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PD-AAF-906-E1

CLASSIFICATION

# PROJECT EVALUATION SUMMARY (PES) – PART I

Report Symbol U-447

1. PROJECT TITLE
511036 4-③

Sub-Tropical Lands Development

2. PROJECT NUMBER
511-T-050

3. MISSION/AID/W OFFICE
Bolivia

4. EVALUATION NUMBER (Enter the number maintained by the reporting unit e.g., Country or AID/W Administrative Code, Fiscal Year, Serial No. beginning with No. 1 each FY) 79-3

☒ REGULAR EVALUATION ☐ SPECIAL EVALUATION

5. KEY PROJECT IMPLEMENTATION DATES

| A. First PRO-AG or Equivalent | B. Final Obligation Expected | C. Final Input Delivery |
|---|---|---|
| FY 75 | FY 75 | FY 81 |

6. ESTIMATED PROJECT FUNDING

A. Total $ 15,304,000
B. U.S. $ 9,700,000

7. PERIOD COVERED BY EVALUATION

From (month/yr.) 9/74
To (month/yr.) 11/79
Date of Evaluation Review 12/79

8. ACTION DECISIONS APPROVED BY MISSION OR AID/W OFFICE DIRECTOR

| A. List decisions and/or unresolved issues; cite those items needing further study. (NOTE: Mission decisions which anticipate AID/W or regional office action should specify type of document, e.g., airgram, SPAR, PIO, which will present detailed request.) | B. NAME OF OFFICER RESPONSIBLE FOR ACTION | C. DATE ACTION TO BE COMPLETED |
|---|---|---|
| 1. Revise evaluation schedule for fourth and final evaluation. | DPE | 2/80 |
| 2. Work with INC to define and document the respective rights of colonists and lumbering companies in San Julian. | RDD | 4/80 |
| 3. Review status of excess property tractors and provide INC a recommendation on their use and/or disposition. | ETD | 3/80 |

9. INVENTORY OF DOCUMENTS TO BE REVISED PER ABOVE DECISIONS N.A.

☐ Project Paper
☐ Financial Plan
☐ Logical Framework
☐ Project Agreement
☐ Implementation Plan e.g., CPI Network
☐ PIO/T
☐ PIO/C
☐ PIO/P
☐ Other (Specify) _____
☐ Other (Specify) _____

10. ALTERNATIVE DECISIONS ON FUTURE OF PROJECT

A. ☒ Continue Project Without Change
B. ☐ Change Project Design and/or ☐ Change Implementation Plan
C. ☐ Discontinue Project

11. PROJECT OFFICER AND HOST COUNTRY OR OTHER RANKING PARTICIPANTS AS APPROPRIATE (Names and Titles)

Gary Alex, Project Manager
Kevin Kelly, DR
Travis Rattan, CON
Gover Carranza, ETD
Harry Wing, RDD
Dan Chaij, RDD
Richard Peters, RDD
Letitia Kelly, DPE

12. Mission, AID/W Office Director Approval

Signature
Typed Name: Abe M. Peña
Date: 2/15/80

AID 1330-15 (3-78)

13. Summary

The Sub-Tropical Lands Development Project is achieving the stated project purpose, but with somewhat reduced output targets and on a delayed time frame. Delays have been due to climatic factors, contracting delays, poor contractor performance, government changes, and GOB financial constraints.

The project has been quite successful in developing a settlement methodology involving nucleated settlement and an orientation program for new settlers. These innovations merit consideration in future colonization projects in Bolivia and elsewhere. Cost per beneficiary and abandonment rate have been reduced below the level of past projects. Attention needs to be given to the problem areas of: forestry policy and operational efficiency.

The project cannot yet document significant increases in per capita incomes. However, real income and productivity increases should come in later years. The colonist's basic human needs are being met much more effectively than under spontaneous colonisation.

Two immediate follow-on projects are desireable. A continued settlement program in San Julian - South should be supported to fully realize and improve on the settlement methodology of San Julian - North. A consolidation program is needed to maintain the momentum of development and provide credit, infrastructure, and technology for the current project area. USAID funded a feasibility study of these two project activities in 1979. The IBRD is studying them for possible funding.

## [illegible]

The 1979 evaluation is the third evaluation of the "Sub-Tropical Land Development Project". The 1978 evaluation was an in-depth review of the project conducted by a team of seven technicians. The present project evaluation is a routine evaluation to review project progress.

The evaluation was prepared by the AID Project Manager in November, 1979 following extensive discussions with INC officials and a one-week visit to the project site. The project was discussed with the following persons prior to drafting of the evaluation:

| | |
|---|---|
| Hernando Vera Jemio | - Director INC |
| Javier Ballivian | - Projector Coordinator (INC) |
| Harry Peacock | - Resettlement Advisor |
| Luis Mazzoni | - Chief of INC Santa Cruz Office |
| Raphael Rocha | - Chief of INC Montero Office |
| Hermogenes Sanguino | - San Julian Project Director (INC) |
| Adolfo Vargas | - Chief of Heavy Equipment Operation INC/Los Cafes |
| Jesús Martinez Lima | - Chief of Department of Social Promotion INC San Julian |
| Martin Miller | - United Church Committee San Julian |
| Juan Steer | - USAID/RDO |

The draft evaluation was reviewed by the USAID/RDO office and then by the Mission Project Committee. The final draft will be translated into Spanish and reviewed with the INC.

In October, 1979 the TDD of this project was extended until February 19, 1981. The next evaluation should be conducted in February, 1981 and will be the final evaluation.

15. External Factors

A number of external factors have had significant impact on the project development. The most important are reviewed here.

A. GOB Financial Situation

After experiencing a relatively steady rate of growth of 6-7% between 1971 and 1977 the Bolivian economy has weakened with growth rates of 4.7% and 4% in 1977 and 1978. Hydro-carbon and mining exports have fallen and inflation increased to approximately 18% in 1978. Continued government subsidies to certain sectors have further exacerbated the problem and led to a severe GOB financial crisis in 1979. The financial situation required budget cuts by the GOB and reduced availability of counterpart funds. The GOB contibution to the project has exceeded estimates in the project paper, but falls short of additional counterpart promised through a 1977 letter from the Minister of Finance.

| GOB Counterpart | |
|---|---|
| Project Agreement | $ 5,104,000 |
| Ministry of Finance Letter | 2,900,000 |
| Total | 8,004,000 |
| Contribution thru 8/31/79 | $ 6,144,000 |

Due to GOB financial problems counterpart funds for road construction were not available in early 1979. A semi-basic payment arrangement was made to fund road construction. Consequently, lack of counterpart contribution delayed payment to the contractor and resulted in some delays on road work. In April, 1979 the GOB made available $ 1 million in counterpart funds for road construction. This provided adequate funding for 1979, but leaves the project $ 1.65 million short of the promised GOB counterpart for road construction. Design changes have been made to narrow terminal sections of access roads and reduce contract funding requirements. These changes plus re-budgeting loans funds may reduce counterpart needs for road construction to approximately $ - 400,000 (Estimate prior to GOB economic measures taken in December, 1979). This would have little negative impact on ability to achieve project outputs and purpose. However, if these funds are not provided on a timely basis in 1980, completion of the 100 kilometers of the San Julian access road may be jeopardized.

The initial 1979 GOB budget for the INC was reduced severely from prior year levels and provided only funds for salaries with no provision for additional investment or operating expenses. This effectively paralyzed INC operations until a joint Ministry of Finance/Ministry of Planning evaluation team visited the project in May, 1979. Based on their findings the Ministry of Finance provided INC with a suplemental budget of $ 250,000. This allowed INC operations to be re-initiated, but dispersement delays have continued to hamper project progress. The

INC operating budget will again be critical in 1980 to allow progess on the project, but because of the favorable report from the Ministry of Finance/Ministry of Planning evaluation in 1979, there should not be a serious problem in this regard.

B. GOB Personnel Changes

Between July, 1978 and November, 1979 Bolivia had two elections and six presidents. During 1978 INC had four directors and the San Julian Project had four field managers. In general, the INC directors have been well qualified and have had experience in colonization, but the frequent changes have led to lack of continuity and poor follow up of pending actions. Changes in INC field managers at San Julian have had greater negative impact on the project performance. The settlement activities and infrastructure preparation in San Julian demand a high degree of administrative ability to manage the diverse field operations. Significant delay in preparation of settlement infrastructure resulted from the lack of experience and dedication of the Los Cafes field manager during the period of January-August, 1979.

Fourtunately, for the project, continuity in the position of Project Co-ordinator, other INC personnel, and the United Church Committee personnel facilitated continued work on the project.

C. Forestry Policy

Since the initiation of the San Julian settlement activities there have been controversies between lumbering interests and colonists. This conflict seems to have increased within the past years for the following reasons:

- increased rate of settlement of new colonists
- project constructed access roads and trails make extraction of lumber from the project area easier.
- increased prices for construction lumber and ease of extraction make it feasible and economical to re-cut areas previously high-graded.

The root of the conflict lies in the fact that colonists are given/sold the land but not mineral or timber rights pertaining to that land. Timber rights are controlled by CDF (Centro de Desarrollo Forestal) which sells concessions to lumber companies. Therefore, colonists are clearing land - with no interest in preserving timber - at the same time that lumber companies are harvesting timber from it. Three negative factors arise from the lumbering conflict. First, there have been threats and confrontations between colonists and lumbermen, but fortunately no physical violence has occurred to-date. Second, colonists are unhappy and feel mistreated when they are given land, while others are free to cut timber from it. Third, and perhaps more importantly, the colonists under the present system have little incentive to conserve or maximize use and extraction of timber from

their land. An additional problem caused by lumbering has been the repeated destruction of access roads prior to gravelling and of trails when used by lumber trucks. In some cases the lumber trucks have ignored roadblocks placed by the construction company or Servicio Nacional de Caminos (SNC).

The ideal from the point of view of the colonists would be for timber concessions to be granted to them along with their settlement certificates. Sale of timber would then give colonists capital needed to continue development of their land. This, however, could lead to "windfall profits" for colonists and settlement by opportunists seeking a fast buck. It could also lead to more organized political opposition to colonization. From the point of view of "pure" colonization, it would be desireable to have all commercial timber removed prior to settlement of colonists. In practice it seems that in the present San Julian project neither of the two "ideals" can be implemented. What is important, however, is the clarification to colonists of their rights and the rights of lumber companies.

Despite the disruption of lumbering in the project area, the increased harvest of timber is a very significant supplemental economic benefit and one which will greatly increase the project's Internal Rate of Return. Lumbering is a factor which must be given greater consideration in future colonization projects - both as an economic benefit from the project and as a factor which must be controlled through development and implementation of better policies

D. FL 480 Title III Funds

A positive external factor has been the FL 480 Title III sub-project for colonization roads. This activity provided additional funding needed for the Chane-Pirai road to construct an eight meter wide road as far as San Jones (Km 60). Without this supplemental funding the roadbed would have had to be narrowed to four meters over most of the length of the road. This would not have been adequate given the heavy volume of traffic already using the road.

E. Heavy Rains in 1979

The unusually heavy rains in Bolivia in early 1979 had both negative and positive influences on the project. These rains, reportedly occuring at this intensity about every 10 to 15 years, flooded some areas of Chane-Pirai and cut the road in several places. Subsequently, the Chane-Pirai road had to be re-designed to prevent future flooding. The roadbed was raised over stretches of approximately ten kilometers and additional culverts were provided. The cost of the road contract was consequently increased by approximately $ 612,400.

In some sense it was fortunate that the flooding occurred during construction of the road so that design modifications could be made at this time.

Although limited flooding occurred in some unsettled lateral areas of the San Julian project, the San Julian road was unaffected. The intensity of the rains and their occurrence late in the season delayed start-up

of work in the dry season. This affected progress on penetration roads, Agricultural Service Centers, and settlement infrastructure.

The favorable affect of the rains was reflected in good crop yields. Some crops were flooded out in Chemo-Piret, but generally yields of corn and, especially, of rice were good.

V. Market for Corn

Over the past few years corn production and marketing in the project area, as in the rest of the country, has been affected by greatly fluctuating market prices. During the crop year 1978-79 a new market channel for corn was developed which has important potential for the project area.

A large rancher in the Beni has experimented for several years with feeding calves grain in order to practice early weaning. This practice allows his cows to regain condition and results in a doubling of his calving rate the following year. In 1979 he began using this practice on a large scale and in early 1979 contracted 14,000 qq. (636 metric ton) of corn at $b 65/qq. ($ 1.82/bu) from San Julian colonists. The rancher did receive this amount, but the corn price rose to $b 90/qq ($ 2.52/bu) in mid-1979 and colonists demanded and received an increase over the contract price.

Problems of non-compliance with the contract and of collecting corn in sufficient quantity may force the rancher to look elsewhere for

his corn supply in the future. However, if the practice of grain feeding early weaned calves catches on in the Beni, the San Julian area will have an extremely good market for corn for the near future.

16. Inputs

Project inputs have in general been completed, but often behind schedule. Contracting for penetration road construction was delayed and work on roads by the contractor is behind schedule due to weather and financial constraints. Equipment procurement was slow.

Only purchase of some equipment locally and provision of non-project IMC equipment allowed work to proceed. The project's well-drilling rig arrived in 1978; pick-up trucks arrived in 1979; and by the end of 1979 project dump trucks and tank trucks were not yet on site for project use.

The following major problems were encountered in providing project inputs:

a) Excess Property Tractors: Project evaluations of 1977 and 1978 discussed the problems with US excess property D-8 tractors purchased with loan funds. In early 1979 three of the tractors were completely over-hauled and returned to work on the project. Despite this over-haul the tractors continued to experience frequent break-downs and maintainance problems and, as of October 1979, had reportedly worked less than a cumulative total of 100 hours in three months.

With the benefit of hindsight it is evident that the excess property tractors should not have been purchased for the project. The project site is remote, maintainance facilities and capability is limited, and many parts for these tractors are not available locally.

INC maintenance facilities are being improved at Los Cafes which should help keep tractors running. However, the INC should investigate the possibility of selling the five excess property tractors and other old and/or excess equipment and using funds to purchase a new D-7 tracto

This should result in increased operating efficiency and reduced costs. The excess property equipment would be useable by private organizations (ie., Mennonite farmers) who have better maintainance capability and who are not bound by beaurocratic constraints in purchasing repairs, working hours, etc.

b) INC Operating Efficiency: Settlement of colonists to-date has kept ahead of penetration road construction. However, in order to prove the wider applicability of the settlement model, INC will have to increase the number of nucleos settled per year. This is mainly dependent on increasing efficiency of infrastructure preparation (lateral road construction, well drilling, and nucleo clearing).

Late arrival of project equipment, delay in work on penetration roads, and high rate of down time with excess property tractors are major reasons for low efficiencies. Other important factors are: lack of a system for having spare parts and materials on hand at the project

site; delay in completing maintenance facilities; and operations restricted to an eight hour day.

The lack of materials and spare parts is the easiest problem to solve. This is partially related to INC's budget cut and partially to lack of adequate maintenance facilities. The major fault, however, is in inadequate planning and management. The well drilling rig has had to shut-down frequently for lack of "driller's mud". This is material needed for drilling which should always be kept in supply.

Truck oil filters have been left un-changed for long periods because no filters were in stock. This may happen to other equipment, too, and results in shortened equipment life and increased down-time.

Maintenance facilities are being completed. The delay has been due to both AID and INC delays in developing plans, obtaining quotations, and reviewing and approving bids.

The rainy season of December through April limits the working season for infrastructure preparation to about seven months during which as much work as possible must be done. The INC should adopt the procedure of the Development Corporation of Turija (CODETAR) and most private companies and work their expensive heavy equipment more than eight hours a day five days a week. This can easily be accomplished by working two shifts for a total of 12 -16 hours a day and/or allowing personnel to work over-time and then allow compensatory leave during the rainy season when heavy equipment work cannot be done.

Increases in operating efficiency are dependent on various levels of project administration: AID; INC/La Paz; INC/Santa Cruz; and, most importantly, INC field administration. A project engineer has just been assigned to Santa Cruz by INC. This should improve project supervision and leaves only the critically needed position of master mechanic vacant (This has been impossible to fill due to low GOB salary levels.) The project would most likely have achieved greater efficiency if more management decision-making responsibility could have been delegated to a decentralized project authority in Santa Cruz.

c) Agricultural Credit: The agricultural credit component of the project failed for a number of reasons and was cancelled. The possibility still exists of utilizing a limited amount of loan funds as a credit capital grant to a local savings and loan cooperative. However, the project manager feels that agricultural credit is not an important component in the "pioneer phase" of Bolivian colonization projects. Colonists are facing a new environment, new crops, and new production techniques and must concentrate on eking out a subsistence - level living. Credit, other than possibly very small amounts, may increase their level of risk with little chance for pay-off. After several years in the colonization zone when settlers have learned new agricultural techniques and have made their commitment to stay in the zone, production and investment credit should be provided through the consolidation phase.

The specific reason for failure of the credit component of this project may be traced to lack of commitment on the part of the Bolivian Agricultural Bank (BAB). The BAB had had bad experience with colonization credit programs in the past and due to the size of this separate credit line it did not receive the degree of attention and emphasis necessary for a successful program. Credit agents were not assigned to the San Julian zone on a permanent basis. Sporadic visits did not allow sufficient familiarity with the colonists' situation nor time to analyze credit requests and follow-up on loans. The plan for a rotating fund for agricultural credit to be transferred to new colonization zones as they are opened does not appear feasible. The project credit funds will instead be integrated into the BAB's Small Farmer Credit Program. Office space in the Agricultural Service Centers will be provided for the BAB and in the future, as agricultural credit becomes more important to the continued development of the colonization zones, the BAB's Small Farm Credit Program should be able to respond to these needs.

17. Outputs

The following table details project outputs as projected in the Project Paper, as currently targeted; and as currently achieved.

Table I: Project Outputs

| | Project Paper Target | Revised Target | Current Status (11/79) |
|---|---|---|---|
| Penetration Road (Km) | 177.25 | 177.25 | 110* |
| Lateral Roads (Km) | 800 | 210 | 130 |
| Families Settled | 5,000 | 3,000 | 2,440 |
| Nucleos Settled | 100 | 50 | 36 |
| Agriculture Service Centers | 2 | 2 | under construction |
| Land Resourse Study | 1 | 1 | 1 |

* 26 kilometers completed and an additional 130 Km at various stages of construction

Project output targets were revised downward following the 1978 evaluation. This action was taken to reflect the fact that there is less land available than was originally estimated and to establish feasible targets for the project given its current status and remaining time.

Available project land has been reduced for several reasons. There are several private land holdings in the project area. These have ill-defined boundaries which have required considerable effort on the part of INC to negotiate and fix. Future colonization projects must have prior aerial photos and clearly defined boundaries. Owners of land in the area then could be given the opportunity to register and, if not registered prior to initiation of project activities, would qualify only for equal treatment as a colonist.

The project area was not as wide as contemplated in the Project Paper. It is limited on the east by the San Julian River and already settled spontaneous colonists and on the west by lowlying land susceptible to flooding. Approximately 65 nucleos can eventually be settled in the San Julian area. The project target is 50 during the life of the loan.

Other reasons for falling behind on project targets are discussed in the section on inputs.

18. Purpose

"The project purposes are: a) to increase the productivity and incomes of approximately 11,000 migrant campesino families who will eventually be living in the project area; b) to expand the production of food crops; and c) to implement and institutionalize a process which can be replicated by the GOB for developing potentially productive, but underutilized lands in the Bolivian Oriente with participating small farmers."

c) "To increase the productivity and incomes of approximately 11,000 migrant campesino families who will eventually be living in the project area".

The project area currently has a population of about 7,200 migrant families. Additional semi-directed settlement will add approximately 1,500 more. Spontaneous colonists and other migrants-shop keepers, truckers, laborers, etc. will likely increase the population and reach the target of 11,000 families within ten years.

Assessing increased productivity and income is difficult. Current survey data indicates a per capita annual income of $ 85 for the project area (MACA Survey, 1978) as compared to a national average of $ 324 (1978 CDSS) and a national rural average of $ 74 (derived from 1978 CDSS). However, per capita income is very difficult to calculate accurately and figures can be questioned. Also, the initial years of settlement are very difficult as colonists adapt to a new environment and attempt to "hack a subsistence out of the jungle". Despite this significant hardship/investment the initial years, only 16.6% of the colonists surveyed by MACA in 1978 stated that their situation was worse than prior to moving to the colonization area.

Subjective arguments that settlers have increased their productivity and incomes are more compelling. The abandonment rate (discussed below) is relatively low. Also, when a plot is abandoned, it is almost always taken over by a friend or relative of a neighboring colonist.

These facts would indicate an attraction to colonists of the colonization area and a likely increase in income or well-being.

b) "To expand the production of food crops"

Data on sale of food crops from the area is limited. However, the 1978 MACA survey in the San Julian area, collected estimates of farmers' production. For the two major food crops produced, these estimates per farmer were 1.3 Metric Tons of corn and 2.6 Metric Tons of rice

Expanding these figures over the total number of 7,200 families in both project areas would result in a total production of 10,660 Metric tons of rice and 29,520 Metric tons of corn. Most of this production probably was used for home consumption and not all was directly due to project activities. However, it does illustrate the productive potential of the zone even at this early stage of settlement.

c) "To implement and institutionalize a process which can be replicated by the GOB for developing potentially productive, but under-utilized lands in the Bolivian Oriente with participating small farmers."

Major success seems to have been achieved towards meeting this project purpose. The settlement process (involving innovations in spatial lay-out and settlement orientation programs) has worked well and appears replicable and adaptable to future colonization activities. Observers from Peru, Chile, Paraguay, and Costa Rica have visited the project, thus enhancing the spread effect for innovations developed here.

The project has achieved relative progress in two criteria often applied to colonization projects: abandonment rate and cost per beneficiary.

Data on abandonment of plots is included in Table II. No plots are left abandoned. If a settler leaves, he has always been replaced, usually by a fried or relative of one of the other colonists in the nucleo.

As indicated in Table II, the "Areas" settled prior to initiation of the orientation program and community - center, spatial lay-out of plots have experienced an abandonment rate of 47.5%. Nucleos settled under the current project have an abandonment rate of 22.7%. Some of this difference is due to a time factor, since the "Areas" were settled between 1968 and 1971 while the nucleos have only been settled since 1972, but obviously some progress has been made towards reducing abandonment rate. It seems, too, that the abandonment rate may be dropping further as the orientation program has been refined and improved over time.

Work of the orientation program has been done by INC employees under the administration of the United Church Committee (UCC). UCC personnel have made heavy inputs into the development of this program, but beginning in 1980 the INC will assume responsibilities of administering the program with the aid of an advisor from UCC. This represents a very important step in institutionalizing the orientation program.

Table II: Transfer of Plots and Abandonment in San Julian Project (Oct., 1979)

| AREAS 1/ | Plots | Transfer | Percentage |
|---|---|---|---|
| Area No. 1 | 62 | 31 | 50.0 % |
| Area No. 2 | 62 | 40 | 64.5 |
| Area No. 3 | 71 | 18 | 25.4 |
| Area No. 4 | 62 | 33 | 53.2 |
| Total | 257 | 122 | 47.5 |
| **Nucleo Settlement 2/ 3/** | | | |
| Nucleo No. 1 | 40 | 26 | 65.0 |
| Nucleo No. 2 | 40 | 19 | 47.5 |
| Nucleo No. 3 | 40 | 20 | 50.0 |
| Nucleo No. 4 | 18 | 4 | 22.2 |
| Nucleo No. 5 | 40 | 23 | 57.5 |
| Nucleo No. 6 | 40 | 14 | 35.0 |
| Nucleo No. 7 | 40 | 27 | 67.5 |
| Nucleo No. 8 | 40 | 34 | 85.0 |
| Nucleo No. 9 | 40 | 8 | 20.0 |
| Nucleo No. 10 | 40 | 11 | 27.5 |
| Nucleo No. 11 | 40 | 16 | 40.0 |
| Nucleo No. 12 | 30 | 3 | 10.0 |
| Nucleo No. 13 | 40 | 8 | 20.0 |
| Nucleo No. 14 | 40 | 10 | 25.0 |
| Nucleo No. 15 | 40 | 5 | 12.5 |
| Nucleo No. 16 | 40 | 7 | 17.5 |
| Nucleo No. 17 | 37 | 2 | 5.4 |
| Nucleo No. 18 | 40 | 0 | 0.0 |
| Nucleo No. 19 | 40 | 2 | 5.0 |
| Nucleo No. 20 | 40 | 6 | 15.0 |
| Nucleo No. 21 | 40 | 3 | 7.5 |
| Nucleo No. 22 | 40 | 0 | 0.0 |
| Nucleo No. 23 | 40 | 1 | 2.5 |
| Nucleo No. 24 | 40 | 0 | 0.0 |
| Nucleo No.26 | 40 | 2 | 5.0 |
| Nucleo No. 27 | 40 | 2 | 5.0 |
| Nucleo No. 29 | 40 | 3 | 7.5 |
| Nucleo No. 30 | 40 | 1 | 2.5 |
| Nucleo No. 32 | 40 | 4 | 10.0 |
| Nucleo No. 33 | 40 | 4 | 10.0 |
| Total | 1,165 | 265 | 22.7 |

1/ Settled 1968-71 by traditional methods - "piano-key" plots and no orientation.

2/ Settled 1972-1978 with orientation and nucleated settlement.

3/ Nucleos 25, 28, and 31 were never settled, since the land designated for these nucleos was privately owned.

Cost per project beneficiary is another criterion often applied to colonisation projects. Two ratios are developed below for the two project areas:

A. Chane-Pirai

| Input* | Cost Estimate |
|---|---|
| Road Construction | $ 5,186,000 |
| Road Design | 163,000 |
| Agricultural Service [illegible] | 144,000 |
| Agricultural Credit | 75,000 |
| Agricultura Service Center Equipment | 30,000 |
| Total Cost | $ 5,598,000 |

* Does not include relatively minor INC operating expenses for the area.

The current population of the area is estimated to be 6,000 families which yields a cost per family of $ 933 (Given an average family size of four persons the cost per beneficiary is $ 233).

B. San Julian

| Input | Cost Estimate |
|---|---|
| Road Construction | $ 4,456,000 |
| INC Operations | 2,940,000 |
| Orientation/Social Services | 545,000 |
| Land Titling | 40,000 |
| Agricultural Credit | 75,000 |
| Agricultural Service Center | 144,000 |
| Agricultural Service Center Equipment | 30,000 |
| Road Design | 163,000 |
| Equipment | 1,588,000 |
| Gross Cost | $ 9,981,000 |
| Minus end-of-project value of equipment | 600,000 |
| Net Cost | $ 9,381,000 |

Estimating end-of-project population at 3,000 families yields a cost per family of $ 3,127 and a cost per beneficiary of $ 782. (These figures compare to cost per family of other Bolivian colonization projects as follows (1975 dollars): Alto Beni I - $ 9,800; Alto Beni II $ 2,500; Chimore - $ 8,800; Yapacani - $ 5,300).

Cost per beneficiary and abandonment rate are not the best measurement of project success as they are not necessarily related to a project's internal rate of return or impact on a country's social goals. They are, however, often applied to colonization projects and for that reason are cited here.

The comparison of cost per beneficiary between the semi-directed San Julian area and the spontaneously settled Chane-Pirai area is worthy of note. Project costs for areas of spontaneous settlement are considerably lower than those for even semi-directed settlement. However, spontaneous settlement costs borne by the colonist include: high mortality rates (reportedly approaching 100% of children under two years of age during initial years of settlement); environmental damage due to lack of any control of settlement areas; relatively large proportion of land going to large land-owners; and need for later investments in land titling, community development, and settlement infrastructure. With spontaneous colonization both capital costs and benefits are deferred to a later stage in the settlement of an area. This approach may be attractive to a government facing severe financial problems.

Positive financial and economic results of the project and, consequently, it's replicability would be considerably improved by an increase in INC efficiency. This needs to be addressed in some way through administrative reform (i.e., decentralization).

While the Sub-Tropical Lands Development Project has made an important contribution to development of colonization methodology, several problem areas remain to be resolved before the system can truly be considered a sound, replicable process. These are operational efficiency, land titling, and utilization of forest resources.

A second stage project is needed to resolve these problem areas and complete the incorporation of the orientation program into INC administration. The project should be carried out in the San Julian South area in order to take advantage of infrastructure, experience, and momentum of the San Julian North project. The project should probably be managed as a decentralized administrative unit with routine decisions made at this level. Emphasis should be given to: administrative reforms to expedite implementation; development of an agricultural plan to minimize use of the swidden agricultural system; and development and implementation of a plan to maximize use of forest resources.

19. Goal: The project goal is to increase small farmer income and standard of living in Bolivia.

Data on indicators of goal achievement is not readily available. To-date project impact would be minimal. The project has to a small degree reduced increase in population density on the altiplano.

Approximately 8,200 families have increased their incomes and productive base. However, true project impact will only be felt later as more of the project land area comes under production and the settlement system is replicated in other lowland areas.

Other projects in the Mission's portfolio and projects of the GOB and other donors are directed towards the same goal. In the project area a local private voluntary organization FIDES (Fundación Integral de Desarrollo) is implementing a consolidation phase project to accelerate the area's development momentum and develop a replicable program for use in other colonization areas. The IBRD is considering financing a development project in the area which would provide agricultural and small industry credit and necessary additional marketing infrastructure. International donors have indicated interest in a program approach to colonization, whereby, the GOB and bilateral donors would finance pioneer settlement of new areas and the international development banks would finance heavier credit and infrastructure requirements of the consolidation phase.

20. Beneficiaries

The principal beneficiaries are the 3,000 new colonist families who will have moved into the project areas by the end of the project (2,440 to-date). Other direct beneficiaries are the 5,500 families who settled in the zones (principally Chane-Pirai) prior to initiation of the project and an estimated 2,500 families who will settle in the zone after termination of the AID Loan project. The total direct beneficiaries will be 11,000 families or about 55,000 persons.

Indirect beneficiaries are those farmers remaining in the altiplano and valleys who have a slightly increased access to land as a result of out-migration of colonists and beneficiaries of future colonization projects which utilize the methodology developed in the San Julian project.

Benefits accrue as follows:

a) Increase in small farm, agricultural productivity:

This increase is mainly due to settlement in a semi-directed, rather than a spontaneous manner and to the provision of basic infrastructure. With the semi-directed settlement colonists receive orientation and instructions on what and when to plant and, also, receive improved seeds. Health care, potable water, supplemental foods, and health orientation provided under this approach make colonists more productive. Settlement is organized and plots distributed so that after several years of land clearing and land improvement the colonist is not forced off of his land by large land owners or others able to obtain legal rights to the land. Roads and trails provide access to markets and production inputs. (Spontaneous colonists are often so isolated that it is not feasible for them to market their production.). On completion of the Agricultural Service Centers, the colonists will be provided a link to credit services and agricultural extension.

b) Reduction in infant mortality:

Sources familiar with spontaneous colonization report a near 100% infant mortality of children less than two years of age during the initial two

to three years of settlement. In the San Julian semi-directed model the infant mortality rate has been reduced to less than the national average. This reduction is due to: supplemental food; health and nutrition training in the orientation program; medical screening of applicants; and access to medical attention because of roads and trails.

c) Control of population growth:

No effect.

d) Promotion of greater income equality:

The project has some impact on income distribution. Observers believe gross incomes to be at least the $ 85 per capita reported in the 1978 MACA survey. This is above the national rural average of $ 74 and likely reflects a considerable increase for colonists as they generally come from the very lowest income stratum. Major income generation potential from the project area, however, lies in the future. The experience in older colonization zones has been for colonists' incomes to increase to the point that they make major capital investments in such things as trucks, cattle, etc.

The immediate impact of the project on equity has been to provide the colonists with their own land. Without the project this land would almost invariably go to large land owners with perhaps spontaneous colonists working/clearing it on a share basis. On receiving title to his land the colonist's net worth increases from near zero to about $ 5,000 (at $100/ha for 50 ha.) and can be increased much more by

clearing the land. Future action should be taken to capture forestry resources for the colonist or to finance colonization activities. This would have an important impact on equity.

e) Reduce unemployment and underemployment.

The project will, in effect, have created at least 9,000 new jobs. This figure is derived from 3,000 families settled on new land with two families members working full time plus one person-year per year of additional hired labor per colonist (Graber, 1978). Employment generated in providing support services, marketing, and economic stimulation of the project area is significant, but can be considered to balance the reduction of spontaneous settlement due to the project.

f) Participation of the target group:

An important aspect of the orientation program is to involve active participation of colonists in community development. Training and actual practice is given in cooperatives and community leadership during the orientation program. The nucleate settlement pattern is also used to help form a sense of community. Communities are forced to take their own-initiative and responsibility in building schools, repairing pumps, and solving problems.

Growth of local government of communities (nucleos) and mini-market towns (MADEPA's) has been quite encouraging.

(Note: Comparison of semi-directed vs spontaneous colonization as opposed to semi-directed colonization vs home area of the colonist is considered valid by most observers of Bolivian colonization. Colonization has become a spontaneous process due to land pressures in the highlands and potential for betterment in the lowlands. Many persons will migrate as spontaneous colonists if they have no other alternative and it is unlikely that government programs of directed and semi-directed colonization will ever account for more than a fraction of all colonists.

The colonist is, also, not the average Bolivian. Often colonists are from the lowest economic strata and are almost "forced" into becoming colonists. However, initiative is another important factor which sets the colonist apart. He is often an individual dissatisfied with his role and willing to break with tradition to better himself).

21. Unplanned Effects of the Project

None, other than increased forest extraction described under External Factors.

22. Lessons Learned

a) Settlement Model: The settlement model used in the San Julian project is basically sound and replicable in other projects. An orientation program should be included as a part of a colonization program. In the case of Bolivia the orientation program can ease the colonist's transition to a very different climatic zone. Under other circumstances

an orientation program can be equally valuable in introducing technologies and building social and community structures at this critical time when the settler has broken with tradition and started a "new life" in a new area. Spatial lay-out of a colonization area can be used to facilitate development of communities and social organizations, as well as improve production efficiencies.

b) Use of PVO's: The UCC has played an important role in the San Julian project as advisors and administrators of the orientation program. PVO's can be more flexible than AID or host governments, are usually very dedicated to development goals, and can even provide more continuity of personnel. Experience shows that PVO's can have a role in these projects, although often special attention must be given to defining this role during project development.

c) Operation of Heavy Equipment: Heavy equipment represents an expensive input for a project such as San Julian. Consequently, the project should obtain the highest possible efficiency of use. In a remote area like San Julian, adequate maintenance facilities should be developed early in the project. A master mechanic should be provided. If he cannot be provided by the host government, an expatriate mechanic should be brought in to service equipment and train local mechanics. Excess property equipment should not be used in remote areas. Rather the best possible equipment should be purchased.

d) Forestry Policy: A better policy is needed related to lumbering in colonization zones. Colonists need some incentive to conserve

valuable timber and need to feel that they are the owners of their land and the corresponding resources. Development of such a policy should be a major purpose of the follow-on San Julian South project. Over the long run Bolivia should explore alternative systems for colonizing other ecological zones which are not suited to permanent cropping systems. Other areas such as the Brazilian shield (grazing), the Beni (flooded rice), and the Pando (tree crops) will probably receive new settlers, but will require alternate production systems in order to protect the environmental resources.

e) National Policy/Program for Colonization: Some work has been done on planning national colonization policies and programs, but it has not been integrated into a long-term plan. Projects are done as foreign donors express an interest. Political changes can cause changes in areas of priority. (Even the southern altiplano in Potosi has been suggested as a site for a colonization project). A planning system should be developed to set over-all objectives and priorities and allow development of projects within this frame work. Inputs of foreign donors may be useful to support the development of this long-term plan.

f) Consolidation Phase: Colonization activities logically and sequentially divide into pioneer phase settlement projects and consolidation projects. The two phases could be addressed in one project, but this does not lend itself to the budgeting and project time frames of donor agencies. Pioneer settlement inputs probably should be kept

to a minimum consistent with provision of basic human needs and supported to provide continued development of colonization zones and bring necessary pay-offs.

g) Future Projects: Ideally, and logically, three future projects should build on the Sub-Tropical Lands Development Project. These have been mentioned previously, but are summarized as follows:

- San Julian-Chane-Pirai Consolidation

This project would provide the credit, agricultural technolog and heavy infrastructure to allow rapid progress of these zones through the consolidation phase. The project lends itself to IBRD financing.

- San Julian - South Settlement

This follow-on activity would extend the San Julian settlement activities to the south and would support incorporation of the orientation program within INC, would require development of a comprehensive forestry policy, and would experiment with administrative reforms in INC project administration. This could be included as a component of the previously mentioned Consolidation Project.

- Alternative Production Systems for Colonization

This project would test alternate production systems to support increased settlement of other, more-fragile ecological zones in Bolivia.