el uso del TUTORAJE en el tomate para evitar que los frutos vayan en contacto con la tierra y el resto de las parcelas no disponen de esta técnica por razones económicas.

MERCADO

La comercialización se realiza llevando a la ciudad de Trinidad. Previamente, el tomate debe ser seleccionado y en lo posible los mas grandes para llevar en cajones de madera que tienen una capacidad de diez kilos. Estos productos son transportados desde la comunidad hasta el camino por un bote a remo o ha motor. El flete por caja de tomate se paga por el transporte de ambos bote y camión.

En la anterior cosecha la caja de tomate costó 5 Bs y a hora en esta época cuesta al rededor 12 a 15 Bs, por su escasez en los mercados de venta. Según los vendedores observan que el cultivo del tomate esta incrementándose ahora por que a la gente le gusta comer. Antes para abastecer el mercado se necesitaba solo 150 cajas, ahora se necesita por lo menos 800 cajas y aun mas.

CREDITO

Los beneficiarios recibieron de ADRA la semillas de hortalizas, pesticidas, herramientas (mochila, pala, azadon) en carácter de préstamo, para ser recuperado en dólares sin recargo de intereses o su equivalente después de vender sus cosechas. La tasa de morosidad fluctúa en un 50 %, es decir dado a la intensidad de lluvias que se registraron este año, gran parte de sus cosechas fueron arrasados por la inundación. El otro factor es que todos sembraron en la misma fecha y cosecharon en la misma fecha con el consiguiente perjuicio económico, por que el precio era muy bajo. Otros no pudieron cancelar por razones familiares que tenían que hacer curar gastar en medicinas de salud, sin embargo, los beneficiarios están conscientes que deben cancelar con las próximas cosechas.

Existe una gran demanda por parte de los beneficiarios, en la adquisición de la peladora de arroz. Actualmente, ellos llevan su arroz en chala a la peladora con el gasto de pasaje, flete de la pelada por unidad, tiempo empleado en el transporte, cargar el arroz desde la comunidad al camino para llevar en camión, nuevamente cargar el arroz pelado desde el camino hasta la comunidad. Toda esta fatiga puede ser aminorado con la dotación de una peladora que ellos se sienten capaz para pagar lo mas antes posible.

Los beneficiarios también solicitan Motobombas para el riego de sus cultivos, principalmente el tomate. ADRA manifiesta que esta en proceso de licitar cinco motobombas para entregar a los beneficiarios que mas necesiten, con este apoyo los productores se encuentran alentados de intensificar sus rendimientos y en lo posible de obtener cosechas hasta dos veces al año.

ORGANIZACION

En la comunidad de San Pablo existe una asociación de productores en hortalizas. El mercado de Trinidad es abastecido en su mayoría por esta comunidad. La venta se realiza en forma individual por el momento, en el futuro se piensa cooperativizar para que la venta se canalice mediante su comité de mercadeo. Esta asociación tiene su comité formado, el mismo que esta compuesto por un Presidente, cuyas funciones es de coordinar con ADRA en la capacitación de sus socios. El tesorero se encarga de controlar el crédito que reciben y al mismo tiempo de recuperar los prestamos.

Dentro de los beneficiarios también existe la ayuda mutua familiar, que ellos lo conocen con el nombre de DIA PRESTADO.
A manera de ejemplo podemos señalar el sistema de cuatro hermanos que trabajan juntos. Un hermano tiene tierras en la comunidad el resto de los hermanos vienen de los valles. El propietario hermano les facilita la tierra, semillas, insumos, herramientas y el total de la producción esta dividido en cuatro partes. Los cuatro hermanos trabajan juntos en cada parcela hasta la cosecha y la producción es repartida por cada parcela en la mitad con el hermano que es propietario y a su ves los hermanos tienen que devolver los insumos en dinero de acuerdo al monto que debe al proyecto.

Durante nuestras visitas en las comunidades Loma del Amor y en el Puente San Pablo se ha constatado a beneficiarios que disponen de recursos económicos, motor para bomba de agua, maquinaria agrícola y contratan la mano de obra para hacer trabajar sus tierras y así poder pagar el crédito que se beneficia de ADRA, mientras que los dueños viven en Trinidad dedicándose a otros actividades de negocios. El propietario les provee una pensión que consta de manteca, azúcar, aceite y carne muy poca o casi nada por que son ellos mismos quienes se proveen de carne por medio la caza. Para conseguir este alimento muchas veces tienen que buscar dos días para cazar un TAITITU que les dura por dos semanas.

Con este sistema nos parece que ADRA esta cooperando a los TERRATENIENTES que viven en las ciudades que tienen tiendas comerciales como por ejemplo Barracas o propietarios que tienen actividades de transporte.

CAPACITACION

El componente de Nutrición esta dirigiendo el programa de promocionar una mejor alimentación de la familia y de los niños de la región mediante los cursos que son llevados en forma integral donde participan las madres orientación sobre el consumo de proteínas, carbohitos, vitaminas y minerales. El impacto que

las mujeres obtuvieron fue la forma de preparar el pan de frijol y la preparación de leche de soya como sustituto a la leche animal. Por esa razón se ve en los huertos de las mujeres estos cultivos y otras hortalizas con gran interés en la producción.

Por razones de seguridad los técnicos de ADRA no se atreven de capacitar a las mujeres en el manejo e usos de los PESTICIDAS por que gran parte de ellas no saben leer y tienen hijos en lactación, dado esta explicación los técnicos hacen el control de plagas de las huertas en forma personal y por cada tratamiento se cobra la suma de 0.50 centavos.

Los hombres que trabajan con los cultivos comerciales son capacitados en el manejo de la mochila y los productos químicos para el control de plagas y para el la fertilización foliar en ambos teórica y práctica en sus propias parcelas. Cabe hacer notar que no se ha observado PARCELAS DEMOSTRATIVAS en las comunidades de producción aplicados a ciertas labores culturales, tales como sistemas de riego, practicas en el mejoramiento de suelos, control de plagas con pesticidad orgánicas, preparación de compuesto, control de malezas y otras.

anexo 1.

PLAGAS IMPORTANTES QUE ATACAN A LAS HUERTAS Y CULTIVOS COMERCIALES DEPARTAMENTO DEL BENI PROVINCIA CERCADO COMUNIDAD PUENTE SAN PABLO

CULTIVOS DE HORTALIZAS

Las hortalizas mas afectadas por las plagas son el coliflor, tomate y repollo según las observaciones de las mujeres encargadas de estos huertos nutricionales. Entre las plagas mas comunes en la región podemos indicar lo siguiente:

Tomate (Solanum Lycopersicum)

Los insectos son las plagas predominantes de este cultivo tales como el gusano minador que se lo come las hojas antes y después del trasplante y los cogollos (peciolos tiernos), que a medida avanza su madurez se transforma en una mariposa (nocturna) que pertenece a la familia de los Heliotis Sp.

La enfermedad conocida con el nombre de PASMO en la comunidad, se refiere al tizón del tomate. Existe dos clases de tizón, uno que es temprano cuando la enfermedad empieza por la parte foliar y el otro cuando la enfermedad aparece por la parte basal de la planta. En fitopatología se conoce con el nombre de ANTRACNOSIS que se caracteriza por que la planta empieza a perder su color verde hacia un tono de color amarillo, encrespándose las hojas.

Otra enfermedad es el TOCTO que se caracteriza por el amarillamiento de las hojas que mayormente afecta a los semilleros en el momento de la germinación. Posiblemente se trata de una CLOROSIS por el color que presenta y esto se debe a la deficiencia de NITROGENO o exceso cantidad de agua en los semilleros. En las visitas que se hizo no se pudo observar estos síntomas por que los almácigos estaban recientemente preparados.

Los frutos del tomate son atacados por gusanos de color verde, estos plagas realizan galerías en los frutos cuando se encuentran en estado verde. Los frutos son atacados por los grillitos que ellos conocen en esta manera, lo cual se refieren a una familia de los COLEOPTEROS de tipo masticador por que se lo come el fruto.

Berenjena (Solanus Melengena L.)

Es atacado por otro insecto conocido con el nombre de TUCURA que se parece a una langosta de la familia de los GRILIDOS (insecto masticador)que se caracteriza por masticar las hojas tiernas de la planta, provocando muchas veces la caída de los frutos por el secado del peciolo que une el fruto. Perteneciendo al orden de los ORTHOPTERA.

Pimentón (Capcicum Annum. L.)

El pimentón verde es atacado por, al igual que el repollo por la PETILLA (Diabrótica Bolteata), que pertenece a la familia de los CHRYSOMCHIDAE. Luego se presenta la TUCURA (Schistocerca Nitems), que pertenece a la familia de los ORTHOPTERAS. El control se realiza con el NUVACRON.

Sandía (Citrullus Lanatus)

Tiene los mismos plagas que el tomate y los tratamientos se realizan con insecticidas químicos, como ser el RUNCUF y el PETROLEX. Los pulgones blancos también atacan a este cultivo, que pertenece al orden de los COLEOPTEROS, el tratamiento se realiza con el DIMECRON.

Cebolla (Alliun Cepa)

Es la hortaliza menos atacada por las insectos, es decir por el ácido lílico que tiene actúa como repelente. El único problema que presenta es la pudrición de las plantulas al nivel del cuello de la raíz que están en reciente germinación (Dumping Off), que pude ser controlada por medio la desinfección de suelos, por medio de productos químicos o mediante la aplicación física (agua hervida).

Coliflor y Repollos (Brassica Oleracea)

Son atacados por insectos de color negro en su estado de fructificación especialmente el coliflor y otros gusanos que se comen las hojas del repollo como el gusano MILITAE , que pertenece a la familia de los Heliotis Sp.

Pepino (Cucumis Sativa).

Estos cultivos por tener siembra directa no presentan mayores problemas en el a taque de plagas, sin embargo el pepino es atacado por un gusano minador durante la época del fruto. Entre las enfermedades mas importantes del pepino se tiene el MILDIUM que es una fungosis, cuyo tratamiento están haciendo con el CUPRAVIT.PM.

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Zanahoria (Daucus Carota)

La plaga que ataca en forma temporal se tiene el Pulgón Negro (Aphis Croccivora), que ataca principalmente al follaje. Como una medida de prevención están utilizando el RIDOMIL. PM

CULTIVOS COMERCIALES

Arroz (Oriza Sativa)

El mayor problema para este cultivo en toda la región es la PETILLA que pertenece a la familia (Diabrótica Nitems). La petilla es un insecto chupador que se alimenta de la savia de las hojas tiernas y el néctar de las flores, provocando el secado y marchitamiento del mismo. La petilla aparece cuando el arroz esta en plena floración. La intensidad de ataque se produce por lo general en las noches

Los pájaros son otro problema que afectan en el sembrado de las semillas, es decir los pájaros escarban la tierra para alimentarse de la semillas de arroz y para evitar este problema los técnicos recomiendan la mezcla de la semilla con un producto tóxico que es el FOLIDOL. La TUCURA como ya dijimos anteriormente se parece a una langosta de tipo masticador ataca a las a las hojas tiernas de la planta.

Frijol (Planta Leguminosa)

Las hojas de frijol presentan galerías que le dan un aspecto de cernidor. La plaga que afecta a esta planta es un GUSANO CORTADOR (Hyadaphis Erysimi), que pertenece a la familia de los Heliotis Sp. Esta plaga generalmente ataca a las hojas tiernas y cuando la planta alcanza una altura de 30 cms.

OBSERVACIONES

Las plagas entre los cultivos de huerto y los comerciales son controlados de acuerdo a la intensidad de ataque de insectos y enfermedades que se registran en la región, como ejemplo podemos considerar entre el tomate y el arroz.

Los productores mencionan que el cultivo mas afectado en la región es el TOMATE, desde la siembra hasta la cosecha se realiza de seis a ocho tratamientos con insecticida para el control de insectos y enfermedades. El último tratamiento se realiza cuando el fruto esta en plena maduración, lo que equivale a decir que faltando ocho días para la cosecha del tomate se realiza el control de plagas. El poder de TOXICIDAD de los insecticidas no pierde en ocho días, por el contrario se mantiene activa hasta mas días de prolongación. Este sistema como en anteriores

informes nos alarma cuando el tomate es consumido por los niños que lo sacan de la misma planta o cuando están cosechados y no están lavados los frutos.

Las hortalizas por ser cultivos suaves y dulces son mas apetecidos por los insectos y fáciles de atacar por su tejido blando. Las semillas vienen del extranjero como ser Estados Unidos, Brasil y otros países, donde las semillas son recolectados de los invernaderos o de los cultivos a campo abierto que son menos afectados por las plagas.

El arroz es cultivo tropical que se encuentra adaptado a la región, aunque en su mayoría las nuevas variedades que están siendo introducidas vienen de la Estación Experimental de Saavedra que es producida en la misma región. Puede ser este factor por el cual las plagas no son tan exigentes en el control. Los tratamientos que demanda desde la siembra hasta la cosecha es de tres veces.

anexo 2.

DEPARTAMENTO DEL BENI
PROVINCIA CERCADO
COMUNIDAD PUENTE SAN PABLO
ZONA NUEVA JERUSALEN
COSTO DE PRODUCCION DEL CULTIVO DE ARROZ EN MONTE ALTO

DETALLE	PERSONA (No)	UNIDAD TRABAJO	CANT.	COSTO Bs UNID.	COSTO Bs TOTAL
PREP. TERRENO					
Chaqueado	1.0	Jornal	25.0	15.0	375.0
Quemado y limpieza	1.0	Jornal	10.0	15.0	150.0
LABORES CULTURALES					
Siembra con punzón y otro echa la semilla Var. CICA-8.	2.0	Jornal	6.0	15.0	180.0
1ra Carpida	1.0	Jornal	5.0	15.0	75.0
2da Carpida	1.0	Jornal	5.0	15.0	75.0
1ra Deshierbe	1.0	Jornal	5.0	15.0	75.0
2da Deshierbe	1.0	Jornal	5.0	15.0	75.0
1ra Fumigada	1.0	Jornal	2.0	15.0	30.0
2da Fumigada	1.0	Jornal	2.0	15.0	30.0
3ra Fumigada	1.0	Jornal	2.0	15.0	30.0
INSUMOS					
Semilla	-	Arroba	2.5	15.0	37.5
Pesticida	-	Botella	1.0	40.0	40.0
COSECHA					
Cosecha con cuchillo y por espiga	2.0	Jornal	20.0	15.0	600.0
SELECCION					
Trillar y ventear	2.0	Jornal	15.0	15.0	450.0
COMERCIALIZACION					
Venta en el lugar	-	Jornal	2.0	15.0	30.0

Venta en Trinidad					
1.- Traslado y cargado al camión.	2.0	Jornal	0.5	15.0	15.0
Descargado del arroz.	2.0	Jornal	0.5	15.0	15.0
Transporte	2.0	Pasaje	-	-	16.0
Bolsas de arroz (100 libras)	-	Flete			75.0
Días de venta	-	Jornal	2.0	15.0	30.0
Gastos de comida	-	-	2.0	10.0	20.0
Gastos de Alojamiento	-	-	2.0	5.0	10.0
Venta en el mercado	-	-	2.0	10.0	20.0
DEPRECIACION					
Herramientas, bolsas envases.					15.0
COSTO TOTAL					
Local					2277.0
Trinidad					2478.0
VALOR-PRODUCCION					
Cosechado					
Arroz con chala		Arroba	300.0	9.0	2700.0
Arroz pelado (1)		- Arroba	300.0	11.0	
3300.0					
UTILIDAD NETA					
Venta local (arroz con chala). 423.0 Bs					
Venta en Trinidad					
222.0 Bs. (arroz con chala)					

[1]No se tiene el valor que cobra la peladora por unidad de arroz, de lo contrario se hubiera hecho los cálculos respectivos.

Fuente: Se preparó en base a los informes existentes en la oficina (1 de enero 1992) y en base a los datos extractados de los productores.

En el cuadro anterior se analiza que la variedad mejorada tiene un rendimiento doble con relación a la variedad local. Lo que quiere decir que el DESMONTE realizado anualmente para la siembra de arroz con variedades locales es totalmente CONTRAPRODUCENTE, que ni siquiera cubre los gastos de la mano de obra.