

NATIONAL IRRIGATION PROGRAM (PRONAR)

(BO-0040)

EXECUTIVE SUMMARY

BORROWER AND GUARANTOR: The Republic of Bolivia

EXECUTING AGENCY: The National Secretariat for Agriculture and Stockraising

AMOUNT AND SOURCE:

IDB:	US\$25,600,000
Cofinancing:	US\$ 2,000,000
Local counterpart funding:	<u>US\$ 5,300,000</u>
Total:	US\$32,900,000

FINANCIAL TERMS AND CONDITIONS:

Amortization period:	40 years (FSO)
Commitment period:	3 years
Disbursement period:	4 years
Interest rate:	1% first 10 years, 2% thereafter
Inspection and supervision:	1%
Credit fee:	0.50%

COFINANCING: The Government of Germany (GTZ)

OBJECTIVES: The program is aimed at bringing about an institutional and legal rearrangement of the water-resources sector and the irrigation subsector to create the requisite elements for managing and coordinating actions in the subsector, enhance the efficiency of investments and foster the rational and sustainable use of water resources. By means of investments, primarily in the improvement and rehabilitation of small irrigation systems, the program seeks to increase agricultural production in economically depressed areas with the aim of alleviating poverty among farmers in the lowest-income strata.

DESCRIPTION: The activities and actions included in the National Irrigation Program (PRONAR) have been divided into four components as follows:

(i) Institutional strengthening of the irrigation subsector. The National Directorate for Irrigation and Soils (DNRS) will be strengthened with a new organizational structure providing for a decentralization of

its activities in the country's three major watersheds that require irrigation and for the establishment of a national and departmental irrigation committees. Funding will be provided for studies to compile inventories of existing irrigation systems and potentially irrigable areas, reviewing of national irrigation policy and evaluation and transfer of publicly operated systems to their beneficiaries. The component includes also systematizing data on irrigation, and study grants for specialist training in irrigation.

- (ii) Support for water-resources management. Support will be extended for the enactment of a new water law. With a view to the implementation of the principles embodied in the new legislation, the program will provide funding for consultancies as needed for drafting general regulations under the law as well as regulations for each water-user sector. The component also calls for hiring consultants for the purpose of organizing a water authority and getting its operations under way.
- (iii) Technical assistance and training. This component, which will be financed by the Federal Republic of Germany and executed by the German Agency for Technical Cooperation (GTZ), is directed to placing the pertinent institutions, both governmental and private, in a position to channel and provide adequate services in the preparation and execution of rural irrigation projects. Training programs in irrigation-project identification, preparation and implementation will be conducted for the benefit of executing entities. Technical support will be given to the new structure of the DNRS in its new functions and activities.
- (iv) Investments in small irrigation systems. Investments in simple projects designed to rehabilitate or improve small irrigation systems - the total cost of which is not to exceed US\$350,000 or the cost per hectare US\$2,500 - will be financed through the Fondo de Desarrollo Campesino [Rural Development Fund] (FDC). Commitment of these resources by the FDC will be contingent on reaching the successive milestones agreed upon with the Bolivian government for the institutional reconfiguration of the subsector.

**ENVIRONMENTAL
CLASSIFICATION:**

The Environment Committee, at its meeting of July 29, 1994, classified this as a Category III operation. The Committee approved the environmental summary on October 4, 1995.

BENEFITS:

Strengthening and rearrangement of the institutions involved with the irrigation subsector, together with the establishment of an institutional and legal framework for the management of water resources, would create conditions for improving the economic and social efficiency of public investments in irrigation systems and of water use.

The program is designed to emphasize the concept of active community involvement in project identification, design and implementation, a concept that reinforces the government's strategy of decentralization and greater input from beneficiaries in local planning.

The transfer of public irrigation infrastructure to users will free up State resources, which will then be available to fund planning activities and technical support for irrigation development, with benefits for the population at large.

The focusing of investments on improvement of small irrigation systems is a low-risk, highly effective tool for reducing poverty and improving the living conditions of the neediest of Bolivia's rural population.

RISKS:

The impact of the present program at the national level and on the quality of activities it would be funding will depend to a large extent on implementation of the government's plans in the areas of water management and strengthening of the irrigation subsector. Actions taken with a view to minimizing this risk were the adoption of realistic proposals which the government is committed to supporting, and the linking of commitments of investment funds to the attainment of specific milestones toward institutional improvements.

The success of the program will depend on adequate coordination among the participating institutions. Every effort has been made to design a simple implementation scheme that emphasizes communication and clearly identifies the responsibilities of each institution.

With respect to the investment component, the FDC might not be capable of processing the larger volume

of operations the program is expected to generate. The adoption of a decentralization scheme and the provision for additional staff as part of the program are measures taken to minimize the likelihood of this occurring.

**THE BANK'S
COUNTRY AND
SECTOR STRATEGY:**

The Bank's strategy is focused on backing programs and projects designed to: (i) improve social conditions by extending continuous support to the strategy of public participation, investments and reforms in education, health and housing, especially at the basic services level, and for the benefit of the lowest-income groups; (ii) foster sustained economic development by promoting public investment with the object of spurring private investment in the productive sectors, directing investment toward an expansion of production for export and for consumption in the domestic market in accordance with sustainable-development criteria; and (iii) promote the modernization of the State and the strengthening of civil society.

POVERTY-TARGETING: The program meets the Bank's geographic targeting criterion and qualifies as a poverty-targeted investment (paragraph 5.18).

BIDDING PROCEDURE: Consultants will be hired in accordance with the Bank's current procedures. In the case of construction services, if the amount of the call for tenders exceeds US\$1 million the Bank's international bidding procedure will be followed. Construction contracts below that amount will be tendered using the procedures agreed on by the Bank with the FDC for the Program of Investments in Rural Development (PIDC). The threshold in the case of goods will be US\$350,000.

**SPECIAL
CONTRACTUAL
CONDITIONS:**

Conditions precedent to the first disbursement:

- (i) Presentation to the Bank of a subsidiary agreement signed by the borrower and the executing agency with the FDC, and of inter-agency cooperation agreements duly entered into by the National Directorate for Irrigation and Soils of the National Secretariat for Agriculture and Stockraising (SNAG/DNRS), the FDC, the National Secretariat for Civic Participation (SNPP), and the National Secretariat for Natural Resources and the Environment (SNRNMA) (paragraphs 3.4 and 4.1).

- (ii) The borrower shall submit evidence to the Bank of the appointment of the staff and the startup of the Program Coordinating Unit (PCU) (paragraph 3.7).
- (iii) Presentation, to the Bank's satisfaction, of the plan of operations of the technical-assistance component for the first year of the program, including the performance indicators to be attained during the three years of execution of the component (paragraph 3.18).
- (iv) Submit evidence that (a) the FDC has approved the operating regulations agreed upon with the Bank and put them into effect; and (b) the process of decentralization of responsibilities toward the departmental offices previously agreed upon with the Bank has been approved and put into practice (paragraph 3.26).
- (v) Demonstrate that the borrower has been notified by the German government that the latter has issued a directive authorizing GTZ's participation in the program for an amount of up to US\$2 million (paragraph 2.44).

Special contractual clauses:

- (i) Two months before the start of the second and each ensuing year of execution of the program, the borrower shall present to the Bank the annual plan of operations of the technical-assistance component for the year in question (paragraph 3.18).
- (ii) Prior to the start of the first construction project in a given department, the borrower shall present evidence that the departmental prefecture, the SNAG and the FDC have entered into an agreement delegating to the latter entity the responsibility for construction of the works envisaged in PRONAR and their subsequent transfer to the intended beneficiaries (paragraph 3.24).
- (iii) The FDC will require, in the certificate of final acceptance of each works project delivered to a community, that the community report to the FDC annually, for five years following completion of the irrigation works, on the maintenance of the works (paragraph 3.43).

- (iv) Within three months after the loan is declared eligible for disbursement, the borrower must hire the technical officers for DNRS strengthening agreed upon with the Bank (paragraph 2.9).
- (v) Investments in new irrigation infrastructure in areas not currently farmed under irrigation may not exceed 15% of the total investment-component allocation (paragraph 2.30).

Special conditions for investments:

- (i) Before funds may be disbursed for the investment component, the borrower must have added the new additional technical staff agreed upon with the Bank for the FDC, SNPP and SNRNMA (paragraph 2.5).
- (ii) Commitments of the proceeds of the loan for the investment component will be contingent on attainment of the milestones specified for each of the groups of activities described below. No disbursements may be made or funds committed until the first group has been completed. Up to 45% of the funds may be committed after the first group has been completed; up to 30% after completion of the second group; and the remaining 25% after completion of the third group. The order of completion of the second and third groups is interchangeable.

First group. Consists of: (i) creation, adoption of regulations for, and implementation of the National Irrigation Committee and Departmental Irrigation Committees; and (ii) submission of a consensual draft bill of a Water Law to the Parliament by the Executive Branch.

Second group. Consists of: (i) approval and implementation of the general and sectoral regulations of the Water Law; and (ii) creation, implementation and start-up of the Water Authority.

Third group. Consists of: (i) transfer to the communities of the six systems of Punata, Tiraque, Huarina-Peñas (Suriquiña), Tupaj Katari, Uyuchama, and Culpina; and (ii) submission of feasibility studies on the transfer of the systems of Angostura, Tacagua, San Jacinto, Villamontes-Sachapera, and Abapó-Izozog.

I. FRAME OF REFERENCE

A. The irrigation subsector

1. Characteristics of the subsector

- 1.1 The areas of Bolivia under irrigation are located in the arid and semiarid zones of the three major watersheds making up the country. These zones correspond to the regions of the altiplano (high plateau), inter-Andean valleys and Bolivian Chaco. There is no complete inventory of irrigation systems in the country. Based on the latest partial inventory, taken in 1991, it is estimated that 7% of Bolivia's cultivated area (about 100,000 hectares) is under irrigation. Some 73% of this area corresponds to what are known as small campesino or private irrigation facilities with a watering area that averages 1.1 hectares of land per household, such facilities being located mainly in the altiplano region and the inter-Andean valleys. The size of such systems ranges from 10 to 500 hectares, and the irrigated area per household from 0.5 to 1.5 hectares. The total number of households using such traditional systems is estimated at approximately 65,000.
- 1.2 Historically, public investment in the construction of irrigation systems has been low. More significant interventions of the State in the irrigation subsector, either alone or in association with bilateral aid organizations, began at the start of the 1970s with some medium-sized projects. In the period from 1970 to 1994, public outlays for irrigation amounted to US\$108 million, including preinvestment costs, 80% of which were covered by bilateral grants and financing.
- 1.3 Another significant State initiative in the construction of irrigation systems was triggered by the severe drought of 1983. In contrast to its efforts cited in the previous paragraph, the government, with the financial support of international agencies and friendly governments, drew up an emergency plan designed to alleviate poverty in the areas hardest hit by the drought, by means of investments to improve the efficiency of irrigation in rural microsystems. This action had significant impact: 558 projects were financed for the benefit of a total of 18,600 families. The ex post evaluation of the plan, which was performed by an interagency team with the cooperation of the donor agencies, revealed, in general terms, positive results.
- 1.4 Generally speaking, there are three types of irrigation systems in Bolivia: (a) public, (b) semipublic, and (c) private. At the present time there are 12 systems that can be characterized as public or semipublic, with some State involvement in operation and maintenance, although in most of them farmers are organized into user committees which are playing a larger and larger role in the

management of such systems. Nevertheless, most of the area under irrigation is served by small private systems managed and maintained by organized communities.

2. Irrigation, poverty and farmer organization

- 1.5 Irrigation in Bolivia has traditionally been practiced by rural (campesino) communities in the country's highlands. The vast majority of the irrigation systems are small, rudimentary operations which use water inefficiently. Most were built by local farmers, organized in communities, who did the work themselves. These community systems usually consist of rustic dams, simple catchment structures and excavated canals and may be regarded as incomplete systems of limited scope. However, they also offer ample possibilities for improvement and extension at a relatively low cost.
- 1.6 The use of irrigation in these regions goes back to pre-Columbian times. The predecessors of the various indigenous cultures that inhabit this region had already constructed rudimentary systems that enabled them to experiment with irrigation and create a culture centered around the use of water. Campesinos here have a strong tradition of community action, cooperation and organization, rooted in their culture and in the struggle against a harsh rural environment with its punishing climate, soil and water conditions. The people of these regions have developed solid systems over time for the equitable distribution of water rights among the residents of communities. They have also established rules for the judicious use of water for irrigation and other purposes, covering such matters as the communal management of water at the source, its conveyance to individual parcels of land, and the apportionment of water rights under a system based on time of use of the water available from the sources.
- 1.7 This particular feature of irrigation-based organization and tradition among the communities of the altiplano and the inter-Andean valleys provides a means through which resources can be channeled for the alleviation of poverty. Seen in this light, investments targeted to small irrigation systems constitute a low-cost, low-risk alternative for the mitigation of poverty through an increase in farm output at the level of agricultural units. The tradition of community irrigation and organization reduces the risks that would be associated with an effort to improve agricultural yields through the introduction of new technologies.

3. Problems and constraints

- 1.8 Given the limited scope of investments in the past, the irrigation infrastructure is in very poor condition. While it is true that the community does periodic maintenance work on private systems, which are in the majority, some structures such as water intakes, dams and lined canals have reached the end of their useful life and

need to be improved. As a result of this wear and tear, the efficiency of such systems is extremely low and limits the possibilities of increasing farm production.

- 1.9 The bulk of the funds invested in irrigation systems comes from initiatives of friendly governments and bilateral agencies. Such investments are widely dispersed and are not well coordinated, which limits their economic efficiency. In many cases, the projects are designed without the knowledge of the campesino organization and without due consideration to community aspirations. This results in irrigation systems which are hard to operate and fall far short of the original objectives.
- 1.10 The scant resources at the disposal of the agency in charge of regulating irrigation in Bolivia - the National Directorate for Irrigation and Soils (DNRS) - are devoted, for the most part, to the management and operation of the public and semipublic systems. Some of these, which are medium-sized systems, i.e. generally larger than 500 hectares, suffer from deficiencies that the government's meager intervention has not succeeded in overcoming. These deficiencies are associated mainly with the limited attention given to production-related matters, problems of community organization and scant input from communities in the conception of the systems, and environmental problems. In some systems, where the community is well organized and plays a larger role in the administration of the system, the allocation of responsibilities between the State and the community is not clearly defined; this leads to problems in system management and operations. Transferring such systems to the beneficiaries would make the latter responsible for maintaining them and enable the DNRS to devote itself to tasks which are more appropriate to the State, i.e. planning of sector activities pertaining to the coordination and targeting of investments in irrigation.
- 1.11 The country has a shortage of human resources trained in the identification, preparation and implementation of irrigation systems. As a result, some systems are poorly designed and fail to meet community needs. For example, many of the irrigation projects submitted for financing under the program of investments in rural development (PIDC) currently being implemented by the Rural Development Fund (FDC) are poor in quality, resulting in delays and rejected projects. Training in the design and operation of irrigation systems is a critical need for the so-called executing entities (EEs), most of which are nongovernmental organizations, given their future responsibility for the preparation of projects resulting from the public participation process referred to below.

4. Institutional and legal framework for the management of water resources

- 1.12 The institution responsible at the national level for the development of water resources for agricultural production is the National

Directorate for Irrigation and Soils (DNRS), an agency of the Secretariat for Agriculture. However, the DNRS does not have the staff and resources it needs for the performance of its function and is barely able to supervise the irrigation districts under its charge, which cover approximately 15,000 hectares. In addition, there is a duplication of functions among the various governmental institutions active in the sector, which leads to problems in the management of water resources and the coordination of the various efforts under way in the sector by international donor agencies and regional agencies.

- 1.13 The existing legislation on water rights and uses dates from 1906 and is antiquated and inadequate since it has never been updated to adjust it to present needs. This does not affect the irrigation sector alone, but all water-use sectors, public as well as private. The absence of a sound legal framework in the water sector as a whole acts as a disincentive to further investments and creates confusion among the agencies operating in the sector.
- 1.14 The present legislation makes no provision for an agency to regulate water resources. As a result, there are no water ownership records available for the management of water use. The institutional weaknesses and deficient legal framework have prompted disputes among the various water-use sectors such as mining, agriculture, industry, fisheries and potable water supply.
- 1.15 The Government of Bolivia has been promoting a number of legal and institutional measures to set in place a legal and institutional framework for the orderly management of renewable natural resources. As part of this coordinated effort, an environmental law was enacted in 1992, a forestry law is in the final stages of approval and a draft land-use bill is being discussed with affected groups and is expected to be approved in mid-1996.
- 1.16 Enactment of a new water law is also part of this package of legal instruments designed to improve the management of water resources. During the preparation of this National Irrigation Program (PRONAR), consultants were hired with government funds to draft a water law. Discussions on the draft bill with concerned sectors of civil society, to seek a concerted approach, and with the pertinent committee of the Bolivian Congress are now nearing completion. It is expected that the bill can be submitted to Congress by the end of 1995 and its approval is anticipated by mid-1996. The program will support the follow-up and presentation of the proposed water law to the Legislative Branch and the subsequent approval of its regulations.
- 1.17 The new law would lay down the basic principles to govern the use of water resources. The following are significant departures from the 1906 law: (i) the establishment of a right of use and dominion as opposed to riparian rights, with both rights and obligations of users specified; (ii) the institution of private-sector concessions

for the use of water and the transferability of such concessions by the awardee; (iii) the establishment of a public registry of water-use rights; (iv) the planning of resources at the community level on the basis of municipal plans consistent with the civic participation law and the law on the environment and guided by plans at the watershed and national levels; and (v) establishment of a water authority in charge of water-use regulation, oversight and concessions.

- 1.18 The draft bill of a water law strikes a balance between the interests of civil society, the role of the State and environmental protection while also allowing room for maneuver so that, consistent with the country's conditions and characteristics, provision for exploring and adopting more innovative approaches may be made through regulations under the law.
- 1.19 In the matter of rates, Bolivia has no charge for the use of water for irrigation. Even in the systems still under State management, there is no charge for operation and maintenance, primarily because so little maintenance is done by the State and because in most cases the communities have been assuming de facto responsibility for maintaining the facilities. With respect to the recovery of investment costs, the arrangement that has been used for improvements to the systems has been for the communities to contribute a percentage of the cost of the works, normally 20%, in cash or in the form of labor.
- 1.20 In short, from an institutional standpoint the present situation of the water-resources sector and the irrigation subsector in Bolivia may be characterized as follows: (a) the existence of antiquated water legislation that fails to meet the urgent need for orderly management and development of the country's water resources; (b) the absence of a water authority responsible for the management of water resources; (c) institutional weakness and operational limitations of the entity responsible for the irrigation subsector; (d) no national planning system; (e) uncoordinated intervention of a number of government agencies in the development and implementation of irrigation projects; and (f) a limited supply of local human resources with expertise in the planning and management of water resources and the development of irrigation.

B. Situation in the agricultural sector

- 1.21 The agricultural sector plays an important role in Bolivia's economy and is a key factor in its social development as well. The sector is a major contributor to GDP, accounting for an average of 17% in the years from 1990 to 1993 and - more important - provides employment to 50% of the country's labor force.
- 1.22 Primary-sector activity in Bolivia is divided into three clearly delimited zones: the altiplano or high plateau region, with elevations of 3,000 to 5,000 meters above sea level; the

inter-Andean valleys, 1,500 to 3,000 m.a.s.l.; and the tropical region, with elevations of less than 1,500 m.a.s.l. These regions occupy, respectively, 17%, 13% and 70% of Bolivia's land area of 1.1 million square kilometers. Seventy-four percent of the country's population lives in the two highest regions, the altiplano and the inter-Andean valleys.

- 1.23 Bolivia's potentially arable area measures approximately 28 million hectares, 5% of which (1.4 million hectares) is currently under cultivation. The limitations of the agricultural frontier are particularly acute in the inter-Andean valleys and altiplano regions, with their harsher topography and climate and poorer soils, and with less water available for agriculture. This means that in roughly 40% of the country, where most farming is done by campesinos, agriculture is subject to water shortages that make dry farming a high-risk activity.
- 1.24 The output of the agricultural sector comes mainly from modest units worked by small farmers. The prevailing land-tenure structure reflects an overfragmentation and highly uneven distribution of the land: farm units smaller than 5 hectares account for 68.3% of the total number of units but occupy only 1.4% of the land, while units larger than 500 hectares, situated mainly in the tropical zone, account for only 1.8% of the total but occupy 85.3% of the land. These conditions have led to the existence of high population densities in rural areas of the inter-Andean valleys and altiplano which have prompted heavy migration of local campesinos, mostly to the country's major urban centers.
- 1.25 Gender is an important factor in the agricultural sector of Bolivia, especially in matters pertaining to water and irrigation. Women have traditionally borne the primary responsibility for ensuring a supply of water in the home and also share responsibility for the use of water in agricultural production. These responsibilities are increasing as a result of the heavier outflow of men in search of employment opportunities, which often leaves women in charge of farms.
- 1.26 Campesino farming, mainly in arid and semiarid areas of the altiplano and the inter-Andean valleys, is the leading productive segment of Bolivian agriculture. Its output, according to sector statistics, accounts for 60% of the gross value of agricultural production and for most of the basic commodities forming part of the national diet. Campesino farming is oriented basically toward the domestic market. In contrast, the typical export crops such as soybeans, sugarcane, cotton and rice are products of commercial farming, which is practiced in the country's tropical areas, where the greatest potential exists for expansion of the agricultural frontier.
- 1.27 As a result of far-reaching economic stabilization measures and the reduction of State intervention in the agricultural sector in 1985

and ensuing years, the sector is at present virtually free of economic distortions and the State is not intervening in the setting of prices. Nevertheless, the response in terms of added agricultural output has fallen short of expectations, resulting in an average yearly growth of 1.1%, well below the population growth of 2.8%.

- 1.28 The precarious state of the irrigation infrastructure places a significant constraint on the growth of campesino agriculture, as does the present system of water-resources management. For agriculture in general, the principal growth-limiting factors are associated mainly with the absence of support in matters of education, land titling, credit access, rural infrastructure, including irrigation, and agricultural research and extension.
- 1.29 The proposed investments under PRONAR will be targeted to areas which are subject to constraints in terms of climate and topography and where land tenure is highly fragmented; accordingly, it is not their purpose to produce an impact on the country's agricultural output. Investments geared to that purpose would probably have to focus on the tropical plains, where a more modern export-oriented type of farming prevails. The principal purpose of the investments under the program, which are aimed at improving small irrigation systems, is to mitigate the poverty of campesino farmers. Although an increase in farm output is expected to occur, this being necessary if the living conditions of this population are to improve, the impact of such an increase on the country's total farm output would be very slight and would probably not in itself justify the investments.

C. The Civic Participation Law

- 1.30 As part of the decentralization process being implemented by the Government of Bolivia, a Civic Participation Law was approved in April 1994 with the key objective of fostering community participation through a decentralization of political authority and better allocation of public revenues. With the creation of decentralized mechanisms (Watch Committees), civil society has been provided with a means of monitoring the use of public funds. The purpose is to strengthen rural municipalities and communities to enable them to manage their own development on a sustainable basis.
- 1.31 Implementation of the strategy called for in the Civic Participation Law entails - in addition to transferring responsibilities for health, education, irrigation and rural roads to municipal authorities - assigning a leading role to local and decentralized public institutions, and particularly to the 600 or so NGOs that operate in the country, some of which have extensive experience and links with the rural communities.
- 1.32 To help community aspirations materialize into projects, the Civic Participation Law set up a "participative planning procedure"

according to which communities, operating as grassroots organizations encompassing a given area, identify the investments needed for their development and, through executing entities (NGOs or government agencies), place them before the Municipal Council which, by consensus, prioritizes them and designs the municipal development plan. The project identification and prioritization procedures envisaged in the Civic Participation Law will be followed in the irrigation-system investments proposed in PRONAR, thereby furthering the government's efforts in this area.

D. Action of international organizations

1. Participation of the Bank

- 1.33 To date, the Bank has approved 15 loan operations totaling US\$275 million to finance projects in Bolivia's agricultural sector. Only three of those operations, for a total of US\$157 million, have been approved for the sector since 1980, all of them for agricultural credit programs. One of the latter programs, financed by loan 830/SF, is still under way, with 98% of the funds disbursed.
- 1.34 For the irrigation subsector specifically, the Bank provided loan 579/SF-BO for agricultural development in the Bolivian Chaco, approved in 1979 and now fully disbursed, which included funding for irrigation systems. And by means of loan 901/SF-BO (program of investments in rural development - PIDC), approved in 1993 and currently being implemented, the Bank is extending support to small farmers in the form of financing for production activities, including irrigation. A separate section of this document is devoted to the PIDC.

2. International agencies

- 1.35 Bilateral grants and loans from international cooperation agencies have provided a significant share of the financing for irrigation projects. About 80% of the total investment in irrigation projects in the past 25 years, estimated at US\$105 million, has come from international agencies. The principal sources of external financing have been, in order of importance, Germany's KfW and GTZ, the Italian cooperation agency, the Government of Argentina, Canada's CIDA, USAID, the European Community, and UNDP.

3. World Bank

- 1.36 The World Bank recently approved a US\$31 million Rural Communities Development Project for which the World Bank and other sources are providing a total of US\$21.6 million in financing. The project seeks to support the current efforts of the Bolivian government to implement and apply the mechanisms of the public participation process by helping to strengthen the institutions involved in the process, particularly municipalities and community organizations, and by providing training to them.

- 1.37 The project, which covers 94 provinces, includes the following components: (i) formulation and identification of rural investment projects. This component will provide technical assistance to the municipalities and community-based organizations comprising larger municipal groupings, to improve their organization and effectiveness in the area of project identification, design and preparation; (ii) training for public and private organizations in the participatory planning method and in administrative and technical areas; (iii) institutional strengthening of the National Secretariat for Civic Participation (SNPP) and the FDC, especially at the departmental level, to enable the FDC to decentralize its operations; and (iv) investments in small rural infrastructure projects, including irrigation, which would be channeled through the FDC using the same criteria followed in the PIDC. The amount earmarked for investments comes to US\$13.2 million.

E. The Program of Investments in Rural Development

- 1.38 The Rural Development Fund (FDC) was created in 1989 to channel resources into the promotion of small-scale farming. The FDC is the only national institution devoted exclusively to rural development and, as such, has received significant bilateral support from the Netherlands, Switzerland, Sweden, Belgium, Germany and others. In 1993, the Bank approved loan 901/SF-B0 in the amount of US\$12.5 million for the program of investments in rural development (PIDC). When bilateral financing was added in, a total of US\$34.5 million was made available for the program. The loan was declared eligible for disbursement in April 1994.
- 1.39 Execution of the PIDC is divided into three components: (i) infrastructure; (ii) production support; and (iii) institution-strengthening. The execution of the program has been generally satisfactory with respect to FDC performance in the promotion, identification, review and approval of projects. At this writing (40% of the implementation period having elapsed), 66% of the funds have been committed, 26% of them for irrigation projects. The FDC institution-strengthening component has been completed.
- 1.40 Although, as reflected in the foregoing figures, the FDC's performance in the execution of the program has been technically and administratively satisfactory, some difficulties have begun to arise in keeping disbursements on schedule. Disbursements to date have included US\$5 million in Bank funds and US\$4.3 million in local counterpart funds, for a total of US\$9.3 million, which is 27% of the total estimated amount of the PIDC, US\$34.5 million.
- 1.41 The constraint on increasing disbursements has been the contractual disbursement ratio, which was set at 36% IDB to 64% local contribution; this ratio gives a very heavy weight to local funds, estimated at US\$22 million, the bulk of which is to come from grants from friendly countries such as Germany, Japan and Belgium. Owing to delays in the delivery of local funds, the disbursement

rate now stands at 54% IDB to 46% local, which has made it necessary to reduce the disbursement of IDB funds in order to improve that ratio. The government is endeavoring to expedite counterpart disbursements, which are dependent on agreements and negotiations between the donors and the Government of Bolivia.

- 1.42 In July 1995, as part of the preparations for PRONAR, the Bank financed a consultancy to conduct an ex post evaluation of irrigation projects financed by the FDC, in order to obtain information on the results being achieved and problems which have arisen, and introduce adjustments that needed to be made for implementing PRONAR. The consultants visited a sample of 21 projects representing 30% of all the irrigation projects approved to date by the FDC. Of the 21 projects, eight had been completed and 13 were well advanced.
- 1.43 The consultants' final report concluded that, generally speaking, the FDC was carrying out its small-irrigation program in a satisfactory way. Most of the projects were properly focused on poor campesino households. Also noted were the efforts being made by the FDC to improve the quality of the program through decentralization, strengthening its departmental offices and upgrading its procedures.
- 1.44 The evaluation revealed some shortcomings in the economic analysis of projects and noted the absence of procedures to secure community involvement at an early stage of the projects so as to encourage a sense of local ownership. The consultants further recommended an improvement of the procedures for verifying and monitoring the level of beneficiary contributions and a tighter application of oversight procedures. In addition, weaknesses in technical and project-management areas were found at the executing-entity level.
- 1.45 The principal conclusions and recommendations of the consultants were discussed with the FDC and served as a basis for changes in the institution's operating regulations and procedures, decided upon in the course of the analysis mission, which are described in chapter III of this document.

F. Conceptualization of the program

- 1.46 The program proposal originally submitted to the Bank, prepared with the help of the FAO, envisaged a number of institutional-improvement efforts but was directed more particularly to the implementation of a program of irrigation investments that included both small projects and projects larger than 500 hectares, its total cost being approximately US\$50 million. Initially, the Bank indicated that it would support a program of institutional and legal improvements for the subsector prior to financing irrigation investments. Subsequent discussions with the Bolivian authorities led to a conceptualization of the program that emphasizes irrigation-subsector and water-resources management and also

includes an investment component, but one focusing this time on small-irrigation-system improvement projects costing less than US\$350,000. Inclusion of the investment component in the program is justified from three points of view: (i) the improvement of small irrigation systems is a proven and efficient way of mitigating poverty in the Bolivian countryside; (ii) the investment component would complement the PIDC and, like that program, would be executed by the FDC, which has achieved good results in its action in support of small farmers; and (iii) the investments would be contingent on advances in the institutional reconfiguration and would therefore stimulate progress on the institutional and legal improvements.

- 1.47 Accordingly, PRONAR is designed as a means of addressing the major institutional and legal constraints to the development of irrigation in Bolivia, especially small-scale irrigation. To this end, it focuses on institutional strengthening of the DNRS to create a smoothly-operating and solid internal structure that enables the agency to perform its functions. For purposes of institutional coordination, and to make for rational investments in irrigation, provision has been made for the establishment of irrigation committees at the national and departmental levels. Wherever appropriate, action under the program will be implemented on a decentralized basis, with activities focused on the three main watersheds of the arid region of Bolivia: Río Grande, Altiplano, and Pilcomayo.
- 1.48 In addition to strengthening the structure of the DNRS, PRONAR would finance studies that would provide it with the means of discharging its mandate to regulate and oversee irrigation. Such studies would improve the information on existing systems and potential development areas and would generate data for framing national irrigation development policies to efficiently steer public and private investment in the subsector. The program would also support the government's policy of fostering greater private-sector participation in the operation of public infrastructure facilities by encouraging the transfer of State-run irrigation systems to communities.
- 1.49 Because irrigation matters are so closely tied to, and dependent upon, the management of water resources in general, the program will support actions designed to improve the institutional and legal arrangements affecting water resources, with the aim of eliminating the major obstacles to their development. To that end, it would support the processing of a new water law and general and sectoral regulations thereunder. The law would provide a basis for the creation of a water authority, which in turn would make it possible to set up a water ownership registry, grant concessions and resolve conflicts. The program would support this first essential step toward the establishment of more advanced policies with respect to the use and value of water.

- 1.50 The constraint associated with the limited technical capacity of public and private entities to produce good-quality irrigation projects will be addressed by PRONAR through a program of systematic technical assistance to such entities.
- 1.51 The improvement of small irrigation systems in Bolivia has proven to be a highly valuable instrument for channeling public resources into the mitigation of poverty. The inclusion of investment funding to this end in PRONAR is intended primarily to support actions aimed at the abatement of rural poverty. In addition, to further the institutional reconfiguration and improvements contemplated in the program, the investments will be tied to the implementation of specified measures in the institutional components.

II. THE PROGRAM

A. Objectives and targets of the program

1. General objectives

- 2.1 The program is aimed at structuring institutions and devising a legal framework for the water-resources sector and the irrigation subsector to create the requisite elements for managing and coordinating actions in the subsector, enhance the efficiency of investments and foster the rational and sustainable use of water resources. By means of investments, primarily in the improvement and rehabilitation of small irrigation systems, the program seeks to boost agricultural output in economically depressed areas with the aim of alleviating poverty among the lowest-income rural population.

2. Specific objectives

- 2.2 The actions provided for in the program have been focused on attainment of the following objectives:

- (i) create an institutional and legal framework for the efficient management of water resources in the various user sectors;
- (ii) strengthen and reconfigure institutions working with the irrigation subsector so as to create an appropriate institutional framework for the development of irrigation;
- (iii) provide training to public and private institutions to enable them to offer better services in the preparation and implementation of irrigation projects;
- (iv) improve income and living conditions for rural inhabitants;
- (v) support the approach of involving communities as active participants in the planning of their development strategies and improving the technical capabilities of public and private institutions pursuant to the Civic Participation Law; and
- (vi) support the government's strategy of transferring public irrigation infrastructure to private-sector management.

B. Description of the program

- 2.3 The activities and actions included in the National Irrigation Program (PRONAR) have been divided into four components:
- (i) institutional strengthening of the irrigation subsector;

(ii) support for water-resources management; (iii) technical assistance and training; and (iv) investments in small irrigation systems.

1. Coordination and execution arrangements (US\$2,600,000)

- 2.4 The mechanism for coordination and execution includes the creation of an executing unit within the National Directorate for Irrigation and Soils (DNRS) for the overall coordination of the program. The Program Coordination Unit (PCU) planned will be headed by a coordinator and have a total staff of 11, including administrative personnel. This category includes also the costs of support services to be extended to the program's coexecuting agency, the Rural Development Fund (FDC), to which end provision has been made for hiring three program officers, one for each watershed, and two headquarters support staff. It includes the purchase of computer equipment (four computers and printers) and three vehicles.
- 2.5 Program funds will be used to hire two technical officers for the Secretariat for Natural Resources and the Environment (SNRNMA) to coordinate the studies on management of water resources and environmental review of projects. This allotment will also cover the purchase of three computers. Program funds will also be used to second three officers, i.e. one to be stationed in each of the watersheds to be served by the program, to the other agency participating in the program, the National Secretariat for Civic Participation (SNPP), which will assist in the identification of projects and their processing pursuant to the Civic Participation Law. The costs of the coordination and implementation mechanism will be defrayed in part with funds from the loan. The new technical staff must be in place in the FDC, SNPP and SNRNMA before funds for the investment component may be disbursed.

2. Institutional strengthening of the irrigation subsector (US\$1,660,000)

- 2.6 This component includes various actions and activities aimed at improving the subsector's organization and strengthening the functional structure of the DNRS; several studies to improve the available information on existing projects and potential irrigation areas; and an evaluation of public systems with a view to their possible transfer to the private sector. Details on each of these activities, as well as the terms of reference for the consultancies, are available in the technical files of the program. A summary of the principal activities is presented below.
- 2.7 Strengthening of the National Directorate for Irrigation and Soils (US\$660,000). The staff of the DNRS is limited at present to one professional, who serves as director, a secretary, and a support technician. As a part of PRONAR, the organizational structure of the DNRS will be modified and expanded, establishing two units, one for Planning and Promotion and the other for Standards and

Monitoring. The former will be in charge of setting up systematic planning procedures, developing strategies, and promoting plans and programs. The duties of the Standards and Monitoring Unit will consist primarily in developing and disseminating technical standards, guidelines, manuals and procedures and maintaining institutional coordination with other ministries and agencies involved in the use of water resources.

- 2.8 At the regional level, three Watershed Operations Units will be established, one in each of the three major watersheds in the parts of the country requiring irrigation, which will be covered by PRONAR. These units, with the support of technical-assistance teams, will implement and monitor the decentralized activities of the investment and institution-strengthening components.
- 2.9 The additional employees to be recruited for the new proposed structure, which will be retained at the end of PRONAR, will be financed with Bank funds in the first three years of the program. As of the fourth year, 50% of their salary cost will be defrayed with local counterpart funds, and the Bolivian government would undertake to engage these employees under the civil service program, as DNRS line officers. In accordance with this arrangement, the program would finance the salaries of seven professionals: two in the Planning and Programming Unit, two in the Standards and Monitoring Unit, 1/ and three for the Watershed Operations Units. These officers are to be hired within three months after the loan becomes eligible for disbursement.
- 2.10 The program's activities for improving the organization of the subsector would include setting up the National Irrigation Committee (NIC) and Departmental Irrigation Committees (DICs). The NIC would be responsible for working out policies and formulating strategies for the development of irrigation at the national level and for approving all irrigation projects. The DICs would exercise the same functions at the departmental level, with authority to approve irrigation projects costing less than US\$350,000.
- 2.11 Inventory of irrigation systems and identification of potential irrigation areas (US\$140,000). The purpose of these activities would be to update and improve the DNRS project inventory and identify and catalog areas that offer potential for development with irrigation. Five local consultants would be hired for a period of a year for this work. The studies would be carried out under the direction of the Watershed Operations Units and coordinated by the Program Coordination Unit.
- 2.12 Irrigation-development planning and framing of a national irrigation policy (US\$390,000). The end product of this activity

1/ One of these officers would coordinate the technical-assistance component during the execution of the program.

would be a medium-range regional irrigation-development plan for each of the major watersheds making up the action area of PRONAR. This planning effort, the first of its kind in Bolivia, would follow the updating of the inventory of existing irrigation systems and potential irrigation areas. In addition, a national irrigation policy would be drafted and submitted to the National Irrigation Committee for approval. An international consultant would be hired for a total of 18 months, spread over three years, to perform the studies with the assistance of three Bolivian experts, each of whom would be hired for 36 months.

- 2.13 Operational evaluation of irrigation systems (US\$105,000). At the present time there are 11 irrigation systems which are classified as public or semipublic, are still State-owned, and are still receiving some measure of public support for their operation and maintenance. The government has expressed its clear intention of transferring these systems to their users. PRONAR would be supporting these efforts by commissioning studies to examine and determine the appropriate timing, procedures and institutional and legal formalities for transferring these systems to end users.
- 2.14 Six of the 11 systems referred to above would be transferred during the implementation period of PRONAR. In the other five systems, serious problems with user organization or environmental impact have been identified and additional studies in greater detail will be needed. A high-level international consultant would be hired for two months and three local experts for a total of 28 person-months to do those studies.
- 2.15 National information system and registry of systems (US\$155,000). The information currently available on irrigation, the inventory of existing systems, soil and hydrometeorology data and so forth is scattered throughout a number of institutions. Some important information was collected during the preparations for PRONAR, and a large amount of additional information is expected to be gathered in the course of the program, specifically with the updating of the project inventory and the determination of potential irrigation areas. This information will need to be processed and systematized to make it useful to users.
- 2.16 The object of this subcomponent would be to consolidate and expand the ongoing effort by the DNRS to set up an Integrated Irrigation Information System (IIIS) by: (i) updating the modules for inventorying irrigation systems and proposals and recording basic data on agrometeorology and hydrology; (ii) creating modules for information on potential irrigation areas, climatology and basic population data and for monitoring active projects and systems in production; and (iii) classification of data on soils suitable for irrigation. Provision is included for the purchase of computers and software, including geographic information systems. The program will finance the hiring of a systems consultant and an operator for the four years of implementation.

- 2.17 Specialized human-resources training (US\$210,000). Program funds will be used to finance graduate studies in areas of water-resources planning; management, operation and maintenance of irrigation systems; environmental impact assessment; on-farm water and irrigated-land management; and economic and social appraisal of irrigation projects. Three study grants will be awarded at the master's level and three for one-year specialization courses.
3. Support for water-resources management (US\$505,000)
- 2.18 A description of the activities making up this component is given in the following paragraphs. The consultants will be working in close coordination with the government in preparing their proposals and with the Bank to ensure compatibility between their approaches and the Bank's in the area of water-resources management. The terms of reference for the consultancies for this component are available in the technical files.
- 2.19 Organization and start-up of the National Water Authority (US\$200,000). The draft bill of the water law calls for the creation of a water authority whose functions would include, inter alia, sectoral regulation of water resources, resolution of water-use conflicts, awarding of concessions, and enforcement of the water law.
- 2.20 Resources of the program would be used to finance the studies and the preparation of technical and legal documentation and proposals required for the creation and implementation of the water authority. This includes drafting the authority's by-laws and operating regulations, organization chart, job descriptions, salary scale, and so on, as described in greater detail in the terms of reference. A total of 60 consultant-months, including consultants in public administration, water resources, computer systems and legal issues, is programmed for this activity.
- 2.21 Most of the personnel and equipment to be used by the water authority will come from the consolidation of units of the Ministry of Sustainable Development and of other agencies currently performing functions that would be absorbed by the water authority. Creation and implementation of such an authority is one of the institutional milestones to be attained by the Government of Bolivia in order for funds to be released for the investment component.
- 2.22 Drafting of general regulations (US\$155,000). Once the water law has been passed, its general enabling regulations will need to be drafted. This activity will proceed concurrently with the organization and start-up of the water authority, since the two activities are complementary. As stated previously, the water law will establish the basic principles, but provisions governing water use and the administration of the law will be spelled out in detail in the regulations. The technical and legal requirements set out therein will constitute the legal foundations for operation of the

water authority. These general regulations will also serve as a basis for developing the sectoral regulations described below.

- 2.23 Six months is foreseen as the period needed for the consulting services to develop these regulations. This calls for hiring an international expert with extensive experience in the water-resources area, an international economist with experience in the valuation and efficient use of water, a local consultant in water-resources engineering, and a specialist in legal aspects of water legislation. The terms of reference for the consultants provide for an analysis of all schemes that are feasible in the light of the country's laws, conditions and special characteristics, with a view to ensuring optimal efficiency in the use of water, including its economic value in the markets, consistent with the environmental-protection requirements set forth in the nation's environmental law.
- 2.24 Drafting of sectoral regulations (US\$150,000). In order that the water authority may perform its functions effectively and in accordance with the principles enshrined in the proposed water legislation, specific regulations will need to be developed for each water-use sector, to supplement the set of general regulations. Funds of the program will be used to hire an international consultant, who will act as coordinator, and 12 local consultants for three months to perform the studies and develop regulations for each sector. The coordinator will review and adjust the preliminary terms of reference prepared for the consultants in the various specialties. The task of the consultants will be to develop specific water-use regulations for the following sectors: irrigation, drinking water supply, energy, inland navigation, mining and metallurgy, industry and tourism. These regulations will provide the future water authority with the requisite working tools for granting concessions and resolving conflicts over the use of water in the various sectors involved.

4. Technical assistance and training (US\$2,560,000)

- 2.25 The general purpose of the technical-assistance component is to enable governmental as well as private-sector institutions to channel and render adequate services, each in accordance with its mission and functions, in connection with the preparation and execution of small-scale irrigation projects.
- 2.26 Implementation of the provisions of the Civic Participation Law as they relate to project identification, preparation and evaluation is to be based on teamwork among communities, the so-called "executing entities" (EEs) and municipalities. Most of the EEs are NGOs, but others may be government or quasi-public local institutions. The technical-assistance component is intended to train EEs and thereby build up technical capabilities that will make it possible for community proposals to materialize into irrigation projects.

- 2.27 The assistance component will be financed by the Federal Republic of Germany and executed by the German Agency for Technical Cooperation (GTZ). Its activities will be carried out in decentralized fashion by means of technical-assistance units situated in each of PRONAR's action areas or watersheds, i.e. Río Grande, Altiplano and Pilcomayo. The main technical-assistance office will be located in the city of Cochabamba, in the Río Grande valley, and will have approximately 15 employees, between professional and support staff. The program calls for the purchase of vehicles, computers and office equipment for these units. It also includes provision for hiring international consultants on a short-term basis to deliver training courses and technical assistance to the EEs.
- 2.28 The technical-assistance activities are focused mainly on strengthening the EEs to train them and enable them to produce better projects, especially from the self-management standpoint, through intensive beneficiary participation in project identification, preparation and implementation. This is what is called the "PRONAR approach." The sense of ownership and active involvement of the community at each stage of the project has been regarded as the best guarantee of success for the projects. GTZ has acquired extensive experience in this regard through the financing of several irrigation systems, especially under the Inter-Valley Irrigation Program (PRIV), which was highly successful in its use of this approach.
- 2.29 The technical-assistance component includes also a segment of on-farm applied research to identify, generate and disseminate farming practices that make more efficient use of water and soil under traditional irrigated-farming systems. The segment would complement and reinforce the technical assistance on the productive aspects of irrigation systems and, in the intermediate run, would help raise productivity levels in small-scale farming. It calls for field trials of water-management techniques under different soil and crop conditions, to be carried out through a pooling of efforts by the National Irrigation Directorate, the Bolivian Institute of Agricultural Technology (IBTA), nongovernmental organizations and beneficiary rural communities. Its concept and structure are supported by the favorable experience acquired by IBTA in its field studies with NGOs and farming communities. The cost of this segment over the four years of implementation is US\$560,000. Loan funds would be used to finance inputs and supplies for the tests (US\$80,000), operating costs of the NGOs involved (US\$185,000), transportation costs (US\$180,000), and publicity (US\$50,000). The operating costs associated with IBTA's participation in providing technical support and supervising the applied research scheme would come to roughly US\$60,000 and would be covered by the local counterpart contribution.

5. Investments (US\$24,000,000)

- 2.30 Through this component, the program would finance investments in simple projects involving the rehabilitation or improvement of small irrigation systems whose total cost would not exceed US\$350,000 and whose cost per hectare would not be greater than US\$2,500. Investments in new irrigation infrastructure in areas not currently farmed under irrigation may not exceed 15% of the total investment-component allocation. The selection criteria for the inclusion of projects in the program are set forth in chapter III.
- 2.31 Funding for the investments component would be channeled through the nonreimbursable line of credit of the Rural Development Fund (FDC). This is the arrangement being used for loan 901/SF-B0 and for investments included in the World Bank project cited in chapter I. The FDC would be responsible for the technical and economic appraisal and for the final approval of financing for the projects. As explained below, commitment of these funds by the FDC would be contingent on attainment of the milestones in the institutional reconfiguration of the subsector agreed upon with the Bolivian government.
- 2.32 The geographic area where the investments are to be located encompasses the program's three major service areas or watersheds. The preinvestment costs and the costs of supervising the work will also be financed with Bank funds, channeled through the FDC.

C. Definition of institutional milestones

- 2.33 In order to expedite the institutional reconfiguration sought by the program, milestones for the institutional-improvement components were defined in the course of the negotiations with the Bolivian authorities, and commitments of funds for the investments were tied to the attainment of those milestones. To simplify and facilitate the verification of such attainment, the milestones were arranged in three groups and refer to actions that can be readily identified and verified.
- 2.34 **First group.** Consists of: (i) creation and implementation of, and adoption of regulations for, the National and Departmental Irrigation Committees; and (ii) submission of a consensual draft water law to Parliament by the Executive Branch. This first set of activities is a condition precedent to disbursement of the funds for investments. Establishment of the Irrigation Committees at the national and departmental levels is very important: they must be in place and operational before the investment process begins, given their responsibility for coordinating investments in the sector and for seeing to it that the projects are adequately representative from a geographic standpoint, that they are outgrowths of community initiatives, and that they pose no threat to the environment. With respect to the draft water law, the

Executive Branch will need to submit the draft bill before the program begins in order that all the other activities making up the water-management support component may be completed during the program's execution period.

- 2.35 **Second group.** Completion of the activities in this group is a basic prerequisite for consolidating improvements in the water-resources sector, and assumes that the water law has been passed by the Congress. This group consists of: (i) approval and implementation of the general and sectoral regulations under the water law; and (ii) creation, implementation and start-up of the water authority. These activities will create the institutional and legal framework for initiating action on the management and rationalization of water resources, which is one of the key objectives of the program.
- 2.36 **Third group.** The program as conceived is focused on strengthening an agency responsible for setting policy, regulating and steering irrigation activities throughout the country. The continued existence of public systems operated and maintained by the State diverts funds that might otherwise be available for discharging these responsibilities. Experience has shown that the private sector, represented in this instance by the beneficiary communities, has the ability and commitment to take on this operation and maintenance work. The feasibility of these transfers was analyzed in the course of preparing the program and it was concluded that there was a need for operational evaluations, which have since been included as part of the program. This preliminary analysis found that it would be possible to transfer six systems during the program, leaving five to be handed over subsequently. The activities in this third group are: (i) transfer of six systems, those of Punata, Tiraque, Huarina-Peñas (Suriquiña), Tupaj Katari, Uyuchama, and Culpina, to the communities; and (ii) presentation of feasibility studies on transfer of the systems of Angostura, Tacagua, San Jacinto, Villamontes-Sachapera, and Abapó-Izozog.
- 2.37 Completion, to the Bank's satisfaction, of the activities included in each of the groups would allow the commitments for investments and the corresponding disbursements to advance to the following levels of completion:

First group:	45%
Second group:	30%
Third group:	25%

Although the groups are chronologically arranged, it was agreed that the time-frames for completion of the second and third groups could be interchanged if circumstances so required. The choice to tie commitments, rather than disbursements, to attainment of milestones would not hamper FDC/user relations, as would be the case if disbursements were so used. Completion of the first group

would be a condition precedent to the first disbursement for the investment component.

D. Cost and financing of the program

1. Cost of the program

- 2.38 The estimated cost of the program is US\$32.9 million. It would be financed by a Bank loan in an amount equivalent to US\$25.6 million and a local counterpart contribution of US\$7.3 million. The local counterpart funds include, in addition to the contributions from the National Treasury, US\$2 million in contributions by the Government of Germany through its technical-assistance agency, the GTZ, and US\$4 million to be provided by the beneficiaries of the investment projects.

COST OF THE PROGRAM
(in U.S. dollars)

COST ITEM	IDB CONTRIBU- TION	FRG/GTZ CONTRIBU- TION	LOCAL CONTRIBU- TION	TOTAL COST	%
I. COORDINATION AND EXECUTION MECHANISM	2,170,000	-	430,000	2,600,000	8
1.1 Coordination Unit	1,250,000	-	320,000	1,570,000	
1.2 Support for FDC, SNPP-SSDR and SNRNMA	920,000	-	110,000	1,030,000	
II. INSTITUTIONAL STRENGTHENING IRRIGATION SUBSECTOR	1,330,000	-	330,000	1,660,000	5
2.1 Strengthening of DNRS	330,000	-	330,000	660,000	
2.2 Inventory irrigation systems/ identification of areas with potential	140,000	-	-	140,000	
2.3 Irrigation planning/drafting of national irrigation policy	390,000	-	-	390,000	
2.4 Operational evaluation irrigation systems/transfer of systems	105,000	-	-	105,000	
2.5 National information system/registry of systems	155,000	-	-	155,000	
2.6 Human resource specialization	210,000	-	-	210,000	
III. SUPPORT FOR WATER-RESOURCES MANAGEMENT	505,000	-	-	505,000	2
3.1 Organization and implementation of Water Authority	200,000	-	-	200,000	
3.2 Drafting of general regulations	155,000	-	-	155,000	
3.3 Drafting of sector regulations	150,000	-	-	150,000	
IV. TECHNICAL ASSISTANCE AND TRAINING	500,000	2,000,000	60,000	2,560,000	8
4.1 Technical assistance three watersheds	-	2,000,000	-	2,000,000	
4.2 Applied research in production systems	500,000	-	60,000	560,000	
V. INVESTMENTS	20,000,000	-	4,000,000	24,000,000	72
5.1 Preinvestment for irrigation projects	2,000,000	-	-	2,000,000	
5.2 Investments in irrigation projects	16,000,000	-	4,000,000	20,000,000	
5.3 Supervision of irrigation projects	2,000,000	-	-	2,000,000	
VI. UNALLOCATED	392,000	-	316,000	708,000	2
6.1 Contingencies	392,000	-	316,000	708,000	
VII. FINANCIAL COSTS	703,000	-	164,000	867,000	3
7.1 Interest	447,000	-	-	447,000	
7.2 Credit fee	-	-	164,000	164,000	
7.3 Inspection and supervision	256,000	-	-	256,000	
TOTAL COST	25,600,000	2,000,000	5,300,000	32,900,000	100
Percentage	78	6	16	100	

- 2.39 The Bank's loan would fund preinvestment costs and the costs for supervision and construction of the irrigation systems. Cost item 5.3 also includes 4.5% of the FDC's administrative costs. The studies and consultancies included in the institution-strengthening component, the water-resources management improvement component, and the applied research segment of the technical-assistance component would also be financed. Incremental personnel, including both the staff to be taken on for the new structure of DNRS and retained at the close of the program and the staff for the Program Coordination Unit, as well as personnel required for executing the program, would be financed also in part with proceeds from the Bank's loan.
- 2.40 The funds from the German government would be used to finance the technical-assistance component. This includes the costs for personnel, equipment and vehicles and for courses, seminars and similar events conducted as part of the technical-assistance work, with the exception of applied research on production systems, which would be financed with Bank and local funds.
- 2.41 The worksheets used to calculate the table of costs by subcomponent are available in the technical files. These sheets contain information on the nature of each cost and its funding source. The provision for contingencies was figured as 9% of the direct costs of the technical-cooperation components (excluding the investment component). The calculation of possible escalation showed that there would be no increase in costs in that connection.

2. Contribution of the communities

- 2.42 Contributions by the communities that will benefit from the improved irrigation systems are expected to cover 20% of the direct cost of the works. This contribution is normally provided in the form of labor, although at times it is made in cash or as a combination of labor and cash. The FDC uses this system in its PIDC program and has instituted some procedural changes through PRONAR to improve its verification and control. The beneficiary contributions are regarded as essential evidence of community validation of, and commitment to, a project and will be recognized as part of the local contribution.

3. Financing plan

- 2.43 It is proposed that the Bank's loan be subject to the following terms and conditions:

Source of funds:	The Fund for Special Operations
Amount:	US\$25.6 million
Amortization period:	40 years
Grace period:	10 years
Disbursement period:	4 years
Interest:	1% for the first 10 years; 2% thereafter
Inspection and supervision charge:	1% of loan
Credit fee:	1/2 of 1% on undisbursed balance

- 2.44 Prior to the first disbursement of funds from the Bank's financing, the borrower is to demonstrate that it has received confirmation from the German government that the latter has issued a directive authorizing GTZ's participation in the technical-assistance and training component for at least the equivalent of US\$2 million.

III. EXECUTION OF THE PROGRAM

A. The participating agencies

- 3.1 The program calls for the following agencies to play a leading role in its execution: (a) the National Secretariat for Agriculture and Stockraising (SNAG), which is to act as executing agency and whose National Directorate for Irrigation and Soils (DNRS) will be directly responsible for the coordination and overall management of the program and for implementation of the irrigation-sector institutional strengthening and technical-assistance components; and (b) the Fondo de Desarrollo Campesino [Rural Development Fund] (FDC), which will administer the funds for the investment component by providing nonreimbursable financing for small irrigation projects.
- 3.2 The following agencies will also extend support to the program's activities as participating entities: (i) the Secretariat for Natural Resources and the Environment (SNRNMA), which will administer the consulting services under the water-resources management support component and perform its normal functions of monitoring the environmental aspects of irrigation projects; and (ii) the National Secretariat for Civic Participation (SNPP) through the Under-Secretariat for Rural Development (SSDR), which will support the identification of projects for the investment component by eliciting rural-community participation in the identification, development and implementation of irrigation projects and ensuring that projects are included in the municipal development plan, pursuant to the Civic Participation Law.
- 3.3 In order to ensure active involvement in and adequate coordination of activities of the program, the FDC, SNRNMA and SSDR will hire staff who will devote themselves full-time to PRONAR activities. This added staff and the necessary vehicles and office equipment will be financed with program funds, as indicated in chapter II.
- 3.4 The drafts of the interagency agreements to be entered into by SNAG/DNRS with the FDC, SNPP and SNRNMA have been reviewed and approved by the project team and are available in the technical files. The signing of those agreements and their entry into force constitute a condition precedent to the first disbursement from the Bank's loan.

B. Implementation arrangements

1. Organization for executing the program

- 3.5 As mentioned in chapter II, a new functional structure for the DNRS will be created by means of the program. Appended to this proposal as Annex III-1 is the organization chart for this new arrangement,

which shows both the structure to be retained at the end of the program and the structure created solely for the purpose of executing PRONAR; both structures will be actively involved in implementing the program.

- 3.6 The proposal envisages the creation and management of the following structures and instruments for the purpose of implementing the program: (a) a Program Coordination Unit (PCU), as part of the DNRS; (b) a Technical Assistance Coordination Unit, also in the DNRS; (c) the DNRS's Planning and Promotion Department, with its three Watershed Operations Units; (d) the Technical Committee of the program, which will operate at the PCU level for interagency coordination; and (e) the program's Procurement Committee, which will also operate at the level of the PCU. The terms of reference for all the staff that will participate in the execution of the program are available in the technical files.
- 3.7 The PCU has been structured to exercise functions in the areas of programming, financial management, supervision, monitoring and control in connection with the program. In addition, working through the Technical Committee, it will provide for coordination among the various participating agencies. Its structure includes a central unit staffed by the Executive Director of the program, a coordinator for operational and financial aspects of the program, and the administrative and financial personnel required for the performance of its duties. The draft of the legal instrument establishing the PCU as an integral part of the DNRS is in the program's technical files. The creation and start-up of the PCU is a condition precedent to the first disbursement.
- 3.8 The Planning and Promotion Department of the DNRS, which is part of the structure to be retained upon completion of PRONAR, will have three Watershed Operations Units, which will be based in the cities of Oruro (Altiplano region), Cochabamba (inter-Andean valleys), and Tarija (Bolivian Chaco). Each of these units will be headed by a Regional Coordinator assigned specifically to PRONAR. Also working at this regional level will be three Assistant Irrigation Officers of the FDC and three officials of the SDDR who will also be assigned to and financed by the program and whose work will be coordinated by the Regional Coordinator of PRONAR.

2. Interagency coordination

- 3.9 Attainment of the program's objectives will necessitate close coordination among the participating agencies. Indeed, the mechanism for implementing the program has been designed specifically to make for harmonious and complementary relationships among the participants. First of all, the obligations of each agency are clearly delineated in the agreements and in the terms of reference of its staff. Secondly, as shown in Annex III-1, the agencies are coordinated both at the regional level (in the program's three action venues or watersheds) and at the national level.

- 3.10 The coordination nexus at the national level is the program's Technical Committee, which will operate at the level of the PCU and whose officers will be the head of the National Irrigation Department, as chairman, and the Executive Director of the PCU, as technical secretary. The committee's members will be the Operations and Finance Coordinator of the PCU, the Technical Assistance Coordinator, the head of the DNRS Planning Department, and representatives of the FDC, the Under-Secretariat for Rural Development, and the Secretariat for Natural Resources. GTZ's technical adviser will also take part in committee meetings. It is in this committee that the program activities will be coordinated with the participating agencies. This is the level at which discussions will be held concerning potential conflicts, strategies and proposals on execution of the program. This is also where the program will be coordinated with the program of investments in rural development (PIDC) and the World Bank-financed Rural Communities Development Project, the executing agency of which is the SSDR, a member of the Technical Committee. Finally, the Technical Committee will be the forum for discussions on the financing to be provided by the FDC, through parallel operations, to the executing entities to enable them to advise communities on production matters after the irrigation systems become operational.

3. Institution-strengthening

- 3.11 Implementation of this component includes the adoption and entry into force of legislation creating the National and Departmental Irrigation Committees and restructuring and strengthening the DNRS, including its medium-range action plan. The DNRS, with the support of the PCU, will be responsible for this component.
- 3.12 Management and supervision of the consultancies commissioned to update the inventory of irrigation systems and identify areas with potential for small-scale irrigation is a function to be performed by the PCU with assistance from the Watershed Operations Units. These units will, in addition, monitor and supervise the work to be done by consultants with respect to the evaluation of public and semipublic irrigation systems with a view to transferring them to their users. Based on a review of the consultants' reports, the DNRS, in consultation with the general counsel of the National Agriculture Secretariat (SNAG), will make recommendations to the SNAG on action concerning the transfer of the irrigation systems to end users.
- 3.13 The work on systematizing the existing information on irrigation and setting up a national registry of irrigation systems will be done by consultants who will be hired to help the Standards Department of the DNRS develop additional modules with a view to expanding the subsystems of the Integrated Irrigation Information System (IIIS) instituted by the DNRS as part of the preparatory work for PRONAR.

- 3.14 With respect to specialization of human resources, the office of the Executive Director of the PCU, in consultation with the Planning and Standards departments of the DNRS and on the basis of grant-award criteria approved in advance by the program's Technical Committee, will submit to the latter committee a roster of eligible candidates for the various study grants. The grants will be administered by the PCU.
- 3.15 The restructuring and strengthening of the DNRS will generate incremental recurrent costs estimated at US\$180,000 a year through the end of the program. This sum represents only a small fraction (1.7%) of the current expenditures budget of the SNAG for fiscal 1995, which amounted to US\$10,533,000, and is well within the possibilities of the National Treasury.

4. Support for water-resources management

- 3.16 The consultants for the studies to be commissioned under this component will be hired by the PCU in consultation with the National Secretariat for Natural Resources and the Environment (SNRNMA), which will monitor and supervise the consultants' work. The agreement between SNAG/DNRS and the SNRNMA will delineate the responsibilities of each of the parties and state how they are to work together. Internally, within the SNRNMA, the Under-Secretariat for Natural Resources (SSDR) will be the unit in charge of monitoring the consultants' work and coordinating the administration of their contracts with the PCU. In order to oversee the consultants' activities and ensure that they are properly coordinated, the SSDR will activate the Technical Commission on Water Resources created ad hoc by ministerial resolution to deal with matters pertaining to water-resources management.

5. Technical assistance

- 3.17 This component, to be executed by GTZ, will take a decentralized approach to make it more responsive to technical-assistance requirements identified at the level of departments and major watersheds. The organization for implementing the component consists of: (a) the Technical Assistance Coordination Unit, which is part of the DNRS and will be assisted by an international adviser from GTZ; (b) the training team, which is technically qualified to deliver courses, seminars and workshops and will conduct most of its training events at the SNAG's Paracaya Training Center in Cochabamba; and (c) the three teams of advisers, one in each watershed, in charge of helping the DNRS regional coordinator and the coexecuting agencies identify technical-assistance needs and offer technical advice to clients of PRONAR in their respective areas of activity. The national technical-assistance coordinator will be an active member of PRONAR's Technical Committee, to maintain liaison with the units of the PCU and the coexecuting agencies.

- 3.18 Unlike the other components of the program, the activities of which are already known in detail, this component is designed to be implemented over a three-year period on the basis of annual work plans to be submitted for the Bank's consideration. Each plan will establish the technical-assistance and training needs and strategy and set targets for the year in question, including environmental considerations. The work plan for the first year of the program must be submitted before the first disbursement from the proposed loan is made, and must include performance benchmarks for all three years of operation of the component. The work plans for subsequent years are to be submitted to the Bank two months before the start of the ensuing year of execution of the program.
- 3.19 The applied research segment, which is part of the technical-assistance component and would be financed in part by Bank funds, will be implemented under the administrative and financial responsibility of the PCU and the technical responsibility of the Bolivian Institute of Agricultural Technology (IBTA). To this end, SNAG/DNRS would enter into an arrangement with IBTA providing for the latter, through its Regional Research Units in the three PRONAR action areas, to coordinate its technical activities with those of the Watershed Operations Units of the DNRS to prepare and implement the annual work plan, keeping in mind the priority crops and the major subjects of research. The draft of the agreement setting forth the mechanism for coordinating and implementing this segment, as well as the tentative work plan for the first year of the program, are available in the technical files.
- 3.20 The field work under this component will be carried out with the participation of agricultural NGOs, with technical support, guidance and supervision from IBTA, and in conjunction with the communities where the work is to be done. These activities would include on-farm field trials and their follow-up, and interpretation and dissemination of the findings not only for small farmers but also for other private and governmental organizations. The NGOs would be selected by IBTA in conjunction with the DNRS Planning Department on the basis of their work in the rural milieu, their experience in similar operations with rural communities and their presence in the area of influence of the field research.

6. Investments in irrigation systems

- 3.21 The Bank will disburse program funds for the investments component directly to the FDC, availing itself of the institutional structure and experience created in connection with the implementation of the PIDC, which was financed in part by loan 901/SF-BO. To ensure adequate coordination and delineation of functions, SNAG/DNRS will enter into an interagency cooperation agreement with the FDC. The program will utilize and reinforce the FDC's existing financing facility, which relies on the participation of executing entities (mostly NGOs) that are active in the beneficiary rural community and provide technical and logistic support in matters ranging from

the identification of an irrigation project to its operation and maintenance.

- 3.22 The project identification, preparation and implementation cycle will basically follow the procedures laid down in the Civic Participation Law, described in chapter I. Once the project summary is submitted by the executing entity to the FDC, the operation is processed in accordance with the FDC Operating Regulations which were prepared for loan operation 901/SF-B0 and have been amended to gear them better to PRONAR. The selection criteria for project approval, which are included in the Operating Regulations, are described further on. The amount of the operation as approved by the FDC includes preinvestment, technical supervision and construction costs.
- 3.23 Following approval of the operation, the FDC signs a project implementation contract with the "executing entity" (similar to the type of contract provided for under loan 901/SF-B0) and that entity in turn concludes an agreement with the community setting forth conditions for performance of the work and the participation of the beneficiaries organized for the purpose of making their 20% contribution. The executing entity, under the supervision of the FDC and using the FDC tendering regulations developed under loan 901/SF-B0, will call for bids to select the contractor for the work.
- 3.24 When the project is finished, the FDC, with the support of the pertinent Watershed Operations Unit and in conjunction with the community, will be responsible for inspecting and certifying the status of the completed job. The recently-passed decentralization act provides for certain powers to pass to departmental prefects, including: (i) the transfer to prefects of projects currently being executed by agencies of the central government; and (ii) the transfer to prefects of international financing, and the associated financial obligation, for works in progress or awaiting construction. Article 24 of the act stipulates that the irrigation systems to be built will belong to the prefectures. However, the act authorizes the prefectures to delegate their power to execute works and to transfer such works to communities by means of a conditional commodatum. Since the program provides that the works are to be executed by the FDC and transferred to the communities for operation and maintenance, it must be demonstrated, prior to the start of construction on the first job in a given department, that the prefecture of that department, the National Secretariat for Agriculture and the FDC have entered into an agreement delegating to the FDC the power to construct the works to be built under PRONAR and subsequently transfer them to the beneficiaries.
- 3.25 If necessary to ensure adequate operation and maintenance of the systems, the FDC will include in its contract with the executing entity funding for the entity to provide community training during the first year of operation of an irrigation system. In addition, the FDC, using its regular portfolio funds (and in parallel with

the proposed program), will finance technical-support services extended by the executing entity to the community in the area of agricultural planning and production.

- 3.26 The Operating Regulations being used by the FDC in the execution of loan 901/SF-BO have been adjusted to reflect specific recommendations stemming from the evaluations the Bank performed as part of the analysis of PRONAR. In addition, the FDC is beginning to decentralize its operations with a view to expediting their processing and shortening the time required for approval. The draft of the Operating Regulations agreed upon with the Bank is available in the technical files. Prior to the first disbursement, evidence must be submitted to the Bank that: (i) the amended Operating Regulations have been approved and are in force; and (ii) the process of decentralizing responsibilities to the departmental offices has been implemented.

7. Selection criteria

- 3.27 The principal criteria to govern the eligibility of projects for financing under the investment component, which are included in the Operating Regulations of the FDC, are as follows:
- The total cost of the project is not to exceed US\$350,000, and the cost per hectare must not exceed US\$2,500.
 - The contribution of the beneficiaries must be at least 15% of the total cost of the project, and the average of the contributions must be 20%.
 - A community Works Committee must exist as evidence of the community's commitment to the project.
 - Projects of more than US\$250,000 will be subject to individual economic appraisals, and must yield an internal rate of return of at least 12%. ^{2/} For smaller projects, the simplified economic appraisal method agreed upon with the Bank for the PIDC will be used.
 - The project proposal must include an environmental impact assessment.
 - Projects with high operation and maintenance costs, such as those involving the use of electromechanical equipment, will not be eligible.

^{2/} The methodological model for the appraisal was agreed upon with the FDC during the preparation of the program.

- The projects' cost per household must not exceed US\$4,500, and their yearly average cost per household must not be greater than US\$3,500.

C. Environment Committee recommendations

- 3.28 The environmental brief for the program was approved by the Bank's Environment Committee on July 29, 1994, in category III. The environmental summary was approved on October 4, 1995, with the following recommendations: (i) that detailed information on the plan for training in environmental education be made part of the annual work plan that the DNRS is to submit as a condition precedent to the first disbursement; (ii) that assurances be obtained that the environmental monitoring system will be part of the Operating Regulations of the program (FDC); (iii) that the documentation on the operation, especially the terms of reference for the consultants to be hired to help devise a new regulatory framework for water-resources management, contain a requirement that the consultants be included in governmental discussions, on the one hand, and on the other that they maintain contact with the development of the Bank's guidelines for integrated management of water resources, to ensure consistency between the two initiatives; and (iv) that the environmental summary be modified to include a list of the first-year projects with their costs and potential environmental impacts, a better description of the content of the training programs on the use of agricultural chemicals, and a clearer statement with respect to the reliance of the program on beneficiary contributions.

D. Environmental considerations

- 3.29 The legal and institutional framework pertaining to the environment has undergone significant improvements in recent years, notably with the enactment of Law 1,333 on the environment in 1992 and the subsequent creation of the Ministry of Sustainable Development and the Environment in 1993. The Secretariat for Natural Resources and the Environment (SNRNMA) is directly responsible for the environmental monitoring of projects. The current procedures governing this activity include classifying projects in terms of their potential impact on the environment, requirements for more detailed environmental assessments and mitigation measures, and the need to secure a permit from the SNRNMA before beginning any project.
- 3.30 The program is expected to exert a positive impact on the environment through improvements in water conservation and use. The rehabilitation of existing systems will reduce the risks of landslides and, in some cases, the risk of breaks in rustic dams. An improvement in the habitat along canals and reservoirs is also expected. Other positive impacts include the training and technical assistance communities will receive in monitoring the environmental quality of irrigation projects; institutional and legal improvements in water-resources management; and indirect

benefits from the easing of pressures to expand the agricultural frontier.

- 3.31 Since PRONAR will finance mainly the improvement of small irrigation systems already in operation, no significant environmental impacts are expected to ensue from the program. The implementation of the PIDC by the FDC provided some useful lessons as to the use of environmental dossiers and liaison with the SNRNMA. PRONAR would be using the same mechanism, which has been improved as a result of discussions with the national authorities.
- 3.32 The environmental analysis of a representative sample of projects found that impacts could be expected as a result of the construction work, temporary changes in streamflows, salinization and degradation of soils, increased use of farm chemicals, and water shortages. As stated earlier, these impacts are not significant, given the limited size of the projects and existing environmental control measures. Residual streamflows would still be over 20% of present flows, and the rehabilitation of small dams will not increase reservoir size to any significant extent.
- 3.33 Active community participation is a key feature for attenuating any adverse local impacts of the projects. The approach of the program is, in fact, precisely to strengthen the community's involvement in the identification, preparation and execution of projects. The project team found that the present environmental review and quality-control procedures of the SNRNMA and FDC were adequate for the scale of the projects to be financed under the program.
- 3.34 The environmental review procedures, together with the program's selection criteria in terms of a specified maximum cost of projects and their cost per hectare and per household, can filter out projects that could have significant adverse impacts on the environment. The program's technical-assistance and training component includes training on environmental monitoring procedures and measures at the initial phases of project identification, for the executing entities and also for FDC and SSDR project specialists and program officers.
- 3.35 The annual work plans for the technical-assistance component will include activities pertaining to the environmental quality of projects and specify the number and types of courses to be conducted, the content of the training materials, and the target groups. Moreover, an additional specialist in environmental monitoring will be hired for the SNRNMA, using program funds, to strengthen that agency's performance in the areas of environmental classification and oversight and permit issuance.

E. Disbursement period, implementation timetable and tendering schedule

- 3.36 The program will have a disbursement period of four years, which is considered sufficient for achieving its objectives. In the case of

the investment component, the period for commitment of the program funds will expire three years from the effective date of the loan contract in order that the proceeds of the loan can be disbursed within the allotted time period. The technical-assistance component, which is to be carried out by GTZ, will be implemented in three years.

- 3.37 Procurement under the program will chiefly take the form of contracts for consulting services and small purchases of office equipment, computers and approximately eight vehicles. In regard to construction contracts, the jobs involved will be small and simple and none of them will cost over US\$350,000. The FDC's current tendering regulations, which were approved by the Bank for use in the PIDC, will be used in the procurement of construction services. The bidding will be conducted by the executing entities themselves but closely monitored by the FDC, which will intervene at the award stage and whose approval of the successful bidder will be required.
- 3.38 The consultants for the program will be hired in accordance with the Bank's established procedures, which are appended to the loan contract as Annex C. In the event that several works projects are combined to form a single package costing more than US\$1 million, the Bank's international competitive bidding procedure will be followed. For purchases of goods, international bidding will be required when the amount exceeds US\$350,000.
- 3.39 The investment and technical-assistance components will be implemented continuously over the first three years of the program. In the case of investments, the final year will be devoted to disbursing the funds for which commitments were made in the first three years. The timetable for the consulting work is appended as Annex III-2, which lists the number of experts required for each of the consultancies, their specialties and the number of person-months.

F. Performance indicators

- 3.40 A set of benchmarks for each component was developed as a tool for measuring and monitoring the progress of the program (see Annex III-3). In choosing these indicators, it was kept in mind that they must be realistic, readily comprehensible to the users, closely tied to the program's targets and objectives, and quickly and easily verifiable. An additional set of "qualitative" indicators is included in Annex III-4. These indicators will be retained throughout the program and should be helpful in supervising and, especially, monitoring the qualitative aspects of the program.
- 3.41 For the technical-assistance component, which will be carried out on the basis of annual programs, the executing agency is to include a complete set of annualized performance benchmarks for the technical assistance in the first-year work plan to be submitted as a condition precedent to the first disbursement.

G. Operation and maintenance

- 3.42 Upon completion of an irrigation system construction or improvement project under the program, the works will be transferred to the users for operation and maintenance. As indicated in paragraph 3.24, the FDC, in conjunction with the SNAG, will be responsible for making such transfers and obtaining a formal commitment from the communities to maintain the systems.
- 3.43 The irrigation systems contemplated under PRONAR are small, simple, gravity-flow structures owned and managed by the users. Users are normally organized into irrigation associations whose maintenance know-how would be strengthened through the technical-assistance activities of the program and by working side by side with the executing entities in the initial operation of the systems. The ex post review of projects executed by the FDC shows that maintenance is not a problem because it is being done in a satisfactory way by the communities. It has been agreed that the FDC will require, in the certificate of final acceptance of each works project delivered to a community, that the community report to it annually, during the five years following completion of the projects, on the maintenance of the works. These reports will be available to the Bank for review.

H. Ex post evaluation

- 3.44 The monitoring system, with the annual benchmarks set out in Annex III-3, will provide important information for use in measuring progress in the improvement of FDC procedures, as well as yearly progress in the institutional modernization of the irrigation subsector and in water-resources management. The borrower is interested also in performing an overall evaluation of the program's impact upon its completion. This evaluation will be based on a sample of projects carried out with program funds for which a full ex ante economic appraisal is available (projects of more than US\$250,000 and first-year program projects). It is to be carried out three years after the end of the program so that a significant number of projects with consolidated levels of production will be available. The intention is to use the methodology developed for the ex ante appraisal, adapted where necessary, which will also be used by the FDC for the evaluation of projects costing over \$250,000.

I. Readiness of the projects

- 3.45 The representative sample submitted to the Bank for analysis, which would serve as the group of projects for the program's first-year work plan, consisted of 32 projects, seven of which were new and the rest proposed improvements to existing systems. The sample was broadly representative of the three major watershed areas encompassed by the program.

- 3.46 From the technical standpoint of engineering and hydrology, the projects were found to be well-designed and far enough along to invite construction bids. The supporting documents include an analysis of unit prices consistent with realities market in each locality. It was found that in the case of most intake and conveyance facilities appropriate criteria had been used to determine the least-cost alternative. The periods for executing the projects range from three to 18 months. The longest are those for projects on which construction must await the start of a dry spell.
- 3.47 The new projects forming part of the sample included three sprinkler irrigation systems. These were rejected on the grounds that the technology they involved was more sophisticated than the techniques that campesinos are accustomed to using, and the operation and maintenance costs were more than these farmers could afford.

J. External audits

- 3.48 The financial statements for the components of the program administered by the Program Coordination Unit and for the investment component to be administered by the FDC, as well as those of the FDC itself, will be submitted annually to the Bank after being audited by a firm of independent public auditors acceptable to the Bank.

IV. THE BORROWER, THE EXECUTING AGENCIES AND OTHER PARTICIPATING ORGANIZATIONS

A. The borrower, the executing agencies and participating entities

- 4.1 The borrower will be the Republic of Bolivia, and the executing agency will be the National Secretariat for Agriculture and Stockraising (SNAG) through its National Directorate for Irrigation and Soils (DNRS). As a condition precedent to disbursement of the loan, the borrower is to have signed a subsidiary agreement to transfer the proceeds of the financing to the SNAG and the Rural Development Fund (FDC), the latter as coexecuting agency. The National Secretariat for Natural Resources and the Environment (SNRNMA) and the National Secretariat for Civic Participation (SNPP), through the Under-Secretariat for Rural Development (SSDR) will participate as support agencies, with the functions and responsibilities described in chapter III.
- 4.2 The borrower will provide counterpart funding for the program by means of specific allotments in the annual budgets of the SNAG. Given the high priority that the government ascribes to the program, and considering the relatively small amount of counterpart financing to be provided by the National Treasury - US\$1.3 million over four years - no problems are anticipated in making the governmental contribution to the program.

B. The executing agency

- 4.3 The SNAG was created in September 1993 by Law 1,493 on Ministries of the Executive Branch, and is regulated by the provisions of Supreme Decree 23,660 of October of the same year. Its primary mission is to formulate and implement policies, programs and projects for the development of agriculture, agribusiness and fisheries in Bolivia, including specifically the promotion of irrigation projects. With its new organizational structure, the SNAG replaces the former Ministry of Rural Affairs and Agriculture (MACA) and becomes part of the new Ministry of Economic Development.
- 4.4 The central organization of the SNAG includes - in addition to advisory units and administrative, financial and legal support units - three operational under-secretariats, for agriculture, for stockraising and for forestry development, harvesting and fisheries. Each of these under-secretariats in turn has 10 national directorates in charge of programs and projects in particular areas of agricultural development. At the decentralized level, the SNAG has nine departmental offices, which coordinate the work of the various agricultural committees and services in each department of the Republic. The SNAG has a staff of 524, categorized as follows: professional level 143; technical level 225; secretarial level 74; and clerical level 82.

- 4.5 The SNAG budget for 1995 totals US\$38.3 million, including US\$10.5 million (27%) for current expenditures and US\$27.8 million (73%) for capital spending. The budget includes SNAG transfer payments to its associated subsector agencies. The total budget is financed by US\$12.6 million from domestic sources (33%) and US\$25.7 million from foreign loans and grants (67%). An analysis of the SNAG's budget performance statement for 1994, its first complete fiscal year, shows that actual expenditures came to 98.3% of the budgeted amount.
- 4.6 The Administrative Department is responsible for administrative and financial matters in the SNAG and operates under the policies established for the various systems: goods and services administration, budget, cash management, and public borrowing. The governmental accounting system used identifies financial transactions by program or administrative unit and by individual source of financing, domestic or foreign. The Department produced the SNAG budget performance report, balance sheet and income statement for fiscal 1994 on a timely basis.
- 4.7 Internal control is in the hands of the Audit Unit, which currently has two auditors and follows the procedures established by the SAFCO Act of 1992. External auditing is done by the Office of the Comptroller General of the Republic, which is empowered by law to preaudit SNAG expenditures and performs ex post audits. The Audit Unit is being provided with an additional auditor to enable it to perform its overall functions more effectively and to monitor the administrative and implementation mechanism to be instituted for PRONAR as part of the structure of the Irrigation Directorate (DNRS).
- 4.8 Though only recently established, the SNAG is the successor to the former Ministry of Rural Affairs and as such incorporates within its structure several years of experience in the operation of agricultural development plans and programs nationwide. Its organization has been revamped, and on the administrative and financial side it has had occasion to administer the proceeds of foreign loans and grants, in a satisfactory manner.

C. The coexecuting agency

- 4.9 The Rural Development Fund (FDC), which will administer the funds allotted to the investment component, is a rural promotion and development agency whose basic function is to channel resources on a nonreimbursable basis and in the form of credit into the financing of small projects designed to benefit Bolivia's rural communities by providing basic infrastructure and support services for the production and marketing of farm commodities. Created by Supreme Decree 22,154 of March 15, 1989 as a not-for-profit publicly chartered corporate entity endowed with administrative, technical and financial autonomy, the FDC, which was initially a

unit of the Ministry of Rural Affairs, was transferred to the Ministry of the Presidency by Supreme Decree 24,010 of May 1995.

- 4.10 The Administrative and Financial Department of the FDC operates a computer system, recently installed, that includes budget, accounting, fixed-assets and personnel management subsystems in addition to keeping separate records of the investments pertaining to each of the FDC's sources of financing. The new system has ample capacity to meet FDC financial-management needs and satisfies the requirements of both the Office of the Comptroller General of the Republic and the Superintendency of Banks, the agencies in charge of financial oversight of FDC operations.
- 4.11 The FDC's Audit Unit reports directly to its board of directors. It has prepared and put into practice a manual containing internal control procedures based on the SAFCO Act. The unit's operations, which are regarded as satisfactory, are based on six-month work plans providing for specific audit tasks and priorities. External control over the FDC is exercised by the Office of the Comptroller General of the Republic and the Superintendency of Banks.

D. The participating entities

1. The Secretariat for Natural Resources and the Environment

- 4.12 The SNRNMA was created in September 1993 by Law 1,493 on Ministries of the Executive Branch and is regulated by the provisions of Supreme Decree 23,660 of October of the same year. Its basic functions are to formulate, propose and implement policies, programs and projects pertaining to the use and conservation of Bolivia's natural resources, in keeping with the environmental-preservation and sustainability criteria that constitute the basic guidelines of the present government's National Development Plan.
- 4.13 The SNRNMA is part of the new Ministry of Sustainable Development and the Environment, created in 1993, for the institutional strengthening of which the Bank provided financial support under loan 929/SF-BO, approved in November 1994, in the amount of US\$19 million. This loan is still awaiting disbursement eligibility because of delays in congressional consideration of the loan contract.
- 4.14 The institutional situation of the SNRNMA has undergone no major changes since the Bank examined it when processing loan 929/SF-BO. Its structure includes three under-secretariats, one each for Promotion, Natural Resources, and the Environment. It currently has 33 employees - 19 professionals and 14 at the administrative, secretarial and clerical levels.

2. The Under-Secretariat for Rural Development

- 4.15 The SSDR was initially established as a Secretariat and regulated by the same legislation that created the two Secretariats cited

above. It was organized and put into operation following the enactment of the Civic Participation Law in May 1994. Its basic mission is to promote integrated development in rural areas with the participation of local (mega-municipal) grass-roots organizations. The SSDR operates through two national under-secretariats, for Production Promotion and Social Promotion, and nine departmental directorates. The SSDR recently became part of the National Secretariat for Civic Participation.

- 4.16 The activities of the SSDR are aimed at strengthening rural communities and municipalities by providing logistical and technical support and conducting special training programs to instill a participatory approach in the identification, preparation and execution of local projects calling for investments in rural infrastructure. This Secretariat has 97 employees in the nine departments of the country for its work at the national level (52% of its total staff) and 89 at its headquarters in La Paz (48%), for a total of 186 employees, including 122 professionals and technical officers (65%) and 64 secretarial and administrative employees (35%).

V. FEASIBILITY OF THE PROGRAM

A. Technical feasibility

- 5.1 The experience of the beneficiaries in agriculture and in water management provides assurance that the projects will achieve their intended objectives. The program's beneficiaries are familiar with the principal farming practices and experienced in the use of improved seeds and the application of fertilizers, chemicals and other inputs.
- 5.2 The beneficiaries of the program have a tradition of organizing for the purpose of managing limited supplies of water on a communal basis. Their commitment to contribute at least 20% of the cost of the projects will provide evidence of their shared responsibility for the work involved in implementing the proposed projects. The beneficiaries of each project will be aware of the nature of the planned works, the implications of the works for their farms, and the additional efforts required from them to ensure optimal operation and maintenance.
- 5.3 The works envisaged for improving irrigation systems are simple. With proper maintenance of these structures by the beneficiaries themselves, they should continue to serve the community for a period extending beyond the 20 years of useful life assumed.

B. Institutional and financial feasibility

- 5.4 The institution-strengthening envisaged in the program is designed on a realistic basis consistent with the country's institutional and financial capacity. The program's linkage between attainment of major institutional milestones and commitment of investment funds will clearly provide added stimulus to the efforts to carry out the institution-strengthening activities.
- 5.5 The management scheme proposed for the program reinforces and supplements the implementing capacity of the National Directorate for Irrigation and Soils (DNRS) from the outset. The arrangement includes a number of features that make for complementarity and consistency of action between the levels concerned with operations programming, financial administration, logistical support and executive coordination through the PCU and the levels responsible for the implementation of specific operations and activities (regional operations units and coexecuting agencies), in the interest of greater administrative efficiency for the organizational structures involved.
- 5.6 As for the investment component, the program will be availing itself of the Rural Development Fund (FDC), an agency which has experience in similar programs and which will institute a

decentralization process to further expedite its operating procedures. Moreover, the Operating Regulations of the FDC have been amended to correct some shortcomings identified in the current program of investments in rural development (PIDC) operation. This should improve the action of the FDC and the quality of the projects.

C. Socioeconomic feasibility

1. General

- 5.7 The economic rationale for the investments in micro-irrigation is that the projects are adequately targeted to the poorest rural groups and their economic impact is significant relative to their costs. The inclusion in the program of criteria based on ceiling costs per project, per household and per hectare targets the investment toward projects involving small-system improvements on a scale commensurate with the situation and possibilities of the campesinos. Furthermore, the financing of low-cost projects makes it possible to spread the program's benefits among a sizable group of rural residents. The requirement of community participation from the initial concept stage of a project, together with the requirement that, prior to the approval of financing by the FDC, all of the project's beneficiaries sign a commitment to make a contribution at a specified minimum level, will tend to channel the resources into simple projects involving low operational risks and offering an adequate economic return.
- 5.8 The economic analysis of the program was based on an evaluation of 21 micro-irrigation projects already financed by the FDC as part of the PIDC and on feasibility studies of a representative sample of 32 projects that would be implemented during the first year of the National Irrigation Program (PRONAR). Of the 21 PIDC projects, 13 were in progress and eight were completed. Most of the projects call for the improvement of intake structures and the lining of canals, though there are five small-dam projects in the PIDC and three in PRONAR. While all three of the major physiographic areas of the program are represented, more than 50% of the projects in both samples are in the inter-Andean valleys.

2. Targeting

- 5.9 Despite the absence of any specific targeting criteria based on the socioeconomic characteristics of the beneficiaries, the benefits of the PIDC micro-irrigation projects have accrued almost exclusively to low-income farmers. Fifty-five percent of the beneficiaries of the projects visited were classified as "very poor" or "extremely

poor." ^{3/} The projects prepared for PRONAR will also benefit farmers with low or very low incomes. As indicated in Table V-1, the amount of land cultivated by these farmers averages 0.95 hectares in the valleys; the community with the largest cultivated area per household (4.53 hectares) is in the plains.

TABLE V-1

INDICATORS OF THE PRESENT AGRICULTURAL SITUATION AND THE IMPACT OF PRONAR PROJECTS							
Region	No. of projects	Present cultivated area per household		Annual agricultural income per household US\$ ^{4/}	Average investment amount (US\$)	Cost per household (average)	Internal rate of return (weighted average)
		Average (ha)	Max. (ha) ^{5/}				
Altiplano	7	0.65	0.95	239	83,448	1,108	16.2
Valleys	13	0.82	1.80	512	113,903	1,100	21.8
Plains	3	2.92	4.53	1,318	265,909	4,009	13.6

5.10 Data on total household income were unavailable, but the annual receipts from crops suggest that the income levels are low, and extremely low in the altiplano. The annual agricultural income per household in the altiplano is US\$230, 40% of the minimum wage. The projects benefiting the poorest farmers, generally situated in remote regions of the high valleys, are low in cost and originated with the efforts of NGOs with active community involvement. The PIDC projects visited include five in this category with a direct investment cost of less than US\$60,000, and PRONAR includes four projects with a cost below US\$86,000. Owing to problems of access and to their limited size, all of these projects are carried out by force account by NGOs, which in addition provide technical assistance in the operation and maintenance of the systems and farming and stockraising activities.

3. Economic impact

5.11 The PIDC applies two economic eligibility criteria: US\$2,500 as the maximum cost per added hectare of irrigable land and an internal rate of return of at least 12% based on a model of a

^{3/} In the absence of household-income data, it was decided to use indicators based on the quality of the dwelling and availability of basic services such as electricity, potable water, sanitary facilities, health, education, and access to urban centers.

^{4/} Refers to the largest average cultivated area found in the PRONAR projects.

^{5/} The value of production at farm level, net of cash costs.

typical farm for each of the three physiographic areas. The cost-per-hectare criterion has proven to be an effective tool and has made for the selection of low-cost projects and appropriately sized works. In order to take the higher economic returns of more intensive production systems into account, the operating regulations define irrigable hectares as the surface under irrigation (irrigation perimeter) multiplied by the crop intensity factor. The ex post evaluation of several PIDC projects revealed low levels of community participation and contribution. Given the importance of these inputs to the quality of the projects, an effort is being made to strengthen community involvement in the various stages of project processing - identification, preparation and execution - by including detailed requirements in FDC approval procedures. The minimum contribution required from the community will be 20%, which may be either in cash or in labor.

- 5.12 The wide variety of crops (more than 15 in some projects), the existence of many sharply differentiated agroclimatic zones, and the paucity of information on campesino production systems make the economic appraisal of micro-irrigation systems complex and imprecise.
- 5.13 As part of the feasibility studies, the consultants and the technical team in charge of preparing the program obtained information on the present production situation on the farms and on prices observed at the producer level. The findings of the cost-benefit analysis of 23 projects that would be carried out during the first year are summarized in Table V-1. Seven projects (three in the plains area, three in the valleys and one in the altiplano) were excluded because of their low economic returns.
- 5.14 The higher returns on projects in the inter-Andean valleys are attributable to the sound initial production base in the valleys (most of the communities there have well-organized irrigation systems) and to favorable climate conditions that allow two crops to be grown per year, or in some cases as many as three. In contrast, several projects in the Chaco region are new and have a relatively high cost per beneficiary household. Raising the internal rate of return of such projects to 12% would require an expansion of the tillable area and an intensification of production on a scale that exceeds the financial reach and management capabilities of the farmers.
- 5.15 While the altiplano is subject to significant weather and soil constraints, the low cost of works projects, the low opportunity cost of labor and the availability of organic fertilizers and of nutrient-rich silts deposited along the shores of streams in times of flooding make it possible for projects in this region to yield adequate rates of return.

D. Environmental feasibility

- 5.16 The program will use the same environmental review and control system that the FDC has been using, with satisfactory results, in its irrigation programs. The works projects envisaged in the program are small and extremely simple, and their potential negative impacts on the environment would to a great extent consist of localized and temporary problems associated with the construction work. The "filter" provisions built into the program, i.e. maximum cost per project and per hectare and household, will keep the projects simple and low in cost. Given that at least 85% of the funds allotted to the investment component will be devoted to the rehabilitation of existing systems, the number of new projects the program will finance will be relatively small. This will minimize the occurrence of stronger impacts such as those associated with the construction of new systems.
- 5.17 Finally, the program will exert positive impacts on the environment by improving the use of water resources and by fostering community participation in and commitment to the projects at every stage, and providing training for technicians and beneficiaries on environmental aspects of the projects through the technical-assistance component.

E. Poverty-targeting

- 5.18 In accordance with the Eighth Replenishment mandate on alleviation of poverty and with the implementation criteria established by the Management of the Bank, this program complies with the geographic targeting criterion and qualifies as a poverty-targeted investment.

F. Gender issues and impact on ethnic groups

- 5.19 It is estimated that more than 90% of the beneficiaries of the irrigation systems to be improved or built as part of the program are of Indian heritage. The program will support the government's strategy of promoting greater participation of rural communities in local planning, leading to a stronger involvement of grassroots organizations, most of whose members are Indian, in the control and management of their physical, social and political environment.
- 5.20 The importance of gender issues to a successful outcome of the projects was considered during the preparation of PRONAR, and efforts of various kinds were made to minimize the risk of marginalizing women and their needs in the program and to emphasize those activities that create better opportunities to respond to women's needs.
- 5.21 To this end, the program focuses investments on the rehabilitation of small existing irrigation systems rather than on the construction of new and larger ones, it having been shown that the opening up of large new areas marginalizes women because only men acquire

rights to land and water. The focus on existing projects strengthens the present allocations of water rights and work-assignment mechanisms, areas in which women are seen to be increasingly involved.

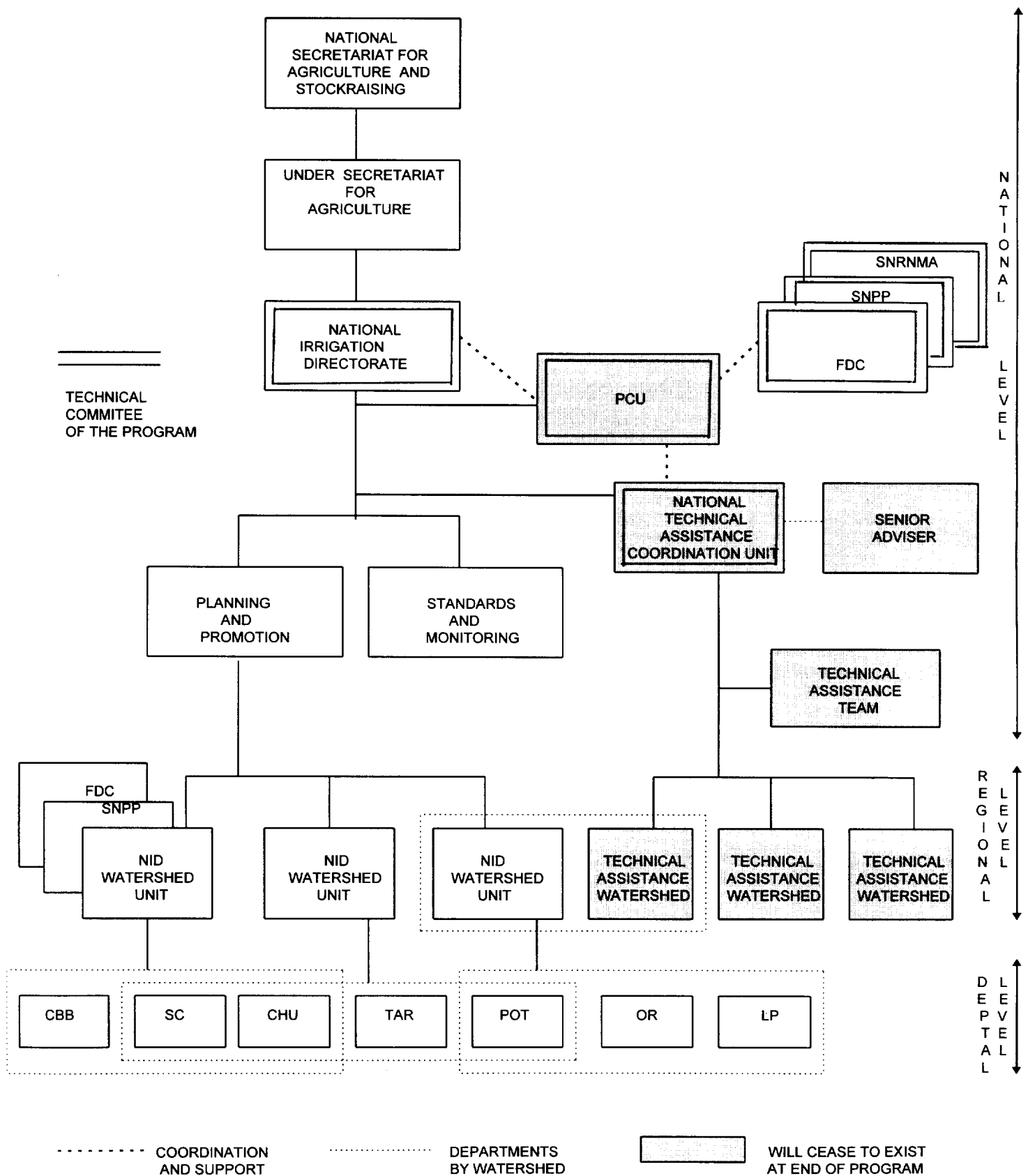
- 5.22 The FDC, which will be in charge of the investment component of PRONAR, has a specialist assigned to perform the gender-issues analysis required for all project proposals submitted for its consideration.
- 5.23 The program will offer training courses and seminars on gender issues for Under-Secretariat for Rural Development (SSDR) and FDC project specialists and program officers through the technical-assistance component.

G. Risks of the program

- 5.24 The impact of the program described herein at the national level and on the quality of the projects to be financed with its funds will depend to a large extent on implementation of activities in the areas of water management and strengthening of the irrigation subsector. In this context, the conceivable risk to successful implementation of the program would basically be a failure by the government to adopt in timely fashion the planned measures to regulate water use and strengthen the mechanisms for planning and promoting irrigation, and to implement such measures effectively. In order to minimize this risk, the proposals formulated by the government were reviewed at length in the course of analyzing the institutional component of PRONAR. This made it possible to structure the priority institutional measures realistically with a view to the possibility of implementing them in the political and institutional conditions prevailing in Bolivia.
- 5.25 The main elements that could generate risks during the execution of the program are well-defined and structured in such a way as to ensure their smooth implementation. These elements, moreover, are part of the institutional milestones that will determine the pace of the investments in irrigation.
- 5.26 The FDC could prove unable to handle the expanded volume of operations to be generated by the program, which will necessitate significant increases in the use of human resources for the technical and economic appraisal of projects and the administration of contracts and disbursements. This risk would be minimized by the reinforcement of the FDC's staff provided for in the program and the decentralization process currently under way.
- 5.27 Weak coordination and collaboration among participating institutions would hinder the attainment of the program's objectives in all its components. A system of interagency agreements clearly setting forth and delineating the duties and obligations of the agencies participating in PRONAR will be in effect. Ultimately,

the underlying concept of the program itself, which delimits the areas of action of each institution and seeks to avoid duplication of efforts and potential "turf battles", should attenuate any risk in this regard.

ORGANIZATION FOR THE EXECUTION OF PRONAR



CROCONS

NATIONAL IRRIGATION PROGRAM (PRONAR)					ANNEX III-2															
LOCAL AND INTERNATIONAL CONSULTING SERVICES																				
CONSULTING ASSIGNMENT	RESOURCES	UNIT	QUANTITY	UNIT TOTAL	0	1				Q	U	A	Y	E	A	R				
					4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	
INSTITUTIONAL STRENGTHENING IRRIGATION SUBSECTOR																				
2.2. Project inventory/identification of areas with potential	5 local consultants. (1 x 5 subbasins)	P/M	12	5,000	xxx	xxx	xxx	xxx												
	Subtotal		12																	
2.3. Irrigation development planning at major-watershed level, and formulation of national irrigation policy	3 local consultants (1 per basin)	P/M	90	2,500			xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	
	1 internacional specialist	P/M	18	7,000			xxx	xxx			xxx	xxx				xxx	xxx			
	Subtotal		108																	
2.4. Operational evaluation of public/semipublic irrigation systems:	Local consultant: 2 P/M per system; 6 systems.	P/M	12	2,500	xxx	xxx	xxx	xxx												
	Local consultant; 4 P/M per system; 4 systems.	P/M	16	2,500	xxx	xxx	xxx	xxx	xxx											
	internacional specialist	P/M	2	7,000	xx															
	Subtotal		30																	
2.5. Organization, systematization and centralization of existing data. Consolidation of integrated irrigation and drainage information system. Consultant assigned to DNRS	1 local consultant (Info.-processing)	P/M	48	1,750	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	
	1 operator	P/M	48	500	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	
	Subtotal		96																	
SUPPORT FOR WATER-RESOURCES MANAGEMENT																				
3.1. Organization and implementation of Water Authority	Local consultant (Public admin.)	P/M	18	2,500	xxx	xxx	xxx	xxx	xxx	xxx										
	Local consultant (Water resources)	P/M	18	2,200	xxx	xxx	xxx	xxx	xxx	xxx										
	International consultant	P/M	8	7,000			xxx	xxx	xx											
	Legal consultant	P/M	8	1,800			xx	xxx	xxx											
	Local consultant (Systems analyst)	P/M	8	1,800			xxx	xxx	xx											
	Subtotal		60																	
3.2. General regulations under Water Law:	Local consultant	P/M	6	2,000	xxx	xxx														
	International consultant (Hydrology)	P/M	6	7,000	xxx	xxx														
	International consultant (Economics)	P/M	6	7,000	xxx	xxx														
	Local consultant (attorney)	P/M	6	1,800	xxx	xxx														
	Subtotal		24																	
3.3. Water-use regulations by sector:																				
- Water-use regulations, irrigated farming	Local consultant	P/M	3	2,200	xxx															
	Legal consultant	P/M	3	1,800	xxx															
	International consultant	P/M	4	7,000	xxxx															
	Subtotal		10																	
- Water-use regulations, potable water supply:	Local consultant	P/M	3	2,200	xxx															
	Legal consultant	P/M	2	1,800	xx															
	Subtotal		5																	
- Water -use regulations, energy sector:	Local consultant	P/M	2	2,200			xx													
	Legal consultant	P/M	2	1,800			xx													
	Subtotal		4																	
- Water-use regulations, inland navigation:	Local consultant	P/M	2	2,200			xx													
	Legal consultant	P/M	2	1,800			xx													
	Subtotal																			
- Water-use regulations, mining sector:	Local consultant	P/M	3	2,200			x	xx												
	Legal consultant	P/M	2	1,800			x	x												
	Subtotal		5																	
- Water-use regulations, industry:	Local consultant	P/M	3	2,200			xxx													
	Legal consultant	P/M	2	1,800			xx													
	Subtotal		4																	

**NATIONAL IRRIGATION PROGRAM (PRONAR)
PERFORMANCE BENCHMARKS**

COMPONENT	YEAR				TOTAL UNITS
	I	II	III	IV	
I. INVESTMENTS					
1. Projects approved (No.)	36	44	42	38	160 projects
2. Irrigation systems built and turned over to communities (No.)	24	50	44	42	160 systems
3. Rural communities served (No.)	52	56	48	44	200 communities
4. Beneficiary households served (No.)	3,287	3,313	3,200	3,000	12,800 households
5. Hectares under irrigation improved (ha)	2,542	2,588	2,510	2,360	10,000 ha
6. New hectares placed under irrigation (ha)	3,612	3,588	3,500	3,300	14,000 ha
II. INSTITUTIONAL STRENGTHENING SUBSECTOR					
1. National Irrigation Committee installed and in operation	1				1 NIC
2. Departmental Irrigation Committees installed and in operation	7				7 DICs
3. DNRS departments and Watershed Operations Units installed and in operation	3				3 departments
4. Inventories of irrigation systems (Altiplano, Río Grande and Río Pilcomayo) completed	3				3 inventories
5. Inventories of areas with irrigation potential (Altiplano, Río Grande and Río Pilcomayo) completed	3				3 inventories
6. Irrigation plan for Altiplano watershed prepared	20%	40%	40%		100%
7. Irrigation plan for Río Grande watershed prepared	20%	40%	40%		100%
8. Irrigation plan for Río Pilcomayo watershed prepared	20%	40%	40%		100%
9. National development policy for irrigation subsector approved			100%		100%
10. Evaluations of public irrigation systems for transfer to users completed (No.)	4				4 systems
11. Evaluations of semipublic irrigation systems for transfer to users completed (No.)	8				8 systems
12. Irrigation systems transferred to final users (No.)	2	4	2		8 systems
13. Irrigation systems transferred to final users (hectares)	7,500	4,700	5,961	2,300	20,461 ha
14. Irrigation subsector information system installed and in operation	1				1 information system
15. National registry of irrigation systems installed and in operation	1				1 national registry
16. National technicians specialized (study grants) in irrigation (No.)		2	2	2	6 technicians
III. WATER-RESOURCES MANAGEMENT					
1. Draft Water Law submitted to National Congress	1				1 draft law
2. Water Law enacted			1		1 law
3. General Regulations for Water Law approved			1		1 Regulation
4. Proposal on organizational structure of Water Authority approved			1		1 structure
5. Water Authority installed and in operation				1	1 Authority
6. Water-use regulations for potable water supply approved			1		1 Regulation
7. Water-use regulations for irrigation approved			1		1 Regulation
8. Water-use regulations for energy subsector approved			1		1 Regulation
9. Water-use regulation for inland navigation approved			1		1 Regulation
10. Water-use regulations for mining subsector approved			1		1 Regulation
11. Water-use regulations for industry and tourism subsector approved			1		1 Regulation

**QUALITATIVE INDICATORS TO BE MONITORED DURING
THE EXECUTION OF PRONAR**

PROBLEM TARGETED	MEASURES	INDICATOR	PROGRESS			
			Year 1	Year 2	Year 3	Year 4
Institutional strengthening, Irrigation subsector						
Weak national agency for irrigation policy-setting, planning and development	Devise a new institutional structure to strengthen the DNRS	Approval of resolution creating new structure; hiring of additional staff	Start-up of the DNRS	Structure still in place	Structure still in place	Structure still in place
Inadequate irrigation investment planning; no national policy to guide subsector	Produce specific studies to set up an irrigation planning system and draft a national irrigation policy	Delivery of specific studies by consultants and approval of studies by the authorities			Delivery of studies	Projects prioritized on basis of plan and plan
Most investments are made alone, not centrally planned or with community input	Set up a National Irrigation Committee and Departmental Irrigation Committees	Approval of resolutions setting up the Committees, and start-up of their operation	Creation of the Committees	75% of projects submitted to Committees for approval	100% of projects	100% of projects
Lack of information at national level on existing irrigation systems and irrigation potential of each area of the country	Inventory irrigation systems and possible irrigable areas. Systematize information	Delivery of studies and implementation of computerized system		Information systems in operation	Idem	Idem
Support for water-resources management						
Weak, inadequate legal framework; no valuation of water resource	Approval of a new, modern Water Law and general enabling regulations	Congressional approval of the Water Law; drafting and approval of general regulations thereunder			Approval of Water Law and general regulations thereunder	Implementation of new legal instruments
Disputes over water use	Creation of a water authority empowered to settle disputes and award concessions	Water authority set up		Studies of authority's organization completed	Water authority begins operation	Water authority operating
Water not managed or allocated by different sectors	Development of sets of regulations for each water-use sector	Approval of sectoral regulations by authority having jurisdiction		Studies completed	Regulations in force	Idem

PROBLEM TARGETED	MEASURES	INDICATOR	PROGRESS			
			Year 1	Year 2	Year 3	Year
Technical assistance						
of knowledge about g social organization gation	Courses to teach partici- pating institutions the PRONAR approach	Courses delivered, topics covered, number of persons trained	To be prepared in annual operating plan (AOP)	Idem	Idem	Idem
esino organizations ways able to operate maintain systems; once ns are in place, they now-how of irrigated- g techniques	Seminars and training for communities. FDC financing for executing entities (EEs) to advise communities once systems in place	Courses delivered, topics covered, number of persons trained. % of irrigation projects approved by FDC, including advisory support	Data in AOP ----- Advisory support given for 60% of projects	Advisory support for 90% of projects	Advisory support for 100% of projects	Idem
ns not planned or ned with a view to esino needs	Training in "PRONAR approach" for EEs and participating institutions	Courses delivered, topics covered, number of persons trained	Data in AOP	Idem	Idem	Idem
ck technical capacity duce good-quality ts	Training and technical assis- tance for EEs in technical features of irrigation project design	Courses delivered, EEs assisted, number of persons trained. Good-quality projects presented to Fund	Data in AOP ----- 60% of projects presented are of acceptable quality	80% of projects presented are of acceptable quality	90% of projects presented are of acceptable quality	Idem

PROBLEM TARGETED	MEASURES	INDICATOR	PROGRESS			
			Year 1	Year 2	Year 3	Year 4
Investments in rural Irrigation						
own project ication, without unity input	Amendment of FDC Oper. Regs. to require creation of Works Committee in each community. Formal commit- ment by community to contribute to project and approval of final design of works	Approval of modified FDC Oper. Regs. and their implementation. Increase in number of projects having Work Committees	A Committee in place for 60% of projects	A Committee in place for 90% of projects	A Committee in place for 100% of projects	Idem
community contribution not registered, and super- intermittently	Modification of FDC project monitoring form to effectively track quality and amount of beneficiary contribution	FDC monitoring form modi- fied and being used by program officers. Increase in number of projects so monitored	Beneficiary contribution monitored in 75% of projects	Beneficiary contribution monitored in 100% of projects	Idem	Idem
Official economic appraisal of projects; effi- ciency of investments not ad	Revamping of FDC economic appraisal model for projects under US\$250,000. Individual economic appraisal for large projects	New economic appraisal model implemented. Oper. Regs. amended to require individual economic appraisal for projects over US\$250,000	100% of projects appraised using new methodology	Idem	Idem	Idem
Internal project review approval processes slow	Plan to strengthen FDC departmental offices and decentralize functions	Staff added to departmental offices. Decentralization plan implemented. FDC processing time shortened	FDC processing time 15% shorter	FDC processing time 30% shorter	Maintain	Maintain
on projects do not ess needs identified by unities or fit with and regional development plans	Creation of a National Irrigation Committee and Departmental Irrigation Committees to review all irrigation projects and ensure their consonance with current development plans	National and Departmental Irrigation Committees operating. % of irrigation projects reviewed by the Committees	60% of projects reviewed by the Committees	90% of projects reviewed by the Committees	100% of projects reviewed by the Committees	Idem

PROPOSED RESOLUTION

BOLIVIA. LOAN ____/SF-BO. TO THE REPUBLICA DE BOLIVIA
(National Irrigation Program "PRONAR")

The Board of Executive Directors

RESOLVES:

That the President of the Bank, or such representative as he shall designate, is authorized, in the name and on behalf of the Bank, to enter into such contract or contracts as may be necessary with the República de Bolivia, as Borrower, for the purpose of granting it a financing to cooperate in the execution of a National Irrigation Program. Such financing will be for the amount of up to US\$25.600.000, or its equivalent in other currencies, except that of Bolivia, which are part of the Fund for Special Operations and will be subject to the "Terms and Financial Conditions" and the "Special Contractual Conditions" of the Executive Summary of the Loan Proposal.