

**DEVELOPMENT OF A REGULATORY FRAMEWORK FOR THE WATER SUPPLY
AND SANITATION SECTOR IN BOLIVIA**

(TC-96-05-16-6)

EXECUTIVE SUMMARY

EXECUTING AGENCY: Ministry of Capitalization

BENEFICIARIES: Water Sector Superintendency [Superintendencia Sectorial de Aguas] (SSA)

OBJECTIVES: The objective of the project is to foster the efficient and self-sustainable delivery of water and sewer service and to encourage private investment in that sector.

DESCRIPTION: The project will have three principal components: (i) preparation of the regulatory framework for the sector; (ii) development of quality standards for water and sewer service; and (iii) start-up and strengthening of the regulatory agency, the SSA.

An investment project known as the basic sanitation program for urban areas (BO-0125) is being carried out concurrently to finance the work of improving and expanding water-supply and sewer services in cities with a population greater than 5,000. The cooperation proposed herein is an integral part of the BO-0125 program, which the Board of Executive Directors of the Bank is expected to approve in December 1996.

FINANCING:

Modality:	Grant
Recipient:	US\$ 353,000
MIF:	US\$ 980,000
Total:	US\$1,333,000

IMPLEMENTATION SCHEDULE: Period for execution: 18 months.
Period for disbursement: 21 months.

ENVIRONMENTAL CLASSIFICATION: The Environment Committee, at its meeting of October 29, 1996, classified this as a Category II operation.

SPECIAL CONTRACTUAL CONDITIONS: In addition to the applicable general contractual conditions, the following special conditions will be included:

- a. As a condition precedent to the first disbursement, the executing agency will present to the Bank: (i) evidence that it has hired the coordinator; and (ii) a detailed work plan for carrying out the program.
- b. As a condition for continuing the disbursements, provision is made for a mid-term program review, to be conducted 12 months after the contract is signed. The following conditions are to be met by that date: (i) the Water Superintendent will have been appointed and will be actively performing his duties; (ii) all the executive decrees pertaining to sector regulation will have been approved; (iii) at least five professional staff members will have been hired at the SSA and will be performing their duties; (iv) the SSA will be physically established and functioning; and (v) the necessary budget will be available for operation.

I. COUNTRY ELIGIBILITY

- 1.1 On October 6, 1993, the Donors Committee declared the Republic of Bolivia eligible for all financing modalities.

II. BACKGROUND

A. The sanitation sector in Bolivia

- 2.1 Bolivia has one of the lowest coverage indices for water-supply and sewer services among the Latin American countries. ^{1/} It is estimated that the public water-supply systems in urban areas serve 75% of the population. This means that about 900,000 urban inhabitants have no service. Coverage of wastewater disposal systems is even lower, at an estimated 36%. In rural areas, these percentages are lower still, as only 24% of the population has an organized water-supply service and approximately 15% use latrines or other individual systems of disposal. The health conditions of the Bolivian population are generally precarious, with a life expectancy of 59.7 years and an infant mortality rate of 73.2 per 1,000, the latter being one of the highest in Latin America. Enteric and waterborne diseases are the second most common types of diseases reported and the leading cause of infant mortality and morbidity.
- 2.2 The Bolivian government has been taking steps to reorganize the sector and remedy the shortcomings in its legal and institutional framework at the national, regional and local levels. In that context, it issued a decree in November 1991 to create the National Office of Basic Sanitation [Dirección Nacional de Saneamiento Básico] (DINASBA). This office was assigned the tasks of prioritizing plans and projects, developing investment programs, establishing rules and regulations, developing a tariff policy, promoting health education, and the overall functions of a sector planning and coordinating agency at the national level. Despite these wide-ranging responsibilities, DINASBA presently has a shortage of staff and has been unable to perform all of the duties assigned to it.
- 2.3 In recent years, a number of laws have indirectly modified the sector's institutional framework. Prominent among these laws were the executive branch reform law which modified several ministries, the community participation law which introduced reforms that affect the original mandate of the decree creating DINASBA by granting more authority and resources to the country's

^{1/} According to the 1992 census, the total population of Bolivia was 6.4 million, with an urban population of 3.7 million.

municipalities, and the administrative decentralization which transferred several functions from the central government to the departments.

2.4 The sector regulation system (SIRESE) law was enacted in October 1994, with the objective of regulating, controlling and supervising the activities of various sectors including water supply and sewerage. The law set up a general superintendency under the supervision of the Ministry of Finance, as well as sector superintendencies with responsibility for each specific sector. Among the functions of these superintendencies are approving and publishing prices and tariffs according to the legal procedure prevailing in the sector, granting and renewing concessions, encouraging efficiency and monitoring the delivery of service. Thus, the law centralizes the regulatory function of the sanitation sector in a single entity, the Water Sector Superintendency. Establishing this entity as a functioning body is a key objective of this project.

2.5 Water-supply and sewer services are provided principally by municipal entities. In the city of Santa Cruz and many smaller cities, users have organized themselves into cooperatives. The government has now decided to encourage the private sector to become involved in financing and operating these services through the granting of concessions in the cities of La Paz and Cochabamba. The existence of a legal framework and a regulatory agency is considered an essential condition for involving the private sector in these services.

B. General framework of the project

2.6 In order to support the government's efforts to organize the institutional and legal framework of the sector, the Bank approved funding for a preliminary sector study under the credit program for urban development and sanitation (PRODURSA II, loans 777/OC-BO and 914/SF-BO). The study included an analysis of the legal, institutional, financial and administrative factors that affect the development of the sector, and it produced a plan of action to solve those problems considered the most critical. Its recommendations are being considered in the proposed project.

2.7 Concurrently with the proposed operation, an investment project known as the basic sanitation program (BO-0125) is being carried out to finance the work of improving and expanding water-supply and sewer services in cities with a population greater than 5,000. The technical-cooperation funding proposed herein is an integral part of that program, for which approval is expected in December 1996.

2.8 The government intends to obtain private-sector participation as soon as possible for the administration and operation of water-supply and sewerage services in Bolivia through the establishment of a new regulatory framework for the sector. It will begin this

process in the cities of La Paz and Cochabamba where, upon completion of the government's timetable, the concessions given will be governed by their respective contracts. In order to ensure consistency between the contracts and the regulatory framework in the target sector, the two tasks have been concentrated in the same unit of the Ministry of Capitalization, and the activities of this program have been accorded priority in order to take immediate action on the detailed preparation of the regulatory framework. The implementation of the regulatory framework envisioned in the proposed operation will increase private-sector participation in other enterprises in the sector.

- 2.9 Under the SIRESE law, the sector superintendencies for telecommunications, electricity and transportation have already been created and are functioning. The establishment of the Water Superintendency and its enabling regulations constitutes the government's current main priority in the sector and is the basic purpose of the proposed operation.

III. THE PROJECT

A. Objectives of the project

- 3.1 The general objective of the project is to foster efficient and self-sustainable water and sewer services. To achieve that end, the pertinent legal provisions will be established and a modern sector-regulation system will be put into place to ensure separation of the planning, regulation and service functions and to encourage private-sector participation through objective, sound and non-discriminatory practices.
- 3.2 The project will have three principal components: (i) preparation of the regulatory framework for the sector; (ii) development of quality standards for service; and (iii) start-up and strengthening of the Water Superintendency as the regulatory agency. The development of the project takes into account the government's urgent need to establish an adequate regulatory framework consistent with the concession contracts that may be granted beforehand to private companies to provide service in La Paz and Cochabamba. Special consultants will have to be hired in order to meet this objective.

B. Project components

1. Preparation of the regulatory framework

- 3.3 The principal activity to be conducted will be the definition of sector regulations that are essential for setting up the regulatory

framework, and the adaptation of a number of rules governing the functioning of the sector. These regulations tentatively include:

- a. Regulations on institutional aspects, which define the roles and responsibilities of the principal entities that will operate in the sector, specifically including the Water Superintendency, the service providers, and the sector planning agency.
 - b. Regulations on the use of public property and creation of easements.
 - c. Regulations for concessions and authorizations, which establish the principles and procedures for granting concessions.
 - d. Tariff regulations, which establish the criteria, formulas and procedures for setting and updating service tariffs.
 - e. Regulations on service, which establish the rights and obligations of service providers and users.
 - f. Regulations on violations and penalties, which establish the fines to which service providers are liable in the event of nonperformance.
- 3.4 Additional provision is made for the identification and possible modification of various other rules that could affect the sector agenda. These include matters related to taxation, banking and finance, accounting and other areas.

2. Development of quality standards for service

- 3.5 As an important adjunct to the regulations, this activity will define the quality standards for service that are to be met by the providers and that will be the focus of regulation. The following tasks are envisioned:
- a. Gather and organize the existing regulations pertaining to standards for: water supply, including quality, quantity, continuity and pressures; collection of sewage and its disposal in receiving bodies, including standards on dumping liquid industrial waste into the sewer system, and standards associated with the disposal of treated or untreated sewage into receiving bodies; and matters pertaining to customer service in commercial areas such as billing, complaints, new connections, tariff information, service contracts, and other considerations.
 - b. Recommend and propose standards that complement or modify the existing ones, as may be deemed necessary and consistent with the prevailing sector conditions in Bolivia.

- c. Define for each standard the parameters, quantitative criteria to be used, and the procedures for measurement, validation and control.
- d. Train SSA staff to interpret and apply the recommended regulations.

3. Start-up of the regulatory agency

- 3.6 In the context of the SIRESE law, it is necessary to start up and strengthen the Water Superintendency in order to ensure that its sector regulation functions are properly carried out and to guarantee its independence, financial self-sufficiency and administrative autonomy. The following tasks are envisioned:
- 3.7
 - a. Definition of the administrative structure: (i) organizational design of the superintendency; (ii) its organizational chart; (iii) description of functions; (iv) staff requirements and qualifications; (v) physical infrastructure and equipment requirements; and (vi) budget and financing.
 - b. Definition (software and hardware design) of information systems covering: (i) the service providers subject to regulation; (ii) tariffs, including baseline data on development plans and the associated costs, and any other background information pertinent to tariff determination; (iii) actions taken by service providers in regard to compliance with standards, development plans, tariff levels, coverage, service quality, and operating and financial management indicators. Also included is the software and hardware design of an internal management control system for the SSA and the formulation of an information systems plan that encompasses all of the previous systems. It is anticipated that all systems will be brought into operation, establishing control and feedback procedures that are appropriate for drawing up the final design.
 - c. Equip the SSA and provide the necessary infrastructure to operate it properly.
 - d. Training for SSA staff in subjects appropriate to their roles within the new regulatory framework. Specific provision has been made for developing a special workshop on tariffs, and sharing of information and experiences with staff of similar regulatory agencies in other countries of the region.
 - e. Local-contribution financing of salaries and compensation for the superintendent and five professional staff members.
- 3.8 As a special reinforcement for the SSA, a "tariff framework" study has been included for the purpose of establishing the criteria, methodologies and information-gathering systems that are required

for tariff calculations. This tariff-setting function is a key objective of the SSA.

4. Project coordination

- 3.9 Financing is included for a consultant to carry out the work of coordinating the activities provided for in this project. The specific tasks to be carried out pertain to: identifying and selecting consultants, reviewing and/or tailoring specific terms of reference, hiring consultants, coordinating the counterpart teams for supervising the studies and consulting services, and managing the operation according to the Bank's information requirements (see paragraph 3.16).

C. The budget

- 3.10 The project budget is presented in the following table.

(in US\$)			
CATEGORIES	MIF	LOCAL CONTRIBUTION	TOTAL
Preparation of regulatory framework	252,000		252,000
Development of quality standards	138,000		138,000
Start-up of the SSA	474,400	321,000	795,400
Coordinator	49,000		49,000
Supervision and contingencies	66,600	32,000	98,600
PROJECT TOTAL	980,000	353,000	1,333,000

D. Organization and execution

- 3.11 The project will be executed by the Technical Group for Water Sector Capitalization under the Ministry of Capitalization, which will hire a coordinator to manage and supervise the implementation of the proposed activities. This ministry already has experience with establishing regulatory frameworks and superintendencies for the telecommunications, electricity and transportation sectors.
- 3.12 The Technical Group for Capitalization will maintain close coordination with the General Superintendency of SIRESE while the studies are being conducted. As soon as the Water Superintendent is appointed, he will join the aforementioned Technical Group to guide and direct the work of the consultants, especially the work related to starting up and strengthening the regulatory agency.
- 3.13 Several consultants are expected to be hired in accordance with the annexed terms of reference. In each case, depending on the nature

of the particular contract, the Ministry will designate the appropriate counterpart staff to follow up on and review the associated reports.

- 3.14 The hiring of consultants, whether they be companies or individuals, will be conducted in accordance with Bank and MIF procedures. Consideration has been given to hiring a specialized consulting firm to draw up the legal framework for sector regulation. The executing agency may, however, with Bank approval, perform the tasks indicated in the terms of reference through the hiring of individual consultants.
- 3.15 It is estimated that program execution will take 18 months, as indicated in the annexed tentative implementation schedule.

E. Disbursements

- 3.16 The grant funds will be disbursed in accordance with Bank procedures, and the procurement of goods and services will be limited to MIF-eligible countries.

F. Supervision

- 3.17 The operation will be supervised by the Bank's Country Office in Bolivia, which will endeavor to coordinate the activities with the supervisory activities of the urban basic sanitation program (BO-0125). The executing agency will submit quarterly progress reports that (i) summarize the principal activities carried out to date, (ii) identify the problems encountered, (iii) make the appropriate recommendations to move the program forward satisfactorily, (iv) summarize the consultants' recommendations and conclusions, and (v) recommend any changes in the distribution of resources without changing the modality, increasing the funding or rescheduling activities. These recommendations are to be approved by the MIF office and the project team.

G. Special contractual conditions

- 3.18 As a condition precedent to the first disbursement, the executing agency will present to the Bank: (i) evidence that it has hired or appointed the coordinator; and (ii) a detailed plan of activities for carrying out the program.
- 3.19 As a condition for continuing the disbursements for this operation, provision is made for a mid-term program review, to be conducted 12 months after the contract is signed. The following conditions are to be met by that date: (i) the Water Superintendent will have been appointed and will be actively performing his duties; (ii) all the executive decrees pertaining to sector regulation will have been approved; (iii) at least five professional staff members - including in particular those designated as upper-level managers in the organization chart - will have been hired and will be

performing their duties at the superintendency; (iv) the superintendency will be physically established and functioning; and (v) the necessary budget will be available to operate the superintendency for the current year.

H. Evaluation

- 3.20 Three months after the completion of the operation, the executing agency will submit a final report evaluating the results, in which it will indicate the principal achievements, difficulties encountered and recommendations on future action to pursue sector development.

IV. BENEFITS AND RISKS

- 4.1 The execution of this project will make it possible to draw up an institutional and legal framework for the sanitation sector in Bolivia, enabling it to overcome a serious deficiency that has thus far hindered its operation. Secondly, and taking into account the concepts introduced in the legal framework, it will establish a modern, efficient system of regulation that will result in significantly enhanced quantity and quality of service in Bolivia, with consequent benefits in terms of quality of life for the population. And lastly, the legal framework will enable private enterprise to participate in the sector, thus attracting financing and experience in an area until now reserved for public entities or cooperatives. The creation and start-up of the Water Superintendency is an important step toward the consolidation of the sector's institutional framework.
- 4.2 This operation is considered an essential complement to the urban basic sanitation program (BO-0125), which is financing sector investments of US\$70 million. The existence of the regulatory framework and the superintendency will place these investments in the context of overall efficiency in the use of resources, and in addition it will result in adequate tariffs and the establishment of incentives and controls for better management of services.
- 4.3 The risks associated with project have to do with any future change of administration in Bolivia. Only to the extent that the new authorities embrace the objectives and scope of this operation can its continuity and success be ensured. It is anticipated that the mid-term review will coincide with the early years of the new administration and will be an opportunity to confirm the priority and scope of this operation.

V. FULFILLMENT OF ELIGIBILITY CRITERIA

- 5.1 The proposal is fully consistent with the general objective of the MIF, which calls for strengthening investment and expanding the private sector as ways to accelerate economic growth and social development in Bolivia. It is also consistent with the criteria for awarding financing under the technical cooperation facility (Article 3, Sections 2(c) and (d) of the Agreement Establishing the MIF), which provides for the granting of funds to governments to finance advisory services needed to establish and/or strengthen the regulatory agencies and to advise on the design and implementation of the privatization programs.
- 5.2 The project is also consistent with the priorities set by the donors for the technical cooperation facility. Moreover, similar projects have already been approved for Argentina, Colombia, Ecuador, Nicaragua and Paraguay. Financing in the form of a grant is recommended in order to speed up the reform process.

VI. COMPATIBILITY WITH THE BANK'S COUNTRY PROGRAM

- 6.1 The operation is compatible with the Bank's strategy for Bolivia, inasmuch as the programming paper indicates that the Bank will take part in financing programs for the sanitation sector in order to support the establishment, development and implementation of a new legal and institutional framework.

VII. AVAILABILITY OF MIF RESOURCES

- 7.1 The project will be financed by means of a grant, on the basis of the following considerations: (i) the Donors Committee declared Bolivia eligible for all financing modalities on October 6, 1993; and (ii) Bolivia meets the eligibility criteria for obtaining grant funds, as set forth in Article 3, Section 5(b), of the country eligibility memorandum.

PROJECT SUMMARY

MIF FACILITY I BOLIVIA REGULATORY FRAMEWORK FOR THE WATER SUPPLY AND SANITATION SECTOR		
General project objective Restructuring of the water supply and sanitation sector in order to achieve greater efficiency and facilitate private sector participation.		
Specific project objectives (i) Establish a regulatory framework for service; and (ii) start up the regulatory agency.		
1. Preparation of the regulatory framework	Review the drafts of the sector regulations pertaining to: institutional aspects; use of public property and creation of easements; concessions and authorizations; tariffs; service provision; violations and penalties. Review other rules.	Final version of each regulation and of other legal reforms, 3 months after consulting services begin.
	Assist in writing the final version of each of these documents.	
	Review the proposed regulatory framework and the bidding conditions for concessions granted to private enterprises for service provision in La Paz and Cochabamba for consistency. Recommend appropriate modifications to the bidding conditions.	Recommendations on bidding conditions, 3 months after consulting services begin.
	Coordinate the recommendations on service quality with the rights and duties of service providers and users set out in the regulations on service.	Incorporate recommendations on service quality into the regulations, 3 months after consulting services begin.
2. Development of quality standards for service	Gather and organize the existing regulations pertaining to drinking service, collection of sewage and disposal in receiving bodies, and customer service.	Document with technical standards and procedures for service quality control, 3 months after consulting services begin.
	Recommend and propose complementary standards or modifications of existing ones.	
	Establish applicable quantitative criteria and the procedures for measurement, validation and control.	
	Train SSA staff to interpret and apply the recommended regulations.	10 SSA specialists trained in 15 months.
3. Start-up of the SSA	Establishment of the administrative structure including: organization chart, description of functions, staff requirements and qualifications, physical requirements, and annual budget requirements.	Manual of administrative structure in 3 months.
	Establishment of information systems, including those covering: service providers, tariffs, actions taken by service providers, and internal management control.	Manuals prepared in 6 months. Systems operational at SSA in 9 months.

3. Start-up of the SSA (continued)	Procurement of all equipment and infrastructure necessary for operation.	Specified equipment available in 9 months.
	Training for SSA staff in subjects appropriate to their roles.	10 specialists trained in tariffs, in 18 months.
	Financing of salaries for SSA staff.	Superintendent and 5 professional staff members hired and on the job in 9 months.
	Tariff framework study conducted.	Framework document in 13 months.
4. General support	Hiring of program coordinator.	Coordination concluded in 14 months.

**MIF — FACILITY I — BOLIVIA
REGULATORY FRAMEWORK FOR THE WATER SUPPLY AND SANITATION SECTOR
ESTIMATED BUDGET**

Activities				Local contribution US\$	MIF US\$	Total US\$
I. Regulatory framework						
I.1	Preparation of regulatory framework	Quantity	US\$/day	Days		
	International consultants	5	1,600	18.0	144,000	
	Bolivian consultants	10	360	30.0	108,000	
	Subtotal 1				252,000	252,000
I.2	Quality standards for provision	Quantity	US\$/day	Days		
	International consultants	1	1,600	18.0	28,800	
	Bolivian consultants	2	360	60.0	43,200	
	Training expenses				20,000	
	General expenses and OH	50%			46,000	
	Subtotal 2				138,000	138,000
II. Start-up of the regulatory agency						
II.1	Organizational design	Quantity	US\$/month	Months		
	Business administrator	2	2,000	5.0	20,000	
	International consultant (Tariffs)	1	15,000	0.5	7,500	
	Local consultant (Sanitation engr.)	1	4,000	0.5	2,000	
	General expenses and OH	50%			14,750	
	Subtotal 3				44,250	44,250
II.2	Definition of information systems	Quantity	US\$/month	Months		
	Systems analyst	1	4,000	9	36,000	
	Programmers	2	2,000	9	36,000	
	Sector specialist engineer	2	3,000	9	54,000	
	General expenses and OH	35%			44,100	
	Subtotal 4				170,100	170,100
II.3	Equipment	Quantity	P.Unit			
	Computer equipment	20	3,000		30,000	30,000
	Server	1	20,000		10,000	10,000
	Information systems software license	1	120,000		60,000	60,000
	Operations software licenses	4	2,500		5,000	5,000
	Furniture	300	150		45,000	
	Subtotal 5				150,000	105,000
II.4	Training	Quantity	US\$/month	Months		
	Tariff calculation workshops					
	International consultants	2	15,000	0.8	22,500	
	Bolivian consultants	3	4,000	1.0	12,000	
	Preparation of case study	Global			23,050	
	Dialogue with regulatory agencies	Quantity	Unit cost	Trips		
	Travel	5	2,000	3.0	30,000	
	Per diems	5	200	21.0	21,000	
	Subtotal 6				108,550	108,550

ANNEX II

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Activities				Local contribution US\$	MIF US\$	Total US\$
II.5	Tariff framework study	Quantity	US\$/month	Months		
	International consultants	1	15,000	1.5	22,500	
	Bolivian consultants	3	4,000	2.0	24,000	
	Subtotal 7				46,500	46,500
II.6	Initial operation of the SSA	Quantity	US\$/month	Months		
	Superintendent	1	4,000	9.0	36,000	
	Professionals	5	3,000	9.0	135,000	
	Subtotal 8				171,000	171,000
III.	General support	Quantity	US\$/month	Months		
	General coordinator	1	3,500	14.0	49,000	49,000
	Grand total				321,000	913,400
	Supervision and contingencies				32,000	66,600
	Project total				353,000	980,000

[illegible]

URBAN BASIC SANITATION PROGRAM

(BO-0125)

EXECUTIVE SUMMARY

**BORROWER AND
GUARANTOR:** Republic of Bolivia

EXECUTING AGENCY: The program executing agency will be the Fondo Nacional de Desarrollo Regional [National Regional Development Fund] (FNDR). The service providers will act as coexecuting agencies. The Ministry of Capitalization will execute the component for the development of a sector regulatory framework.

AMOUNT AND SOURCE: IDB (FSO): US\$70,000,000
MIF: US\$ 980,000 *
Local counterpart funding: US\$17,853,000
Total: US\$88,833,000
* Separate technical-cooperation operation being processed.

**FINANCIAL TERMS
AND CONDITIONS:** Amortization period: 40 years
Disbursement period: 4 years
Interest rate: 1% for 10 years; 2% thereafter
Inspection and supervision: 1%
Credit fee: 0.5%

OBJECTIVES: The main objective of the program is to improve the hygiene and health status of the Bolivian urban population, through the expansion and improvement of water supply and sanitary sewerage services in cities with over 5,000 inhabitants. The program further seeks to: (i) promote greater private-sector participation; (ii) support the process of developing and consolidating the sector's regulatory framework and organizing and strengthening its regulatory agency, the Water Board; and (iii) contribute to the development and strengthening of local companies or cooperatives responsible for delivering water supply and sanitation services in the participating cities.

DESCRIPTION: The proposed program, under the multiple-works modality, consists of three components: (i) works involving water collection and supply, and sewage collection, treatment, and disposal; (ii) technical

cooperation operation to be financed by the MIF to support the development of a regulatory framework for the sector and the establishment of the Water Board, which will be the sector's regulatory agency; and (iii) institutional strengthening of companies delivering the services, through actions aimed at improving their administrative and operational efficiency.

- a. Depending on the needs identified in each participating city, the water supply works will include construction or improvement of surface water catchment areas, drilling or rehabilitation of wells, procurement and installation of pumping equipment, and construction of conveyance pipes, storage tanks, hydraulic interconnections, water treatment plants, distribution systems and related facilities (storerooms, workshops, and laboratories). The sanitary sewerage works will include the construction of secondary networks, trunk sewers, intercepting sewers, pumping stations, outfalls, and treatment plants, in addition to the types of buildings mentioned above. In general, the projects would seek to use existing facilities to the extent possible, and avoid substantial conversions of existing systems (US\$73,980,000).
- b. The main activities to be carried out in developing the regulatory framework are: (i) the drafting of regulations on institutional matters, use of goods in the public domain and the granting of easements, concessions and authorizations, rates, service delivery, and infraction and penalty provisions; (ii) the definition of quality standards for the services, to provide adequate protection for users' rights, public health, and the environment; and (iii) activities related to setting up the regulatory agency, which include the identification of: the administrative structure and method of financing; operational and accounting procedures; information systems; training needs; and requirements for computer equipment needed to carry out the functions (US\$1,333,000).
- c. Under the institutional strengthening component – and depending on the specific needs of each enterprise – the following activities will be financed: (i) improvement of business operations, including inventory systems, billing,

collections, and customer services;
(ii) improvement of the administrative area, including accounting, budget, and material and human resource management systems; and
(iii) improvement in operations, including master metering, house metering, inventories of systems and facilities, loss reduction, equipment and civil works maintenance, and sanitary control (US\$3,650,000).

ENVIRONMENTAL CLASSIFICATION: The Environment Committee classified this as a Category III operation. On October 15, 1996, it approved the program's environmental summary, which was sent to the PIC on October 18, 1996.

POVERTY TARGETING: Under the terms of the Eighth Replenishment mandate on poverty alleviation and the Bank's criteria for implementing that mandate, this program qualifies as a poverty-targeted investment, inasmuch as, based on the projects in the sample, 70% of the beneficiaries are considered low-income.

CONTRACTING OF CIVIL WORKS, GOODS, AND CONSULTING SERVICES: The Bank's current procedures will be followed in the procurement of goods and contracting of services to be financed with the loan proceeds. The threshold amounts above which international competitive bidding is required are US\$3 million for works, US\$250,000 for goods and related services, and US\$200,000 for consulting services (paragraph 3.19).

BENEFITS: The following goals would be achieved through execution of the program:

- a. 70,000 new water and sewage connections would be installed, benefitting some 350,000 people;
- b. a new legal and institutional framework for the sector would be established that would make it more efficient and would promote private sector participation;
- c. an autonomous regulatory agency for the sector would be set up and strengthened; and
- d. the administrative, business, and operations areas of the participating enterprises would be improved.

RISKS:

- a. A delay in implementing the sector's regulatory framework could slow the implementation of improvements in the efficiency and quality of the services and in the promotion of private sector

participation in other cities, which would attract resources for partial funding of investments needed in the sector. However, the government has demonstrated its commitment to implementing this framework as soon as possible.

- b. Although the country has a modern legal, environmental framework, environmental issues are not being fully addressed at this time. The execution of loan 929/SF-BO - which provides for institutional strengthening of the Ministry of Sustainable Development and the Environment (MDSMA) - will improve the environmental management capacity of the central government and, indirectly, that of the departmental prefectures. However, given the slow execution of this loan, this risk is expected to be mitigated by: (i) the use of the environmental unit of the FNDR, which has had hands-on experience in environmental analysis and management of projects similar to those included in this program; and (ii) the institutional strengthening of the prefecture of Santa Cruz, where industrial pollution problems were identified in the body of water receiving effluent from the treatment plants to be financed with program resources.

**EXCEPTIONS TO
BANK POLICY:**

No exceptions to Bank policy are anticipated.

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

The Bank's strategy in Bolivia identifies the need to support programs and projects aimed at fostering sustainable development, with emphasis on structural reforms, investment promotion, increased productivity, State decentralization and reform, improvement in the population's social conditions, and environmental protection. In the water supply and sanitation sector, which is viewed as essential to the well-being of the population and the country's development, the Bank's objective has been to promote the modernization of its legal and institutional framework, in order to improve service delivery quality and efficiency, foster private sector participation, expand the coverage of existing systems, and make the services self-sustaining. The creation and strengthening of an independent regulatory agency and the administrative and financial advancement of the local companies delivering the service are key elements of this strategy.

**SPECIAL
CONTRACTUAL
CONDITIONS:**

As conditions precedent to the first disbursement, the borrower will submit evidence to the Bank that:

- a. the program's Operating Regulations, previously agreed upon with the Bank, have entered into force (paragraph 3.14);
- b. the consultant who will coordinate the regulatory framework has been hired and a detailed work plan to execute the component has been presented (paragraph 3.5); and
- c. the agreement for transfer of resources to the FNDR has been signed (paragraph 3.2).

Other special conditions:

- a. a mid-term review of the program will be conducted that will center on an evaluation of the extent to which the program's goals are being met (paragraph 3.28); and
- b. appropriate conditions regarding maintenance, to be included in the Operating Regulations, have been agreed upon (paragraph 3.23); semiannual progress reports (paragraph 3.27); data collection (paragraph 3.30); the program's financial statements (paragraph 4.10); and rates (paragraph 5.5).

I. FRAME OF REFERENCE

A. The sanitation sector in Bolivia

- 1.1 Demographic growth and migration from rural areas to the cities has caused a considerable increase in Bolivia's urban population, which rose from 26% to 58% of the total population between 1950 and 1992. ^{1/} This increase has been especially noticeable in larger cities such as La Paz, Cochabamba, and Santa Cruz, and in some medium-sized cities, with annual growth rates of 4.5%. As a result, such urban centers have generated great pressure on the supply of public services, the demand for which has not always been met effectively.
- 1.2 Comparatively, Bolivia has one of the lowest rates of water supply and sanitary sewerage coverage in Latin America. It is estimated that public water supply systems cover 75% of the population in urban areas. This means that some 900,000 urban inhabitants do not have access to this service. The coverage of sewage disposal systems is even lower, estimated at 36%. In rural areas, these percentages are lower still, with an organized water supply service available to only 24% of the population, while some 15% use latrines or other appropriate individual disposal systems. The health conditions of the Bolivian population are generally poor, with a life expectancy of 59.7 years and an infant mortality rate that is among the highest in Latin America - 73.2 per 1,000. Enteric, water-borne diseases are the second most common illness recorded and the top cause of infant morbidity and mortality.
- 1.3 The national government has been taking steps to reorganize the sector and correct the weaknesses in its legal and institutional framework at the national, regional, and local levels. In November 1991, a decree was issued creating the National Basic Sanitation Directorate] (DINASBA), under the National Under Secretariat for Urban Affairs in the Ministry of Human Development. The department was assigned the tasks of setting priorities for plans and projects, preparing investment programs, establishing standards and regulations, furthering health education, and, in general, acting as the sector's planning and coordination body at the national level.
- 1.4 Despite this wide-ranging set of functions, DINASBA currently has a insufficient staff and has not yet been able to take up all its responsibilities. Under the same decree, sanitation units or offices were created in each of the country's nine departments.

^{1/} The total population of Bolivia, according to the 1992 census, was 6.4 million, of which 3.7 million lived in urban areas.

The task of these units is to create departmental plans and programs and set priorities, provide technical and administrative advisory services to the local entities involved in the sector, carry out and supervise works, and provide water quality control for the localities that lack the means to do so. These units are still at the embryonic stage.

- 1.5 In October 1994, Congress passed the Sector Regulation System Act (SIRESE), the objective of which is to regulate, monitor, and supervise the activities of various sectors, including water supply and sewerage. The act established a General Board, attached to the Ministry of Finance, and sector boards in charge of each specific sector.
- 1.6 The boards' functions include approving and publishing prices and rates, granting and renewing concessions, promoting efficient service delivery, and, in general, complying with and enforcing legal requirements and sector regulations. The act thereby centralizes the regulatory function in a single agency, the Water Board.
- 1.7 Currently, the General Board and those boards involved in the telecommunications, electricity, hydrocarbons, and transportation sectors, which were given priority under the Capitalization Act, are in the process of being consolidated. The startup of the Water Board and implementation of its regulations have not been undertaken and will be the main focus of the technical cooperation operation to be financed with Multilateral Investment Fund resources, as described below.
- 1.8 The resources allocated to the sanitation sector in Bolivia are currently channeled through two institutions: the Fondo Nacional de Desarrollo Regional [National Regional Development Fund] (FNDR) and the Fondo de Inversión Social [Social Investment Fund] (FIS). The FNDR channels resources primarily towards localities with over 5,000 inhabitants while the FIS focuses on smaller towns. The FNDR, executing agency for two projects financed by the Bank (PRODURSA I and II) and future executing agency for the proposed operation, is an agency set up by the government to promote balanced development of the country's regions through the financing of public investment programs and projects.
- 1.9 Water supply and sewerage services are delivered by municipal agencies, with few cases where the area of activity covers more than one location. In some cities - and in many smaller localities - the institutions have organized as cooperatives, i.e., nonprofit private entities. In others, the services are delivered by force account through the municipal governments or by municipal enterprises. In rural areas, neighbors' committees are generally set up to operate community water supply services.

B. Sector investment needs

- 1.10 In view of the above-mentioned low levels of service coverage, the sector's investment needs are significant. It is estimated that to meet current shortages and increase coverage of the urban population to close to 100%, investments in excess of US\$550 million would be required. Approximately 75% of these investments would be used to expand sanitary sewerage services, including wastewater treatment, which is where the greatest shortfalls occur (2.3 million city dwellers do not have access to this service). The amount of resources mentioned highlights the importance of seeking additional sources of financing, the private sector being the most obvious one.

C. Government strategy for increasing private sector participation

- 1.11 The national government is working to increase private sector participation and establish a sector regulatory agency, in the context of its general objective of modernizing the sanitation sector and thereby making service delivery more efficient and expanding coverage of water supply delivery and sewage collection and treatment systems. In addition to incorporating a Water Board into the aforementioned multisector regulatory system (SIRESE), and to introduce direct participation by private companies in the sector, the government has set an initial goal of granting water supply and sewerage concessions in two of the largest cities, La Paz and Cochabamba.

D. The Bank's strategy

- 1.12 The Bank's strategy in Bolivia emphasizes supporting the government to eliminate obstacles that affect the country's economic and social development, through projects and programs aimed at: promoting sustainable development, by supporting structural reforms, encouraging investment, and increasing productivity; supporting State reform and decentralization; and improving social conditions and maintaining and restoring the environment.
- 1.13 As explained below (section H), the Bank has been supporting the development of the water supply and sanitation sector through numerous operations, focusing primarily on urban areas. Its objective has been to promote efficient and self-sustaining service delivery, as an essential component of the population's well-being and the country's economic development. Special emphasis has been placed on the urgent need to promote access to the service by the largest possible number of users, while bearing in mind the importance of having properly strengthened local enterprises.
- 1.14 The proposed program supports government initiatives and includes actions that will contribute to achieving the aforementioned objectives. Under the PRODURSA II project, the Bank financed a

study entitled "Analysis of the status of the basic sanitation sector" (1995), which recommended the implementation of a gradual action plan, divided into two phases, to achieve sustainable development in the sector. The first phase, aimed at developing the legal and institutional framework, focused on the creation and strengthening of an autonomous and independent regulatory agency with a high level of technical expertise. The second phase focused on actions to be taken at the operational level, emphasizing greater participation by the private sector and its resources. This operation is consistent with those general lines.

E. The service concession process in La Paz and Cochabamba

- 1.15 The definition of the strategy for water supply and sewerage concessions in the cities of La Paz and Cochabamba – including (i) formulation of selection criteria for interested parties; (ii) definition of goals for expanding and improving the services; and (iii) establishment of contracting parameters – is currently being prepared by the Ministry of Capitalization, with advisory assistance from international consultants and the financial support of the World Bank. The government hopes to produce an information sheet for interested parties as well as the terms of reference and corresponding concession contracts, under a fast track formula whereby, if no significant delays occur, interested parties will be required to present proposals within a relatively short period (during the first quarter of 1997). The regulation of services for which concessions are granted would be performed through the respective contracts, since regulations under the sector's regulatory framework would not be totally completed.
- 1.16 The government has expressed interest in being able to announce to those interested in the concession process the possibility of the Bank's financing, through this program, of the two projects proposed in La Paz and Cochabamba, which would make possible a significant increase in the coverage of the respective services. The Bank has expressed its agreement and willingness to contribute to the success of the process and has indicated the minimum requirements that would have to be met for the two projects to be financed. These requirements are: (i) the commitment by the private company of a level of investment of its own resources at least equivalent to the project's local counterpart, to expand the services; (ii) the use of transparent procedures acceptable to the Bank in the bidding process for the concessions; (iii) development of a mechanism to ensure that the Bank's funds are used to support – not substitute for – private capital; (iv) the application of financing conditions similar to financial market conditions since the service would be delivered by private concessionaires; and (v) the inclusion of the areas identified as priorities in the service expansion plans (see paragraph 1.28).

F. The proposed program

- 1.17 The proposed program, which is consistent with the Bank's country strategy, was designed and sized on the basis of the Bank's sector evaluation, the government's plans regarding the concession process, and the lessons learned from the execution of earlier projects. The proposed operation had been conceived initially as a specific program for five cities: La Paz, Santa Cruz, Cochabamba, Montero, and Riberalta. However, in view of the government's decision to accelerate the process of granting concessions for water supply and sewerage services in La Paz and Cochabamba and, therefore, the likelihood that these projects will be financed by the private sector - with the possible participation of the Bank's Private Sector Department - it was considered advisable to convert the proposed operation to a global multiple-works program.
- 1.18 This modality gives the program flexibility by allowing the Government of Bolivia to develop a concession strategy for the cities of La Paz and Cochabamba that simultaneously: (i) increases the possibilities of success in the concession process; (ii) encourages possible interested parties to contribute more investment resources; and (iii) allows the release of program resources tentatively reserved for these two projects, for use in other Bolivian cities. To achieve these objectives and to pursuant agreements reached with the Bank, one of the main criteria for awarding concessions will be a mechanism to discourage use of program resources while at the same time allowing their use to achieve minimum goals in terms of expanding service coverage in the two cities. In addition, the loan contract will include the possibility of repaying the loan without penalties of any kind, to facilitate the replacement of proceeds from the financing with resources from private banks, with the possible participation of the Bank's Private Sector Department.
- 1.19 As indicated in paragraph 3.10, enough projects have been or are being prepared so that it will be possible to substitute cities within the program and to finance 10 mid-sized cities, assuming that the concession process is successful, thereby releasing the resources tentatively reserved for the two main cities mentioned.
- 1.20 The program's Operating Regulations will establish the guidelines that will govern program execution in terms of the possible participation of the private sector. Given the concessional nature of the resources of the loan and the desire not to introduce distortions into the Bolivian financial market, the amortization terms and interest rates will vary, depending on whether the service is delivered by public institutions (including user cooperatives) or transferred to private companies. In the latter case, the financial terms and conditions will be similar to those of the financial market.

- 1.21 In order to support the government in defining the sector's institutional and legal framework, the proposed program will include a technical cooperation operation to be financed with MIF resources. The profile for this operation (TC-96-05-16-6) was sent to the Programming Committee for consideration on October 7, 1996. It is expected to be approved by the Donors Committee of the MIF in December 1996. The objective of this operation is to promote the efficient delivery of water supply and sewerage services on a self-sustaining basis, through the preparation of the regulatory provisions that: guarantee the institutional separation of the planning, regulatory, and service delivery functions; establish incentives and quality standards for service delivery; and identify criteria and systems for setting and reviewing rates that will guarantee protection of the user and efficiency in resource use and promote private sector participation in other Bolivian cities. The MIF operation is comprised of two main components: (i) formulation of a regulatory framework for the sector; and (ii) startup and strengthening of the regulatory agency.

G. Environmental considerations

- 1.22 With the support of the Bank and other international institutions, Bolivia has been making significant progress over the last few years in establishing a legal and institutional framework for the environmental sector. In April 1992, Congress adopted the General Environment Act and created the Secretaría Nacional del Medio Ambiente [National Environment Secretariat] (SENMA). In September 1993, the Ministry of Sustainable Development and the Environment (MDSMA) was created, absorbing SENMA, which is now responsible for environmental planning in the context of national development. With the enactment of the regulations under the General Environment Act in 1996, Bolivia now has a modern environmental management system. In addition, in the context of these regulations, enforcement of legislation became the responsibility of the departmental prefectures, whose reorganization is still under way.
- 1.23 In November 1994, the Bank approved a reimbursable technical-cooperation operation in the amount of US\$19 million (929/SF-BO), to support the government in its efforts to improve environmental management capacity. Among its numerous actions, the project provides for the institutional strengthening of the MDSMA, assistance in the generation of policy proposals and sector strategies, and the development of pollution control instruments. The operation has experienced some delays because of changes in the sector's authorities, and conditions precedent are in the process of being fulfilled.
- 1.24 The MDSMA has been weakened by the loss of part of its mandate under the General Environment Act's regulations, as a result of the Decentralization Act. Moreover, the prefectures are still not

ready to implement environmental management systems. To circumvent these problems, environmental management of the proposed program will be undertaken directly by the FNDR, with which the Bank has established a working project environmental assessment system. This system is similar to the one for which regulations were established in the Environment Act of 1996. At the same time, the environmental management capacity of the prefecture of Santa Cruz will be strengthened, since in that city industrial pollution problems were identified in the body of water receiving effluent from the project's sewage treatment plants.

H. The Bank's participation in the sector

- 1.25 Since 1965, the Bank has financed five operations in the sector, with loans totalling US\$71.2 million. Since 1990, the Bank has financed two multisector global credit programs known as PRODURSA I and PRODURSA II, executed by the FNDR. These operations, with loans of US\$60 million and US\$64 million, respectively, were basically intended to finance infrastructure and public utility works in urban centers, including basic sanitation works. The latter accounted for 21% of the total cost of the programs and are limited to projects with individual amounts below US\$8 million.
- 1.26 It should be noted that some problems arose during execution of PRODURSA I, as a result of the FNDR's lack of experience and the speed with which the program was being executed. The main problems encountered involved incomplete files, which prevented verification of the numerous activities related to the bidding process; failure to observe discretionary limits in a small number of projects; and failure to apply some of the eligibility criteria set forth in the Credit Regulations. Once these anomalies were detected, a process was implemented to bring operation administration into line, with assistance from the Country Office. These experiences were taken into account when the next operation – PRODURSA II – was designed, and its execution has been going well.
- 1.27 In addition to having a positive impact on the quality of life of the beneficiary population through increased municipal utility supply and coverage, PRODURSA's multisector programs, the second stage of which is 29% disbursed, have supported government decentralization and have contributed to the project preparation and evaluation process.
- 1.28 As a preliminary step for the proposed program, in 1991, the Bank approved technical-cooperation financing operation ATN/JF-SF-3697-BO to prepare master plans, feasibility studies, and final designs of projects in eight cities, most of them departmental capitals. The studies included socioeconomic evaluations of the alternatives considered, institutional and financial analyses of the enterprises or cooperations, and

environmental impact assessments of the proposed works, in addition to matters related to project engineering.

- 1.29 Other institutions, primarily the World Bank, the KfW, and bilateral funds, have contributed resources to the development of the urban sanitation sector. In the project sample for the proposed program, such investments have been duly taken into account to identify the scope and objectives of the respective projects.
- 1.30 The Bank's participation in the aforementioned projects has allowed it to gain valuable experience in the sector, which has been used in the design of the proposed project. Firstly, the need to promote institutional development in the sector has been identified, with emphasis on the implementation and consolidation of an effective regulatory system that will make service delivery more efficient and will encourage participation of private initiative under various modalities. Secondly, the use of the FNDR as executing agency for the proposed program and intermediary with local entities arises from the Bank's general satisfaction with the way that institution has carried out the PRODURSA programs, in which difficulties that arose were adequately resolved. Lastly, the investment projects proposed for each participating city need to be complemented with actions in the administrative area of each company, thereby contributing to the institutional development and sustainability of the service.

II. THE PROGRAM

A. Objectives

- 2.1 The general objective of the program is to improve the hygiene and health status of the Bolivian urban population, through the expansion and improvement of water supply and sanitary sewerage services in cities with over 5,000 inhabitants. The program further seeks to: (i) promote greater private-sector participation; (ii) support the process of developing and consolidating the sector's regulatory framework and organizing and strengthening its regulatory agency, the Water Board; and (iii) contribute to the development and strengthening of local companies or cooperatives responsible for delivering water supply and sanitation services in the participating cities.

B. Goals

- 2.2 The following goals would be achieved through execution of the program:
- a. 70,000 new water and sewage connections would be installed, benefitting some 350,000 people;
 - b. a new legal and institutional framework for the sector would be established that would make it more efficient and would promote private sector participation;
 - c. an autonomous regulatory agency for the sector would be set up and strengthened; and
 - d. the administrative, business, and operations areas of the participating enterprises would be improved.

C. Description

- 2.3 The proposed program would consist of three components: (i) works involving water collection and supply and sewage collection, treatment, and disposal; (ii) technical cooperation to support the development of a regulatory framework for the sector and the establishment of the Water Board, which will be the sector's regulatory agency; and (iii) institutional strengthening of companies delivering the services, through actions aimed at improving their administrative and operational efficiency.
- 2.4 Depending on the needs identified in each participating city, the water supply works will include construction or improvement of surface water catchment areas, drilling or rehabilitation of wells, procurement and installation of pumping equipment, and construction

of conveyance pipes, storage tanks, hydraulic interconnections, water treatment plants, distribution systems and related facilities (storerooms, workshops, and laboratories). The sanitary sewerage works will include the construction of secondary networks, trunk sewers, intercepting sewers, pumping stations, outfalls, and treatment plants, in addition to the types of buildings mentioned above. In general, the projects will seek to use existing facilities to the extent possible, and avoid substantial conversions of existing systems.

- 2.5 The main activities to be carried out in developing the regulatory framework are: (i) the drafting of regulations on institutional matters, use of goods in the public domain and the granting of easements, concessions and authorizations, rates, service delivery, and infraction and penalty provisions; (ii) the definition of quality standards for the services, to provide adequate protection for users' rights, public health, and the environment; and (iii) activities related to setting up the regulatory agency, which include the identification of: the administrative structure and method of financing; operational and accounting procedures; information systems; training needs; and requirements for computer equipment needed to carry out the functions.
- 2.6 Under the institutional strengthening component – and depending on the specific needs of each enterprise – the following activities will be financed: (i) improvement of business operations, including inventory systems, billing, collections, and customer services; (ii) improvement of the administrative area, including accounting, budget, and material and human resource management systems; and (iii) improvement in operations, including master metering, house metering, inventories of systems and facilities, loss reduction, equipment and civil works maintenance, and sanitary control.

D. Cost

- 2.7 The total cost of the program is estimated at US\$88,833,000 equivalent, with the following breakdown of the financing: (i) US\$70 million from the resources of the Fund for Special Operations; (ii) US\$980,000 from the MIF on a nonreimbursable basis; and (iii) US\$17,853,000 in the form of local counterpart funding. The investment categories and distribution by source of financing appear in the following table.

TABLE 2.1					
Total cost and financing plan (US\$ thousands)					
Investment category	IDB (FSO)	MIF 2/	Local contribution	Total cost	% Total
1. <u>Engineering and administration</u>	<u>4,160</u>		<u>3,240</u>	<u>7,400</u>	<u>8.3</u>
1.1 Studies and designs	800		200	1,000	1.1
1.2 Supervision	3,360		840	4,200	4.7
1.3 Administration	0		2,200	2,200	2.5
2. <u>Direct costs</u>					
Water supply and sewerage works	60,734		13,246	73,980	83.3
3. <u>Associated costs</u>	<u>3,034</u>	<u>980</u>	<u>969</u>	<u>4,983</u>	<u>5.6</u>
3.1 Institutional strengthening	3,034		616	3,650	4.1
3.2 Regulatory framework and agency		980	353	1,333	1.5
4. <u>Finance charges</u>	<u>2,072</u>		<u>398</u>	<u>2,470</u>	<u>2.8</u>
4.1 Interest	1,372		0	1,372	1.6
4.2 Credit fee	0		398	398	0.4
4.3 Inspection and supervision	700		0	700	0.8
Total	70,000	980	17,853	88,883	100
Percentage	78.8	1.10	20.1	100	

1. Engineering and administration (US\$7.4 million)

2.8 This item is comprised of the following subcategories:

- a. Studies and designs (US\$1 million). This amount was estimated based on the possibility that engineering adjustments may have to be made during the construction stage. It also includes costs related to environmental studies required under the program.
- b. Supervision (US\$4.2 million). Supervision of construction was estimated on the basis of past FNDR experience with similar projects and covers costs related to services to be provided by the consulting firms responsible for supervision during works construction, which generally range between 4% and 6% of the

2/ The MIF technical-cooperation operation will be processed separately.

cost of the program. Such firms will be hired in accordance with Bank-recommended policies and procedures.

- c. Administration (US\$2.2 million). This item represents personnel costs and other administrative costs attributable to the operation of the units located in the coexecuting companies, which will be in charge of project administration during execution.

2. Direct costs (US\$73.98 million)

- 2.9 This category, accounting for 83.3% of the program's total cost, includes direct costs resulting from civil works construction and procurement of material and equipment needed for operation of the projects to be financed. It also includes costs related to purchase of land, contingencies, and cost escalation.

3. Associated costs (US\$4,983,000)

- 2.10 The cost allocated to this category is comprised of: (i) institutional strengthening of service delivery companies in the participating cities, estimated on the basis of the detailed programs proposed for each city in the sample, and institutional strengthening of the Ente Administrator de los Recursos Hídricos del Río Piray [Administrative Agency for Piray River Water Resources] (SEARPI); ^{3/} and (ii) studies involving the sector regulatory framework and startup and operation of the Water Board.

E. Program financing

1. IDB

- 2.11 The Bank will finance 78.8% of the program cost, or US\$70 million, from the resources of the Fund for Special Operations, to be disbursed in foreign exchange in accordance with the Bank's policies.

2. Multilateral Investment Fund (MIF)

- 2.12 The MIF funds will be used exclusively to finance studies on the sector regulatory framework and the startup and operation of the Water Board. The amount provided for totals 1.1% of the total program cost, or US\$980,000, to be disbursed in foreign exchange during the first 18 months of program execution and in accordance with the MIF's operating policies.

^{3/} The institutional strengthening of this agency related primarily to the Santa Cruz project is one of the recommendations in the program environmental study.

3. Local contribution

- 2.13 The coexecuting companies will provide the local contribution, equivalent to US\$17,853,000, or 20.1% of the total program cost.

III. PROGRAM EXECUTION

A. Executing agency and coexecuting entities

- 3.1 The program will be executed by the Fondo Nacional de Desarrollo Regional [National Regional Development Fund] (FNDR) in accordance with the agreed operating regulations. The FNDR will be responsible for receiving and managing the resources from the Bank and for analyzing and, where applicable, approving projects submitted to it for consideration.
- 3.2 A draft agreement will be prepared to govern the basic terms and conditions of the government's transfer of the loan proceeds to the FNDR, subject to the same terms and conditions set forth in the loan contract, with the exception of the MIF resources allocated to the development of the regulatory framework, which will be nonreimbursable and will be transferred to the Ministry of Capitalization. The exchange risk will be assumed by the coexecuting companies. The signing of this agreement will be a condition precedent to the first disbursement (see conditions precedent).
- 3.3 In the case of projects in larger cities, the respective companies will be responsible for contracting and technical works supervision. The FNDR will undertake these functions for entities that, for whatever reason, do not have the experience or capacity to carry out the functions properly. This is expected to occur in the small and medium-sized cities.
- 3.4 Activities related to institutional strengthening of companies or cooperatives will be conducted similarly to works construction activities. Companies that have sufficient capacity will be responsible for the activities. In the other cases, the FNDR will be in charge of hiring consultants and purchasing the material or equipment involved, as set forth in the program's Operating Regulations.
- 3.5 The Ministry of Capitalization, in coordination with the FNDR and SIRESE, will be in charge of executing the technical cooperation operation being financed through the MIF, the objective of which is to establish a regulatory framework for the sector and to start up the Water Board. Building on its extensive experience in the capitalization of other sectors of the economy (e.g. electricity, transportation, hydrocarbons, and telecommunications), the ministry will be responsible for drafting the regulations for the sector and for strengthening the Water Board, for which purpose a specialized unit will be set up and local and international consultants will be hired. The hiring of the consultant who will coordinate the regulatory framework and the presentation of a detailed work plan

for execution of the component will be a condition precedent to the first disbursement (see conditions precedent).

B. Execution modality

- 3.6 The program will be executed as a global multiple-works program for the main purpose of introducing flexibility into the identification of the cities to be included. This modality will allow the Government of Bolivia to continue making progress in the granting of service concessions in La Paz and Cochabamba, while keeping the possibility open of financing projects proposed in those cities with resources from the private sector or, as a last resort, with resources from this program pursuant to criteria described in paragraphs 1.16 and 1.18.
- 3.7 The FNDR will be in charge of transferring the proceeds of the financing to the projects that turn out to be eligible based on the criteria preestablished in the program's Operating Regulations (see section D).

C. Project sample

- 3.8 The project sample analyzed included the cities of Santa Cruz, Cochabamba (southeastern section), Montero, and Riberalta. The coverage of water supply distribution systems in these cities, as in other Bolivian cities, is wider than that of sanitary sewerage systems. The low coverage of sewerage systems means that individual solutions predominate, which generally do not meet acceptable sanitary standards. Individual disposal methods also generate surface- and groundwater pollution problems, endangering the health of the population and, in many cases, causing gradual deterioration in the underground aquifers. The following table summarizes the demographic information and coverage of the services in the sample cities.

TABLE 3.1 STATUS OF SERVICES IN THE SAMPLE CITIES				
City	1996 population (estimated)	Rate of coverage of:		
		Potable water	Sewerage	Wastewater treatment
Santa Cruz	828,200	90%	31%	31%
Cochabamba	477,000	62%	52%	52%
Montero	66,000	85%	21%	0%
Riberalta	51,800	0%	0%	0%

- 3.9 The feasibility of the proposed project in La Paz-El Alto was also reviewed (its designs have yet to be completed). The Bank recommended making some adjustments during the design phase. The studies, designs, plans, and specifications of projects in the sample were prepared by international consulting firms, in accordance with generally accepted engineering principles. The solution proposed for each project reflected the results of a feasibility study, in which the available alternatives were duly considered. The direct costs of the projects in the sample amounted to US\$51.4 million equivalent, which accounts for 69% of the direct costs of the program. The following table summarizes the main characteristics of those projects.

TABLE 3.2 PROJECTS IN THE PROGRAM'S SAMPLE				
PARAMETER	CITY			
	Santa Cruz	Cochabamba	Montero	Riberaña
<u>Water supply system</u>				
- Beneficiary population	--	84,000	11,000	--
- New connections	--	13,500	1,720	--
- Increase in coverage	--	18%	8%	--
Direct cost (US\$ millions)	--	10.11	1.64	--
<u>Sewerage system</u>				
- Beneficiary population	140,000	75,000	44,000	30,800
- New connections	16,900	12,200	6,180	4,120
- Increase in coverage	17%	16%	49%	53%
- Increase in treatment	17%	16%	72%	53%
Direct cost (US\$ millions)	19.07	9.43	7.30	3.87
Total direct cost (US\$ millions)	19.07	19.54	8.94	3.87

- 3.10 In addition to the projects in the sample and the La Paz-El Alto project (which would cost about US\$20 million), the FNDR has a significant number of projects that could be financed, many with feasibility studies and final designs partially or fully completed. The FNDR has received applications for financing for projects in 18 municipalities located in Bolivia's nine departments, for an approximate additional cost of US\$52 million.

D. Operation Regulations

- 3.11 The program's Operating Regulations set forth the guidelines for its execution. The regulations identify the eligible institutions

and activities, as well as the requirements that each must meet. They also describe the terms, conditions, and restrictions applicable to the financing. Given the concessional nature of the loan and the desire not to introduce distortions into the Bolivian financial market, the amortization terms and interest rates will differ, depending on whether the services are delivered by public institutions (including user cooperatives) or transferred to private companies. In the former case, the Bank's FSO resources will be provided at a 6% annual rate for a maximum term of 25 years. ^{4/} In the latter case, the terms and conditions will be similar to those offered in the financial market.

- 3.12 The interest rate spread obtained on charges to the executing companies will be used to finance other sanitation projects in accordance with criteria established in the program's Operating Regulations.
- 3.13 The Operating Regulations set forth the technical, environmental, economic, financial, and institutional criteria that the projects must fulfill to be eligible. It should be noted that one of the eligibility requirements for investment projects is the inclusion of an institutional strengthening plan for the service operator, based on recommendations from the institutional diagnostic study of the companies in the sample.
- 3.14 For projects not included in the sample, the Operating Regulations also establish discretionary limits so that the FNDR may approve financing directly without having to obtain the Bank's prior nonobjection. These ceilings have been set at US\$3 million for investment projects and US\$150,000 for institutional strengthening programs and studies. Approval of the final version of these regulations by the FNDR is a condition precedent to the first disbursement of the operation (see conditions precedent).

E. Land, easements and rights-of-way

- 3.15 Generally speaking, the proposed projects will not give rise to significant problems in terms of land use inasmuch as a large portion of the works involves expanding water distribution and sewerage collection systems, which will be built along public thoroughfares. It will therefore not be necessary to expropriate land or establish rights-of-way. Another significant portion of the investments consists of improving and rehabilitating existing facilities.
- 3.16 The above notwithstanding, the program works will require some additional land to be purchased or expropriated and some

^{4/} These terms and conditions are equivalent to those established for subloans under PRODURSA II.

rights-of-way to be established. In these cases, the procedures set forth in Bolivian legislation will be followed, which have proven to be adequate and sufficiently flexible in the course of previous programs. In any case, the respective companies must demonstrate the availability of the land and authorization of use of rights-of-way as one of the requirements for project eligibility.

F. Execution period and investment timetable

- 3.17 The period for disbursement(s) of the loan proceeds will be four years, determined after a detailed analysis of execution of all the program components, including bidding processes. The deadline for physical initiation of the works will be 30 months and was established on the basis of the amount of time required for the construction of the projects, which ranges from six to 12 months.
- 3.18 The following table summarizes the program's disbursement timetable. The Region 1 technical files contain detailed information on this matter.

TABLE 3.3 INVESTMENT TIMETABLE (In US\$ thousands equivalent)						
	YEAR 1	YEAR 2	YEAR 3	YEAR 4	TOTAL	%
Loan (FSO)	13,792	20,286	20,419	15,503	70,000	78.8
MIF	600	380	-	-	980	1.1
Local contribution	3,912	5,651	5,397	2,893	17,853	20.1
Total	18,304	26,317	25,816	18,396	88,833	100
Percentage	20.6	29.6	29.1	20.7	100	

G. Procurement of goods and contracting of services

- 3.19 For the procurement of equipment, materials, and other goods related to the program and for the contracting of works financed in whole or in part with the loan proceeds, international competitive bidding will be used in all cases in which procurement of such goods exceeds the equivalent of US\$250,000 and the contracting of construction services exceeds the equivalent of US\$3 million. These thresholds are justified since for similar projects in Bolivia foreign bidders have participated when the amounts involved exceed such thresholds. In other cases, calls for bids may be limited to local firms. For the hiring of consultants, the threshold above which international competitive bidding will be required is US\$200,000. Contracts involving smaller amounts will

be tendered in accordance with national legislation provided it does not conflict with the Bank's procedures. The procurement of works and goods by private sector enterprises may be effected through limited bidding procedures, in accordance with market practices for the type of goods or works in question. The Bank will make sure that such procurement takes place at market prices and in such a way that the costs involved are consistent with the program's requirements.

- 3.20 On the basis of an analysis of the projects in the sample, it is estimated that some 10 calls for bids will be issued for works and three for procurement of goods. In the case of the large cities, separate calls will be issued for the construction of works and the procurement of materials and equipment. The tentative procurement schedule, which appears in Annex I, is based on the characteristics of the projects in the sample. It should be noted that since this is a multiple-works program, and therefore cities may be replaced, the procurement schedule is merely an indication of the types of procurement that may be undertaken under the program.

H. Operation and maintenance

- 3.21 The operation and maintenance of the systems to be built or rehabilitated under the program will be the responsibility of the companies or cooperatives in each city. One of the main objectives of the institutional strengthening component proposed is to improve operating conditions at these service operators through staff training and the procurement of maintenance equipment, water quality laboratories, tools, workshops, and storerooms. In addition, the strengthening of the financial and business areas of the companies will have a positive effect on the availability of resources to fulfill these functions. The operation and maintenance of the systems will therefore improve significantly as a result of the program.
- 3.22 If the delivery of services is contracted out to the private sector in some of the cities in the program, the main responsibility for operation and maintenance will lie with the private company. The contracts involved should therefore include detailed guidelines on the quality of the service and on the operator's obligation to maintain facilities and equipment.
- 3.23 It is recommended that the program's Operating Regulations require the participating companies to submit annually to the FNDR, during a ten-year period starting from the year in which each of the works is completed, an annual maintenance plan for these works, including a report on the previous year which will also record the condition of the systems (see contractual conditions). These reports will be available to the Bank and the FNDR will forward them at its request.

I. Environmental considerations

- 3.24 The environmental summary for the operation was considered and approved at the October 15, 1996, meeting of the Environment Committee. On October 18, the summary was sent to the PIC. A detailed environmental analysis of the projects in the sample was conducted, specifying their positive and negative environmental effects during the construction phase and operation and maintenance. Mitigation plans to be implemented were also identified. The program's Operating Regulations include special requirements to be met by each project before it is carried out. In addition, environmental criteria were developed to be used in the analysis of the projects that have still not been prepared. These criteria will also be part of the program's Operating Regulations.
- 3.25 In order to introduce the service to the users, information will be provided periodically on the physical, chemical, and bacteriological quality of the distributed water. To this end, the program's Operating Regulations will temporarily establish minimum requirements in each city on the main parameters to be included, the frequency with which they are to be presented, and the means of dissemination to be used. The final regulations on this matter will be part and parcel of the component relating to the sector's regulatory framework.

J. Monitoring and follow-up

- 3.26 Monitoring and follow-up of the program will be performed by the Bank's Country Office in Bolivia. The executing agency will submit semiannual progress reports to the Bank (see contractual conditions).
- 3.27 The reports prepared by the Country Office on the status of the loans will record the problems that arise in the execution of the program and the solutions proposed. A summary of these issues will be included in the annual report on the portfolio prepared at the beginning of each calendar year.
- 3.28 For the purpose of examining the progress made towards the program's goals, a mid-term review will be conducted after the contract has been in force for 24 months or one month after 50% of the program resources have been disbursed, whichever comes first (see contractual conditions). In order to guarantee proper implementation of the sector regulatory framework component, the objective of which is to improve the performance of the service delivery companies and encourage the participation of private initiative in the sector, a review will be conducted 12 months after the effective date of the operation.

K. Program performance indicators

- 3.29 To evaluate achievement of the program's goals, the indicators in the Logical Framework, which appears in Annex II, will be measured. The following are the most significant indicators:

Indicators	Goals
Water and sewerage connections	70,000
Improved efficiency of the companies:	
- house meters	≥ 90%
- unmetered water	≤ 30%
- billing/collection efficiency	≥ 85%
- operating ratio	≤ 80%
- debt/equity ratio	≤ 60/40

L. Data collection

- 3.30 In order to monitor program performance, the executing entities will gather and process data on the indicators mentioned in the preceding paragraph and send them to the Bank through the FNDR. This data, which may be used for an ex post evaluation of the program, must be delivered in annual reports beginning in the second year of execution and for five years after each project is completed. The first report will describe in detail the procedure used for gathering and processing the data. Data on the indicators included in the program's Logical Framework will be presented.

IV. INSTITUTIONAL AND FINANCIAL ANALYSIS

A. The borrower, the financial agent, and the executing entities

- 4.1 The borrower will be the Republic of Bolivia and the executing entities will be the sanitation companies to which the resources of the financing will be transferred. A sample of the universe has been formulated, which is comprised of firms in the cities of Cochabamba (SEMAPA), Santa Cruz (SAGUAPAC), Montero (COSMOL), and Riberalta. In the case of Riberalta, a municipal enterprise was recently created to deliver water supply and sewerage services. The executing entities that participate in the program will be responsible for providing the local counterpart resources for their respective projects.
- 4.2 The Fondo Nacional de Desarrollo Regional [National Regional Development Fund (FNDR)] will be the operation's financial agent, responsible for managing the loan, and the Bank's sole interlocutor.

B. National Regional Development Fund

1. Institutional analysis

- 4.3 The FNDR was established in 1987 as a decentralized, nonbank financial development institution, with legal status, administrative, technical, and financial autonomy, and its own assets and property.
- 4.4 Its objectives are to contribute to improving the standard of living of the population, promote harmonious and balanced development of all the country's regions, and make public enterprises at the regional, local, and municipal level more efficient in their operations.
- 4.5 The FNDR is run by its board of directors, the executive director, and the general manager. The operations area is comprised of the credit committee, the project committee, and the following divisions: development, finance, administration, and institutional strengthening. Support is provided by the internal auditor and legal counselor. This distribution of functions and responsibilities is appropriate for this type of institution.
- 4.6 In this operation, the FNDR will be responsible for managing the resources, including disbursements to executing entities, processing of requests for disbursement to the Bank, control over fulfillment of contractual clauses and procurement procedures, supervision of the status of the works, and maintenance of the program's records and financial statements. If projects not

included in the sample are financed, the FNDR will be responsible for evaluating them.

- 4.7 A review of the FNDR's management indicates that it has a suitable administrative structure and experience in executing programs with multinational institutions that qualify it to undertake these activities. Its institutional and financial analysis of the projects in the program sample was found to be satisfactory.
- 4.8 The FNDR's experience in executing programs with international agencies is extensive and diverse. The FNDR's participation in these programs varies from being the agency transferring the funds to executing agencies for projects previously identified and approved to conducting the technical, environmental, socioeconomic, financial, and institutional evaluation of the projects. It is currently involved in six programs partially financed by international agencies that are proceeding satisfactorily.
- 4.9 The FNDR maintains separate records for each of the aforementioned programs and their respective annual financial statements are audited by independent public accountants. Unqualified auditors' reports were issued for the statements for the fiscal year ended December 31, 1995.
- 4.10 It is recommended that the financial statements of the proposed program be audited by a firm of independent public accountants during the execution period (see contractual conditions).

2. Financial condition of the FNDR

- 4.11 The FNDR's financial statements were analyzed to show their scope, since by executing this program the FNDR is not making any financial commitments, the coexecuting entities being responsible for providing the local contributions to the projects.
- 4.12 The FNDR's main assets are comprised of its loan portfolio, which increased 49% between 1993 and 1994 as a result of the PRODURSA I loans. In 1995, the loan portfolio did not vary significantly. It is expected to expand considerably in 1996 as a result of the PRODURSA II placements.
- 4.13 The resources of international agencies were the main source of the institution's funds. At December 31, 1995, long-term liabilities totalled US\$74.4 million, i.e., 76% of assets. In the last three years, the FNDR has maintained a positive operating margin - sufficient to cover its administrative expenditures, which are deemed reasonable.

C. Institutional and financial analysis of the companies executing the projects in the sample 5/

1. SAGUAPAC (Santa Cruz)

- 4.14 This company was organized as a cooperative whose members use the service. Its administrative structure is currently being reorganized, most significantly to create a new separate planning department instead of using consultants for this task. Its employee ratio falls within an acceptable range, with 4.5 employees per 1,000 connections, which the institutional strengthening to be provided under the program is expected to reduce.
- 4.15 Collections for water supply and sewerage services are sufficient to cover operation and maintenance costs and expansion-related costs. The financial statements for the last three years indicate that such income is sufficient to cover operating costs in their entirety.
- 4.16 The cooperative's financial condition remained acceptable over the period examined, having maintained a comfortable liquidity level and a reasonable debt level. However, its collection efficiency, which was 82% in 1995, needs to be improved.

2. SEMAPA (Cochabamba)

- 4.17 SEMAPA is a decentralized municipal utility company that has administrative, financial, and operational autonomy. The distribution of functions and responsibilities within the company is acceptable and an institutional strengthening program is currently under way, partially financed with resources from the World Bank.
- 4.18 Currently the employee/connection ratio is 7.7/1,000, which is considered high. The company is being downsized to correct this situation.
- 4.19 In March 1996, a rate adjustment was implemented to allow the company to cover its operating and maintenance costs and full depreciation of its fixed assets. The financial statements analyzed show a very tight liquidity situation, which is the result of low rates and inefficient collection for services. With the above-mentioned rate adjustment and the completion of projects currently under way that will make it possible to increase the volume of water sold, the firm's financial situation is expected to improve.

5/ Selected indicators relating to the companies appear in Annex III.

3. COSMOL (Montero)

- 4.20 The distribution of functions and responsibilities at COSMOL is acceptable. The cooperative is currently undergoing reorganization, the most important aspects of which are the establishment of internal auditing and business departments. Staffing levels are high in relation to the number of connections, but all in all are rather modest.
- 4.21 Income from rates has always been sufficient to cover operation and maintenance costs but not always enough to cover fixed asset depreciation entirely. In 1995, this shortfall accounted for only 2% of income. In 1996, a rate adjustment was approved to enable COSMOL to cover all its operating costs.
- 4.22 The cooperative has a good liquidity level and almost no long-term liabilities. Collection for its services falls within the reasonable range.

4. Riberalta

- 4.23 In June 1996, the Empresa Municipal de Servicios Básicos de Riberalta [Riberalta Basic Municipal Services Company] was set up, even though water supply and sewerage services are not available in Riberalta at this time. The water supply system is being built with World Bank resources managed by the FNDR. An ad hoc unit has been set up in the municipality to supervise and inspect the water supply project works, and it will later take on the same functions for the sewerage project included in the proposed program. The cost of the project includes resources for the startup of the company.

V. PROGRAM FEASIBILITY

A. Technical feasibility

5.1 The project is considered feasible and fully justified from the technical standpoint. This stance is supported by the following major factors:

- a. The program addresses pressing needs to expand and upgrade water supply and sanitary sewerage services in Bolivia's major cities.
- b. Engineering designs, cost estimates, and acceptable bidding documents and conditions have been prepared for the projects in the sample, which account for 69% of the program's direct costs. In addition, some projects have studies under way and could make up the rest of the multiple-works program, thereby guaranteeing fulfillment of the proposed goals.
- c. The execution timetable effectively reflects required performance deadlines for all scheduled activities. Accordingly, the proposed four-year disbursement period is considered both realistic and feasible.
- d. The FNDR and coexecuting entities have the necessary technical staff and experience to properly manage the program and its numerous components. The execution plan, in addition, provides for advisory support from consulting firms specializing in those activities, such as construction supervision and institutional strengthening, that the FNDR or the companies may not be able to perform adequately.
- e. The institutional strengthening program for participating companies will enable them to improve their performance in functions related to reliable operation and proper maintenance of the facilities and equipment.

B. Administrative feasibility

5.2 The program's financial agent, the FNDR, has the organization and experience to manage programs of this kind and execute the financial intermediation activities properly. Its structure is suited to the analysis of this type of project, an activity it performs effectively.

5.3 The companies included in the sample – with the exception of Riberalta – have the necessary experience and capacity to operate and maintain the works to be financed. These companies have project execution experience and have the administrative and

control procedures to ensure that the resources they receive to finance their works will be properly managed.

C. Financial feasibility

5.4 The financial projections for SAGUAPAC, SEMAPA, COSMOL, and Riberalta indicate that these firms have the capacity to contribute the local counterpart for their respective projects and to service their debts.

5.5 The companies' financial projections indicate that they need to maintain their rates at a level high enough to allow them to service their debts and provide the local contribution to the projects. It is therefore recommended that the loan contract require income from the rate structure to be sufficient to cover all operating costs, including administration, operation, maintenance, and depreciation. If the resources generated by the above requirement are insufficient to service the debt completely and on a timely basis and finance part of the expansion program, measures will have to be adopted - which could include rate adjustments - to fulfill said requirement (see contractual conditions). SEMAPA, SAMAPA, and SAGUAPAC will be required to finance at least 20% of the expansion program, while the other companies will be required to finance at least 10%.

D. Environmental feasibility

5.6 In general, the program will have a positive effect on the environment through increased sewage treatment and better use of water resources. However, its implementation could have some localized, short-term negative effects. For this reason, during the program's preparation, environmental impact assessments were conducted for all the projects in the representative sample. As a result, mechanisms to regulate and control the projects to be financed and environmental eligibility criteria to serve as a basis for preparing and analyzing the other projects in the program were prepared. The program is therefore considered feasible from the environmental standpoint.

E. Socioeconomic viability

5.7 The socioeconomic evaluation of the operation involved an analysis of the indicative sample of four cities: Santa Cruz, Cochabamba, Riberalta, and Montero. The Bank closely followed the preparation, including the economic analysis, of projects in five additional cities that were included in other financing programs, to verify the capacity for preparing and evaluating the additional projects that will complete the program.

5.8 During the preparation of each project, the following socioeconomic considerations were taken (and will be taken) into account:

(i) demand; (ii) analysis of alternatives; (iii) cost-benefit analysis; (iv) incentives to rationalize consumption; and (v) analysis of beneficiaries. The results, which appear in the table in this section, are in the form of consumption numeraire efficiency prices expressed in July 1996 values.

- 5.9 Both benefits and costs included came from comparing the situation with and without the project, with incremental values derived from execution of the proposed works. In addition, the costs included administration and contingencies equal to 15% of the direct investment costs. It should be noted that in projects involving sewerage only, costs associated with an increase in water consumption were taken into account.

1. Least-cost analysis

- 5.10 The works included in the sample were considered in the feasibility studies or master expansion plan for each city. These studies identified technically feasible least-cost solutions, with limits on effluent quality.
- 5.11 Santa Cruz was a special case. The program budget was cut during its preparation, from US\$38 million to less than US\$20 million. The Santa Cruz project consisted of two independent wastewater collection and treatment subprojects and priorities were set on the basis of economic, environmental, and social criteria. The economic net present value, without taking into account environmental economic benefits, would be US\$14.1 million for the eastern zone subproject and US\$23.1 million for the western zone subproject. The eastern zone subproject was chosen because of its much greater environmental benefits, since wastewater currently accumulates on the roads, while the area of the subproject not selected has acceptable individual solutions and isolated collection and treatment systems. In addition, the chosen alternative would serve a higher incremental number of people (110,000 against 60,000 in 1997).
- 5.12 In terms of the materials for the systems' components, such as pipes, pumps, and tanks, costs related to investment, maintenance, energy loss, disruption risk, useful life, etc., were held to be lower, estimated at present value using a 12% discount rate.
- 5.13 The sanitation projects showed that final disposal solutions and sewage treatment plants were technically viable, economic least-cost solutions, in view of investment, operation, and maintenance costs.

2. Cost-benefit analysis

- 5.14 The Cochabamba project will provide water supply, sewerage, and wastewater treatment services to the southeastern part of the city,

the main marginal area of the city that is currently expanding. Without the project, the population buys water from private parties and consumes only 600 liters per month per person. Sewage is dumped into the streets. With the project, the resulting benefits are twofold: (i) private benefits, in terms of increased well-being resulting from increased water consumption based on the reduced rate charged to the consumer (2,500 liters per month), from the improved environment, and from a healthier home; and (ii) public benefits, such as the savings in economic resources from source substitution and the improved environment. These benefits were calculated using the SIMOP model developed by the Bank. A sub-project in the city of Montero will have similar results.

- 5.15 In the Riberalta, Montero (a different area from the one mentioned in the preceding paragraph), and Santa Cruz projects, which are sewerage and wastewater treatment projects, the private benefits generated are increased well-being from expanded water consumption, improved environment and household health, and resource savings by eliminating individual solutions. As to the public benefits, the environment is improved and/or preserved, with the resulting positive impact on the population's health in general, the quality of groundwater improves since it has been receiving the wastewater, and the impact on the receiving surface waters is reduced. The analysis of these projects was done based solely on the private benefits using the SIMOP model. The economic return results should therefore be considered lower limits. As the following table shows, the projects in the sample are economically profitable and can therefore be financed by the program.

City	Cost ^{1/} (US\$ millions)	Benefit (US\$ millions)	NPV (US\$ millions)	EIRR (%)
Santa Cruz	42.5	56.6	14.1	16.8
Cochabamba	19.7	27.4	7.7	19.7
Montero (water and sewerage)	3.6	6.2	2.7	22.3
Montero (sewerage)	11.8	36.2	24.4	24.6
Riberalta	4.6	4.7	0.1	12.7

^{1/} Investment, operation, and maintenance.

3. Sensitivity analysis

- 5.16 An analysis was conducted of sensitivity to the elasticity of demand for potable water once sewerage service is supplied, to the price elasticity of demand, to the rate of growth, and to the investment costs. The probability and values of these parameters for which the projects would not be feasible were calculated. The

results obtained were robust, with the exception of Riberalta, since the likelihood that the projects will not be profitable is very low.

4. Incentives for rational use of the service

- 5.17 In the cities of the sample that have services, house meters are used in 70% of the connections. For projects to be financed with program resources, 100% of the connections will be metered.
- 5.18 As to the rate structure, in the cities of the sample, consumers are charged a base rate for a minimum amount of water (between 10 and 15 cubic meters), after which they pay for each additional cubic meter consumed. In Riberalta, a charge will be levied for each cubic meter consumed. Econometric models were used to calculate the percentage of families with consumption below the basic amount. In most cases, that percentage would be low, which implies that the rate structure is suitable in terms of providing incentives to rationalize consumption.
- 5.19 Current rates were compared with long-term marginal costs and were found to be similar, with the exception of the residential sectors in Cochabamba and Riberalta. The rate per cubic meter is US\$0.44 and US\$0.29, while the marginal costs are US\$1.16 and US\$0.45, ^{6/} respectively. However, the rates charged by the companies in the sample cover their operating costs in full, including depreciation, and are generating resources to service their debts, with enough left over to invest in works. In the regulatory framework that is being designed as part of the program, the rates will take into account long-term marginal costs and will be set in such a way as to allow the companies to be financially self-sustaining, as the Bank's policy in this regard requires.

5. Analysis of the beneficiaries

a. Ability to pay

- 5.20 The analysis of the ability to pay verified that the monthly bill for water and sewerage service was less than 5% of household income. In Santa Cruz and Cochabamba, the bills of 13.7% and 10.5% of the families, respectively, exceeded that amount. According to data on income distribution, these families pay, on average, 6.6% and 6% of their household income in Santa Cruz and Cochabamba, respectively. Taking into account that these financial burdens are not much above the 5% limit, these families are not expected to have trouble paying. The results for the cities in the sample are as follows:

^{6/} Primarily because of the high cost of future expansions and the social cost of capital.

City	Basic payment (US\$/mo.)	% with low ability to pay
Santa Cruz	6.41	13.7
Cochabamba	2.68	10.5
Montero	2.60	1.4
Riberalta	1.40	0.0

b. Impact on low-income groups

- 5.21 The proposed program fulfills the geographical targeting criteria and qualifies as a poverty-targeted investment. The percentage of low-income beneficiaries in the program, based on the projects in the sample, would be approximately 70%, estimated by taking into account the low-income level for Bolivia, which was Bs 192 per month per person on the date of the analysis.

F. Risks of the operation

- 5.22 The following risks could have a negative impact on the operation:

- a. A delay in implementing the sector's regulatory framework could slow the implementation of improvements in the efficiency and quality of the services and in the promotion of private sector participation in other cities, which would attract resources for partial funding of investments needed in the sector. However, the government has demonstrated its commitment to implementing this framework as soon as possible.
- b. Although the country has a modern legal, environmental framework, environmental issues are not being fully addressed at this time. The execution of loan 929/SF-BO – which provides for institutional strengthening of the Ministry of Sustainable Development and the Environment (MDSMA) – will improve the environmental management capacity of the central government and, indirectly, that of the departmental prefectures. However, given the slow execution of this loan, this risk is expected to be mitigated by: (i) the use of the environmental unit of the FNDR, which has had hands-on experience in environmental analysis and management of projects similar to those included in this program; and (ii) the institutional strengthening of the prefecture of Santa Cruz, a city where industrial pollution problems were identified in the body of water receiving effluent from the treatment plants to be financed with program resources.

PROPOSED RESOLUTION

BOLIVIA. TECHNICAL COOPERATION FOR DEVELOPING
THE REGULATORY SCHEME FOR THE POTABLE WATER
AND SANITATION SECTOR

The Donors Committee of the Multilateral Investment Fund

RESOLVES:

1. That the President of the Inter-American Development Bank, or such representative as he shall designate, is authorized, on behalf of the Multilateral Investment Fund, to enter into such agreements as may be necessary with the Republica de Bolivia and to adopt such other measures as may be pertinent for the execution of the plan of operations referred to in Document MIF/AT-_____ with respect to technical cooperation, the purpose of which is to develop the regulatory scheme for the portable water and sanitation sector.

2. That up to the amount of US\$980.000 is authorized for the purpose of this resolution, chargeable to the Technical Cooperation Facility of the Multilateral Investment Fund.

3. That the above mentioned sum is to be provided on a non-reimbursable basis.