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MEMORANDUM FOR THE  
L.A. DEVELOPMENT ASSISTANCE EXECUTIVE COMMITTEE

FROM: USAID/Bolivia  
SUBJECT: Intensive Review Request (IRR)  
Sub-Tropical Land Development Loan

1. Borrower

The Republic of Bolivia

Implementing Agency: National Colonization Institute (INC)

2. Amount and Terms

A loan in the amount of approximately \$8.0 million, for a project of approximately \$12.0 million, is proposed. The loan will be repayable over 40 years including a grace period of 10 years on principal with interest at 2% per annum during the grace period and 3% per annum thereafter.

3. Purpose

The general goal of the proposed project is to promote increased Bolivian food production and increase small farmer income by assisting such farmers to participate more actively and effectively in the development of yet unexploited sub-tropical areas of eastern Bolivia ("the Oriente"). The immediate purpose of the project is to apply the lessons of past experience in colonization to the agricultural exploitation of approximately 400,000 hectares by about 10,000 small farm families. 1/

To the extent that the proposed project is successful, it should serve as a model or prototype for similar projects in the future which should substantially increase Bolivia's food production and the participation of smaller farmers in such production.

There are two principal features of this model distinguishing it from prior programs: 1) concentration on spontaneous colonization areas that have proven economic viability in contrast to virgin land development; and 2) the distribution of peripheral lands in the project areas in such a way that traditional social-cultural institutions are trans-

1. See Annex I for a review of past colonization efforts, the main problems limiting success in those efforts, and the model or prototype implied for future projects in sub-tropical lands development.

*if gov. settlement has worked anywhere? does Bolivia want to know this type of money? What does this mean? What is this?*

The rate of migration has increased rapidly in the last five years, and is currently about 6,000 families per year. With the completion of new access roads this number is expected to increase substantially. The proposed project recognizes this basic shift in the rate of migration to the lowlands, compared to the late 1950's and early 1960's when highland dwellers had to be urged to migrate. With the increasing rates of spontaneous migration the emphasis of future assistance must be on channeling migrants to the most economically productive areas and consolidating production and social services in those areas.

The majority of Bolivia's rural population (85 percent) is concentrated in the Altiplano and high valleys which have only 34 percent of the land area. Farm size is predominantly minifundia as a result of the Agrarian Reform activities dating back to 1953. Population growth and inheritance are further subdividing the relatively small plots. The Altiplano and valley regions are thus becoming more and more overpopulated relative to their capacity to produce. In contrast, the Oriente is characterized by large amounts of arable lands but a very limited population. 1/ Available evidence indicates that production and incomes of migrants in the Oriente are significantly higher than in the Altiplano and valleys which in turn evidences inefficient allocation of human resources in the agricultural sector. 2/

Based on such production and income differentials, there are three principal effects to be achieved from facilitating the growing population shift from the Altiplano and valleys to the Oriente. First, the global output of the agricultural sector (and the economy) is increased since such labor produces a greater output in the Oriente than it did in the Altiplano and valleys. Second, the mix of production is shifted to crops that can be produced in the Oriente and are currently in short domestic supply and/or can be exported. Finally, the level of income of the campesino tends to be raised in both regions of the country. It is raised in the Oriente because the migrant works more land and produces more output there than in the Altiplano. Since some land by migration is left free in the Altiplano, the incomes of those who remain behind also tends to increase.

The complementary activity of providing research, extension, credit, etc., tends to increase the productivity of the small farmer in the Oriente, thus increasing his income even further and providing more incentive to Altiplano and valley residents to migrate.

1. See Annex III, Map 1 for the geographic division and profile of Bolivia.
2. Kelso Wessell, The Profitability of Small Farms in Bolivia (Ithaca, Cornell University, 1972) p.26.

The project is primarily directed to the small farmer in the project area. Available evidence indicates there are approximately 6,000 small farmers in the project area, that an additional 4,000 could be expected in the next five years and that together they will need and will absorb the funds and services proposed.

Several studies have been done which indicate the increases in income that can be realized by migrant families who move from the highlands to the lowlands. Wessel estimates that farm family incomes increase from \$242 to \$427 or by 57%.<sup>1</sup>/Royden indicates the average per capita incomes in the settlement of Cuatro Ojitos in the project area was \$178 in 1971 compared with average agricultural product per rural dweller of \$44.<sup>2</sup>/ A methodist church study showed that net average family income in the same area was \$1,052 in 1972.<sup>3</sup> These estimates do not consider increased productivity from technical change in the area through provision of productive services. (See the Economic Section for a preliminary estimate of the internal rate of return to the proposed project investment.)

5. Background 4/

Production in Bolivian agriculture tends to take place on either very large modern farms, that are completely integrated into the market economy, or on relatively small units with most production for producer subsistence. The large farm sector, involving less than 5 per cent of the rural population, is concentrated in the sub-tropical Santa Cruz and Beni areas of the Oriente region. This region has 66 per cent of the country's arable land, but only 15 per cent of the rural population. The main crops of the large farm sector are cotton, rice, sugar, and corn in Santa Cruz, and beef in the Beni. Modern techniques of production are extensively utilized in this sector, especially in crop production in the Santa Cruz. Factor and product markets are well developed as are processing industries and services. Arable virgin land is relatively abundant, and the large farm sector has enjoyed substantial financial support from central and local governments, and the private sector.

In contrast the small farm sector comprises over 95 per cent of the rural population with the largest majority (almost 90 per cent) of these concentrated on the relatively limited and depleted soils of

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1. Kelso Wessel, The Profitability of Small Farms in Bolivia, pp. 26
  2. Thomas Royden and Boyd Wennergren, The Impact of Access Roads on Spontaneous Colonization (Logan, Utah; Utah State University, 1973) pp. 67-68.
  3. Kenneth Graber, Agricultural Life in the Colonies. Methodist Church in Bolivia, 1972, pp. 75.
  4. For more detail on the agricultural sector and its role in the economy see the DAP.

has been a factor in the construction and planning of additional roads in the area by the GOB.

In addition to the inputs into colonization, AID has loaned approximately \$55.0 million since 1960 for the construction of roads between Santa Ana-Covendo, Caranavi-Santa Ana, and Cochabamba-Chapare (roads 1 and 4) that serve both directed and spontaneous colonies. 2/

In the general project area, AID financed at a cost of \$9.6 million the roads from Montero 1) east to Puerto Banegas which will link with German/GOB road and the proposed AID road in the San Julian area 2) north to Cuatro Ojitos which will link with the proposed AID road in the Chané Independencia area and 3) west to Yapacaní. The section of road from Yapacaní to Rio Víbora is still under construction. Also, in the mid 1950s and early 1960s, U.S. government resources were used to clear land and provide research and extension which facilitated the development of the Santa Cruz region.

## 6. Project Description

This project envisions the provision of essential infrastructure and services to accelerate the consolidation and development of the project area 1/located northeast of Santa Cruz (see Map 2, Annex III). The project area encompasses approximately 400,000 hectares, is currently occupied by about 6,000 spontaneous settlers and has the capacity to absorb an additional 4,000 small farm units (40 has.) and 100 commercial scale units (500 has.) within the next three to five years given the infrastructure contemplated in this project (see Map 3, Annex III).

The cost of the proposed project will be approximately \$660 per family for the 10,000 families expected to be initially benefited (\$6,000,000 divided by 10,000 families). This cost per family compares favorably with early colonization projects in the Alto Beni I which cost \$3,350 per family while the INC/BID project cost an average of \$1,605 per family. Neither previous colonization project's cost calculations included the cost of roads.

Crop production will focus on basic grains (corn, sorghum, rice), oilseeds, sugar, and livestock (pork, cattle) which are being produced in the project area. These commodities are currently in short domestic supply or of export potential with favorable prices and some basic marketing/processing infrastructure in the Santa Cruz area.

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1. See Annex V for a list of criterion used to select the project area.
  2. See Annex IV for a definition of directed and spontaneous colonization.

principal Santa Cruz station, will focus on site specific adaptive research, varietal trials and cultivation practices leading to a stable small farm agriculture. Extension will bring research results to small farmers and educate project participants to incorporate these new practices when other inputs, such as credit, modern inputs, etc., are available.

Training activities will also be carried out at the service centers by the United Churches group, MINAG, INC, and SNDC, in such diverse programs as home economics, orientation for new colonists, community development, sub-tropical farm management, health and sanitation.

Credit for small farmers will be provided by the BAB (or other appropriate institution) with MINAG providing credit agents in the field. Credit will be made available to a selected group of more promising small farmers in the project area, with production credit given in the first year, and medium term credit given in the second and following years to reliable clients. Credit agents will help select the participants to receive credit, help develop the initial farm budget, assist loan recipients in implementing their farm plan by providing information and access to modern inputs, check the progress of the crops at strategic points, and finally assist the farmer in marketing. Initial goals for the project include credits for about 20% (or approximately 1,200) of small farmers in the project area. The estimated number of clients per credit agent will be approximately 50. The possibility of providing credit in kind (modern inputs) will be explored if, during intensive review, it becomes apparent the private sector will not undertake sale of such inputs in the project area.

The marketing situation in the area is generally good; rapid growth in agriculture is inducing new private sector investments in processing, storage, etc. In this regard, previous AID loan funds (FRA) are being directed to these activities, and their benefits should extend to the project area. Unless the intensive review indicates otherwise, no project resources will be devoted to off-farm marketing or processing activities.

Other Social Services. The project also envisions the provision of potable water systems, and to a lesser extent schools and health services involving community, self-help participation. Community wells will be drilled in selected locations of the project area. Construction will be carried out by SNDC in coordination with INC. In addition SNDC will assist in organizing communal efforts for self-help construction of schools and sanitary posts, in cooperation with the Ministries of Education and Health, and assist in the organization of campesino groups.

with loan funds by INC to improve its project management capacity, implement an evaluation program for the loan project, and improve in-service training.

Additionally loan funded technical assistance will be contracted by INC to study and evaluate in detail the potential of sub-tropical lands of Bolivia for agricultural development. Emphasis of this study will be not only on the total amount of land available for development, but on the kinds of crops and products that can be produced, the implications for regional development, and other proposed infrastructure projects (e.g. the relatively large amount of roads proposed for construction in the Beni in the next five years). Such a study is urgently needed if the GOB is to effectively plan future strategies for efficient economic growth. This detailed study has been identified in the sector assessment as one of the serious gaps in information for assessing the potential of agriculture in developing the economy.

7. Financial Plan and Cost Estimates

- a. Tabular Summary (see next page)
- b. Description of Financial Plan

The GOB inputs shown in the financial plan are generally for salaries and operating expenses associated with the proposed loan project. The amounts shown in the AID Loan section of the Plan are composed of the following items:

1. Roads. AID loan funds of \$6.0 million will be utilized for: 1) the improvement of approximately 90 Kms. of existing road and the design and construction of an additional 80 Kms. of new road in the San Julian area; and 2) the construction of 200 kms. of minimal access road. SNDC with community assistance also is expected to contribute to the improvement of existing penetration roads. The \$1.2 million GOB contribution includes SNC supervision of road construction and the estimated cost of construction of the "German/GOB" road.

2. Production Services. Expenditures are estimated as follows:

a) Research and Extension - Approximately \$ 200,000 of AID loan funds will be used to construct and equip two field station/extension centers, including agricultural machinery, essential offices and other structures, vehicles, and necessary supplies and materials.

b) Credit - An estimated \$ 500,000 of AID loan funds will be used to provide production, marketing and improvement credits. 1/

1. During the intensive review the advisability of providing credit from this project or from the Agricultural Production and Marketing Loan (FRA) will be determined.

AID loan funds of \$80,000 will be utilized for vehicles.

c) Marketing - FRA funds in the amount of \$1.0 million are expected to be invested in the development of regional marketing and processing infrastructure.

3. Social Services. AID loan funds in the amount of \$150,000 will be used for the purchase of well drilling equipment and pipe, and \$200,000 for materials needed for the construction of schools, health centers and potable water systems. In addition, the SNDC Loan (511-L-044) is expected to provide \$100,000 for support of self-help construction activities.

4. Project Administration. Expenditures for project administration are divided into three components as follows:

a) Basic operations.- AID loan funds of \$150,000 will be utilized for the procurement of vehicles, and communication and office equipment for INC. GOB contribution of \$900,000 will cover salaries and operating expenses for the central and regional offices including surveying, community organization, titling, coordination and supervision activities.

b) technical assistance.- AID loan funds of \$250,000 will be provided for contracted U.S. and local technical assistance: \$200,000 for 4 m/yrs. of U.S. technical assistance to INC in project management, evaluation and training and \$50,000 for the training of migrants by the United Churches group.

c) resource study.- AID loan funds of \$500,000 will provide for 8 m/yrs. of U.S. contracted professional services at approximately \$45,000 m/yr. (including salary, overhead and local transportation costs), \$40,000 for vehicle and office equipment, and \$100,000 for local professional, and data collection and analysis support costs.

## 8. Factors Affecting Project Feasibility

### a. Social and Cultural Patterns

Rural Bolivian communities have developed a multitude of social-cultural institutions which bind the community together, and to other communities, and provide mutual support and security to the individual members of the community. These institutions include, among others:

1. Compadrazgo (god parent) - This binds one individual to another by ritual; the god-parent is obligated to assist his god-son in time of his or his families need;

management and evaluation unit with a method of informing the organizations involved of any bottlenecks in the operation of the project and the action(s) required of the relevant organization(s) necessary to correct them. During intensive review, further discussion will be held between the GOB and USAID with the intent of formalizing the unit, determining its exact composition and establishing the general procedural guidelines to be followed.

## 2) Project Management Capability

*INC project with bottlenecks*

Since its creation in 1965, INC has administered a \$9.1 million loan from the IDB intended for the development of the Alto Beni II, Chimoré and Yapacaní projects. These projects have not been altogether successful (i.e. they have exhibited relatively high rates of abandonment <sup>1/</sup> and have only low or medium expectation of economic viability <sup>2/</sup>) due partially to, what appears to be, INC's project management capability. Therefore, during intensive review, methods for improving the project management capability of INC will be explored.

At present, it appears that the regional offices, which have the responsibility for project management, are staffed with insufficiently trained personnel. Therefore, a partial solution to the project management problem might be to provide additional training to the existing regional office personnel in project management. In addition, the function of the regional office should be expanded to encompass the responsibility for conducting periodic evaluations of the status of the various project components to determine if these components are contributing, as planned, to the success of the program. If not, INC would take remedial action to correct the bottlenecks before they cause lasting damage. These changes will require additional training of the staff in evaluation and supplementing the existing staff with competent people who are qualified in project evaluation.

## 3) Administrative Capability

### a) National Colonization Institute (INC)

While the INC/IDB project mentioned above was not totally successful the project provided the ~~LEO SANTOZI~~ Office with valuable practical experience in program administration. In addition, the institute is now headed by a former AID financed student who will soon receive his PhD in Land Tenure from the University of Wisconsin. It is considered that INC's administrative capacity has improved through experience and staff additions and that with technical assistance in management and evaluation it should be able to administer the proposed loan project.

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1. Programa de Colonización: Informe Final, INC/BID, page 40.
  2. Michael Nelson, The Development of Tropical Lands (Baltimore: John Hopkins Press, 1973) p.263.

Mission considers the United Churches Organization to be capable of carrying out orientation and training. However, during intensive review the organization's capabilities will be examined taking into consideration the size of its present staff and the need for possible future staffing additions.

e) National Road Service (SNC)

SNC is in charge of the Bolivian highway network. SNC will be responsible for the supervision and maintenance of the all weather, access roads in the proposed project area. Since 1962, SNC has been responsible for the construction of approximately \$82.0 million in A.I.D. financed highways. It is considered to be an effective organization by the Mission and other international financing agencies (IDB is presently considering a \$60.0 million loan to SNC for the construction of the Caracollo-Quillacollo Road) and no administrative or other problems are foreseen in SNC supervising the road construction phase of the proposed project.

e. Economic Feasibility

A preliminary analysis utilizing the Internal Rate of Return methodology indicates that the project is economically feasible. Annex VI sets forth the assumptions and calculations employed. This analysis indicates that the rate of return which makes the present value of net cash flow from project investment equal to zero is 30.2%. In other projects, the Mission has assumed the opportunity cost of capital to be 12%, and therefore, the benefit-cost ratio of the proposed project is greater than one.

9. Environmental Considerations

The proposed loan project will affect the environmental or ecological system in the Oriente in two principal ways: through the construction of roads and the parcelization and clearing of virgin land areas. If not handled properly, these activities could cause ecological damage to the proposed project zone as well as to the adjacent land areas.

TDY assistance in the field of Tropical Soils Agronomy is requested during the intensive review stage to assist in the development of adequate ecological safeguards. USAID/ETD will study the effects of constructing roads in the project zone and will take appropriate action to see that the ecological damage from such construction is minimized.

10. Other International Donor Agency Participation

The sector assessment is expected to further define new GOB plans in the development of the Oriente. Current and proposed GOB projects with international donor agencies suggest the general direction of development likely to occur in the region, however.

In the south Oriente (Chaco), the UNDP is currently financing a project known as Abapo-Izozog to determine the potential of this region for agricultural development, principally under irrigation. This project is expected to involve approximately \$3.0 million of UN/FAO assistance within the 1972-76 project period.

The proposed AID project will assist the GOB to address new land development efforts in the central Oriente. Tentative IDB plans suggest assistance for possible consolidation projects in the Chapare-Chimore area in the lowlands north of Cochabamba.

Thus, it appears that the UNDP, AID and IDB may all be assisting in future new lands development activities with the GOB. Each effort relates to a distinct area of the Oriente and the ongoing coordination between these entities, and with the GOB, suggests there would be no problems for lack of a unified approach.

- 2) a Transportation Economist and an Agricultural Economist 1/ with a background in Agriculture Policy and Project Analysis for approximately 15 working days; and
- 3) an expert in small farmer Credit Systems for approximately 15 working days.

d. In March 1974, the CAP should be completed and submitted to RDD/W.

12. Project Committee

L. Armstrong	-	Loan Officer, Project Chairman
R.D. Dudley	-	Chief, Engineering and Transportation Division
J.R. Moffett	-	Chief, Rural Development Division
D. Bathrick	-	Chief, Community Development Division
R. Clark	-	Office of Controller
A. Diaz	-	Program Officer
R. Mye	-	Economist

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1/ Douglas Jones, a direct hire agricultural economist assigned to the RDD/Bolivia staff is programmed to arrive in La Paz on February 1, 1974 and may be able to provide this input.

## LIST OF ANNEXES

- Annex I - Past Colonizations in Bolivia and Prototype for New Lands Development
- Annex II - Preliminary Sector Assessment Findings and Tentative GOB and AID Strategies
- Annex III - Maps
  1. Geographical Division and Profile of Bolivia
  2. Colonization Areas of Bolivia
  3. The Project Area
- Annex IV - Definitions of Terms in Describing Colonization and Characterization of Stages in the Process of New Lands Development
- Annex V - Criteria for Selection of Project Area
- Annex VI - Economic Analysis

Past Colonization in Bolivia and  
Prototype for New Lands Development

The purpose of this Annex is to briefly describe and characterize past colonization efforts in Bolivia, determine the key factors limiting success, and describe a prototype for new lands development. There are several excellent studies of Bolivian colonization activities which provide the information source for this Annex, and to which the interested reader is referred for more detail.<sup>1/</sup> All the studies, whether evaluating the general process of colonization in Bolivia, or focusing on some more detailed aspect, are remarkably consistent in two major conclusions. First, "directed" colonization projects are much less successful in terms of attracting and keeping colonists, than in "spontaneous" colonization, although the reasons cited for this vary. Second, access to markets is necessary for successful development of new lands.

After the revolution in 1952, the eastern lowlands received greater attention in the development strategy of the country. Since the lowlands were so sparsely populated, migration from the highland was to play a key role in development of the agricultural sector. The three main objectives of this migration were:

1. to help equalize the distribution of the rural population with respect to land resources;
2. to diversify and increase agricultural production by promoting the cultivation of tropical and sub-tropical crops such as rice and sugar; and
3. to populate frontier zones and remote areas, thus promoting their integration into modern economic life.

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<sup>1/</sup> Studies of Colonization in Bolivia include: 1) Michael Nelson, the Development of Tropical Lands (Baltimore: John Hopkins, 1973); 2) Gordon N. Keller and Percy Aitken, "Socio-Cultural Factors in Colonization in Bolivia" (Utah State University-RDD/USAID Discussion paper No. 5, 1973), mimeographed; 3) Kelso Wessel, The Profitability of Small Farms in Bolivia (Cornell University, International Agricultural Development, mimeograph 27, April, 1972); 4) Kelso Wessel, "An Economic Assessment of Pioneer Settlement in the Bolivian Lowlands" (Unpublished PhD dissertation, Cornell University, 1968); 5) Inter-American Development Bank, "Evaluation of Tropical Colonization Projects in Latin America" (Papers on Agricultural Development No. 7, Washington, D. C. 1970); 6) Thomas Royden and Boyd Wennergren, "The Impact of Access Roads on Spontaneous Colonization" Chané-Piray Area of Santa Cruz, Bolivia" (Utah State University Series 23/73, 1973); and 7) Fredrick Fliester, Colonization in Bolivia, Montero 1971.

failure of this project including lack of access to markets and the lack of economic viability in the absence of the government subsidies. When the substantial government assistance ceased, many settlers abandoned the project.

Colonization without external financing was tried next in the Santa Cruz area under the direction of CBF and the Ministry of Defense. While the level of assistance was lower than at Cotoca, it was still relatively high. Colonies developed under this system included Aroma (1954), Huaytu (1954), Caranda (1955), and Cuatro Ojitos (1956). These colonies were also initially unsuccessful with high rates of abandonment (50-70%) for the same reasons that affected Cotoca. However, the development of a paved access road in the late 1960's has made some of these areas economically viable. For example, net average family income is \$b 12,625 at Cuatro Ojitos, and \$b 13,484 at Aroma but is only \$b 5,058 at Huaytu apparently because of access to markets afforded by paved roads which run through or very near to the former two colonies. While the access roads helped increase the population of Cuatro Ojitos from around 500 families in 1960, to a high of 1,200, the recent drought adversely affecting the potable water supply, has reduced the population to a level of about 800 families. Aroma has had a similar experience losing more than 200 of a total of 300 families due to the drought. Thus, although the access road brought prosperity to these two old colonies, lack of potable water has reduced the population. The recent installation of a potable water system in Cuatro Ojitos is expected to encourage an increase in the population back to around 1,200 families.

During the same period of time, the CFB and Ministry of Defense developed colonies including several groups of foreign colonists, who immigrated to the Santa Cruz colonization areas. These included three separate groups of Okinawans (1954, 1958, 1963), a group of Japanese (1957), and a group of German descended, Paraguayan Mennonites. With the exception of the Mennonites, these groups were sponsored by either their host government or other foreign groups, and received assistance from the group that sponsored them. They also apparently benefited from GOB assistance including production credit loans as well as land. In contrast to the directed colonies of CBF, there has been almost no abandonment of the foreign colonies. These colonies also were directed and lacked access to markets, etc., but had two features that distinguished them from CBF colonies. The first was the presence of traditional social-cultural institutions which greatly reduced risk associated with migration, and led to cooperative organization of production, and the utilization of more modern factors including credit. The second was consistent presence of resident agronomists from the inception of the projects, who developed experiment stations for crops to be produced in the colonies.

community center, and 118 families had already abandoned the colony. The settlement of Yapacaní proceeded on a similar plan, but with the help of the military for precolonization work. This project was much more successful however, with the presence of 1,179 families in the area as of 1965. However, the Bolivian Government was unsuccessful in meeting its goal of quickly resettling 8,000 families in the three projects. As of 1965, only 2,335 colonists had settled in the project areas.

As indicated above, direction of all public colonization projects passed to INC in 1965. The development of the three project areas continued under BID financing and with USAID loans of approximately US\$12.1 million for construction of access roads between Yapacani-Rio Víbora, Santa Ana-Covendo and Caranavi-Santa Ana. In addition, approximately US\$52.0 million was loaned for completion of highway 1 and 4 between Cochabamba and the Chapare.

The objectives of the program as stated by the National Colonization Institute were similar to those given by earlier entities except that recognition was given to spontaneous colonization. The objectives of the three projects were:

1. To transplant rural people from the densely populated highlands;
2. To increase and diversify the agricultural production of the country; and
3. To serve as an incentive for the settlement of a large number of spontaneous colonists on the periphery of the projects.

However, the goal of relocating 100,000 families was not reached. In fact, the final report of INC-BID made in 1970 indicates only 8,717 additional families were assisted during the period 1965-1969. Thus, only 11,270 families were assisted under the CBF-USAID, CBF-BID, and INC-BID projects in Alto Beni, Chapare and Yapacani during 10 years,<sup>1/</sup> or 11.3% of the goal of 100,000.

An analysis of the INC-BID project in the same report indicates that directed colonization by the Bolivian government has been a costly method of sponsoring the settlement of the "tropical frontier."<sup>2/</sup> The average cost of resettling a family under the project was US\$1,605. At this cost, the total investment to the GOB to relocate 100,000 families as programmed for the 1961-70 period would approximate US\$160 million. Such an investment was clearly beyond the fiscal capabilities of the GOB. Finally, of the 8,717 colonists sponsored by the three projects between 1965-1969, 43 percent eventually abandoned their land, with many of these becoming spontaneous

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<sup>1/</sup> INC-BID, Programa de Colonización - Informe Final, La Paz, 1970

<sup>2/</sup> Ibid.

1. The presence of an all weather access road. This feature was cited as a critical factor in the abandonment of land on most GOB sponsored colonization projects. In contrast most spontaneous colonization has occurred along such roads, and foreign groups have built and maintained their own roads.
2. Location of production in response to market forces. This is closely related to the access road, but also includes the consideration of market forces in selecting production sites. GOB projects have tended to be located in remote areas, particularly in the early colonies. As a result, economic returns have too often not been great enough to permit the amortization of debts incurred by colonists in the directed projects. In contrast, the spontaneous colonizers have responded to natural market forces; other things equal, their production is likely to be more profitable. While the foreign groups may be somewhat more isolated, they are more strategically located than the GOB colonies.
3. The Economic Viability in Production. This is an important factor which may have been overlooked in much of the literature on colonization. In actual practice, there are three general classes of technology in the colonization areas of Bolivia. One is the slash and burn technique used by most spontaneous colonizers, who are limited to hand labor, and must use such techniques to bring jungle land into production. Rice is the principal market crop grown because of the government price support. This in combination with the relatively short growing season guarantees a quick cash return.<sup>1/</sup> Since dryland rice is sensitive to weed competition and soil nutrients, the farmer must either invest in weed control and artificial fertilization of rice land to maintain yields in the third or fourth years, or go to more permanent crops such as cane, bananas, or pasture, or move into new land. The latter choice seems to be the one taken by most spontaneous colonizers, who have no access to modern factors of production and a more stable agriculture. This suggests slash and burn agriculture yields the highest return to the spontaneous colonizer who is not able to incorporate more modern factors in his production process.

The second level of technology is that utilized by colonos in GOB projects who have managed to adopt more modern factors of production and develop a more stable agriculture. According to statistics cited above, however, almost 50% of the colonos who initially enter GOB colonization projects eventually leave.

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<sup>1/</sup> Other crops are grown for subsistence.

to replace the old seem to develop much faster among the spontaneous colonizers than among colonos on GOB projects.<sup>1/</sup>

5. The development of cooperative action. The foreign groups have been able to develop a high degree of local community cooperation, which has been very important in their success. This has permitted the Japanese group to maintain an all weather access road from the Japanese colony, to market and purchase cooperatively, to maintain an experiment station, to use production credit, etc. Similar comments apply to the Mennonites and Okinawans. This capacity seems closely related to the presence of traditional social-cultural institutions. The spontaneous colonizers have also shown some proclivity for cooperation, although not in any degree to that shown in the foreign groups. Such cooperation is most likely related to maintenance of the main access road, and some public services such as health, schools and water supplies. Cooperation has been almost non-existent in the GOB directed projects. With most of the services provided, there has been little incentive or need for cooperation, and most attempts at GOB sponsored cooperative organization failed.
6. The presence of a potable water supply. This is an essential element in the stability of settlements in new-lands areas. It was provided early in most GOB and foreign colonies. However, where it was inadequately developed, the effect has been disastrous.

These findings suggest a prototype for future development of new lands. First, the emphasis should be on consolidation of spontaneous colonization areas which strongly indicate economic viability of the area. Consolidation should include development of an all weather access road, and a potable water supply. Settlement and development of such areas should be encouraged in a way that traditional social-cultural institutions are transferred and maintained. Finally, productive services (research, extension and credit) must be provided and institutions developed for incorporating such services to increase productivity. In this regard, cooperative action should be encouraged. The provision of production services should recognize the need for development of human capital, and should concentrate on saving the scarce factor - labor.

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<sup>1/</sup> See Gordon N. Keller and Percy Aitken, "Socio-Cultural factors in Colonization in Bolivia: An Integrated Model for New Lands Development", Discussion paper # 2, Utah State University/USAID/ Bolivia, 1973) mimeographed.

Preliminary Sector Assessment Findings and Tentative  
GOB and AID Strategies

Based on preliminary results of the on-going sector assessment of agriculture, the following are the major problems restricting agricultural development:

1. A stagnant technology in the small farm sector of agriculture (comprising at least 95 percent of the agricultural population) with resultant low levels of productivity, family income, and very limited supply responses in the face of strong demand pressure.
2. An increasingly inefficient allocation of human resources in Bolivian agriculture relative to the natural resources endowment, with people concentrated on the limited and poor lands of the Altiplano and valleys.
3. High cost of inputs for agricultural production (fertilizer and chemical supplies, seeds, production credit, tools and machinery, irrigation, harvest labor) and a lack of information on prices and availability of such inputs.
4. An inefficient product marketing system; e.g. lack of market information and data, non-standard weights and measures, lack of transportation, and lack of storage facilities.
5. Lack of industries with forward and backward linkages into agriculture.
6. Lack of human capital, both at the technical and general levels of education.

In addressing the problems impeding development of Bolivia's rural sector, and the resultant characteristics therein, the GOB has two basic goals: 1/

1. To increase the per capita income of the rural population as rapidly as possible based on increased productivity of the sector. While couched in economic terms this goal encompasses concern for health, education and other basic needs of the population.
2. To obtain a more egalitarian sharing of the fruits of this economic progress so that increases and income are not concentrated in the hands of a few individuals. This goal is concerned with (1) broadening and deepening the internal market by further integrating the

1/ From speech by Hugo Banzer Suarez (President of Bolivia), January 1, 1973.

present GOB plans:

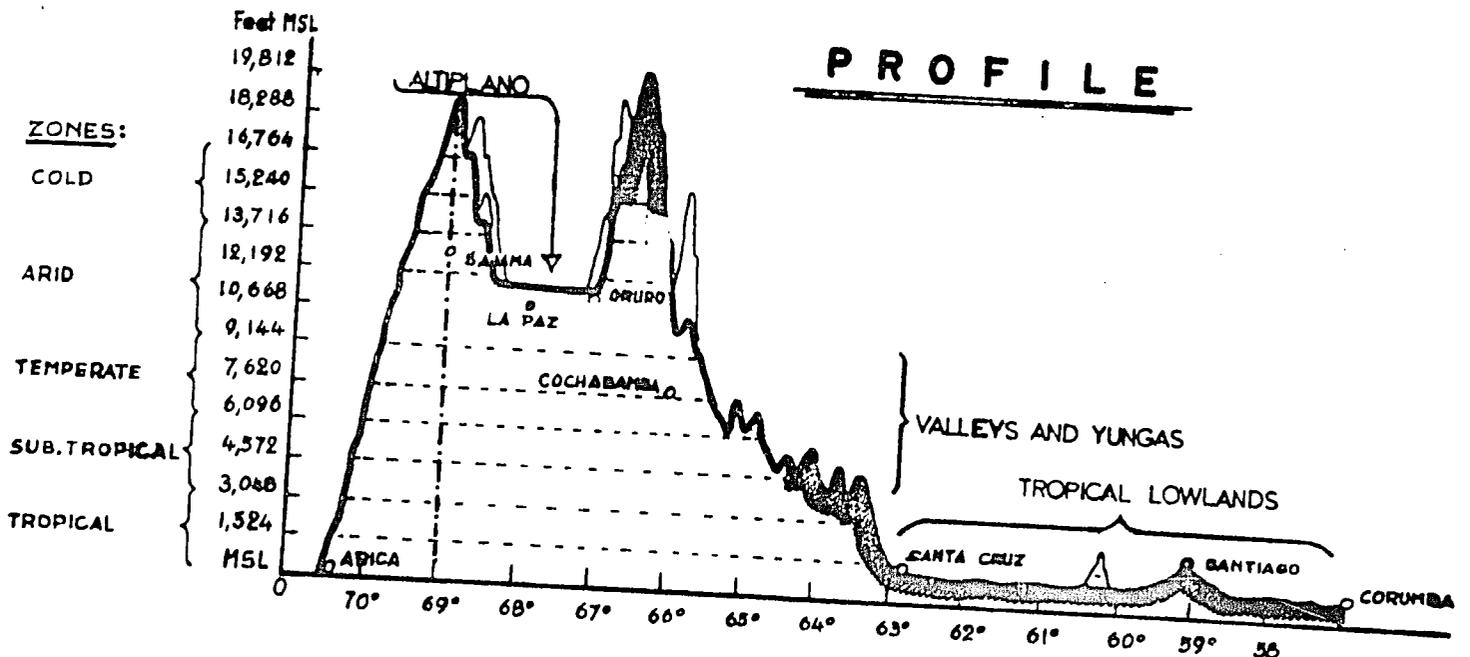
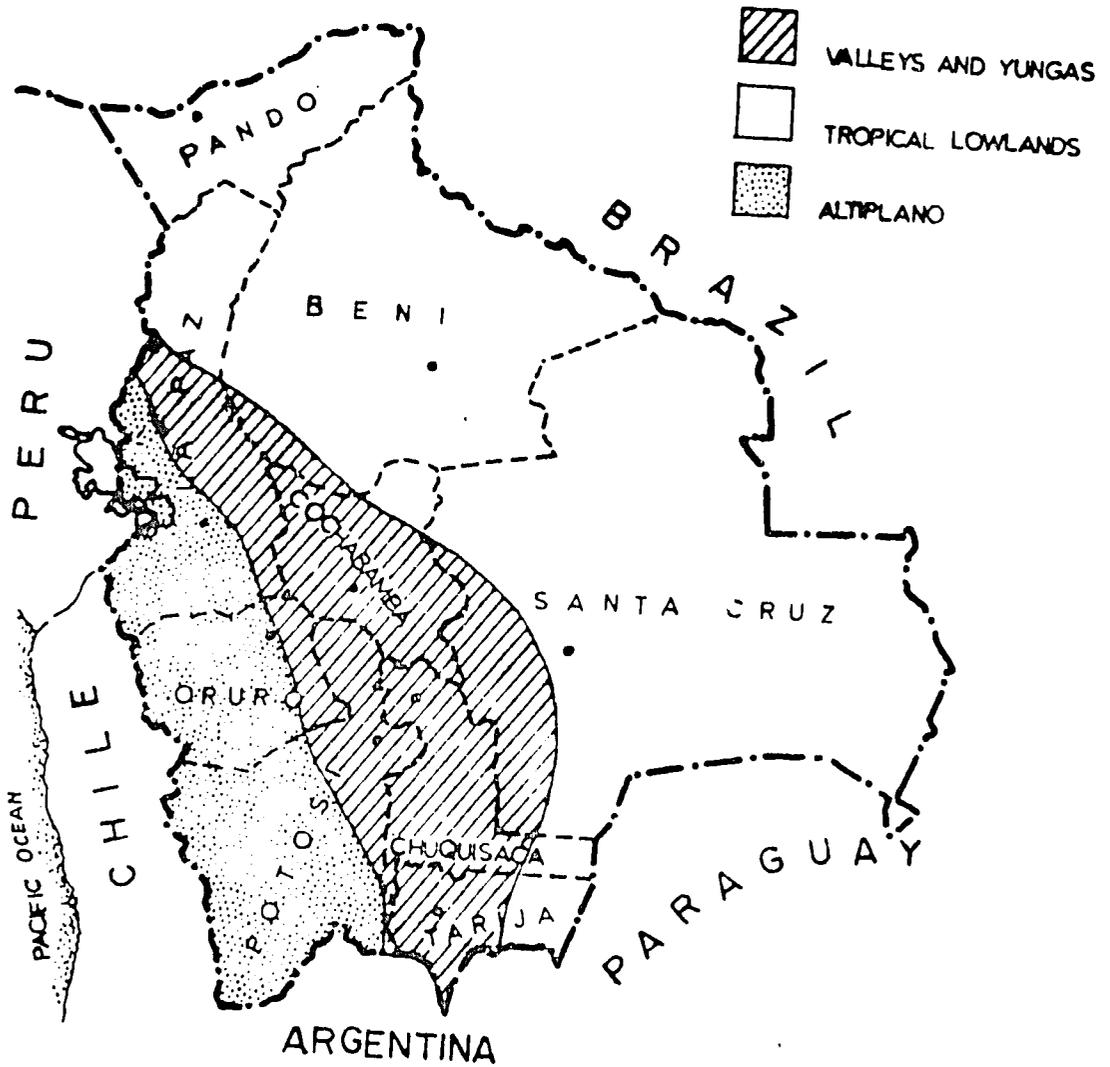
1. Loans and technical assistance to develop service centers in the Valleys and Oriente as a basis for increasing productivity and production of the small farm sector in these regions, through the use of more modern factors of production.
2. Loans and technical assistance to increase production through expanded use of sub-tropical land in the Oriente by providing critically needed infrastructure for consolidation of existing areas of spontaneous colonization and encouraging permanent migration.
3. Loans and technical assistance to encourage cooperative organization in the small farm sector of the Valleys and Oriente in conjunction with the service centers.
4. Development of the faculty of agriculture at the Universidad Mayor de San Simon in Cochabamba, and secondary schools of agriculture in conjunction with the proposed AID-financed service centers, as well as continuation of the existing scholarship programs and in-service training.
5. Loans and technical assistance to reorganize the public services sector to serve agriculture.

A N N E X      III

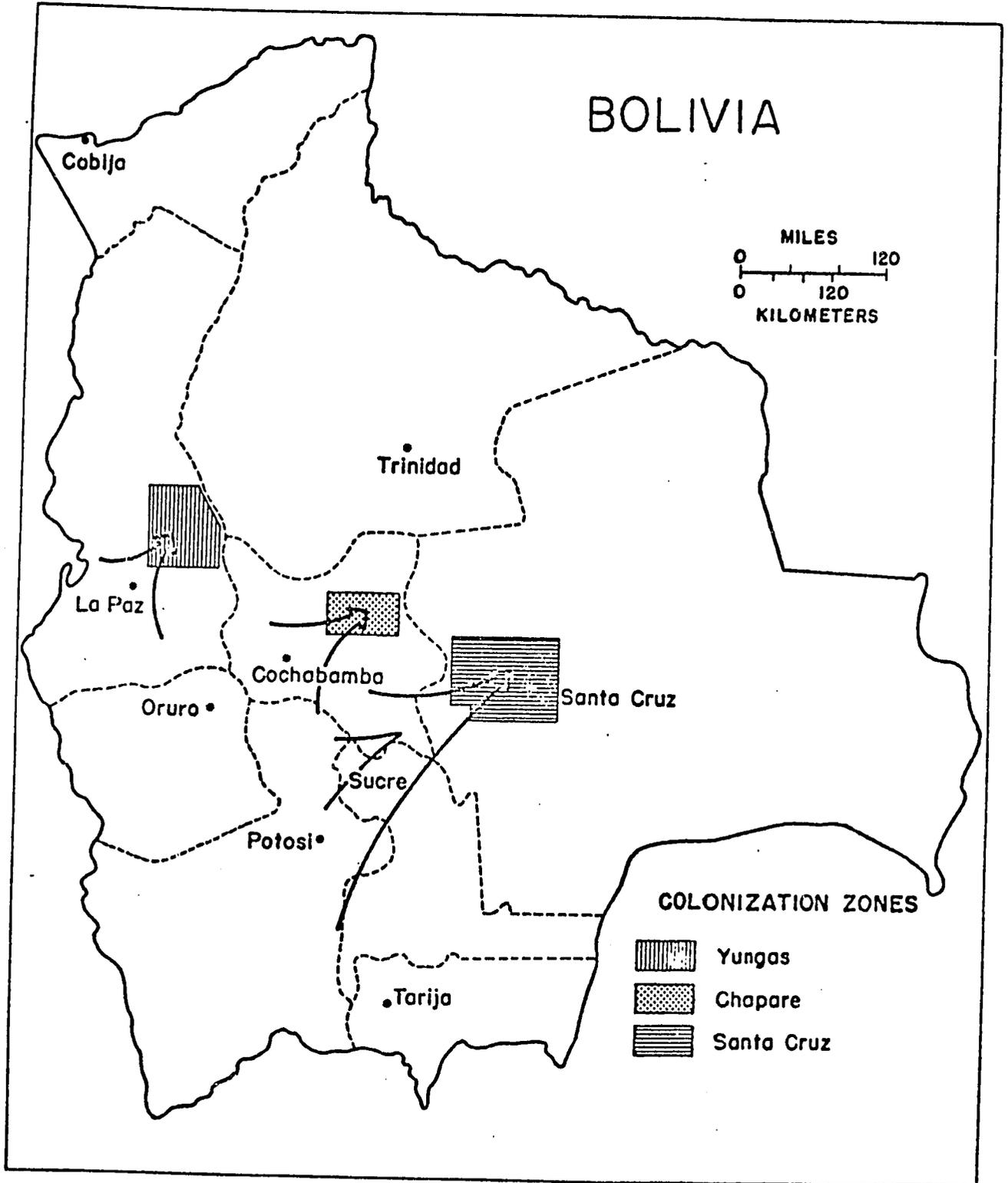
M A P S

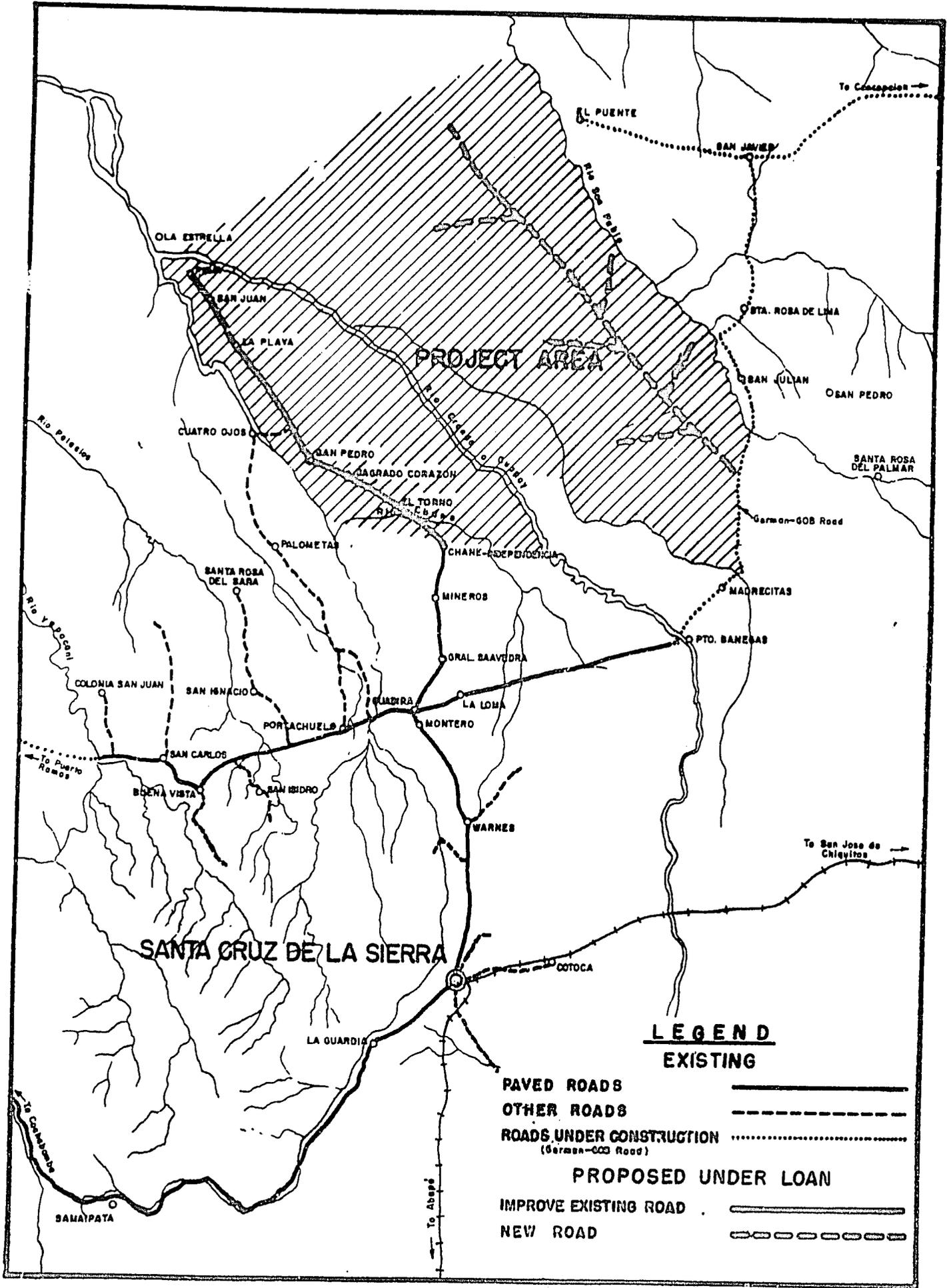
1. Geographical Division and Profile
2. Colonization Areas of Bolivia
3. The Project Area.

# BOLIVIA



Internal migration patterns during recent decades. Bolivia, 1966





**PROJECT AREA**

**SANTA CRUZ DE LA SIERRA**

**LEGEND**  
**EXISTING**

- PAVED ROADS —————
- OTHER ROADS - - - - -
- ROADS UNDER CONSTRUCTION .....  
(German-GOB Road)
- PROPOSED UNDER LOAN**
- IMPROVE EXISTING ROAD —————
- NEW ROAD - - - - -

DEFINITION OF TERMS USED IN DESCRIBING COLONIZATION, AND CHARACTERIZATION OF STAGES IN THE PROCESS OF NEW-LANDS DEVELOPMENT.

I. Definition of Terms

Directed Colonization refers to government projects with a high degree of control over the colonists with respect to: a) selection of migrants, b) the distribution of land, and c) the provision of a large number of services including transportation to the colony, land clearing, living subsidies, production credit, health services, education, etc. Colonists initially practice a slash and burn agriculture and in many cases are not able to assimilate the technology to change to a more stable agriculture. The normal consequence for these colonists is that they move on to a new plot of land outside the colony (when soil fertility is exhausted, and weed growth has increased) and become spontaneous colonizers.

Inmigrant Colonies refer to colonies inhabited exclusively by groups of foreigners. Direction in such colonies is usually restricted to land sub-division on the part of a board of directors of this foreign group, and stipulations concerning who may purchase land in the colonies. Such colonies usually have a high degree of community cooperation for the provision of various social and productive services, and have developed a stable agriculture with almost no desertion.

Spontaneous Colonies are the conglomeration of colonists in an area as a result of natural migration. Such areas are usually located adjacent to an access road that has been opened as a result of other activity; e.g. a logging road, or an inter-regional highway. Government services may subsequently be provided in response to demand of the settlers, in contrast to semi-directed or directed settlements where services are provided in order to promote a population shift, i.e. the creation of a demand for land. Most such colonos are squatters with no legal right to the land they inhabit and cultivate. Also, spontaneous colonists almost exclusively practice a slash and burn type of agriculture, moving on to a new plot of land after four or five years.

II. Stages in New Land Development

Three successive stages in the development of new land have been identified. All are arbitrary in that there is continuous gradation between the stages and on many projects all three stages exist simultaneously. The pioneer phase is only associated with directed government or private land settlement in virgin areas, although in practice the principal areas of such settlement in Latin America are spontaneous. Typically pioneer zones are characterized by: (1) recent and continuing settlement of limited lands cleared from

CRITERIA FOR SELECTION OF PROJECT AREA

The following criteria were used to select the general area from a number of possible sites representing several sub-regions of the Oriente where the GOB has plans for sub-tropical lands development:

1. Capacity of the area (climate, rainfall, soils, etc.) to produce commercial crops and livestock products which are in domestic supply and/or which have export potential, as well as crops for subsistence until the farms become fully commercialized. Such a tentative list includes rice, corn, oilseeds, sugar, pork, cattle, chickens, wheat and forages for commerce and subsistence, as well as yuca and vegetables for subsistence.
2. The extent and distribution of the area in class I and II soils and the current status of the land with respect to ownership. Land located in proximity to commercial land (large plots) is preferable to isolated regions for several reasons: (a) source of employment for "colonos", (b) source of labor for commercial agriculture removing limiting labor shortages; (c) access to product markets; and (d) access to more advanced techniques.
3. Existence of social and productive infrastructure. To the extent infrastructure is already in place, fewer additional resources will be required. The following kinds of infrastructure need be considered; (a) social infrastructure including health services, potable water, education, etc. (b) production services including research, extension, credit and availability of more modern factors of production; and (c) marketing services including transportation, milk and processing plants, storage, credit, etcetera.
4. Proximity to proposed AID-financed development center for the Central Oriente region referred to in DAP. Such a center would provide a series of services including research, extension, credit, sale of modern factors of production, information on prices, and possibly purchase and storage of products. A part of the focus of this proposed regional center is a strong supportive role to the GOB's sub-tropical land development effort.
5. Consideration of the social-cultural barriers to migration and selection of sites where Altiplano-Valley residents would have the lowest resistance to migrating.
6. Lack of other donor or GOB activity in the area.
7. Some evidence of economic viability through "successful" spontaneous colonization.

### ECONOMIC ANALYSIS

The purpose of this preliminary analysis is to give an indication of the economic viability of investment in the proposed sub-tropical lands development project, recognizing that a complete project analysis will be necessary during intensive review. The internal rate of return to investment in the access road, potable water, and transfer of social-cultural institutions has been calculated. (This preliminary analysis does not consider investment in the proposed service centers for research, credit, extension, etc., since data are not readily available on the magnitude of expected benefits). <sup>1/</sup>

The data used in this analysis are provisional in nature, and require further documentation, although there is reason to believe the data are reliable. <sup>2/</sup> In addition, the internal rate of return is calculated only for direct returns to the investment; consideration of secondary benefits is left for the intensive review.

The project investment is assumed to be disbursed at a steady rate over the first 5 years of the project. The cost for the roads and social services is estimated to be \$ 9.1 million out of \$11.2 million for the total project including the service centers.

The direct benefits from the road and social services are expected to accrue to small farmers in the project area and are calculated as the difference in net family income before and after the project. These benefits are expected to accrue to two general classes of small farmers, those already in the project and those expected to enter the project area over its life.

There are approximately 6,000 families already in the project area, mainly in the Chané-Piray area (C-P) <sup>3/</sup>. The average net family income in Cuatro Ojitos which is on the South edge of C-P and which is served by a paved road is \$b.12,625. In contrast the average net family income in C-P area which has only a seasonal road is just \$b. 5,568 <sup>3/</sup>.

Further, net family incomes decline as one goes north into C-P until they are at an average only \$b. 1,949 at Hardeman. Since soils and climate are almost identical in Cuatro Ojitos and Chané-Piray the difference in average net family income must be due to market access

- <sup>1/</sup> The data will be developed during intensive review, and the project analysis expanded to consider all parts of the project. Increases in incomes from increased productivity induced by the service centers are expected to increase the internal rate of return to project investment.
- <sup>2/</sup> Several different sources indicate the same order of magnitude for economic returns from developing sub-tropical lands relative to opportunities in the Altiplano and Valleys.
- <sup>3/</sup> See Salesian Fathers, "Cuadro Estadístico de la Situación Demográfica de la Zona Chané-Colonia Piray". Marzo 1973.

YEAR	Costs	B e n e f i t s			Net Cash Flow
		Chane-Piray	San Julian	Total	
1975	1,820,000	0	0	0	-1,820,000
1976	1,820,000	0	0	0	-1,820,000
1977	1,820,000	2,117,100	76,000	2,193,100	373,100
1978	1,820,000	2,117,100	152,000	2,269,100	449,100
1979	1,820,000	2,117,100	228,000	2,345,100	525,100
1980	0	2,117,100	304,000	2,421,100	2,421,100
1981	0	2,117,100	304,000	2,421,100	2,421,000
1982	0	2,117,100	304,000	2,421,100	2,421,100
1983	0	2,117,100	304,000	2,421,100	2,421,100
1984	0	2,117,100	304,000	2,421,100	2,421,100
1985	0	2,117,100	304,000	2,421,100	2,421,100
1986	0	2,117,100	304,000	2,421,100	2,421,100
1987	0	2,117,100	304,000	2,421,100	2,421,100
1988	0	2,117,100	304,000	2,421,100	2,421,100
1989	0	2,117,100	304,000	2,421,100	2,421,100

The rate of return which makes the present value of net cash flow from project investment (the internal rate of return) equal to zero is 30.2%. This can be compared directly to the opportunity cost of capital, which in other projects the Mission has assumed to be 12%.

Therefore, this preliminary analysis suggests the project is feasible, with a benefit-cost ratio greater than one. It should be recalled that an even higher rate is expected based on the expected increase in the net cash flow from investment in the service centers.