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ARGENTINA

NATIONAL RURAL POTABLE WATER PLAN (IV STAGE)

(AR-0180)

PROJECT REPORT

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A R G E N T I N A
NATIONAL RURAL POTABLE WATER PLAN (IV STAGE)

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I. INTRODUCTION

A. Background

- 1.01 The Bank has contributed to the financing of seven urban and rural water supply programs in Argentina. ^{1/} In this regard, Stage IV of the National Rural Water Supply Program is the continuation of a program begun in 1965 with the financial participation of the Argentine Nation, the Servicio Nacional de Agua Potable (SNAP), the Respective Provincial Services (SPAR) and the Bank. This program also represents a coordinated effort to attain the goals set forth in the International Water Supply and Sanitation Decade - as agreed upon in the United Nations Water Conference - that 80% of the urban and rural population should be supplied with water by 1990.

B. Application and Priority

- 1.02 In a letter of March 11, 1981, accompanied by supporting information, the Ministry of Economy requested a Bank loan for partial financing of the program. This same communication also confirms the priority the government has given the program - as the Bank's programming mission of March 1980, and a special mission of October of the same year had already been informed.

C. Missions

- 1.03 From April 27 to May 8, 1981, an analysis mission gathered information in Argentina on the technical, economic, financial, institutional and legal aspects of the program considered in this Project Report, as well as information on the state of execution of Loans 14/IC and 526/SF which help to finance the Third Stage of the National Water Supply Plan.

^{1/} See Chapter III of this report.

II. FRAME OF REFERENCE

A. Recent Economic Situation and Prospects

1. The Argentine economy in 1980

- 2.01 Since 1976 Argentina has been affected by a series of institutional changes carried out as a part of the government's decision to restructure the economy, increase its international competitiveness and reduce the rate of inflation. As a result, economic activity has experienced important fluctuations, both acute and short-lived, which have been felt in virtually all sectors of the economy. During the period 1976/1980 the economy as a whole grew moderately at an average rate of 2.5%, while in 1980 the GNP rose only 1.1%. The improvements experienced in the balance of payments and in the government accounts during the four previous years waned in 1980. Nevertheless, the government was able to reduce the rate of inflation, keeping it at 80% annually, approximately half of that registered during the previous two and a half years.
- 2.02 The greatest impact on economic activity during 1980 came from the external sector. According to public information on national accounts, exports of goods and nonfinancial services declined 5.6% in real terms in comparison with 1979, after having increased at almost 20% annually during the four previous years. Imports, on the other hand, continued to increase during 1980 by 32%, compared to the 40% increase of the year before. This growth in imports was even more unusual if one takes into account the historically positive relationship between the growth of the national product and imports. Investments rose 7.6% despite the low growth of the GNP. The public sector was partially responsible for this growth. In the private sector, the principal investments occurred in mining and energy. Many enterprises took advantage of the price differential between domestic and foreign capital goods by importing a large quantity of machinery and equipment. Investments decreased markedly, however, in the agricultural sector owing to low prices and bad weather.
- 2.03 During 1980, real salaries in the industrial sector declined very little, despite the decrease in industrial activity. However, the cost of salaries was reduced in real terms because of the decrease in special workloads, shorter work weeks and longer periods between wage increases. The salary differential between skilled and unskilled labor, as well as among large (more than one thousand workers) and small industrial companies, showed an increase. While average unemployment remains at only 3.5% in Greater Buenos Aires, government studies show that 27% of the work force is classified as self-employed, compared to approximately 20% in 1970. Employment in the industrial sector, which reached 37% in 1974, was only 30% in 1980.

2. Results of the first quarter of 1981

- 2.04 Available data for the first quarter of 1981 show the difficulties Argentine authorities are facing this year. The GNP increased only 0.2% in the first quarter compared with the same period in 1980. Industrial production declined 4.2%, with a drop of 14.2% in basic metals industries and 15.4% in capital goods industries. Statistics for the month of April indicate that unemployment was increasing, though not seriously, in every city under study. Regional unemployment was especially noteworthy in Córdoba, where most of the automobile industry is located. Automobile sales declined 42% in comparison with the first quarter of 1980, and the major companies have announced their intention of cutting production and laying off additional workers. A decrease of 7,000 jobs was announced during the month of May. In the agricultural sector there was a significant recovery owing to the exceptional corn harvest which has supported that sector. However, meat and fish production declined, and little improvement has been announced in other agricultural categories.
- 2.05 In the first quarter the balance of payments suffered a high deficit, despite the increase in agricultural produce available for export. The commercial deficit was US\$800 million. In the commercial area the deficit was calculated at US\$2,149.2 million, leaving a total deficit of approximately US\$2,285.5 million as the overall balance.
- 2.06 The new government assumed power at the end of March 1981. Among the first measures adopted in the search for solutions to the present situation were the devaluation of the peso by 28%, the reduction of domestic interest rates through free market operations, the increase of cash reserves and the establishment of special export taxes. Devaluation was used to stop the continued loss of foreign reserves and to dissipate the reigning uncertainty with respect to the new economic policies. The government has announced, however, that it will pursue its objectives of stabilization, and consequently will maintain the budget of the previous administration.
- 2.07 Despite the measures taken to contain the increase of interest rates, the current high rates, reaching an annual rate of more than 135% for 30-day term deposits, have exerted great pressure upon the economy of industrial and agricultural enterprises.
- 2.08 The initial devaluation adopted by the new government, combined with the high interest rates, reduced the flight of capital. However, within a month there was a new increase in capital flight, which led to additional devaluations inflating the peso to more than 5,000 per dollar and to the announcement that the peso would be devalued by 6% monthly until further notice.

3. Outlook for the rest of 1981

- 2.09 The Argentine economy is confronted by economic difficulties which have been manifested in a loss of US\$6 billion in foreign reserves between October 1980 and July 1981, in a decline in economic activity which is projected to continue in 1981 and a rise in both the rate of inflation and unemployment.
- 2.10 To confront these difficulties, the current economic administration has carried out a series of measures which are designed to support the economy and restrain the flight of foreign capital. In addition to the devaluation of 10% carried out by the previous economic administration, three devaluations of 30, 30 and 35% were made since March and the exchange market was divided with a fixed rate for commercial and a floating rate for financial transactions. In order to stem the flight of capital the government will undertake to finance an increasing proportion of its deficit from internal financial markets and a consortium of foreign banks extending the length of amortization beyond the one or two-year periods for which almost half the debt was originally contracted. The government plans to extend lines of credit with a 2% real annual interest rate to private sector firms so as to be able to re-finance up to 50% of their debt obligations for periods of up to seven years.
- 2.11 The government expects the economy to recover from the current economic recession sometime in 1982, but the cost will be in an increasing government deficit (projected at 4% of gross domestic product in 1981), increased inflation (currently at 104% measured July 1980-July 1981 and 10% latest monthly figure), and a large jump in the unemployment rate (5.4% currently up from 2.5% in October 1980). The most rapid improvements in the economy are expected to occur in the foreign sector. While it has not imposed any new import tariffs, it does expect the devaluation to bring an end to the rapid increases in imports and to renew incentives to exports. Service expenditures, particularly tourism which accounted for more than US\$1.5 billion in outflows in 1980, will be sharply curtailed during the current year.
- 2.12 It is likely that other major policy measures will be announced during the coming months as the current situation develops. Substantial differences among the various ministries regarding the future course of the economy still exist as evidenced by the resignation of the presidents of the Central Bank and the Banco de la Nación as well as the Secretary of Industry and Mining. The major issue which needs to be resolved seems to revolve around the demand to support and protect national industry at one extreme and to bring the rate of inflation back under control at the other.

B. Population

- 2.13 According to official documents the national population has grown as follows:

<u>Year</u>	<u>Population</u>	<u>Inhabitants (thousands)</u>	<u>%</u>	<u>Growth index</u>
1960	Urban	14,758	74	
	Rural	5,267	26	
	Total	20,025	100	
1970	Urban	18,458	79	2.26%
	Rural	4,932	21	-0.66%
	Total	23,390	100	1.57%
1977	Urban	21,286	82	2.06%
	Rural	4,847	18	0.25%
	Total	26,133	100	1.59%

- 2.14 Preliminary data from the 1980 census indicate a total population of 27,863,000 with a growth index with respect to 1970 of 1.78%. The trend toward urban population growth and the decrease of rural population is evident. It is estimated that of a total population of 30,204,000 expected by 1990, the urban population will reach 85.4% and the rural population will decrease to 14.6%.

C. Planning and Current Situation of National Sanitation Sector

- 2.15 In Argentina there is no National Drinking Water and Sewerage Plan with established goals for medium-term coverage of urban as well as rural sectors. There is only a National Rural Drinking Water Plan whose updating and execution is under SNAP. On the other hand, SNAP is now involved in advanced negotiations for the contracting of a consulting firm to develop a National Rural Sewerage Plan. Owing to these conditions, the provincial governments have had to establish and review their own priorities in that sector. The absence of such plans means that investments in that area lack a definite policy and depend primarily upon the availability of funds. Consequently, it is doubtful that the goals set for the 1981-1990 Decade by the United Nations Water Conference can be reached. Those goals would mean providing drinking water services to a population of 6.3 million urban and 0.4 million rural inhabitants in population areas of 100 to 2,000 persons by the year 1990.
- 2.16 According to a study by the Pan American Health Organization (PAHO/WHO), of a total national population of 26.1 million in 1977, 53% was served with drinking water through residential connections. Of the urban population, which numbered 21.3 million, 63.6% had residential connections

and in the rural areas 7% enjoyed such service. In the Federal District, 95.5% had the same coverage, as did 40% in the rest of Buenos Aires, and 67% in the remainder of the urban zone. ^{1/} Notwithstanding the difficulty of supplying drinking water and sewage disposal services to a dispersed population, the percentage of concentrated rural population (1,183,000 inhabitants) with drinking water services through residential connections increased to 28.8%. A population estimated at 4% in urban areas and 5% in rural areas was served by drinking water from public fountains. When that data is compared with previous years, it can be seen that the percentage of urban population served decreases, whereas the corresponding rural population with those services increases.

- 2.17 Insofar as sewage disposal, the urban population served was estimated to be 7.2 million, equivalent to 34%, of whom 3.8 million lived in Greater Buenos Aires and represented 53% of the urban inhabitants served. There is no information on the rural population with this type of service, nor are there reliable data on the number of septic tanks and latrines in the country, though a significant number of rural inhabitants doubtlessly have some type of service. This was confirmed by analyzing the projections of the representative sampling, which showed that of 17,500 dwellings, 71% have inside installations with bath, 28% have latrines and only 1% have no means of disposing of wastes. In general, except for some 19 treatment plants in operation, the waste waters collected by sewerage systems are discharged into waterways without treatment, causing problems of contamination.
- 2.18 It can be affirmed that in recent years the increase in drinking water and sewerage services in urban and rural areas has been less than the demand created by the normal population growth.

D. Financing by International Agencies

- 2.19 For the last 15 years, the IDB has been the source of international financing in the drinking water sector - urban as well as rural - as may be appreciated in Chapter III of this report. This financing has included technical cooperation for institution building, training of personnel and studies for the preparation of projects. The World Bank has not yet financed any program in this sector. However, it is presently considering, at a preliminary level, financial participation in the urban sector.

E. Rate Structure

- 2.20 The present rate policy maintained in the urban sector by the national government, through its Empresa Obras Sanitarias de la Nación (OSN), establishes the free faucet system, which distinguishes among customers on the basis of the characteristics of the property and surface area served,

^{1/} See Appendix 1.

as well as the geographic area, with no regard for the costs of exploitation inherent in each system. Consequently, it does not take into account considerations relative to the distinct technical-economic characteristics of the services of various regions of the country. Though at present there is an attempt to cover production costs with the income generated by these rates, in many cases the rates have not kept up with cost increases. This situation was aggravated because of the failure to measure consumption at the user level in the cities, which has been particularly serious in Greater Buenos Aires. It may be pointed out, however, that an improvement has begun with the adjustment of rates in conformity with requirements established in loans 526/SF-AR and 14/IC-AR and the program for the installation of 440,000 water meters which is financed with funds from these loans.

- 2.21 The situation referred to will change fundamentally with the transfer of OSN services to the provinces. As of the transfer, each province must adjust the rate to fit the real costs in that zone, since there will be no compensation in the future for benefits and deficits. The provinces seem to have a definite and consistent policy in that regard, and in the transfer resolution it is indicated that the provinces must resolve to fix rates that cover the costs of exploitation, including the depreciation on revalued assets and obtaining a reasonable return on the same.
- 2.22 Insofar as the rate policy applied in the National Rural Water Supply Program, the income from rates at the system level should be sufficient to cover at least the costs of operation, maintenance and administration, and the service on the debt of the subloan granted by SNAP from the IDB loan. Moreover, the rate should generate resources for the setting up of a reserve fund for repairs, and in the case of the third stage (loans 526/SF and 14/IC-AR), for the depreciation of systems. The use of the rate schedule is provided for in the agreements between SNAP and the province and between the province and the community. In these agreements the following is set forth: (i) it is the responsibility of the province, through SPAR, to establish the rates applicable to each program and submit them to the consideration of SNAP; (ii) the community is obligated to put those rates into effect and to take charge of collection, and (iii) it is the responsibility of SPAR to control the collection of rates. In the provincial-community agreement, it is established that the rates should be reviewed periodically, at least every two years, as well as in response to variations in the value of the dollar with regard to the type of exchange for repayment of the subloan. There is nobody to regulate the rate policy for this type of program.

F. The Sanitation Sector in the Program Area

1. Drinking water and sewerage service

- 2.23 The geographic area in which the proposed program will be carried out includes practically the entire country and will benefit localities with

populations of 100 to 15,000. Most of the systems to be constructed are described as "introduction to drinking water services", meaning that the beneficiary localities lack a formal system of water supply and satisfy their needs by private wells using the upper aquifer (underground water), which is generally exposed to bacteriological contamination by the presence of septic tanks and latrines belonging to the very inhabitants, or by untreated surface waters. Only a few projects, approximately, six, are expansions of existing systems which are in unsatisfactory condition with partial coverage.

- 2.24 In the localities included in the program there is no sewerage service. In accord with its resources, each family has a bath or latrine, as may be seen in paragraph 2.16. Several beneficiary populations of the proposed program have indicated an interest in proceeding with installation of the sewerage system once they have public drinking water.

2. Institutional structure

- 2.25 Drinking water and sewage disposal services are primarily the responsibility of the provincial governments. However, national and federal institutions such as Obras Sanitarias de la Nación (OSN), Servicio Nacional de Agua Potable y Saneamiento Rural (SNAP), and the Dirección Nacional de Saneamiento Ambiental (DNSA) have been working in that sector. This participation is legalized by agreements with each of the provinces.
- 2.26 OSN is responsible for the drinking water and sewage systems of the Federal District and was created for that purpose. Later, the provinces delegated the responsibility for the provision of those services in their jurisdictions to OSN. It has carried out its mission through the Gerencias Regionales, units that depend technically and administratively on the Central in Buenos Aires. This latter function has been taken away as part of the national government's policy of decentralization. The services OSN operated were transferred to the provinces, and it remained in charge only of those of the Province of Buenos Aires. ^{1/} As of that transfer, such services are the exclusive responsibility of each province insofar as the systems are located within their jurisdiction.
- 2.27 SNAP is a dependency of the Ministry of Public Works and Services, through the Department of Water Resources. It was created in 1964 to supply drinking water services to rural populations and now covers nuclei of 100 to 10,000 inhabitants. Its function is regulatory, financing and providing technical support to the provincial services. The provincial services are responsible for the design and construction of the systems, as well as the supervision of the operation, maintenance and administration of the services, which are delegated to the communities through cooperatives or administrative juntas.
- 2.28 The relation of SNAP to the provinces is established through agreements which set out in detail the obligations and responsibilities of SNAP and the provincial services. In turn, the relation between the provincial

services and the local or community bodies is provided for in agreements which also stipulate in detail the responsibilities and obligations during the execution stage of the works and the administration of services.

- 2.29 The DNSA is a dependency of the Ministry of Public Health and Environment and is directly under the Department of Promotion of Health and Rehabilitation. Basically it promotes the organization of provincial sanitation bodies and acts in the water services sector among the dispersed population and rural nuclei not covered by SNAP. It fulfills a regulatory function and gives financial support to provincial programs through formal agreements. It is also responsible for the quality control of drinking water.

1/ See paragraph 5.22 for more details.

III. EXECUTION OF PREVIOUS LOANS

A. Background

- 3.01 The Bank has contributed to the financing of drinking water programs in the urban and rural sectors of Argentina through the grant of seven loans for a sum equivalent to US\$122.7 million.

B. Urban Sector

- 3.02 Four loans have been approved for the urban sector for a total equivalent to US\$53.7 million: 43/SF, 86/TF, 70/SF, 14/IC and 526/SF. Loans 43/SF, 86/TF and 70/SF have been fully disbursed and the corresponding facilities completed. The Bank's review or evaluation of these loans appears in document PR-832-A of October 20, 1977.
- 3.03 Loans 14/IC and 526/SF. Currently being executed. The contracts were signed on April 15, 1978, 14/IC for a sum of US\$31 million and 526/SF for a sum of US\$52 million. Both loans serve to expand financing of drinking water services in urban and rural sectors of the country. The execution of the urban subprogram, which has received Bank contributions of US\$46 million, is the responsibility of Obras Sanitarias de la Nación (OSN). This subprogram encompasses the construction of a drinking water system for 700,000 residents in the area of La Matanza in the province of Buenos Aires and the installation of 440,000 meters in that area and in various other cities, which will serve as the foundation for establishing a system of tariffs based on metered consumption. As of June 30, 1981, the weighted material progress of the subprogram was approximately 44% and 14% of the proceeds of the loan had been disbursed. On the same date, the local contribution to the subprogram had reached 38% of the estimated total. The principal causes for the discrepancies between the material progress of the subprogram and the Bank disbursements were delays encountered in complying with the prerequisites, in preparing the documentation for the bidding and carrying it out, and in the preparation and approval of Decree 1510, which protects international bidding. All the projects in the program were begun on schedule and are currently in progress or completed. The first phase of the meter plan has also been finished, with the installation of 40,000 meters, and the second phase, of 100,000 meters for the area of La Matanza, is underway. Bidding will be opened soon to prequalified firms for the third phase of 300,000 meters.

C. Loans Disbursed in the Rural Sector

- 3.04 The Bank has granted three loans in the rural sector for a total of US\$69 million: 114/TF, 302/SF, 526/SF and 14/IC. The execution of these projects is the responsibility of the Servicio Nacional de Agua Potable (SNAP), with the participation of the various Servicios Provinciales de Agua Potable Rural (SPAR).

- 3.05 The evaluation of loans 114/TF and 302/SF appears in document PR-832-A, mentioned above. Because it provides the immediate background for the proposed program, a summary of the principal aspects of the execution of these projects is presented below. These projects financed stages I and II of the Plan Nacional de Agua Potable, as follows:
- 3.06 Loan 114/TF-AR. Approved on August 12, 1965. The contract was signed on August 26 of the same year. The estimated cost of the program was US\$10 million, of which the loan financed up to US\$5 million. The loan funds were completely disbursed by December 1970. The projects financed were finished in the second half of 1972. Two hundred and fourteen systems were constructed through the program, benefiting a population of 256,000. The designs contemplated a capacity adequate to handle a future population of 449,000.
- 3.07 The effective cost of the program was US\$15.8 million. The cost overruns were met through additional local contributions. The projects constructed were adequate for the requirements of the beneficiaries. Acceptance of the service was shown by the high number of requests for new connections to the completed systems.
- 3.08 The execution of the program served as a framework for the organization and training of the personnel of the national, provincial and community institutions that participated in it. The program made possible the use of plastic piping in the distribution networks and the adoption of consumption regulators and meters, which had only been used rarely in Argentina. Additional studies of more than 80 communities were carried out as part of the program to serve as a basis for the execution of the second stage.
- 3.09 Similarly, under the item for technical assistance (US\$17,600), consultants were hired to carry out studies on "SNAP's Administrative-Accounting System and its Relation to the SPARs" and on the administration of the community agencies, which were considered satisfactory by SNAP and the Bank.
- 3.10 Loan 302/SF. Approved June 28, 1971. The contract was signed on October 6 of the same year. The total cost of the program was estimated at US\$25 million, of which the loan financed US\$12 million. With the execution of the program, 194 systems were constructed, benefiting a population of 327,565 residents, 26% more than the number planned. Fifty-nine thousand house connections were made to the constructed systems, of which 48,420 have meters. The effective cost of the completed program was equivalent to US\$30.9 million, 19% more than originally estimated. The cost overruns were covered by additional local contributions.
- 3.11 The beneficiary communities have made the expected contributions in a satisfactory manner and have accepted the tariff clause adopted for the program, which establishes that they should cover, at least, the administrative, operating and maintenance costs and the debt service.

- 3.12 The loan included a technical cooperation project (US\$150,000) for the administrative and technical improvement of the participating agencies, which was carried out satisfactorily. Through the included training program, 421 professionals and technicians were trained. The effectiveness of the courses is evident in the efficient operation of the service's completed systems. As part of the program, 130 additional projects were prepared, to serve as a basis for the continuity of the program.

D. Loans Being Disbursed in the Rural Sector

- 3.13 Stage III of the Plan Nacional de Agua Potable Rural is currently being executed. Its details are as follows:
- 3.14 Loans 14/IC and 526/SF-AR. The contracts were signed on the date and for the amounts mentioned in paragraph 3.03 of this report. The execution of the rural subprogram, which is currently receiving financing from these two loans for the equivalent of US\$35,750,000, is the responsibility of the Servicio Nacional de Agua Potable (SNAP) in cooperation with the provincial services (SPAR). This subprogram originally consisted in the construction of approximately 226 drinking water supply systems to supply 270 rural localities with 100 to 10,000 residents each, to benefit a total population of 400,000 residents. In response to a request made by the borrower, in October of 1980 the Bank approved a reduction in the material goals of the project to 143 drinking water systems to serve 176 rural localities, given the sharply escalated internal costs that had taken place in the country. At the same time, an increase in the project's cost by the equivalent of US\$17 million was approved. This increase was to be met in part by a corresponding increase in the local contribution from SNAP, the provincial services, and the communities. The Bank also approved the cancellation of US\$1,250,000 of loan 14/IC-AR, in keeping with the guidelines of the Bank on the use of foreign exchange in effect on the date when the operation was approved. According to those guidelines, foreign exchange was to be used for direct or indirect foreign costs. The modifying contract for this cancellation is pending signature. As of June 30, 1981, the weighted material progress had reached 52%, 96 projects had been finished, and the remaining systems were under construction. In the period for the initiation of construction, which ended on April 15, 1981, all the construction for 141 systems or projects had been started and contracted for; however, it will not be possible to incorporate the two remaining projects at this stage. These 141 systems will serve 175 localities with approximately 352,000 residents in all. On the date mentioned, the disbursements made charged to the rural subprogram amounted to 38%. Taking into account the present goals and objectives of this operation, and because it is currently under active construction, it is expected to be completed.
- 3.15 The incorporation of the 14 provinces participating in this third stage has been accomplished through SNAP-Province agreements, in a gradual manner and along with the strengthening of the administrative structures

of the provincial agencies. In general, the latter are functioning adequately, although in the case of some provinces the personnel for the supervision, advising, and execution of maintenance activities needs to be improved. The positive performance of the community agencies or co-operatives in the satisfactory execution of the projects and in their administration and operation should be noted.

- 3.16 The quality of the completed facilities is satisfactory, both in those facilities done by contract and in those executed on force account. The bidding for contracts was opened internationally, since the financing of the projects is in part through a loan of foreign exchange (14/IC-AR). All the firms represented in the bidding were Argentine.

E. Compliance with the Contractual Clauses

- 3.17 The clauses on tariffs for loans 114/TF and 302/SF establish that, at the least, administrative, operating and maintenance costs, as well as the debt service, should be covered. In loans 526/SF and 14/IC, the tariff clause stipulates that the tariffs for the rural systems shall cover the costs of administration, operation, maintenance and depreciation. The information available from SNAP for the year 1980, for 387 systems out of a total of 477 systems in operation, that is, for 81% ^{1/}, indicates the following: i) 338 systems, that is, 87% of the reported total, show surpluses and are in compliance with the clauses on tariffs; ii) 49 systems showed a deficit for the year 1980, of which 25 systems correspond to stage I (114/TF-AR), 19 to stage II (302/SF-AR) and 5 to stage III (526/SF-AR and 14/IC-AR). SNAP did not have precise information on the financing of these deficits by the community, but experience indicates that they probably had funds from previous fiscal years or, in the case of the cooperatives, income from other services; (iii) it has been observed that the communities adjust the tariffs periodically in order to meet cost increases, as well as to meet the debt service that must be paid by its equivalent in dollars; and (iv) it was also noted that in some communities, where payments are made quarterly or biannually, there have been delays in the collection of tariffs. A delay in the payment of some subloans has also been noted, due to the geographical isolation or transportation difficulties of the localities. On the basis of the information examined, a high percentage of the systems are complying with the tariff clause. Nevertheless, the exact number of systems that do or do not comply with this clause cannot be specified. With the

^{1/} For 201 systems, results from all four quarters for the year are included, for 51, three quarters, for 65, two quarters, and for 70, one quarter.

aim of correcting this lack of information on the results of the systems' use, it is recommended that in the contract for the proposed loan, SNAP be required to present the Bank annually with information on the income and expenses of the systems financed by the proposed program, and on the expenditures for the servicing of the subloans, as well as with the statement of accounts receivable. 1/

- 3.18 The remaining clauses of contracts 114/TF and 302/SF have been fulfilled to the Bank's satisfaction.

F. Maintenance of Facilities and Equipment

- 3.19 In stages I and II of the Plan Nacional de Agua Potable Rural, technical cooperation projects were included that have enabled SNAP to train personnel for the maintenance of the facilities and equipment. This personnel, employed by the provincial services or community agencies, has been carrying out the maintenance work in a satisfactory manner. Under the personnel training program included in stage III, with funds from ATP/SF-1611-AR, SNAP organized, and consultants were hired for, courses for operator-administrators, courses for accounting techniques, and courses for operations and maintenance supervisors. The personnel thus trained had been selected beforehand by both the cooperatives and the SPARs to attend these courses, and having finished their training, the majority were hired by the community services.
- 3.20 Furthermore, SNAP also adopted measures aimed at a gradual implementation of preventive maintenance activities, preparing documents that are being used by the SPARs: i) standards for preventive maintenance of installations and equipment; ii) inventory lists and specifications for equipment by locality; iii) inventory lists and classification of installations and equipment by province; and iv) scheduling and control of preventive maintenance by province. These constitute a set of clear, concrete documents, adapted to the nature of the projects and far superior to those which were in use previously. Their full implementation will make it possible to increase the working life of the water systems, to have available an inventory of equipment and installations, to rationalize the advising and control of the community agencies by SPARs, and to have annual maintenance plans for each community and each province. SNAP has carried out this task by distribution and explaining the significance and application of these documents through its regional engineers. They were well received and responded to. Nevertheless, this work should be complemented with a maintenance schedule, to be implemented by the SPARs in cooperation with the various community agencies. For this purpose it will be necessary to increase the number of vehicles and, eventually, of personnel.

1/ See Recommendation 3.

- 3.21 In the case of some provinces (such as Catamarca), the maintenance and repair activities are carried out by the provincial agency, which is not adequately equipped for the task. Vehicles, a mobile workshop, tools, and an improvement in the existing laboratory for water quality control are needed.
- 3.22 In summary, i) important advances have been made leading to the elaboration of plans and the realization of maintenance, among which the preparation of adequate standards and inventories of equipment and installations stand out; ii) given the customary operation of the services by the community agencies, with advice and control by the SPARs, the implementation of the plans for, and the effective realization of, the work of preventive maintenance is being done gradually. It is expected that upon completion of all the stage III facilities, within the next 2 years, the preventive maintenance plans will have been almost totally implemented, and it is felt that what has been done so far is acceptable; iii) it would be advisable to fortify the appropriate sections of the SPARs with vehicles and equipment and, in the case of provinces in which maintenance is the provincial agency's responsibility, with mobile workshops and laboratory equipment as well. 1/

1/ See paragraph 4.18, in which the equipment included in the proposed program for the enhancement of these activities is noted.

IV. THE PROGRAM AND ITS FINANCING

A. Objectives

4.01 The principal objectives of the program are as follows:

- (a) To provide an initial population of approximately 285,000 persons in 160 rural and semi-urban sites with potable water, mainly via house connections, by building 150 water supply systems.
- (b) To enhance the proficiency of mid-level personnel responsible for supervising construction of the new systems and for ensuring their operation and maintenance.

B. Program Description

1. Criteria for selection of sites

4.02 Generally speaking, the sample projects and the rest of the projects in the program involve sites that have been or will be selected by the provincial potable water authorities (SPAR) and approved by SNAP, in accordance with the following criteria. Each site:

- (i) must have a population of 100-15,000 inhabitants at such time as its specific project is approved by the Bank; 1/
- (ii) may not have a water system that already supplies more than 120 liters a day per person;
- (iii) must have a reasonably reliable source of water, of adequate capacity to meet demand over the 20-year design period, and of sufficiently high quality so as not to require any costly treatment.
- (iv) must be subjected to the following economic analyses:
 - (a) cost effectiveness for sites with less than 10,000 inhabitants. The highest acceptable figure has been set at US\$40 per capita, measured in dollar value as of April 1981.
 - (b) Cost-benefit for sites with more than 10,000 inhabitants. To be eligible, projects must have a 12% minimum rate of economic return.

1/ In the course of the program's earlier stages, the size of the populations served has been gradually increased. Stage III covers sites with populations ranging from 100 to 10,000. SNAP has now decided to exercise its authority in order to expand its coverage under the proposed program to include populations of up to 15,000.

Should a project's cost effectiveness turn out to be higher than the maximum indicated in (a), its eligibility can still be determined by the second mode of analysis, (b). Furthermore, it is recommended that allowances be made for exceptional cases, with prior Bank approval, as was done in certain instances under loans 14/IC-AR and 526/SF-AR. Projects with a cost-effectiveness yield exceeding the maximum or with an economic return below 12% may be financed when the site in question is plagued by a high incidence of water-borne diseases or problems of poor water quality, such as a high content of arsenic, fluorine, or other salts, and when local revenue does not permit site authorities to make a greater contribution to defray project costs. The sum allocated for this type of project may not exceed 5% of the direct cost of the program; 1/

(v) Must be able to contribute more than 10% of construction costs;

(vi) must be prepared to charge its customers for water service.

4.03 These selection criteria are practically the same as those used under loan 526/SF-AR for Stage III. For that loan, cost effectiveness was established at \$15 per capita, calculated at late 1977 prices; for the proposed program, the cost-effectiveness figure has been set at \$40, in terms of April 1981 prices. The proposed program, however, will be serving some sites with up to 15,000 inhabitants, so the cost-benefit analysis will be introduced to determine economic eligibility for all sites with populations over 10,000.

2. Design and experimental sample

4.04 The sample projects have been formulated in accordance with the design specifications indicated in the SNAP Technical Guidelines. 2/ The rest

1/ In Stage III, exceptions of this type accounted for 2% of direct cost.

2/ For the purpose of updating its technical guidelines, SNAP plans to use its own resources to carry out a study of consumption curves in the sites covered by the National Rural Water Supply Plan that already have potable water service. The aim of this study, to be conducted outside the framework of the proposed program, is to determine levels of use, demand ratios (daily and hourly peaks), and quantities lost through the distribution system. This information is especially important in that it will permit SNAP to revise the Technical Guidelines with a view to improving its capacity to formulate future water supply programs similar to the proposed program. In addition, a study will be done to obtain information for an evaluation of the economic and social impact of the National Rural Water Supply Plan. This study will include some sites in which public water service is not yet available. The results of both studies will be submitted to the Bank through the Field Office in Argentina.

of the projects in the program will also be tailored to these specifications, as stipulated below:

- Design period: 20 years (for certain equipment, such as pumps, motors, chlorinators, etc., the period is 10 years).
- Supply: 50 liters a day per person for public sources and 130-260 liters a day per person for systems providing house connections.
- Demand ratios; daily peak: 120% of daily average; hourly peak: 180% of daily average.
- Storage: 25% of daily consumption average.
- Water pressure: minimum - 10 meters
maximum - 50 meters.
- Minimum diameter: 50 mm.
- Materials: cement asbestos, PVC, and, occasionally, galvanized steel.

4.05 The experimental sample comprises 45 systems, which account for 37% of the direct cost of the program. 1/ The final designs for these systems are acceptable to the Bank. Their main characteristics are shown in Table IV-I.

1/ See Appendix 2 for the tentative location of the systems.

Table IV-1

Province and Site	Population		Source of Supply	Type of System		House Connections (1st year)	Cost (in US\$1,000) (contingencies included)
	Current	Future		Pumping	Gravity		
1.0 BUENOS AIRES							
1.01 Alberdí	2,481	3,225	Underground	x		575	445.8
1.02 Ascensión	1,975	2,568	Underground	x		467	458.7
1.03 Bordenave	576	864	Underground	x		160	141.4
1.04 Carlos Naón	663	995	Underground	x		167	142.1
1.05 Comodoro Py.	664	994	Underground	x		177	144.9
1.06 Cortines	800	1,200	Underground	x		159	140.8
1.07 Est. Bonifacio	1,359	1,767	Underground	x		314	234.8
1.08 Ferré	1,120	1,456	Underground	x		280	233.6
1.09 Gober.Ugarte	668	1,002	Underground	x		171	115.2
1.10 Goyena	498	747	Underground	x		128	112.9
1.11 La Aurora	710	1,065	Underground	x		160	144.2
1.12 Pedernales	860	1,290	Underground	x		200	163.9
1.13 San Agustín	469	704	Underground	x		106	101.7
1.14 San José	1,884	2,449	Underground	x		413	215.8
1.15 Torres	814	1,221	Underground	x		188	193.8
1.16 Agustín Roca	576	864	Underground	x		145	173.7
1.17 Arribenos	2,217	2,882	Underground	x		600	533.4
2.0 CORDOBA							
2.01 Despeñaderos	3,158	4,693	Underground	x		465	713.6
2.02 Monte Buey	4,118	5,938	Surface		x 1/	802	1,072.9
2.03 Ordóñez	1,486	1,921	Surface		x 1/	301	349.8
3.0 ENTRE RIOS							
3.01 Aldea Brasileira	376	564	Underground	x		95	78.4
3.02 Aldea Protestante	371	557	Underground	x		111	99.2
3.03 Irazusta	498	747	Underground	x		125	69.7
3.4 Vila Paranacito	790	1,027	Underground	x		152	141.7
4.0 FORMOSA							
4.01 Gral. Fotheringan	756	1,058	Surface		x	121	182.2

1/ Existing aqueducts to be used as source of supply.

Province and Site	Population		Source of Supply	Type of System		House Connections (1st year)	Cost (in US\$1,000) (contingency included)
	Current	Future		Pumping	Gravity		
5.0	JUJUY						
5.01	Juella	376	548	Surface		x	Public source 43.5
5.02	San Francisco	257	334		x		Public source 41.8
6.0	SAN JUAN						
6.01	El Rincón	1,456	2,020	Underground	x		310 485.8
6.02	Gral. Acha	810	1,110	Surface	x		189.9
7.0	SANTA FE						
7.01	Centeno	2,148	2,792	Underground	x		430 860.4
7.02	Humberto I	3,661	4,759	Underground	x		1,103 1,384.7
7.03	San Genaro	2,954	3,840	Underground	x		705 1,066.6
7.04	Santa Isabel	2,857	3,778	Underground	x		700 492.0
7.05	Santa Teresa	2,455	3,246	Underground	x		615 459.9
7.06	Sunchales	9,914	13,111	Underground	x		2,605 2,075.1
7.07	Sarmiento	1,000	1,300	Underground	x		200 262.7
7.08	Vera	9,928	12,906	Underground	x		2,080 1,378.5
7.09	Sauce Viejo	1,384	1,799	Underground	x		300 257.0
8.0	SANTIAGO ESTERO						
8.01	Lugones	371	556	Surface	x		82 234.0
8.02	San Félix	250	430	Underground	x		Public source 65.6
9.0	TUCUMAN						
9.01	Finca Cornet	2,250	3,375	Underground	x		320 417.8
9.02	Los Bulacios-						
	Los Villagral	765	1,148	Underground	x		120 231.4
9.03	Los Suelos	1,134	1,774	Underground	x		160 255.2
9.04	Bella Vista	9,995	15,652	Underground	x		1,710 2,008.9
10.0	RIO NEGRO						
10.1	Altos de Bariloche	9,941	14,721	Surface		x	1,890 2,083.2

- 4.06 Each system will consist of water collection facilities, treatment units, pipelines, storage tanks, and distribution systems with house connections. Most residences served will have consumption meters, although a few will be equipped with consumption regulators, and, in a very limited number of cases, there will be public taps for small communities that do not have the capacity to operate a pumping system.

3. Characteristics of the system

- 4.07 The program involves the construction of approximately 150 potable water supply systems to serve 160 sites with populations of 100-15,000 inhabitants. An estimated 120 of these systems will be installed in totally rural communities (with less than 2,000 inhabitants) and the rest will be for semi-urban areas (with over 2,000 inhabitants). In a few of the semi-urban sites, population will exceed 10,000.

(a) Collection

- 4.08 In most cases, the collection facilities will consist of mechanically drilled wells with an average depth of 40 meters, lines with steel piping and equipped with a filter at the water entry point. In some systems, surface water drawn directly from rivers and existing irrigation channels will be used. In a few systems, manually drilled wells of reinforced concrete, up to eight meters in diameter, will be used to draw sub-surface water from dams, which will also have to be built.

(b) Treatment

- 4.09 The selected sources of supply will undergo treatment to free them of all contamination. Underground water will be chlorinated with calcium or sodium hypochlorite. Surface water will pass through treatment plants, to be constructed, and will be subjected to sand filters, silt basins, and slow filters; a chlorine solution will be added just before the water leaves the plant. No problems involving excessive fluorine or arsenic content are anticipated; however, should such a case arise, special treatment plants will be constructed to remove these elements. A reasonable provision of funds (US\$500,000) has been allotted under category 2 of Direct Costs to cover this contingency.

(c) Transport

- 4.10 Pipelines will be installed to link the water supply sources with the tanks or reservoirs. They will generally be made of cement asbestos and PVC and will measure at least three inches in diameter.

(d) Storage

- 4.11 Most of the reservoirs will be made of reinforced concrete and raised above ground level. In a few systems, they will be built at ground level (with supports).

(e) Distribution

- 4.12 The piping in the distribution systems will be made of cement asbestos for pipes 150 mm in diameter and larger, and PVC will be used for the rest. Minimum diameter will be two inches. The necessary valves will be inserted to isolate the main circuits. It is estimated that at least 80% of all homes along the distribution pipelines will be connected to each system once construction is completed.

(f) House connections

External house connections are included in the direct cost of the proposed program. The cost of internal connections will be charged to the individual customer. Based on the experience acquired in previous stages, no problems are anticipated in this regard.

4. Training

- 4.13 The proposed program includes a training plan to upgrade the proficiency of mid-level personnel responsible for the supervision, operation and maintenance of the new systems. This plan involves three courses for operators/administrators, which are expected to draw a total of 90 participants; two courses for construction supervisors with 60 participants; one course for operation and maintenance supervisors, with 30 participants; and one course in accounting methods, with 20 participants. Both the theoretical and practical courses will be taught by Argentine professionals. Training is a third phase in this type of operation. 1/

C. Cost of the Program

- 4.14 The total cost of the program has been estimated at US\$89,325,000 at April 1981 dollar value. The sources of financing and distribution of costs by investment category are shown in the following table:

1/ These courses are described in greater detail in Appendix 3.

Table IV-2

COST AND FINANCING OF THE PROGRAM
(thousands of US\$)

Investment Categories	(IC)	I D B			LOCAL	Grand Total	%
		Foreign exchange	(SF) Local	Total	Local Currency		
1. <u>Engineering and administration</u>		-	1,000	1,000	13,000	14,000	15.7
1.1 Design		-	500	500	500	1,000	1.1
1.2 Supervision and Administration <u>1/</u>		-	500	500	12,500	13,000	14.6
2. <u>Direct costs</u> <u>2/</u>		28,700	14,075	42,775	21,750	64,525	72.2
2.1 Supply equipment execution works		28,700	14,075	42,775	21,750	64,525	72.2
3. <u>Associated costs</u> <u>2/</u>		-	1,100	1,100	400	1,500	1.7
3.1 Vehicles and equipment		-	1,100	1,100	-	1,100	1.3
3.2 Land		-	-	-	200	200	0.2
3.3 Training		-	-	-	200	200	0.2
4. <u>Financial costs</u>		7,000	1,325	8,325	975 <u>3/</u>	9,300	10.4
4.1 Interest		6,643	1,150	7,793	-	7,793	8.7
4.2 Credit fee		-	-	-	975 <u>3/</u>	975	1.1
4.3 Inspection and supervision		357	175	532	-	532	0.6
Total		35,700	17,500	53,200	36,125	89,325	100.0
Percent		40.0	19.6	59.6	40.4	100.0	

1/ Vehicles and laboratory equipment includes contingencies and escalation.

2/ Includes contingencies and escalation, except "land".

3/ To be paid in foreign exchange.

- 4.15 The costs were calculated on the basis of the amount of construction work to be done and the unit costs for the various categories in the experimental sample. These values, in turn, were derived from prices officially established in each province for materials and labor, plus social costs as determined by the government, which are also the figures the construction companies use in preparing their proposals. Also taken into account were recent rates for contracting and direct administration charged for jobs similar to those required by the program. Equipment costs are based on the bids submitted by potential suppliers. The amounts designated for the different investment categories provide a reasonable indication of the total cost of the program in April 1981 prices.
- 4.16 Engineering and administration costs (US\$14,000,000) include: (i) \$1,000,000 for the formulation of projects yet to be undertaken in the program. This sum also covers any design services required during the construction phase. Design accounts for 1.0% of project cost; (ii) technical supervision of program operations, which will be the responsibility of both the provincial authorities and SNAP. This includes salaries and other employment benefits for professional, technical, and other staff directly responsible for program operations, the cost of 11 vehicles suitable for rural use, to be operated by the above-mentioned staff in the course of their duties, and supplementary laboratory equipment for water analysis. ^{1/} It is not expected that any special consultants will be hired for the supervision of construction work; considering that the projects are not complicated, the provincial authorities and SNAP will have full responsibility for this job; (iii) and finally, office expenditures and a portion of the administrative costs both for the provincial authorities and for SNAP have been taken into account. The sum of US\$13,000,000 has been allotted for supervision and administration activities. This accounts for 14.6% of the total cost of the program, which is considered reasonable.
- 4.17 Direct construction costs (US\$64,525,000) account for 72.2% of the total cost of the program and include pipes and accessories, meters to gauge volume of flow and consumption, pumping equipment, electrical substations, chlorinators, structural steel, cement, sand, wood, gravel, tools and other equipment, transport of materials, labor, technical services, contractors' fees, etc. Costs for the projects yet to be initiated were estimated on the basis of the experimental samples, using average figures for the different population intervals.
- 4.18 Concurrent costs (US\$1,500,000) include US\$200,000 for the training plan described in item 4.13, US\$200,000 for the acquisition of land and building permits, and US\$1,100,000 for the purchase of ten vehicles suitable for rural use, six mobile shops units to perform major maintenance work in provinces where local capacity is sufficient, and supplementary computer equipment for SNAP. By adding a minicomputer to SNAP's existing

^{1/} See Appendix 5 for categories of equipment.

equipment, it will be possible to increase printer speed from 60 to 200 characters per second, augment internal and external memory, and expand the operational system of single-phase processing into COBOL and multi-phase processing. This equipment would also aid SNAP in computerizing its budget and monitoring the financing of project construction, and could be used for other financial operations as well as in technical areas. Finally, it could facilitate the administration of the portfolio of subloans made to the provinces and tabulate operating statistics for potable water systems in service, in order to monitor their performance.

- 4.19 Finance expenses (US\$9,300,000) were calculated on the basis of the program's investment schedule 1/ and the Bank's current financing conditions.
- 4.20 The provision for contingencies included in the portion of supervision and administration and in concurrent costs was figured at 10%. The contingencies allowance under direct costs was figured at 12%; this is regarded as reasonable in view of the characteristics of the projects, virtually all of which will rely on tapping an underground source of water, which nearly always involves an element of uncertainty. In addition, a provision of US\$500,000 has been set aside for five systems that might require special treatment plants owing to problems of water quality.
- 4.21 The Bank's current rates 2/ were used in calculating escalation, except that no escalation was figured for 1981 because it was felt that the increase in domestic prices this year would be offset by devaluations of the Argentine peso. For equipment and vehicles, the escalation in 1981 was taken into account. The resulting values have been incorporated into the respective investment categories.

D. Financing of the Program

- 4.22 The total cost of the program is US\$89,325,000, which will be financed by means of two Bank loans, one in foreign exchange from inter-regional capital in the amount of US\$35,700,000 and the other in local currency from the Fund for Special Operations, in the amount of US\$17,500,000. The loans account for 40.0% and 19.6% of the total amount, respectively. The percentage for foreign exchange is consistent with the policy established in document FP-33-1 for the social infrastructure sector in the countries of Group A, which include Argentina. The loan in local currency from the FSO accounts for 33% of total financing from the Bank.

1/ See Appendix 6.

2/ 1981: 10.4% (only equipment and vehicles); 1982: 9.4%; 1983: 8.5%; 1984: 8.0%; 1985: 7.8%.

- 4.23 The local contribution would total US\$36,125,000 equivalent (40.4% of the total cost of the program), 45% of which is to be covered by the government and by SNAP, 35% by the provincial water authorities (SPAR), and 20% by the participating communities. Upon completion of the construction work, these communities will be responsible for the operation of the systems, and it is therefore recommended that the loan contract contain a clause, as in the previous stages, whereby the borrower would be obligated to submit evidence to the Bank, prior to the call for bids, to show that an agreement between the provincial water service and the corresponding local authority has been signed for the construction of the system. This agreement would have to indicate the amount to be contributed by the community and the provincial agency and lay the foundations for the system's subsequent operation, maintenance, and administration, as well as for the hiring of technical personnel to carry out these tasks. 1/
- 4.24 Bank resources will finance (i) the cost of the vehicles to be used in the technical supervision of the project (US\$400,000), supplementary laboratory equipment (US\$100,000), and a part of project design (US\$500,000); (ii) 66.3% (US\$42,775,000) of the direct construction costs; (iii) vehicles and equipment for maintenance of the water supply systems in certain provinces, plus computer equipment (US\$1,100,000). Furthermore, in response to a request from the borrower, the Bank will finance the interest payments during implementation of the program. Thus, finance expenses have been included in the cost of the program, with the exception of the credit commission. Resources required for Bank inspection and supervision will be financed in the same way.
- 4.25 The local contribution of US\$36,125,000, of which US\$35,150,000 (39.3% of the cost of the program) is to be provided in local currency, would cover engineering and administration costs (with the exception of vehicles for technical supervision, laboratory equipment, and some of the design work); plus a portion of the direct construction costs (US\$21,750,000), for which it has been estimated that the communities could contribute the equivalent of US\$7,225,000 in cash; the credit commission (US\$975,000 in foreign exchange); real estate and building permits (US\$200,000); and the training plan (US\$200,000).
- 4.26 The conditions proposed for IDB financing of this program are as follows:

1/ See Recommendation 2.

	<u>IC</u>	<u>SF</u>
Repayment period	20 years	25 years
Grace period	4.5 years	4.5 years
Disbursement period	4 years	4 years
Interest <u>1</u> /	9.25%	3%
Credit commission	1.25%	-
Inspection and supervision	1%	1%

The recommendation to schedule the repayment period at 20 years for the IC loan and 25 years for the FOE loan is based on the guidelines established in document GP-91-6, dated February 27, 1981.

1/ The interest rate charged will be that in effect at such time the loan is approved by the Board of Executive Directors.

V. INSTITUTIONAL AND FINANCIAL ANALYSIS

A. The Borrower

- 5.01 The borrower would be the Argentine Nation, which will assume the service of the proposed loan. The local contribution to the program will be provided by the Nation, the participating provinces, and the communities which are the beneficiaries of the projects.

B. Institutional Scheme of the Program

- 5.02 In the execution of the program, the following three levels of participating entities are distinguished:

The Nation. Through the Servicio Nacional de Agua Potable y Saneamiento Rural (SNAP), the Nation is responsible for the technical, administrative, accounting, legal and social consultation which will be required for the achievement of the National Plan, and for the supervision of the administrative and financial management of the efforts to organize and motivate the beneficiary communities. The Nation will pass on to SNAP the proceeds of the IDB loan, which will be handed over to the provinces as subloans. Moreover, the Nation will contribute to financing the local contribution.

The Province. By means of the provincial potable water services, which have come to be known as SPARs, the province will be responsible for the organization and motivation of the communities; the preparation of projects and budgets for works to be submitted to SNAP for approval; the execution of works by public bidding or, as is appropriate in each case, on force account; and assistance to the communities in the management of systems and in the collection of funds which should be repaid to SNAP. ^{1/} The Province will contribute to the SPAR to cover its operating costs.

The Locality. The communities, by means of cooperatives or neighborhood boards, contribute financially to the construction of the systems and take charge of their operation and maintenance, as well as billing for services and collecting payments.

- 5.03 Division of responsibilities is established by agreements between SNAP and the province, and between the province and the community.

C. The Program Executing Agency

1. Nature

- 5.04 The Servicio Nacional de Agua Potable y Saneamiento Rural (SNAP) is the organism responsible for the execution of the program. This is an

^{1/} See Resolution IC 8(c)(i) and Resolution SF 7(d)(i).

^{2/} See paragraphs 5.22 and 5.23 on the transformation of the SPARs.

independent organism created specifically for the execution of the National Plan by Decree 9762 of December 1964. Its current structure, purpose, and functions are defined in Decree 2629 of April, 1973. SNAP is subordinate to the Subsecretaría de Recursos Hídricos (Department of Water Resources) of the Ministry of Public Works and Services.

2. Functions

- 5.05 The functions of SNAP are the promotion, supervision, and administration of the program for the provision of potable water and sanitation to rural communities. Specific works are executed through the provincial rural potable water services (SPARs).

3. Executive level

- 5.06 The highest-ranking official is the Administrator-General, named by the Executive Branch. The Administrator-General is responsible for proposing policies and executing the plans and programs approved by the Ministry of Public Works and Services, for coordinating the activities of SNAP with the provincial governments and the communities, for supervising the development of plans, administering funds, and directing the activities of the different sectors of the organism. The Administrator represents the entity in signing agreements, in the purchase and sale of real estate, and in judicial and extrajudicial arrangements. He is assisted in his functions by the Sub-Administrator who is in charge of the operations of the organism in the absence of the Administrator.

4. Organization

- 5.07 The organizational structure of SNAP, defined in Decree 2629 of April 1973, shows 1/ two Offices which are subordinate to the Administrator - the Technical Office and the Economic-Financial Office - as well as the Regional Delegations and the Department of Planning and Management Control. The Technical Office includes the Departments of Engineering and Promotion. It is charged with studying and approving the projects of the provinces, proposing technical engineering standards and social promotion standards and their modification, promoting the execution of works, supervising their construction, and supervising the programming of courses of action for the achievement of approved plans. The Economic-Financial Office consists of an Accounting Department and a Department of Economic-Financial Studies, and also includes the Treasury, Personnel, and Receiving and Dispatching Offices. Its function is to assist the Administrator in the performance of the economic, financial, accounting and resources management of SNAP. The Economic-Financial Office must propose the budgets of SNAP, and evaluate projects from an economic and financial point of view with regard to their satisfactory execution. It takes charge of the accounting documents of the organism,

1/ See organizational chart in Appendix 9.

the elaboration of reports, the supervision of the execution of the budget, the management of the funds placed at the disposition of SNAP, and the administration of personnel, communications and general services.

- 5.08 The Department of Planning and Management Control is in charge of evaluating the development of plans and programs and of proposing the modification of these plans, directs the collection of information from each sector, analyzes and evaluates financial requirements, and proposes the management of the activities which will permit the detection and correction of failures in the achievement of programs.
- 5.09 The five Regional Delegations, located in the cities of La Plata, Corrientes, Tucumán, Córdoba and Viedma, cover all the provinces of the country and have as their function to establish coordination between SNAP and the provincial services, verifying directly the achievement of plans and programs, studying projects and advising the provinces on projects and the advisability and form of their execution, on compliance with technical standards in engineering and promotion, on the operation and maintenance of services already in use, on the financial requirements of works, and on compliance with commitments made by the province and the communities. Each regional service should be directed by an engineer, who represents SNAP to the provinces, and should be composed of three units: engineering, administrative and accounting control, and community promotion.

5. Personnel

- 5.10 The staff of the SNAP currently totals 89 officials and employees, of whom 25 are professionals: 13 engineers of various sorts, 7 accountants, and 5 in other disciplines. Of the remaining 64 persons, 9 are technicians and 55 are classified as administrative personnel.
- 5.11 The personnel requirements of SNAP are provided for in its organizational chart, on which the following situation exists as of April 1981: 1/

	<u>Number</u>	<u>Percentage</u>
Positions foreseen	131	100
Positions filled	89	68
Vacancies	42	32

1/ See Appendix 10.

5.12 For the disbursement of loans 526/SF and 14/IC-AR, it was required that the Bank be presented with a plan for contracting the personnel to complete the technical and administrative staff of SNAP, as well as evidence that at least 80% of the personnel of the existing five regional delegations had been hired. This precondition was duly fulfilled to the satisfaction of the Bank, but subsequently restrictions of the Government of the Nation on filling vacancies and delays in the process of contracting personnel have resulted in a situation in which 42 (or 32%) of the 131 positions provided for are unfilled. This lack of personnel is most acute in the regional delegations and results in weakness in the supervision of the SPARs and of the community entities, especially with regard to the operation and maintenance of systems now in use. It should be pointed out that in the current personnel structure of the regional delegations there are 35 posts, of which 20 (58%) are filled; currently, SNAP is undertaking the measures necessary for filling these positions. 1/ Nevertheless, and for the purpose of assuring adequate supervision of SNAP in the construction phase of the proposed program, as well as in the operation and maintenance of systems now in use, it is recommended that, prior to the first disbursement of the proceeds of the loan, the borrower, through SNAP, present to the Bank evidence that it has completed the staffing of the Regional Services with professional and technical personnel, 2/ including a Chief of the Service, a regional engineer, a regional technical supervisor, a regional accountant, and a regional accounting assistant; this level of personnel must be maintained throughout the period of execution of the program. 3/

6. Comments on the organization and functioning of SNAP

5.13 In general, SNAP is organized in a way which is adequate for the fulfillment of its purposes, and its procedures are acceptable. Nevertheless, it will be necessary to perfect the information system for the operation and maintenance of projects already put into service, in order to evaluate and make decisions in the cases in which there are deviations from standards. It is considered that SNAP will be capable of overcoming this weakness, once its data-processing capacity is increased 4/ and it is completely staffed, especially in the regional delegations.

1/ Decree 411/81 freezes all positions in the Public Administration for 1981, and therefore an exemption from this regulation must be requested; SNAP reports that it has already received the support of the Ministry of Public Works and Services for this exemption.

2/ The number of these Regional Services could be reduced to 4, inasmuch as plans call for coverage of Region V (Neuquén, Río Negro, Chubut and Santa Cruz) from headquarters in Buenos Aires, using personnel from the Technical and Economic Financial Directorates.

3/ See Resolution IC 8(c)(iii), Resolution SF 7(d)(iii) and Annex A, Chapter VII.

4/ In the concurrent costs of the program, an item is included for financing the acquisition of computation equipment for SNAP with Bank resources.

7. Financial administration

- 5.14 The provisions of the Ley de Contabilidad del Estado (State Accounting Law) are followed in the administration of the financial resources of SNAP. In accordance with these provisions, budgetary accounts are maintained, and a registry of the movement of funds and of goods and inventory. Also, separate accounts are maintained for the program partially financed with the resources of the IDB loan, in which the progress of this program is shown. This bookkeeping is done in both Argentine currency and U.S. dollars.
- 5.15 SNAP is governed by a yearly budget, which forms part of the General Public Administration Budget. Government funds are received from the Treasury by means of payment orders and direct transfers. SNAP has available a data processing facility of limited capacity, which is chiefly used for bookkeeping in the execution of projects, including the registry of projects, certificates of progress and payments. Also, the collection of subloans has been mechanized. SNAP plans to increase its data processing capabilities, which will be financed (US\$100,000) with the resources of the proposed program.
- 5.16 As part of the internal control system, an adequate distribution of functions has been established as well as a procedure for authorizations and verifications. SNAP does not have available an internal auditing system as part of its internal controls. No recommendations are made about this, since, in addition to the established procedures for internal control, the Tribunal de Cuentas de la Nación (National Audit Office) maintains a permanent delegation in SNAP, which intervenes in anticipation of the movement of funds; the establishment of an operations audit office is not justified, given the size of the entity. Moreover, the Contaduría General de la Nación (National General Accounting Office) exercises control over budgetary transactions. The financial statements of the IDB program are subject to audit opinions by the Contaduría, and the opinion for 1979 presents a clean opinion on the financial statements of the program in execution, as well as on the budgetary performance of SNAP.

8. Budgetary performance

- 5.17 In order to give an idea of the importance of the expenses of SNAP, the statement of the budgetary performance is shown; 2/ in summary, the data from this statement follow:

1/ In the concurrent costs of the program, an item is included for financing the acquisition of computation equipment for SNAP with Bank resources.

2/ See Appendix 11.

Table V-1

(Equivalent in constant (January 1981) US\$ thousands)

	Executed			Budget
	1978	1979	1980	1981
<u>Income</u>	21,432	14,721	13,740	23,629
<u>Expenses</u>				
Operations	1,433	1,655	2,185	3,570
Capital	18,569	10,698	10,346	18,658
Debt service	1,340	1,601	1,209	1,401
Total Expenses	21,432	13,954	13,740	23,629
Excess (or deficit)	-	767	-	-
	=====	=====	=====	=====

5.18 With respect to budgetary performance, the following comments are offered:

- (i) The income of SNAP includes the contributions made by the government to the financing of the program, which have constituted from 42% to 59% of the total income from 1978 to 1980; the use of the IDB loans have represented from 50% of total income (in 1978) to 29% (in 1980). The only income of SNAP itself is that from the recovery of subloans to the provinces, the relative importance of which has gone from 8% in 1978 to 12% in 1980;
- (ii) In 1978 SNAP executed 69% of the approved operating budget; in 1979 the figure was 89%, and in 1980 80%. In capital expenses, the level of achievement varied between 100% and 77% in the three years examined. The level of expenses shows the development of the program of rural water systems; and
- (iii) The relation of operating expenses to capital expenses has grown from 8% in 1978 to 16% in 1979 and 21% in 1980. This change responds to a lower level of investments in the years 1979 and 1980 and to increases in operating costs which can be attributed to greater costs in supervising an increasing number of potable water systems in operation.

5.19 Debt service refers to the IDB loans. SNAP has had a balanced budget and shows a budgetary surplus only in 1979; this surplus was used in the budget for the year 1980.

9. Subloan recoveries

- 5.20 With regard to the portfolio of subloans to the provinces, in comparing the amounts which should have been collected during the year with the amount actually collected, the level of recovery has appreciably improved from 59% in 1979 to 87% in 1980. The amount past due on March 31, 1981 totaled the equivalent of US\$158,000, owed by 7 provinces of a total of 21 which participate in the program. Just 4 of the provinces account for 93% of the amount due. The delay in these four provinces is attributed to financial difficulties and problems of distance in maintaining a more effective system of billing the communities, especially in Catamarca, which owes US\$51,000 or 32% of the total owed. The registry system does not permit the total portfolio of SNAP to be known; as a consequence it is recommended that the contract establish the requirement that information be obtained on the state of income and expenses of the systems which have been financed and of the accounts receivable, as well as on the use of funds recovered from the subloans. ^{1/} On the other hand, the collection activities of SNAP are generally acceptable. Adequate administrative procedures for billing the provinces are available.

D. Servicios Provinciales de Agua Potable y Saneamiento Rural (SPAR) (Provincial Potable Water and Sanitation Services)

1. Nature

- 5.21 The SPARs are provincial organisms which are dependencies of the Ministries or Departments of Public Works, of the Economy, or of Social Well-being of the respective provinces. There are a total of 22 SPARs created between the years 1965 and 1967.
- 5.22 In keeping with the government's policy of administrative decentralization, it has been decided to transfer to the provinces the regional potable water services which were administered by Obras Sanitarias de la Nación (OSN) (Sanitation Works of the Nation). The transfer has been made formal by means of agreements between the Federal Government and the provincial governments; these cover the effective transfer of personnel, installations and equipment. The provinces, for their part, must adopt measures which might include the following modalities: (i) the creation of new entities which would incorporate the services of OSN and SPAR; (ii) the retention of the SPARs and the creation of new entities for the operation of the services of OSN. From the documentation now available, it appears that of the 22 participating provinces: (a) in 9 of the provinces, the SPARs will come to form part of a new entity which will handle rural and urban services; (b) in 4 provinces, including Buenos Aires, there will be no changes as a result of the transfer of the services of the OSN, and (c) in the remaining 9 provinces, the situation is the following: in two of them, it must be confirmed whether

^{1/} See Recommendations 3 and 4.

the SPARs will continue to function in a decentralized manner; in two provinces, there is not enough information to permit an opinion, and for five provinces there is not any information at all.

- 5.23 In response to the foregoing, and taking into consideration the characteristics of the proposed program, it is recommended that, prior to the invitation to bids for the first project in a province, it must be demonstrated to the Bank that the respective provincial organism has in its structure a unit, staffed with the necessary personnel and at an adequate level to permit it efficiently to carry out the program of works planned for the province and to maintain adequate supervision of the potable water services in operation. 1/

2. Functions

- 5.24 The provincial services will be responsible for planning and executing works in the programs undertaken by SNAP and the provinces. In keeping with this mission, in general they are responsible for the study of sources, the performance of socioeconomic studies, the elaboration and/or review of projects, the preparation of documentation and bidding procedures, and the construction of works either by direct management or by contracts with third parties. The provincial services are responsible for the control and supervision of services already in use, with the possibility in some cases of direct operation and administration.

3. Organization

- 5.25 The organizational scheme of the SPARs is generally adapted to the requirements of the program. Three well defined administrative areas are established: (i) engineering; (ii) social promotion, and (iii) economic-financial. 2/ The specific functions of the three basic units of each SPAR are:

(i) Engineering. The formulation and evaluation of projects; the execution of works or, if these are done under contract, the supervision of works; consultation; cooperation in the maintenance of the services; and supervision of the operation and maintenance entrusted to the community entities.

(ii) Administration and Accounting. Administration of the special account in which are deposited the resources to be invested in the work and the funds collected as payments by the community entities as repayments of subloans; general accounting for the provincial service; and advice on and supervision of the administrative and accounting functions of the community entities.

1/ See Recommendation 2(b).

2/ See in Appendix 12 the tables of organization of four SPARs which can be considered typical SPARs.

- (iii) Community promotion. The performance of socioeconomic studies; the promotion of the Plan at the level of the rural communities; the formation of an awareness of sanitation, and the organization of the community entities.

4. Personnel

- 5.26 The personnel which provide services in the 22 SPARs total 1,287 officials and employees, which represents an increase of 194 over the number for November 1977 when the previous loan was studied. The breakdown follows:

	<u>Number</u>	<u>Percent</u>
Professionals	188	15
Technical staff	467	36
Administrative	342	27
Services	290	22
	<u>1,287</u>	<u>100</u>

- 5.26 The number of personnel in a SPAR varies between a minimum of 13 and a maximum of 75, with the exception of the SPARs in the provinces of Tucumán and San Juan, which have 268 and 195 officials and employees respectively, since these SPARs execute works by direct management. It is felt that in general terms the personnel of the SPARs are adequate in number and in capabilities for the execution of the program. The relation between officials and employees in the SPARs (1287) and the number of systems in operation (477) is 2.7 per system, which can be considered acceptable for the administration of the systems. Works are generally executed by contract.

5. Financial administration

- 5.28 In general, the accounting system of the SPARs is budgetary, and is governed by the public accountancy standards prevailing in each province. The SPARs are subject to the anticipatory and retrospective financial supervision of the contadurías generales (general accounting offices) of the provinces, and the tribunal de cuentas (audit office) or similar supervisory organisms.

6. Financial resources

- 5.29 Funds for the operations of the SPARs are obtained in budgeted payments assigned to the provincial organism to which the SPARs are affiliated. The agreements between SNAP and the provinces also establish the commitment of the Nation to contribute to the operating expenses of the SPARs in those cases in which the provincial contributions do not duly cover the operating expenses of the SPARs. Investment expenses are covered by the allotments of SNAP, by budgetary resources, and by the IDB loan, the allotments of the provinces, and the contributions of the communities.

- 5.30 The resources are handled through the special provincial account. This account is handled by the respective SPAR and consists of the contribution of the province and the cash contribution of the communities, as well as payments of reimbursable contributions. The SNAP hands over funds from its account to the account of the province (SPAR) against work certifications and confirmation that the province has the necessary local contribution. Without prejudice to this, SNAP can provide advances when it is appropriate that the province stockpile materials.

7. Budgets

- 5.31 Information is presented below on the annual budgets allotted in the period from 1978 to 1980, since data are not available on the amounts executed; however, this permits an idea of the magnitude of the resources available to the SPARs:

Table V-2

(Equivalent in constant (January 1981) US\$ thousands)

<u>Expenses</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>
Administrative	4,299	3,253	2,330
Operations and maintenance	1,759	1,301	823
Investment in works	<u>13,484</u>	<u>11,709</u>	<u>10,553</u>
Total	<u>19,542</u>	<u>16,263</u>	<u>13,706</u>

A decrease is seen in the allotted sums expressed in constant dollars, as a result of the inflationary process. The greater costs of Stage III of the program are being handled in a greater proportion by the provinces. ^{1/} It should be noted that operation and maintenance of the systems is the responsibility of the community entities, and SPAR budgetary allocations will be used to support maintenance work and meet unexpected expenses for repairs that cannot be covered by those entities (see paragraphs 6.28 and 6.29 of this report).

E. Community Entities

- 5.32 The operation and administration of water systems which are to be built under the program will be entrusted to the rural community entities promoted by the SPARs. The communities will also participate in the execution of projects by making cash contributions. The nature of these community entities will vary, but the cooperative system will predominate. As part of the program, training will be provided to the personnel who administer and operate the systems.

^{1/} See Appendix 13.

- 5.33 In an initial phase, the basic functions of the community entities consist of contributing to the creation of a favorable attitude of the inhabitants with regard to the improvement of their living conditions by means of the National Plan for Rural Potable Water and other similar programs, and cooperating in the tasks undertaken under the Plan with the participation of the community inhabitants by means of their individual cash contributions; later, the entities assume the responsibility of operating and administering the water systems which have been constructed, including the collection of the income from charges, and serve as liaison with the SPARs.
- 5.34 The community entities should have the capacity of acquiring rights and contracting obligations; for this purpose, they are extended the necessary legal standing. The statutes and regulations which they establish are adapted generally to the models for such materials which are prepared and provided by SNAP. The staffing of each of the community entities will differ considerably, according to the requirements of each system.

VI. IMPLEMENTATION OF THE PROGRAM

A. Operational Procedure

- 6.01 The procedure to be followed for the proposed program would be the same as was employed satisfactorily in executing Loans 114/TF, 302/SF, 526/SF and 14/IC, which financed the three previous stages of the National Rural Water Supply Plan.
- 6.02 The executing agency would be the National Rural Water Supply and Sanitation Service (Servicio Nacional de Agua Potable y Saneamiento Rural (SNAP)). That agency would be responsible for planning the program and for the technical and administrative supervision. The rural water supply agencies in the province (SPAR) would be in charge of executing the project through public bidding and through agreements that would be signed with the SNAP. It would not be necessary to contract specialized services to supervise the actual implementation since the SNAP has the experience and specialized personnel to do so.
- 6.03 The organizational structure of the SNAP is considered to be well suited to its functions, and the experience of the provincial agencies in implementing previous programs has been satisfactory. As reported in paragraph 5.22, these agencies will be somewhat affected by the transfer of drinking water services which the Obras Sanitarias de la Nación - OSN (National Sanitation Services) has been effecting as part of the decentralization process agreed upon by the government.
- 6.04 The construction program would be launched with projects from the representative sample, which include designs, specifications and other documents. By making some minor readjustments, the public bidding process could begin without delay, and each province publishes notices to bid for each of the systems, as is the practice in Argentina. In this way, the construction of nearly 45 aqueducts, for which the estimated period of actual construction would be approximately 20 months, could commence.
- 6.05 The training plan will be executed by Argentine professionals and supervised by the SNAP, as was the case for previous loans where results have been satisfactory. It would especially benefit personnel from the new communities where training is inadequate, and would begin with the selection and hiring of the professionals, in accordance with the Bank's policy in this area. The SNAP and the professionals would sign an agreement for the purpose. The courses will be based on the terms of reference and on the programs prepared by the SNAP ^{1/}, and on the methodology presented by the professional. Generally, the courses end with the preparation of manuals when this is necessary, and in all cases, there is a final report on aspects dealt with in the course. The estimated duration of this program to be implemented in several stages is three years, beginning in the middle of the first year.

^{1/} See Appendix 3.

B. Preparation of Remaining Projects

- 6.06 The remaining projects, which along with the representative sample, will constitute the program, will be designed by the water supply agencies in the provinces through engineers and national firms specializing in this type of work. They will be approved by the SNAP before being presented to the Bank. In view of the fact that by the time the Bank loan is approved, around 60 projects would be available and an average of six projects could be prepared on a monthly basis, as occurred in the third stage, it is estimated that these remaining projects will be completed within 18 months of the entry into force of the loan contract.

C. Acquisition of Lands and Rights-of-way

- 6.07 According to the documentation received with the representative sample, in approximately 60% of the communities, the provincial authorities have legal possession of the lands on which program facilities are to be constructed, especially wells, tanks, treatment plants, etc. Based on experience in previous stages, no problems are anticipated in the other communities. Insofar as rights-of-way are concerned these do not have to be obtained since most of the piping will be installed on public streets except on a few supply lines where no difficulties have been anticipated either. In any event, there are legal provisions that would make it possible to take immediate possession of the lands if this were necessary. However, in accordance with the Bank's policies, before the invitation to bid is extended, for construction of each of the program facilities, the borrower must provide proof that he is the owner or that he has rights over the lands on which the works will be constructed. 1/

D. Purchase of Goods and Services

- 6.08 The procedures to be followed for the bidding and award of project contracts and for the purchase of the necessary equipment and materials for the program will be in conformity with legal provisions in effect in Argentina and with the rules established by the Bank on the matter. Appendix 8 shows the bidding procedures for this operation, which must be included in any possible loan contract.
- 6.09 Any purchase of equipment, materials and vehicles and any contracting for work which the program involves, where the amount exceeds the equivalent of US\$100,000 will be subject to public bidding. In those cases where the purchases or contracts are financed totally or partially with foreign currency, the system of international public bidding will apply, whereas in cases where local currency financing is used, or local counterpart funds, bidding may be restricted to the national area.

1/ See Recommendation 1(b).

E. Works on Force Account

- 6.10 In the previous stages of the program, most of the facilities that were constructed in the provinces of Catamarca, Chubut, Santiago del Estero, La Rioja, San Luis and Salta, were executed on force account since the contracting agencies showed no interest in participating in bidding because the amounts were relatively small and were even more so because of the community contribution; but administrative costs were high because the communities were remote and generally had deficient or poor communication lines. Using the on force account method the practice of purchasing materials through public bidding has been followed; therefore areas omitted from bidding account for only approximately 40% of the cost of the facilities. This is why Loans 526/SF and 14/IC included a clause authorizing up to US\$4 million for execution of the works on force account provided the respective executing agency demonstrates that the specific features of the project, or its location ^{1/}, make it advisable to proceed in this manner. Using that same approach, and bearing in mind that these expenditures are to be incurred in local currency in areas of the country where income levels are lower, it is recommended that the present program be given the same authorization for that amount, US\$4 million, to execute the works on force account in those provinces, or in others where the same problems exist, from which amount up to the equivalent of US\$2,560,000 could be applied to funds from the FSO Bank loan.

F. Preliminary Execution Plan (PEP)

- 6.11 It is estimated that all program activities, including the settlement of the last financial obligations and the presentation of the final report, can be completed in four years, beginning on the date of entry into force of the possible loan contract, and that in physical terms, these activities will be completed within two years of that date. Appendix 14 shows the preliminary version of the Project Execution Plan (PEP).

G. Bidding Plan

- 6.12 Based on the systems of the representative sample, which would be the first to be constructed, and the contractual deadline for the actual launching of the works, the schedule for bidding would be more or less the following:

^{1/} As of April 30, 1981, works to be executed on force account in the amount of US\$2,784,000, 70% of the total authorized, had been approved.

Table VI-1

(US\$ Thousands)

<u>Headings 1/</u>	<u>1st year 2/</u>	<u>2nd year 2/</u>	<u>Totals</u>
Supervisory vehicles	350	-	350
Laboratory equipment	90	-	90
Representative sample systems	16,260	-	16,260
Remaining systems	4,500	28,000	32,500
Maintenance and computer equipment	400	570	970
Totals	21,600	28,570	50,170
	=====	=====	=====

- 6.13 According to the SNAP's legislation, that institution may not extend an invitation to bid on behalf of third parties. Consequently, it is the responsibility of the SNAP and the SPAR to make the respective purchase of vehicles to supervise the construction of project works (two for the SNAP and nine for an equal number of SPAR), laboratory equipment to be used by the three SPAR (Appendix 5) and vehicles and maintenance equipment to be used by six SPAR (Appendix 7). Notwithstanding the fact that the amount of the purchase in four provinces will be less than US\$100,000, procedures that permit open bidding including goods produced in countries that are eligible for the Bank, will be followed even in such cases. The bidding procedures include the pertinent provision that ensures fulfillment of this condition.
- 6.14 For the construction of project works, each province promotes the bidding corresponding to its jurisdiction and the practice followed in the country is to bid system by system and to give the respective community groups the opportunity to actively follow up the process. As a result, it is not a custom to group several systems under the same bidding and the procedure followed in some cases becomes an ongoing activity.
- 6.15 In the previous stages, notwithstanding the fact that invitations to public bidding have been made internationally, there has been no response from foreign companies and awards have in all cases been given to national companies. There are no different conditions for the proposed program that would lead one to expect behavior to be different in this stage.
- 6.16 The chronogram of bidding shows that during the first year of implementation of the program 46% of the cost that would be subject to bidding would in fact be bid and that during the second year 54% would be put up for bidding. Consequently that activity would be completed in the first two years of execution.

1/ Includes incidental expenses.

2/ Includes a part of the two calendar years.

H. Investment Schedule (Appendix 6)

- 6.17 In accordance with the project cost, implementation plan and the chronogram for bidding, it is anticipated that the investment schedule (in US\$1,000) will be as follows:

Table VI-2

<u>Resources</u>	<u>1st year 1/</u>	<u>2nd year</u>	<u>3rd year</u>	<u>4th year</u>	<u>5th year 1/</u>	<u>Totals</u>
IDB	1,015	10,180	13,965	15,920	12,120	53,200
Local	<u>960</u>	<u>6,755</u>	<u>10,725</u>	<u>11,095</u>	<u>6,590</u>	<u>36,125</u>
Totals	1,975	16,935	24,690	27,015	18,710	89,325
Percentages	2.2	19.0	27.6	30.3	20.9	100.0
	=====	=====	=====	=====	=====	=====

I. Schedule of Disbursement and Advance Payment of Funds

- 6.18 It is estimated that the schedule of disbursements (US\$1000) of loan funds will be as follows:

Table VI-3

<u>Year</u>	<u>IC</u>	<u>SF</u>	<u>Totals</u>
First <u>1/</u>	-	-	-
Second	8,000	4,000	12,000
Third	8,000	4,000	12,000
Fourth	10,150	4,900	15,050
Fifth	<u>9,550</u>	<u>4,600</u>	<u>14,150</u>
Totals	35,700	17,500	53,200
	=====	=====	=====

The second year includes the establishment of advance payments (7% approximately) to finance contractors and reimbursements of investments made subsequent to approval of the loan but prior to their being declared eligible for disbursements.

J. Capacity of Contractors

- 6.19 There is an adequate number of contracting firms in the country capable of satisfactorily executing program operations. Also, almost all materials and equipment are obtainable on the national market and it is not anticipated that any difficulties will surface in this area either. It is therefore estimated that program operations can be carried out within the anticipated time.

1/ Part of the year.

K. Recognition of Expenses

- 6.20 So as not to interrupt execution of the National Rural Water Supply Plan, the SNAP has begun construction of some of the works of the proposed program. It is estimated here that before the loan is approved by the Board of Directors, but subsequent to March 11, 1981, on which date the request for the loan was submitted, the SNAP will, through public bidding, have awarded and partially executed work contracts as follows:

Table VI-4

<u>Province</u>	<u>Community</u>	<u>Amount Project</u>	<u>Amount to be invested</u>
Buenos Aires	Pedernales	146,400	37,000
	Ascensi6n	409,500	102,000
Río Negro	Altos de Bariloche	1,860,000	465,000
Total		2,415,900	604,000

=====

=====

- 6.21 It is therefore recommended that the loan agreement authorize US\$400,000 in recognition of these expenditures, to be charged to the FSO loan funds and US\$204,000 to be charged to the local contribution as long as requirements that are essentially the same as those established in that agreement have been met.

L. Program Financial Execution

(a) Flow of program funds

- 6.22 The IDB funds will be received directly by the SNAP. The Federal Government would allocate annually to the SNAP the corresponding payable amounts to the local contribution. The SNAP makes sure that both the provinces and the communities make their respective local contributions. For these purposes, the following procedures, which are considered acceptable, are followed in project financing: (i) no change is made in the amount originally obligated with IDB funds during the period of construction; (ii) before declaring the project eligible for disbursement, the SPAR must demonstrate that the local contribution from the province and local entity is available, and (iii) should there be additional charges during project construction, the national contribution is increased as is the share contributed by the province.

(b) Accounting registers

- 6.23 The SNAP keeps separate accounts which identify the origin of the funds and the use of those funds in the program.

(c) Project financing

- 6.24 The project financing plan, which is based on the direct costs of each operation and which follows the established practice in the program, will be as follows:

	<u>% of financing</u>
i. <u>As subloan</u> IDB funds	64%
ii. <u>As contribution</u> National contribution	13%
Contribution from the province	13%
iii. <u>Community contribution</u>	10%
Total	<u>100%</u>

- 6.25 The financial terms for the subloans will be the following: (i) total period: 20 years; (ii) grace period: 18 months; (iii) interest rate annual 8%; (iv) repayment in quarterly quotas; and (v) maintenance of value for which the community assumes responsibility. The respective agreement will establish that IDB loan funds are transferred to the communities under financial terms that are acceptable to the Bank. The rate of interest payable by the communities is determined in accordance with the financial terms of the IDB loans. In accordance with the agreements, the province is responsible for payment of the subloans to the SNAP. The community agency is responsible to the province. The procedure established by the SNAP for collecting from the provinces is considered acceptable. 1/

(d) Use of recoveries

- 6.26 Due to the fact that during the period of implementation of the program recoveries from the service of the subloans occur, for the fourth stage, which is the subject of this report, funds that would accumulate have been estimated on the basis of the investment schedule, the financial terms of the subloans and of the IDB loans. The results in the ten-year period, which are given in Appendix 4, show that during the period of implementation annual surpluses amounting to a total of US\$10,335,000 and would be followed by annual shortages in subsequent years. At the end of the estimated period, the accumulated balance would amount to US\$5,878,000. It is recommended the loan contract should establish that amounts accumulated in excess of those amounts necessary for the service of the loan may only be used for the granting of new subloans suited to the purposes of the proposed program, such as minor extensions and the replacement of equipment. 2/

1/ See paragraph 5.20 of this report.

2/ IC Resolution, Section 8(f) and SF Resolution, Section 8(h).

M. Rates

- 6.27 For the proposed program, it is recommended that the rate to be applied in the systems should yield enough to cover the administrative, operational, maintenance and depreciation costs. This recommendation is based on the Bank's current practice in the rural water supply sector and on the precedent established in Loan 526/SF-AR.

N. Operation and Maintenance

- 6.28 Local agencies will be responsible for operating and maintaining the systems. In most cases these will be cooperatives that already exist in a number of areas and that also meet the electricity service. In communities where have to be installed this will be done before the respective works commence, and they will in all cases be assigned some participation during this stage of construction. For these local agencies to have the necessary technical and administrative capacity to ensure the effective operation of the systems training courses will be held as part of the program for middle-level personnel, in the operation and maintenance areas, including the supervision of these activities. In stages II and III of the National Plan, the SNAP has followed this method, which has had satisfactory results.
- 6.29 To ensure insofar as possible that the systems are effectively operated and properly maintained, it is recommended that the loan contract 1/ include a clause whereby the borrower would be obliged to present to the Bank's satisfaction, beginning in the year following the year in which the first system constructed under the program was put into operation, and henceforth during the following ten years up to the time of completion of all works, within the first quarter of each year (i) an annual plan on the maintenance of the project systems and (ii) a detailed report on management in the previous year in this area, which would include the degree of efficiency achieved and the condition of the systems at the end of the previous year. Furthermore agreements to be concluded between the provinces and the local entities, will see to it that their functions and responsibilities in the operation and maintenance of each system are clearly established.

O. Ecological Aspects

- 6.30 The program will not produce any unfavorable ecological effects since in large measure it is a question of obtaining relatively modest flows of underground water for the users after purifying it for drinking purposes without this affecting people or irrigation areas. Of the communities included in the representative sample, 71% of these have sanitary services for sewage disposal, and it is estimated that given the cultural and living standards of the rural Argentine population, when a public supply of drinking water is made available, they will install the essential works in residences to eliminate the sewage that the project causes.

1/ See Recommendation 5(b).

P. Project Technology

- 6.31 With regard to the way the project was conceived, criteria were designed to provide simple solutions that were free of sophisticated formulas and that would be easily implemented. It is therefore felt that the technology is in keeping with the nature of the work to be executed. With regard to the construction of the systems, while it is true that small teams will be used to dig ditches to place the piping, intensive use will be made of local manpower and materials, and it is estimated that for some time approximately 800 to 1,000 persons could be needed.

Q. Economic and Social Impact Evaluation

- 6.32 After four years, coinciding with the final disbursement of the loan, SNAP will present to the Bank an economic and social impact evaluation. Since this is the fourth stage of a fundamentally homogeneous program, the impact of the present stage can be estimated on the basis of the experience from earlier projects. On the other hand, the baseline data for the ex-ante situation can be obtained from the fourth stage communities. The methodology for the economic evaluation should be benefit-cost analysis, as developed for the appraisal of the present program stage. The social impact should be measured by identifying the present value of the net benefits accruing to low income groups.

The necessary data base must be developed from surveys undertaken in a representative sample of communities with and without a public water system (fourth stage communities). The information required from the communities for each household survey or business includes:

1. Source and costs of existing water supply (for communities without a public system).
2. Per capita consumption by sources of supply and by family income level.
3. Convenience of water supply, i.e. indoor or outdoor taps.
4. Uses for water, e.g. full bathrooms, shower, etc.
5. Use of building (family home, school, commercial, etc.).

In addition to the above, the surveys of communities with a public water supply on local cooperatives should provide:

1. Tariffs paid
2. Actual investment cost

3. Maintenance, operating and administration costs

4. Total number of connections and related population by year.

R. OEO Recommendations

- 6.33 In document GN-1299 of April 1979, the Office of Operations Evaluation Office of the Controller's Office made recommendations on the technical, economic, financial and organizational aspects of seven water supply and sewerage projects. The analysis of the proposed program took into account those recommendations that might be applicable to it. In that sense, special attention was given to practices employed by the SNAP, services in the provinces and community groups with regard to the maintenance of works and equipment, and also in relation to the assessment of the service that would be provided by all the systems in the proposed program, which would generally have meters, or in the case of a few systems, consumption regulators.

S. Inspection and Supervision by the Bank

- 6.34 Supervision of the program by the Bank will be the responsibility of the Bank's Field Office in Argentina.

VII. JUSTIFICATION OF THE PROGRAM

A. Technical Feasibility

- 7.01 The project for the 45 systems constituting the representative sample have been technically well-prepared by the provincial drinking water agencies, following the engineering standards approved by the Bank. All of them have merited SNAP's approval and are acceptable to the Bank. ^{1/} The technical decisions for each system have been made on the basis of a comparative study of alternatives, especially with reference to the source of supply. The treatment for surface water has been designed with the aim of having low cost, easy-to-operate plants available. For the systems using underground water the appropriate hydrogeological studies are available and trial wells have been dug; these will become the working wells. As a security measure, bids will not be accepted for any work if the abundance of the selected source has not been properly verified beforehand.
- 7.02 The preparation of the remaining 105 projects would be contracted for with engineers and/or national engineering firms in the country. From SNAP's experience, no problems are anticipated in completing the remaining designs in the 18 months that the loan contract will be in effect, since the work continues in progress at the present time.
- 7.03 Both the provincial agencies and SNAP will have the necessary capacity for supervising the execution of the program. In this regard, the provinces, in order to be considered eligible to participate in the program, will be required to demonstrate to the Bank's satisfaction their ability to carry out the construction of the facilities and the subsequent supervision of their use.
- 7.04 As a result of experiences with previous loans, the bidding would include both the supply of materials and the construction of the facilities. The majority of the plants would be built by contractors, and only a small group of systems would be constructed on force account. Difficulties are not anticipated either with the supply of materials or with the availability of labor, and it is believed that it will be possible to complete the program in the planned period.
- 7.05 The costs of the systems are considered reasonable. They were calculated on the basis of the quantities of material work to be done and on the unit costs of the various items for the representative sample, using prices officially established in each province for materials and labor, and prices established by the government for social contributions. Equipment costs are based on quotations from possible suppliers. The program contains adequate provisions for incidental expenses and escalating costs.

^{1/} Despite the fact that additional economic information is required for three of the projects, the quality of the sample is unimpaired.

7.06 In summary, all the technical aspects have been carefully evaluated and it has been concluded that the program is technically feasible.

B. Institutional and Financial Capacity

7.07 It has not been considered necessary to prepare financial projections for SNAP, in view of the fact that SNAP is only involved in the execution of the rural water systems program. A substantial part of its operating expenses are charged to the subheading of supervision and administration, which is financed by the local contribution. The capital expenditures would correspond to the outlays for the project's construction.

7.08 It is believed that both the national government and the group of provinces would be able to handle: (i) the local contribution to the proposed program, and (ii) the contributions for the completion of the program in progress that is financed by the funds from loans 526/SF and 14/IC-AR, since altogether the annual requirements for funds would not exceed the annual average called for in the period 1978/1980, with the exception of the years 1982 and 1983, during which the nation would have to raise an additional 8% and 7% respectively, as can be seen in the following table:

Table VII-1

(In thousands of US\$)

	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>Total</u>
<u>Fund requirements</u>						
(i) <u>Nation/SNAP</u>						
Program in progress	3,524	2,688	216	-	-	6,428
Proposed program	430	3,150	4,015	5,005	2,755	16,255
	<u>3,954</u>	<u>5,838</u>	<u>5,131</u>	<u>5,005</u>	<u>2,755</u>	<u>22,683</u>
Annual average of						
funds used 1978/1980	5,841	5,841	5,841	5,841	5,841	29,205
Surplus or (shortfall)	1,887	(4)	(710)	836	3,086	6,522
(ii) <u>Province/SPAR</u>						
Program in progress	8,223	6,272	504	-	-	14,999
Proposed program	340	2,445	3,820	3,890	2,150	12,645
	<u>8,563</u>	<u>8,717</u>	<u>4,324</u>	<u>3,890</u>	<u>2,150</u>	<u>27,644</u>
Annual average of						
funds used 1978/ 1980	13,503	13,503	13,503	13,503	13,503	67,515
Surplus or (shortfall)	4,940	4,786	9,179	9,613	11,353	39,876

- 7.09 The funds from the local contribution needed to finance the program are not significant in the national or provincial budgets in comparison with their investment programs. Experience indicates that the community agencies have been able to make part of the local contributions to the various projects. 1/ The Argentine Government gives priority to projects financed by international organizations in executing its budget.
- 7.10 SNAP, which would be the agency in charge of implementing the program, has the needed organization and procedures, and experience in executing similar programs. The professional staff of the regional delegations would be strengthened as necessary. SNAP is also capable of evaluating the administrative and financial capacity of the provincial agencies that would be responsible for the construction of the projects and the supervision of the operation and maintenance of the systems in use. The organization, personnel, and procedures of these provincial agencies are adapted to the requirements of the program, even for the promotion and organization of community agencies, and are presently in the process of reorganizing. A recommendation has been made in this regard to ensure the satisfactory execution and operation of the systems. 2/

C. Socioeconomic Analysis

1. Methodology

- 7.11 The approach to appraising this project is to do a benefit-cost analysis of each project in the sample. Subsequently, the results of this analysis are compared with the more traditional, cost-efficiency ratios, also derived for each project. The comparison of the two indicators for the project sample tests the validity of using the cost-efficiency ratios as the principal economic criterion for the selection of projects for the entire fourth stage program. Moreover, the correlation analysis provides the cut-off value for the cost-efficiency ratio.
- 7.12 The gross economic benefits of any rural water project are mainly: (1) the value of increased water consumption, (2) the resources saved by switching from the alternative source of water supply and (3) the improved water quality. The following analysis does not take account directly of the health benefits from improved water quality due to inadequate information.
- 7.13 The methodology for estimating resource savings is to identify the costs and quantities of water consumed in the alternative to the project. This is relatively simple compared with the approach to calculating the value of increased water consumption. The calculation of the benefits from increased consumption are based upon derived demand curves for water. The demand curves are estimated by applying multiple regression

1/ See Appendix 13.

2/ See Resolution IC 8(c)(iii) and Resolution SF 7(d)(iii).

techniques to available data on water consumption, prices and some measure of average family income. The gross benefits are then calculated by taking the area under the demand curve which corresponds to the increase in water consumption with the project. This methodology is explained further in the subsequent sections.

- 7.14 Throughout the analysis, market and economic efficiency prices are assumed to be equal. Virtually all of the project's inputs and outputs are nontraded, which makes it difficult to identify any distortions brought about by import tariffs and trade policies. The possibility of distortions from other taxes is reduced since construction costs will be exempt from the value-added tax. With regard to labor, recent IDB loan project evaluations and other studies have assumed that wages and salaries are equal to the opportunity cost of labor. This is due to low unemployment and the absence of other distorting factor. Although unemployment is reportedly rising, there is presently no basis for projecting or estimating a divergence between the market and efficiency wage.
- 7.15 The assumption equating market and efficiency prices is undoubtedly an oversimplification for energy costs and the gross benefits. ^{1/} Concern for the resulting deficiencies in the benefit-cost analysis, however, is diminished by the difficulty in even obtaining consistent market prices for inputs and benefits. This difficulty arises from the sharp, successive devaluations of the peso in recent months.

2. Estimation of demand curves

- 7.16 The benefits from increased water consumption depend upon the price people are willing to pay for each additional unit of consumption and the tariffs actually charged for this water. As described below, the water tariffs established by each cooperative will vary mainly in response to the differences in water system costs. The response of consumers to whatever price is established can be estimated on the basis of the observed behavior of consumers in the same or similar communities. The data on observed behavior come from two sources. The first source is a survey of 14 communities included in earlier stages of this program. This sample reflects the geographic and community-size characteristics of the towns included in the sample developed for analyzing the present stage. The second source of information is the SNAP engineering staff, who were asked to estimate the costs of existing water supply and related consumption levels in several communities included in the new project sample.

^{1/} The market and efficiency prices are likely to differ for gross benefits (resource savings and the value of increased water consumption) due to the existence of a 20% value added tax on most goods and services.

- 7.17 In order to obtain the consumer's response to a price change, it is necessary to isolate the response to price from the other factors which determine water consumption. Consequently, the first step is to identify as many factors as possible which influence water consumption and to observe how much each one explains increases or decreases in water use.
- 7.18 The 14 community survey provides per capita water consumption and tariff information over a period of three years, from 1978 to 1980. ^{1/} In addition, the average family income is available for each community from the original socioeconomic surveys developed for the previous project stages. The first attempts to estimate water demand curves utilized only these data from communities with public water supply.
- 7.19 All of the regression results based upon the community survey show very low price elasticities of demand (e.g., -0.07). The insensitivity of water consumption to changes in price is not unexpected, since water tariffs are low relative to income. Consequently, income is not important in terms of the capacity of families to buy water. But income is very important in the capacity to use water. The ability to use water, and water demand, are affected greatly by the installation of a bathroom. This observation is supported by the data on bathrooms collected for the original 55 community sample developed for the fourth stage program. These data, presented in the following table, show the concentration of houses with bathrooms in the three, relatively high income provinces of Buenos Aires, Córdoba and Santa Fe. In the 14 community sample, the average family income for these three provinces was double that for the other provinces included in the sample (Santiago del Estero, Tucumán, Entre Ríos and Jujuy).

^{1/} A more detailed discussion of the sample is presented in Appendix 15. The appendix also presents the equations used in estimating the demand curves.

Table VII-2

Houses in Original Project Sample
with Bathrooms, by Province

	<u>Houses</u>	<u>Houses with Bathrooms</u>	<u>Proportion Houses with Bathrooms</u>
Buenos Aires	5,276	3,675	0.70
Catamarca	271	33	0.12
Santa Fe	8,940	6,824	0.76
Tucumán	92	4	0.05
San Juan	259	75	0.29
Santiago del Estero	85	2	0.02
Córdoba	2,276	1,671	0.74
Entre Ríos	280	81	0.29
Total	17,469	12,365	

- 7.20 In view of the apparent relationship between family income and the presence of bathrooms, the influence of income was expressed indirectly through a "dummy" variable distinguishing the communities with a high proportion of bathrooms from those with a relatively low proportion of bathrooms. The communities in the provinces with a high concentration of bathrooms were given a value of 1, while the other communities were assigned 0 as the dummy value.
- 7.21 The results of the regression equation incorporating the dummy variable help to explain a large part of water consumption. As shown in Appendix 16, water price and the dummy were able to explain 76% of the variation in quantity of water consumed. Moreover, the regression coefficients were statistically significant. The regression results were improved further by the inclusion of the data on costs and water consumption developed by SNAP engineers for communities without public water systems. The addition of these observations improved the statistical significance of the regression coefficients and raised the response of water consumption to the price and dummy variables. These factors now explained 88% of the variation in consumption. ^{1/}
- 7.22 The regression results show that the existence of bathrooms dictate water consumption in the range of the water tariffs paid by consumers in the sample communities. Within this marginal price range, from zero price to US\$1.20 per cubic meter, the demand for water is highly inelastic for the communities where bathrooms are common. In fact, for

^{1/} As developed in Appendix 15, the best statistical results were obtained from a logarithmic formulation of the regression equation. Consequently, the demand curves described in this section are all curvilinear.

these communities, the price elasticity of demand approaches zero. Consequently, there is no projected increase in water consumption with the investment in public water systems in the communities of Buenos Aires, Córdoba and Santa Fe (group 1). For the 29 sample communities in group 1, the gross benefits of subproject investments are confined to resource savings.

- 7.23 There is expected to be an increase in water consumption with the project in the 16 communities without bathrooms (group 2). The regression equation described above, utilizing both sources of price and consumption data, provides a price elasticity of demand of 0.17 for group 2. This elasticity seems low for consumers moving from a relatively primitive and expensive water supply to a more convenient and much cheaper public system. When the statistical analysis is based only upon the SNAP cost and consumption data corresponding to the "without project" situation, the price elasticity of demand is 0.46. ^{1/}
- 7.24 The contrasting statistical results with the alternative data bases could reflect a difference in the water product with and without the project. The water source without the project is most frequently a well or cistern located outside the house. With the project, water is brought into the house. The inside water tap is obviously more convenient than an outside source. This suggests that the project brings an outward shift in the demand curve for water, reflecting a greater willingness to pay for the project water than the water in the alternative situation due to greater convenience. There is inadequate data, however, to test this hypothesis.
- 7.25 The price elasticity of 0.46 and the other elements in the related regression equation conform best to the most easily observed price and quantity relationships. For instance, the water purchased from tank trucks has a readily obtained price, and consumption is also reasonably certain. The data provided by SNAP show per capita daily consumption for purchased water is 20 liters when price is around US\$15 per m³ of water. At this cost, the equation with the price elasticity of 0.46 calculates consumption at 24 liters per capita per day (LCD). The alternative equation, with a 0.17 elasticity, has water consumption at 112 LCD for the same price. Moreover, the reasonableness of the preferred equation is good until marginal prices fall below about US\$0.25 per m³. Below this price, consumption exceeds 150 LCD, which is considered to reflect the physical limit of consumption without bathrooms. This is indicated by the data from the 14 community sample, which show average consumption for group 2 at or below 150 LCD with a zero marginal price.

^{1/} As shown in Appendix 15, the R² in this case is 0.94 and the tests of statistical significance produce excellent results.

3. Calculation of gross benefits

- 7.26 The gross benefits for group 1 are the resource savings, obtained for the first year by multiplying water consumption in cubic meters by the cost per m³. The water consumption in the first year is for the 80% of the existing community population projected to benefit from the public water system. 1/ The connected population is expected to grow in a linear fashion, until 95% of the population is connected in the last year of the project (20). Throughout the project's life, population is projected to grow at between 1.3 and 3.0 percent, varying from community to community. These growth rates are developed for each community on the basis of historical trends.
- 7.27 In calculating the gross benefits for group 1, per capita daily consumption is set at 150 liters. This is taken as the minimum for communities in which a majority of houses have bathrooms. The per capita consumption level for calculating benefits is estimated conservatively. The likely range for consumption is 150 to 200 LCD.
- 7.28 The cost per m³ of water without the project is put at US\$1.20. These savings correspond to the estimated cost of supplying water from motorized or electrical wells and cisterns. The estimated marginal cost is derived from the data developed by SNAP staff. The cost figure is derived on the basis of annual operating and maintenance costs, as well as annualized investment costs. Using the estimated marginal cost described here, and the other values presented above, the calculation of gross benefits for any given year (i) is:
- $$\text{Gross Benefits} = 1.20 \times 1.50 \times \frac{\text{Connected Population}}{\text{Year } i}$$
- 7.29 The group 2 gross benefits from resource savings, as well as for the value of increased water consumption, are based upon the estimated demand curve. The marginal cost of water supply without the project is estimated as described for group 1, except that the alternative sources are wells and cisterns with manual or no pumps and purchased water. the weighted average of the marginal costs for alternative sources is US\$1.50 per m³. When this price is inserted into the demand curve equation, the resulting consumption is 75 LCD. 2/ These price and consumption values are used to calculate resource savings as presented above for group 1.

1/ These quantities are halved for the first year to reflect a 6-month construction period. For larger systems, this may overestimate first year benefits due to longer construction periods.

2/ The equation for estimating per capita water consumption is:

$$Q = aPe$$

Where: Q = quantity of water consumed per day
P = Price of water per m³
e = price elasticity of demand
a = constant

- 7.30 The gross benefits from increased water consumption correspond to the area under the demand curve which moves from the point of water consumption without the project (75 LCD) to the point of consumption with the project. The latter consumption point is determined by the marginal price for water with the public system and the price elasticity of demand. The marginal price to be charged by the public system (i.e., the price per m^3 in excess of a basic water allotment) is derived mainly by using the SNAP formula for calculating the tariffs for the basic water allotment. As presented in Appendix 16, this formula is based upon project costs. Consequently, tariffs and consumption with the public systems vary considerably among the 16 communities in group 2. Except for one project, the marginal tariffs in the first year vary from US\$0.08 per m^3 to around the alternative marginal cost of US\$1.50 per m^3 . With these values and the related consumption points, the gross value of increased consumption is calculated for each community in group 2.

4. Costs

- 7.31 Investment costs are given in years 1 and 10 of the project life. The costs associated with year 10 correspond to the equipment and machinery which must be replaced every 10 years. The annual costs are for the administration, maintenance and operation of the water systems. The administrative costs are constant over the life of each subproject. The initial operating costs grow proportionately with the increase in connections. The principal operating cost is electricity. Finally, maintenance costs are initially very low. These costs grow annually over the first 10 years of the subproject's life, reaching their peak just before the new investment in year 10. After the additional investment, this cycle is repeated in the second ten years of a subproject's life.

5. Results

- 7.32 The results of the benefit-cost analysis are presented in the second and third columns of Table VII-3. These results are given as the the present value of net benefits (NPV) and as the ratio of the present value of the net benefits to the present value of initial investment costs (NPV/I). The discount rate for obtaining present values is 12 percent. The NPV/I ratios show the amount of net benefits generated by a project for each dollar of investment. When the NPV or NPV/I ratio is zero, as for project 2, gross discounted benefits are equal to total discounted costs, and the internal rate of return is 12 percent. When these measures are greater than zero, the internal rate of return exceeds 12 percent.
- 7.33 The benefit-cost measures have been compared with the cost-efficiency ratios using correlation analysis. As recalled, the numerator of the

cost-efficiency ratio is the sum of annualized investment costs (less the community's contribution) and the annual costs (operating, maintenance and administration costs). The numerator is divided by the community population in year 20 to obtain the cost-efficiency ratio. The cost-efficiency (CE) ratios provide a consistent basis for measuring and comparing costs, but they are inevitably incomplete without any accounting of benefits.

Table VII-3

Comparison of Results of Benefit-Cost Analysis and
Cost-Efficiency Ratio by Subproject

(In US\$1,000)

<u>Project</u>	<u>NPV</u>	<u>NPV/I</u>	<u>CE</u>
1 Aldea Brasilera	47.3	0.61	27.8
2 Aldea Protestante	0.0	0.0	37.4
3 Irazusta	156.5	2.29	16.1
4 Villa Paranacito	210.0	1.50	27.6
5 Gral. Fotheringan	128.8	0.72	26.3
6 Juella	137.3	3.22	13.5
7 San Francisco	60.1	1.46	23.5
8 El Rincón	147.7	0.31	36.6
9 Gral. Achá	167.2	0.88	26.1
10 Lugones	-136.4	-0.59	67.9
11 San Felix	54.8	0.85	30.3
12 Finca Cornet	654.8	1.55	19.8
13 Los Bulacios	140.9	0.62	28.5
14 Los Suelos	332.5	1.32	20.8
15 Bella Vista	3036.5	1.54	22.4
16 Altos de Bariloche	4258.5	2.08	22.4
17 Alberdí	616.9	1.41	21.9
18 Asunción	353.9	0.78	28.6
19 Bordenave	71.5	0.51	33.0
20 Carlos Naón	117.8	0.84	28.2
21 Comodoro Py	135.6	0.95	24.1
22 Cortines	185.6	1.34	23.8
23 Estac. Bonifacio	316.9	1.37	23.5
24 Ferré	183.2	0.80	30.3
25 Gobern. Ugarte	138.9	1.23	22.6
26 Goyena	71.6	0.64	31.0
27 La Aurora	161.4	1.13	25.4
28 Pedernales	210.4	1.31	20.1
29 San Agustín	75.1	0.75	29.3
30 San José	595.8	2.81	15.6
31 Torres	117.1	0.62	28.5
32 Agustín Roca	10.8	0.24	37.5
33 Arribenas	406.5	0.78	28.1
34 Despeñaderos	655.3	0.93	19.3
35 Monte Buey	759.9	0.72	25.3
36 Ordóñez	272.9	0.79	27.5
37 Centeno	-62.2	-0.07	49.2
38 Humberto I	54.9	0.04	44.8
39 San Genaro	42.7	0.04	44.9
40 Sta. Isabel	646.5	1.34	24.7
41 Sta. Teresa	559.7	1.24	24.2
42 Sunchales	2146.7	1.05	24.9
43 Sarmiento	108.3	0.42	36.1
44 Vera	3041.2	2.25	16.7
45 Sauce Viejo	284.2	1.23	26.7

- 7.34 The NPVs in the second column show the projects' economic worth. They are the basis for ranking the projects according to investment priority, as well as for establishing a minimum standard of project acceptability. The CE ratio is not good as a proxy for the NPVs in ranking projects since the correlation between the two measures is low (0.33). The limited statistical relationship between the NPVs and CE ratios also results in a significant difference between the two measures for determining project acceptability. The statistical comparison of the two values results in a maximum, acceptable CE ratio of 30. As can be seen from Table VII-1, this would result in the rejection of eight projects which pass the more rigorous test of benefit-cost analysis.
- 7.35 Since the NPVs are not directly useful for identifying the appropriate cut-off value for the CE ratio, it is necessary to express the benefit-cost results in a different way. When the NPVs are divided by investment costs, they provide a good basis for selecting the CE value corresponding to an NPV of zero or greater. The statistical correlation between the NPV/I and CE ratios is high (0.84), permitting the identification of a cost-efficiency value which would yield almost the same results as a benefit-cost analysis.
- 7.36 When NPV/I is the basis for selecting a cut-off value for CE, the results of statistical analysis establish the maximum acceptable CE ratio as 40. Four projects in the sample of 45 are unacceptable by this standard, including two which are marginally viable by the preferred benefit-cost criterion. This reflects the absence of a perfect correlation between the two criteria. Nevertheless, the predominance of the convergence in the results of applying the two ratios suggest the acceptability of using the cost-efficiency criterion and the cut-off value of 40 for selecting future projects.
- 7.37 When the cost-efficiency ratios exceed 40 for either the project sample or future investments, there are a number of alternatives to rejecting the project. An obvious step is to undertake a benefit-cost analysis of these exceptions. This would result in the approval of projects 38 and 39 in the sample, for instance. Another possibility is to look for design alternatives to lower costs. Finally, the project may be justified if there is evidence of severe problems with water quality, such as those caused by a high concentration of arsenic or salts.

5. Payment capacity of beneficiaries

- 7.38 As developed for the economic analysis, the future project beneficiaries pay more per unit of water without the project than with the public system. Moreover, the poorest communities pay more for water at the present time than the better-off towns in the provinces of Buenos Aires, Santa Fe, and Córdoba. With regard to these three provinces, water consumption is already high and is expected to remain unchanged with the project. Consequently, the consumers connecting to the new systems will experience savings in total water expenditures. The predicted level of

connections is 80% for the first year, rising to 95% over the life of the project. These projections conform with past experience, reinforcing the assertion that consumer savings will be generated by the project for at least 95% of the families in beneficiary communities.

- 7.39 The level and rate of connection is basically the same for the other provinces as for Buenos Aires, Córdoba and Santa Fe. In the lower income communities, however, per capita water consumption will increase with the project. Consequently, even with substantial cost savings, there is likely to be an increase in total family expenditures for water. The capacity and willingness of families to absorb any additional expenditure for water is indicated by the high proportion of existing rural systems operating with surpluses. As stated in the financial analysis, 87% of the reporting cooperatives show surpluses. Moreover, as also indicated in the financial analysis, the communities have demonstrated a willingness to adjust tariffs monthly or quarterly to keep prices constant in real terms. These tariffs are comprehensive in their coverage, in that they meet all administrative, operating and maintenance costs (including replacement costs) as well as the debt service on the IDB loan. The tariffs have been calculated for the fourth stage on the same basis as in the earlier stages of the program. As stated previously, the maximum tariff per cubic meter for the sample communities ranges from US\$0.08 to almost US\$1.50.
- 7.40 During the field trip to relatively low income areas (Catamarca and Tucumán), the analysis mission noted the flexibility of cooperatives in dealing with the poorest families connected to the water system. Since the incomes of these families were usually seasonal, they were allowed to accumulate a deficit in slack periods and pay the accumulated changes in peak periods. Although the mission visited a relatively small sample of cooperatives, this flexibility was evident in all cases.
- 7.41 The above indicators are better evidence of the consumer's capacity to pay than a comparison of incomes with future tariffs. The income data are mainly from 1979, and are presented in income ranges which vary widely from community to community. The updating of the income data to correspond with the tariff data for April 30, 1981 would undoubtedly produce unrealistic results. This is due in large part to the absence of a reliable wage and salary index for any part of Argentina. The situation is made worse by the significant differences among provinces in the movement of wages and salaries.

D. Impact on Low Income Groups

- 7.42 The calculation of the net economic benefits accruing to low income groups is based upon the data for 35 of the 45 subprojects in the sample. The two projects with negative net benefits are eliminated from the base since these projects should not be undertaken without some reformulation to reduce costs and/or increase benefits. The other eight projects are omitted from the calculation because of insufficient income

data. Since five of the eight projects are located in provinces with a relatively high proportion of low income families, the smaller sample is somewhat biased toward underestimating the benefits going to low income groups. As discussed below, however, this bias is offset by some assumptions tending to overestimate the net benefits to low income groups.

- 7.43 The income data for the 35 communities included in the distributional analysis are from the socioeconomic surveys carried out for the rural water program. Most of these surveys were undertaken in 1979. As discussed in the presentation of the economic analysis, there is no reliable wage and salary index for inflating these data to the present. Since the low income level set by the Bank and Argentina is updated with the food component of the consumer price index, the best alternative is to adjust this level to correspond with the community income data. The October 1979 per capita low income level is adjusted accordingly, and then put in terms of monthly family income.
- 7.44 The table on the next page summarizes the source and amount of the present value of net economic benefits generated by the 35 projects. As shown in the table, 70% of the net economic benefits to the private sector accrue to low income groups.
- 7.45 The allocation of consumer benefits and costs in the table is based upon the proportion of families at or below the low income level. This approach is necessary for group 1 because the gross benefits and costs are derived using average consumption and cost data for the communities. Although the unit costs of water without the project are similar for virtually all consumers, there are no data on water consumption by income group within a given community. Nevertheless, the results in taking this approach are probably comparable to the outcome of a more precise accounting. This is due to the prevalence of bathrooms in the group 1 homes and the insensitivity of water consumption to changes in water price. Specifically, the data indicate that per capita water consumption in the 70 to 75 percent of the homes with bathrooms is about the same. Since 52 percent of the group 1 families are at or below the low income level, the allocation of resource savings is likely to be reasonably estimated for almost half of the low income families. For the rest, the table may overestimate net benefits.
- 7.46 The situation is simpler for the group 2 communities. In seven of the ten communities, 100% of the families are at or below the low income level. For the three remaining communities, 64% of the families are classified as low income. In these exceptional cases, the approach for attributing the benefits from resource savings is the same as developed for group 1.

Table VII-4

Present Value of the Net Economic Benefits (Losses)
by Beneficiary Group

(in US\$ thousands)

	Co-ops.	(Province) SPAR	(Nation) SNAP	Low Income Group	Other Private Group	Total Net Flows
1. Water Tariffs	11,449.0	-	-	(8,014.3)	(3,434.7)	0.0
2. Gross consumer bens.(Grp.1)	-	-	-	13,874.8	10,047.2	23,922.0
3. Gross consumer bens.(Grp.2)	-	-	-	10,118.6	218.0	10,336.6
4. Investment Costs	-	(3,093.6)	(10,827.7)	(1,082.8)	(464.0)	(15,468.1)
5. Adm., maint.& operating costs	(5,405.1)	-	-	-	-	(5,405.1)
6. IDB debt service	(6,043.9)	-	6,043.9	-	-	0.0
Total Net Economic Benefits:	0.0	(3,093.6)	(4,783.8)	14,896.3	6,366.5	13,385.4

$$\begin{array}{r} \text{Net Benefits to} \\ \text{Low Income} \\ \hline 14,896.3 + 6,366.5 = .70 \end{array}$$

- 7.47 The distribution of the benefits from increased water consumption could be more precisely estimated through the demand curve analysis used for deriving the gross benefits. This is possible if it is assumed that water consumption is correlated with and rises with income. 1/ Although this assumption could be valid for the group 2 communities, the change in the distribution of net benefits from applying the more rigorous approach is minimal. For the distribution of total net benefits, the difference is unlikely to amount to a percentage point.
- 7.48 All of the costs borne by consumers are allocated in the same proportions as gross benefits. The tariffs paid by consumers cover the annual costs, including the tenth year investment costs, and the IDB debt service. The part of the tariff corresponding to annual costs is income to the cooperatives, while the debt service payment is made to the SPAR and then passed on to the national government for payment to the IDB. The IDB loan is for 60% of the investment, and is assumed to be amortized over 20 years.
- 7.49 Of the initial investment costs, 70% is from the nation through SNAP (including the IDB financing), 20% is from the province through the SPAR, and 10% is from the community.
- 7.50 When the results of this analysis are applied to the Bank lending for the project, 70% of the total loan amount is attributable to the low income group. That is, US\$37.24 million of the US\$53.2 million in total lending is attributable to low income families. 2/

E. Justification of the Use of FSO Funds

- 7.51 The use of local currency FSO resources is justified under the provisional guidelines approved by the Board of Executive Directors in document GP-82-8 of May 20, 1981, in which it was indicated that such local currency could be utilized for projects in less developed regions in any Bank member country and in projects of a social nature, this being the case with the program proposed herein.

1/ This assumption and the related approach for allocating net economic benefits were used in the 1980 analysis of the third stage of the rural water program in Chile.

2/ In order to add the results of this analysis to those for other Bank projects, the net economic benefit flows for the 35-project sample must be adjusted to correspond to the entire universe of 170 water systems. This is done by multiplying the net benefit flows by the ratio of total direct investment costs to the investment costs for the project sample. Excluding inflation, total direct investment is US\$57.6 million and the investment for the sample projects is US\$15.5 million. The resulting factor is 3.7.

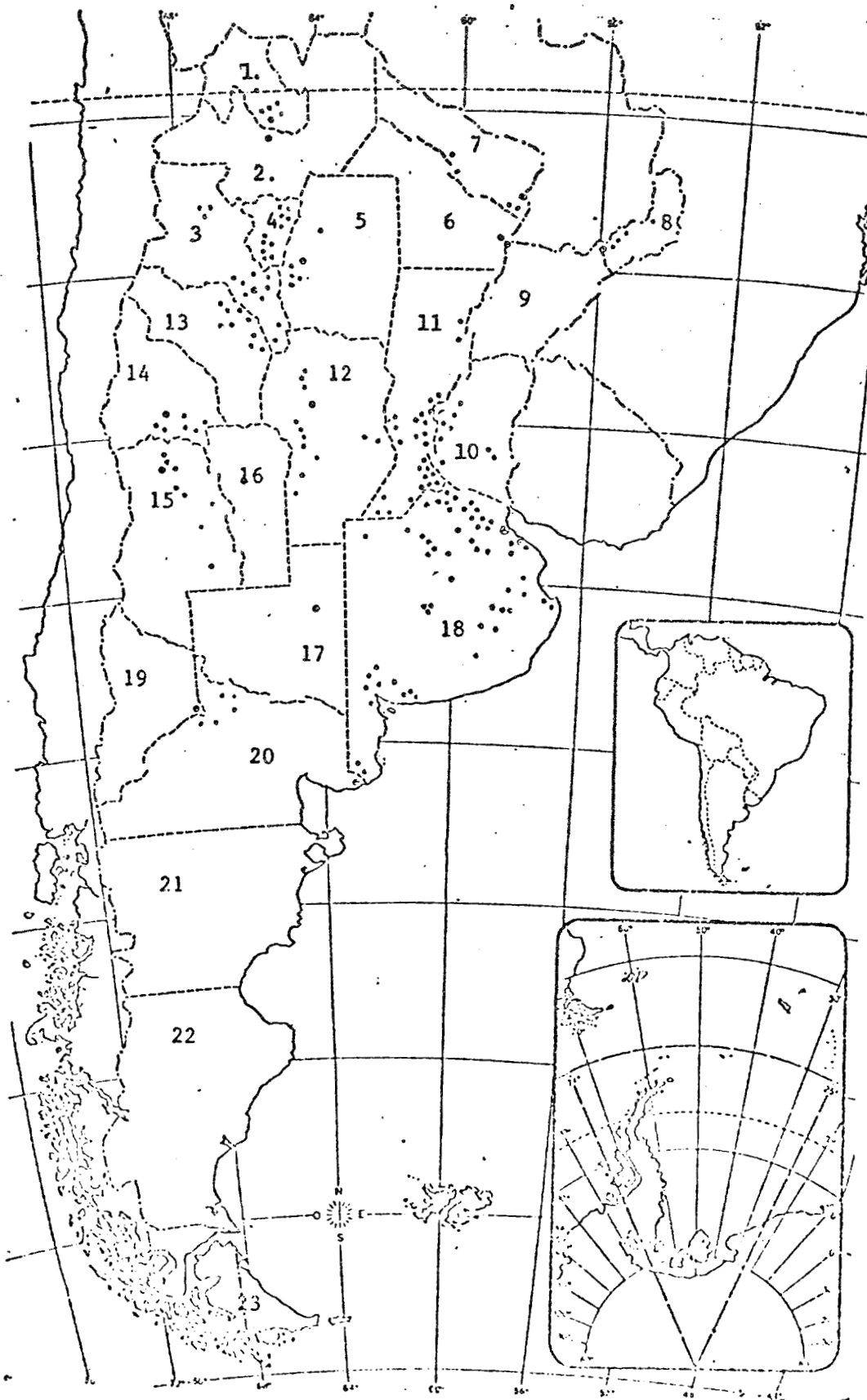
AGUA POTABLE Y ALCANTARILLADO SANITARIO

Cobertura de Servicios en 1977

	ABASTECIMIENTO AGUA URBANO					Rural *	Total	CLOACAS			
	Gran Buenos Aires				Capital			Resto	Otras	Total	
	Capital	Resto	Otras	Urbanas							
	Federal	Bs.Aires	Urbanas	Urbano	Habts.	Potable	Federal	Bs.Aires	Urbanas	Urbano	
Población a fin de 1977, en miles	3,156	6,120	12,010	21,286	4,847	26,133	3,156	6,120	12,010	21,286	
Población Servida a fin 1977											
Con conexión domiciliar	3,016	2,479	8,041	13,536	340.7	13,876.7	2,789	1,022	3,372	7,183	
Con surtidor público	-	-	-	808	259	1,067	-	-	-	-	
Sub Total	3,016	2,479	8,041	14,344	597,7	14,943.7	2,789	1,022	3,372	7,183	
Población servida en %											
Con conexión domiciliar	95.6	40.0	67.0	63.6	7.01	53.1	88.3	16.7	28.1	33.7	
Con surtidor público	-	-	-	3.8	9.3	4.1	-	-	-	-	
Sub Total	95.6	40.0	67.0	67.4	12.3	57.2	88.3	16.7	28.1	33.7	

CUARTA ETAPA: Localización Tentativa de Obras

1. Jujuy
2. Salta
3. Catamarca
4. Tucumán
5. Sgo. del Estero
6. Chaco
7. Formosa
8. Misiones
9. Corrientes
10. Entre Ríos
11. Santa Fe
12. Córdoba
13. La Rioja
14. San Juan
15. Mendoza
16. San Luis
17. La Pampa
18. Buenos Aires
19. Neuquén
20. Río Negro
21. Chubut
22. Santa Cruz
23. Territorio Nacional de Tierra del Fuego



- PLAN DE ADIESTRAMIENTO -

Costo del Programa
(Miles US\$)

<u>Descripción</u>	<u>Monto Parcial</u>	<u>Monto Total</u>
<u>2 Cursos Ininspectores de Obras</u>		
Contratación de profesores	4,200	8,400
Viáticos	2,600	5,200
Secretaría e Impresión	2,100	4,200
Transporte aéreo	1,400	2,800
Imprevistos	2,000	4,000
T O T A L E S	12,300	24,600
<u>3 Cursos para Operadores-Administradores</u>		
Contratación Profesores	11,900	35,700
Viáticos	7,100	21,300
Secretaría e Impresión	3,500	10,500
Transporte aéreo	1,700	5,100
Imprevistos	4,900	14,700
T O T A L E S	29,100	87,300
<u>1 Curso para Supervisor de Operación y Mantenimiento</u>		
Contratación Profesores	13,700	13,700
Viáticos	9,100	9,100
Secretaría e Impresión	3,900	3,900
Transporte aéreo	1,700	1,700
Imprevistos	5,700	5,700
T O T A L E S	34,100	34,100
<u>1 Curso sobre Técnicas Contables</u>		
Contratación Profesores	4,200	4,200
Viáticos	2,600	2,600
Secretaría e Impresión	2,100	2,100
Transporte Aéreo	700	700
Imprevistos	2,000	2,000
T O T A L E S	11,600	11,600
TOTAL GENERAL:		157,600
ESCALAMIENTO :		42,400
COSTO TOTAL :		200,000

CURSOS DE _ _ _ _ _

Términos de Referencia

- 1) Redactar un reglamento que someterá a aprobación del SNAP, para el correcto funcionamiento del curso.
- 2) Organizar y desarrollar los cursos de _ _ _ _ _ de acuerdo al programa adjunto, el que podrá ser modificado por el profesional previo acuerdo con el SNAP.
- 3) Revisar el manual del curso y efectuar, de ser necesario, correcciones o ampliaciones de determinados capítulos, como también redactar otros nuevos de ser conveniente para el dictado de las clases. En ambos casos, el Profesional será responsable y tendrá a su cargo la redacción e impresión de dichos capítulos.
- 4) Nombrar los colaboradores que estime necesarios para la revisión del manual y para el dictado de las clases de cada curso, como también el personal administrativo correspondiente.
- 5) Tener a su cargo la retribución de todos los gastos que se originen con motivo del curso, como ser viáticos, estadías y honorarios de sus colaboradores y del personal administrativo, gastos de revisión del manual, impresión de separatas, papelería y demás erogaciones necesarias para el correcto desarrollo de cada uno de los cursos.
- 6) Al término del curso efectuar una evaluación del mismo, y previo procesamiento entregarlo al SNAP junto con un informe final detallado de todos los aspectos sobresalientes de su organización y desarrollo. Asimismo deberá efectuar una evaluación final de los asistentes a cada curso, en la forma que proponga en su metodología, confeccionando y entregando el correspondiente certificado de aprobación a los asistentes que hayan satisfecho los requerimientos establecidos.

Programa Tentativo del Curso de Operadores-Administradores

- 1) Nociones del plan nacional de agua potable rural.
- 2) Abastecimiento de agua.
- 3) Contaminación del agua y necesidad de su desinfección principio de funcionamiento de aparatos utilizados en la desinfección.
- 4) Hipocloradores.
- 5) Bombas.
- 6) Instalaciones eléctricas.
- 7) Motores eléctricos.
- 8) Plantas de tratamiento.
- 9) Tanques.
- 10) Redes de distribución.
- 11) Conexiones domiciliarias.
- 12) Nociones generales de administración.
- 13) Registros contables.
- 14) Recaudación de tasas
- 15) Depósito de materiales.

Programa del curso de inspección de obras

- 1) Función del Inspector de Obra.
- 2) Sistemas usuales para la ejecución de la obra pública: a) por administración, y b) por contrato. Análisis de los diversos sistemas de contratación de obras.
- 3) Estudio de Bases de Licitación y Contratación de Obras y Pliegos de Especificaciones Técnicas, generales y particulares, planos, presupuestos y demás elementos de la documentación contractual.
- 4) Programación de las obras. Interpretación de los distintos métodos usuales.
- 5) Intervención de la Inspección en:
 - Replanteo de las obras.
 - Instalación del obrador.
 - Iniciación de los trabajos.
 - Acopio de materiales.

- Control de la calidad y mano de obra empleado en la ejecución de los trabajos; pruebas.
 - Verificación de la presencia de personal técnico de la Empresa Contratista.
 - Cumplimiento del plazo de ejecución de obra y estudio de una eventual ampliación del mismo.
 - Contralor del cumplimiento de las leyes sociales y de cualquier otra disposición legal a que contractualmente se halla obligada la Empresa Contratista.
 - Mediciones de los trabajos.
 - Toda otra acción que requiera la intervención del personal destinado al contralor de las obras.
- 6) Certificación de obras, fondo de reparos, garantías, multas, etc. Certificados de Acopios y Desacopios. Variaciones de costos. Modificaciones de obra. Imprevistos.
- 7) Documentación que debe llevar la Inspección:
- Libro de Ordenes de Servicio.
 - Archivo de Actas.
 - Planilla de Avance de Obra.
 - Documentación contractual actualizada (incluyendo modificaciones que se hubieran producido).
 - Copia de certificados.
 - Toda otra documentación que hace al contralor de la obra.
- 8) Recepción de las obras, pruebas, liquidación final, planos conforme a obra, etc.
- 9) Características particulares de la obra de abastecimiento de agua potable a comunidades rurales y recaudos a adoptar por la Inspección en:
- Captación (fuente superficial o subterránea).
 - Fundaciones.
 - Reservorios (cisternas y tanques elevados).
 - Plantas de tratamiento.
 - Excavación de zanjas e instalación de cañerías.
 - Conexiones domiciliarias.

Programa del Curso para Supervisores de
Operación y Mantenimiento

- Matemáticas (nivel secundario - pre-universitario)
- Nociones de Administración
- Relaciones Públicas
- Electricidad
- Motores Eléctricos
- Epidemiología y Bioestadística
- Hidráulica
- Química y Microbiología del Agua
- Captación y Conducción del Agua
- Bombas
- Motores de Combustión Interna y Grupos Electrógenos
- Almacenamiento del agua
- Redes de Distribución
- Conexiones Domiciliarias
- Plantas de Tratamiento
- Instalaciones Domiciliarias Internas

Programa del Curso sobre Técnicas Contables

- Normas contractuales de préstamos BID
- Normas contractuales de convenios Nación-Provincia
- Nociones de Contabilidad General
- Plan y manual de cuentas de la contabilidad de los SPAR y su relación con el SNAP.
- Registros contables y herramientas administrativas
- Sistematización de datos, correlación de imputaciones y seguimiento entre el SNAP y los SPAR
- Presupuesto - Nociones del tema y herramientas necesarias para su confección y seguimiento.
- Documentación respaldatoria y su relación con los desembolsos del BID y los aportes nacionales al proyecto.
- Aspectos tributarios del Plan Nacional de Agua Potable
- Confección de cuadros de origen y aplicación de fondos
- Remisión de información de acuerdo a lineamientos impartidos por el SNAP
- Rendición de cuentas de los SPAR ante el SNAP

SNAP - IV ETAPA

PROYECCIONES DE RECUPERACIONES

(Miles de US Dólares)

	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>	<u>Total</u>
<u>ados</u>											
del principal	-	-	474	2.177	3.413	3.398	3.192	2.986	2.782	2.575	20.997
	-	-	321	1.506	2.444	2.568	2.568	2.568	2.568	2.568	17.111
			<u>795</u>	<u>3.683</u>	<u>5.857</u>	<u>5.966</u>	<u>5.760</u>	<u>5.554</u>	<u>5.350</u>	<u>5.143</u>	<u>38.108</u>
<u>amo del BID</u>											
	-	-	-	-	-	3.745	3.532	3.293	3.055	2.815	16.440
	-	-	-	-	-	3.158	3.158	3.158	3.158	3.158	15.790
						<u>6.903</u>	<u>6.690</u>	<u>6.451</u>	<u>6.213</u>	<u>5.973</u>	<u>32.230</u>
tante)											
	-	-	795	3.683	5.857	(937)	(930)	(897)	(863)	(830)	5.878
	-	-	-	4.478	10.335	9.398	8.468	7.571	6.708	5.878	

EQUIPO DE LABORATORIO
PARA ANALISIS DE AGUA

(3 Sets)

Turbidímetro electrónico
Equipo para ensayos de coagulación
Aparato electrónico para pH
Comparador colorimétrico
Estufa de cultivo
Auto clave
Balanza
Destilador
Mechero bunsen
Termómetro
Juegos de pipetas, probetas, vasos, frascos
buretas, etc.

- Destino -

Provincias:

Buenos Aires
Catamarca .
San Luis

AGUA POTABLE RURAL, 4a. ETAPA
CALENDARIO DE INVERSIONES
(en miles de US\$)

	1 9 8 1			1 9 8 2			1 9 8 3			1 9 8 4			1 9 8 5			T O T A L E S			
	B I D			B I D			B I D			B I D			B I D			B I D			Total
	Divi- sas	Pe- sos	Local Pesos	Divi- sas	Pe- sos	Local Pesos	Divi- sas	Pe- sos	Local Pesos	Divi- sas	Pe- sos	Local Pesos	Divi- sas	Pe- sos	Local Pesos	Divi- sas	Pe- sos	Local Pesos	Grale
nis.	-	200	400	-	700	2.400	-	50	3.950	-	50	3.925	-	-	2.325	-	1.000	13.000	14.0
admin.	-	200	200	-	200	200	-	50	50	-	50	25	-	-	25	-	500	500	1.0
	-	-	200	-	500	2.200	-	-	3.900	-	-	3.900	-	-	2.300	-	500	12.500	13.0
ectos	470	250	380	6.050	1.630	3.870	7.980	4.370	6.400	8.580	4.710	6.890	5.620	3.115	4.210	28.700	14.075	21.750	64.5
as	470	250	380	6.050	1.630	3.870	7.980	4.370	6.400	8.580	4.710	6.890	5.620	3.115	4.210	28.700	14.075	21.750	64.5
urr.	-	-	-	-	1.100	150	-	-	120	-	-	130	-	-	-	-	1.100	400	1.5
quipos	-	-	-	-	1.100	-	-	-	-	-	-	-	-	-	-	-	1.100	-	1.1
mento	-	-	-	-	-	100	-	-	50	-	-	50	-	-	-	-	-	200	2
	-	-	-	-	-	50	-	-	70	-	-	80	-	-	-	-	-	200	2
	470	450	780	6.050	3.430	6.420	7.980	4.420	10.470	8.580	4.760	10.945	5.620	3.115	6.535	28.700	16.175	35.150	80.0
nc.	65	30	180	565	135	335	1.300	265	255	2.180	400	150	2.890	495	55	7.000	1.325	975	9.3
d. 1/	20	10	-	485	95	-	1.220	225	-	2.100	360	-	2.818	463	-	6.643	1.150	-	7.7
gil.	-	-	180	-	-	335	-	-	255	-	-	150	-	-	55	-	-	975	9
	45	20	-	80	40	-	80	40	-	80	40	-	72	32	-	357	175	-	5
	535	480	960	6.615	3.565	6.755	9.280	4.685	10.725	10.760	5.160	11.095	8.510	3.610	6.590	35.700	17.500	36.125	89.3

- EQUIPO PARA MANTENIMIENTO -

1. Seis camiones taller compuestos de:

- Camión de 100 HP, carrozado y adaptado para transporte de operarios, máquinas y herramientas
- Grupo electrógeno accionado por motor diesel
- Grúa hidráulica de 3 tons. de carga útil
- Banco de trabajo
- Armarios para herramientas y ropa
- Aparejo con trípode, de 500 kg.
Bomba de achique
- Equipo de soldadura
- Herramienta general

2. 10 vehículos tipo rural para supervisión de sistemas rurales de agua potable en operación.

3. Destino del Equipo y de Vehículos:

<u>PROVINCIA</u>	<u>EQUIPO</u> <u>MANTENIMIENTO</u>	<u>VEHICULOS</u>
Buenos Aires	-	2
Catamarca	1	1
Córdoba	-	1
Corrientes	1	-
Entre Ríos	-	1
Formosa	1	1
Jujuy	-	1
La Rioja	1	1
San Juan	1	1
Stgo. Estero	-	1
Tucumán	1	-
T O T A L E S	6	10

ANEXO B

PROCEDIMIENTO DE LICITACIONES

Organismos Licitantes

Se entenderá por organismos licitantes a cada Provincia que participe en el Programa (en adelante denominadas "Ejecutores").

Toda contratación a financiarse con los recursos de los Préstamos del Banco se realizará conforme al siguiente procedimiento:

Artículo 1o. Aplicación. Deberá utilizarse el sistema de licitación en todos los casos en que el valor de las adquisiciones y contrataciones exceda del equivalente de cien mil dólares de los Estados Unidos de América (US\$100.000).

Artículo 2o. Ambito de licitaciones. Las licitaciones se limitarán a los países miembros del Banco cuando para su financiamiento se utilicen las divisas de los Préstamos, y podrán restringirse a oferentes nacionales cuando para su financiamiento se utilicen recursos de la contribución nacional o, si los hubiere, pesos argentinos provenientes del Financiamiento.

Artículo 3o. Modalidad de licitación pública internacional. Cuando para financiar total o parcialmente las contrataciones y adquisiciones indicadas en el artículo 1o. deban utilizarse dólares o monedas de otros países distintos a la Argentina y siempre que el valor de las contrataciones y adquisiciones supere el monto determinado en el artículo 1o., el procedimiento de licitación deberá tener carácter internacional.

Artículo 4o. Otras modalidades. En las contrataciones y adquisiciones que se realicen por debajo del monto a que se refiere el Artículo 1o. anterior, el Ejecutor aplicará procedimientos competitivos, como concursos de precios u otros métodos similares, que aseguren la debida atención a los aspectos de economía y eficiencia en la utilización de los recursos destinados al Programa. Cuando se utilicen recursos provenientes del Préstamo /IC-AR, esos concursos o métodos competitivos similares deberán ser internacionales y deberán permitir la oferta de bienes, maquinaria y equipo originarios de países miembros del Banco

Artículo 5o. Llamado a licitación. El llamado a licitación deberá indicar como mínimo el ámbito de la licitación, el organismo licitante correspondiente, el presupuesto, la prestación que motiva el llamado, el lugar, hora y fecha en que pueden obtenerse las bases de licitación, el funcionario ante el cual y el lugar, hora y fecha en que deban presentarse las ofertas, el importe de la garantía, la fuente de financiamiento y las restricciones sobre la elegibilidad de las ofertas. En los casos de ejecución de obras debe indicarse además el sitio de la obra. Dicho llamado deberá ser aprobado por el SNAP y el Banco antes de que se publique.

Artículo 6o. Publicidad. Los llamados a licitación pública se publicarán, como mínimo, en dos diarios de los de mayor circulación en la Capital Federal y cuando corresponda en los boletines oficiales de la Nación y Provincias, según corresponda, mediando cuando menos, un intervalo de 3 días entre cada publicación del correspondiente aviso de licitaciones, en el que se indicará como plazo para el recibo de las ofertas el mínimo de 30 días corridos, contados a partir de la fecha de la última publicación. En casos de licitaciones que excedan del equivalente de US\$500.000 el Banco podrá requerir un plazo mayor, que no será mayor de 90 días. En casos especiales y debidamente justificados el Prestatario y el Banco podrán acordar la reducción de estos plazos.

Artículo 7o. Avisos a Embajadas. Simultáneamente con la publicación de los llamados a licitación pública, se cursarán invitaciones a cada una de las Embajadas, o en su defecto los Consulados de los países miembros del Banco, que tuvieran representación acreditada ante el Gobierno de la Nación Argentina. Las invitaciones deberán contener los mismos datos que se publiquen en los mencionados avisos de convocatoria.

Artículo 8o. Pliego de condiciones. El pliego de condiciones, que incluye los planos y especificaciones de la licitación, será redactado por el Ejecutor y se entregará a los interesados en participar en la licitación al precio que el Ejecutor fije, una vez que se haya aprobado por el Ejecutor y el Banco antes de cada licitación. Las modificaciones a dichos pliegos serán acordadas en la misma forma en cuyo caso el plazo para la presentación de ofertas quedará prorrogado por un período de por lo menos días contados desde la fecha de notificación de esas modificaciones o adiciones o los posibles oferentes, la cual deberá efectuarse por los mismos medios de publicidad usados para la primera convocatoria. Las consultas que evacúe el ejecutor serán puestas en conocimiento de todos los posibles oferentes y del Banco y no producirán efecto suspensivo sobre el plazo de presentación de ofertas.

Artículo 9o. Requisitos para presentar ofertas. Además del requisito de elegibilidad de los bienes y servicios, los proponentes deberán estar inscritos en el Registro de Proveedores del Estado o en el Registro Nacional o Provincial de Constructores de Obras Públicas, según sea el caso, salvo que se trate de firmas establecidas en el extranjero sin sucursales o representaciones en la Argentina, en cuyo caso bastará con la presentación al respectivo Registro y su correspondiente aceptación por parte de éste, la que no podrá ser rechazada sino por causales fundadas y evidentes.

Artículo 10o.: Presentación y Apertura de las Ofertas. Los sobres con las ofertas serán abiertos en el lugar, día y hora establecidos en la convocatoria, en acto público en el cual se anunciarán los nombres de los oferentes y los precios totales de cada oferta. En los casos de licitaciones para construcción de obras, se precalificará a las firmas en cuanto a su idoneidad jurídica, técnica, económica, administrativa y financiera, mediante el sistema de "doble sobre". El sobre No. 1 deberá contener los antecedentes de la firma que permitan evaluar su capacidad para construir la obra licitada. El sobre

No. 2, que será presentado junto con el sobre No. 1, deberá contener la oferta y la garantía de mantenimiento de la misma, y será abierto en reunión posterior a la apertura del sobre No. 1, a la cual el respectivo Ejecutor convocará sólo a quienes resulten precalificados con base en el sobre No. 1.

Finalizada la apertura de los sobres con las ofertas, se levantará un acta en la que constarán los nombres de los oferentes y los precios ofrecidos, y será suscrita por las autoridades del respectivo Ejecutor y los representantes de los oferentes que deseen hacerlo. A partir de la hora indicada para la apertura de los sobres con las ofertas, los proponentes no podrán alterar ni retirar las mismas. El Ejecutor podrá, con posterioridad a la apertura, solicitar a los proponentes aclaración de cualquier aspecto de las ofertas, y los proponentes podrán formular las aclaratorias pertinentes siempre que no modifiquen las condiciones de la oferta original.

Artículo 11o. Análisis de las ofertas y preselección. Presentadas las ofertas, el Ejecutor procederá a elaborar el cuadro comparativo de las mismas con los dictámenes correspondientes, los que serán enviados al SNAP y al Banco para su conformidad, antes de que sea comunicado el resultado a la firma así preseleccionada, junto con la indicación de la oferta que considere el Ejecutor como la más conveniente y las razones que tiene para llegar a dicha conclusión.

Artículo 12o. Modificación de la selección. Si se decidiere adjudicar la licitación a un oferente diferente al recomendado a la que hubiere dado su conformidad el SNAP y el Banco, o se introdujeran otros cambios sustanciales en el informe, se enviarán nuevamente al Banco los documentos pertinentes para su conformidad, procediendo nuevamente de acuerdo a lo establecido en el artículo anterior.

Artículo 13o. Adjudicación. Obtenido el acuerdo del SNAP y del Bancode acuerdo con lo establecido en el artículo 12o. anterior, el Ejecutor enviará al SNAP y al Banco el proyecto de contrato que se propone firmar con el adjudicatario, para su aprobación, y comunicará al adjudicatario lo previsto en los pliegos de licitación.

Artículo 14o. Licitación desierta. El Ejecutor declarará desierta la licitación en los casos en que no pueda adjudicarse el contrato por falta de oferentes. Asimismo, se declarará desierta la licitación en los casos en que no se presente oferta alguna con precio aceptable o ajustada a las condiciones del pliego de condiciones. En todos los casos, el Ejecutor deberá dejar constancia expresa en los pliegos de licitaciones, de que se reserva estos derechos. En ambas situaciones, el Ejecutor deberá oír al SNAP y al Banco antes de pronunciarse al efecto. En todo caso en que se declare desierta la licitación se efectuará una segunda, salvo que el Ejecutor, el SNAP y el Banco convengan en otra forma de proceder para la selección del adjudicatario.

Artículo 15o. Rescisiones. Cuando un contrato haya sido rescindido por falta de cumplimiento del contratista, ya sea que se trate de la calidad de la obra o del plazo de la ejecución, o de la calidad o plazo de entrega de la

maquinaria, equipo u otros bienes, u otras causales establecidas en el respectivo contrato, el Ejecutor, el SNAP y el Banco deberán acordar el curso a tomar frente a esta situación.

Artículo 16o. Organismo Ejecutor. Sin perjuicio de las atribuciones legales que le correspondan al Ministerio de Economía, será el ejecutor la autoridad competente para efectuar llamados a licitación para la adquisición de bienes así como para la contratación de obras.

Artículo 17o.: Márgenes de Preferencia: En la evaluación y adjudicación de las ofertas que se reciban como consecuencia de una licitación internacional para la adquisición de bienes, (maquinaria, equipo, materiales, etc.), se podrá reconocer a los bienes de origen argentino o según corresponda, originarios de países pertenecientes a la Asociación Latinoamericana de Integración (ALADI) un margen de preferencia conforme con las siguientes normas:

(a) Margen de Preferencia Nacional

- (i) Se considerará que un bien es originario de la Argentina cuando el costo de los materiales, mano de obra y servicios argentinos empleados en su fabricación represente por lo menos 40% del costo total del bien.
- (ii) A los efectos de la comparación de propuestas, se tendrá como precio de la oferta de productos de origen argentino, el precio de entrega del producto puesto al pie de la obra, una vez deducido lo siguiente: (1) los derechos de importación pagados sobre materias primas principales o sobre componentes manufacturados, y (2) los impuestos nacionales sobre ventas, al consumo y al valor agregado, incorporados al costo del artículo ofertado. El oferente deberá proporcionar la prueba documentada de las cantidades que, de conformidad con los subincisos (1) y (2) anteriores, deben deducirse, con el solo objeto de facilitar el cotejo de propuestas.
- (iii) También a los efectos de esa comparación, se tendrá como precio de la oferta de productos de origen extranjero, el precio CIF del mismo producto (excluidos derechos de importación, consulares y portuarios), al cual deberá sumarse el importe de los gastos siguientes: (1) los de manipuleo en puerto, y (2) los de transporte local, desde el puerto o lugar fronterizo de entrada hasta el pie de la obra.
- (iv) Para efectuar cotejo de precios entre ofertas de origen nacional y extranjero se estará a lo siguiente:
 - (1) los costos expresados en moneda extranjera se convertirán a su equivalente en pesos argentinos, para lo cual se utilizará el tipo de cambio pactado entre el Prestatario y el Banco en el Contrato de Préstamo, a la fecha de comparación; y

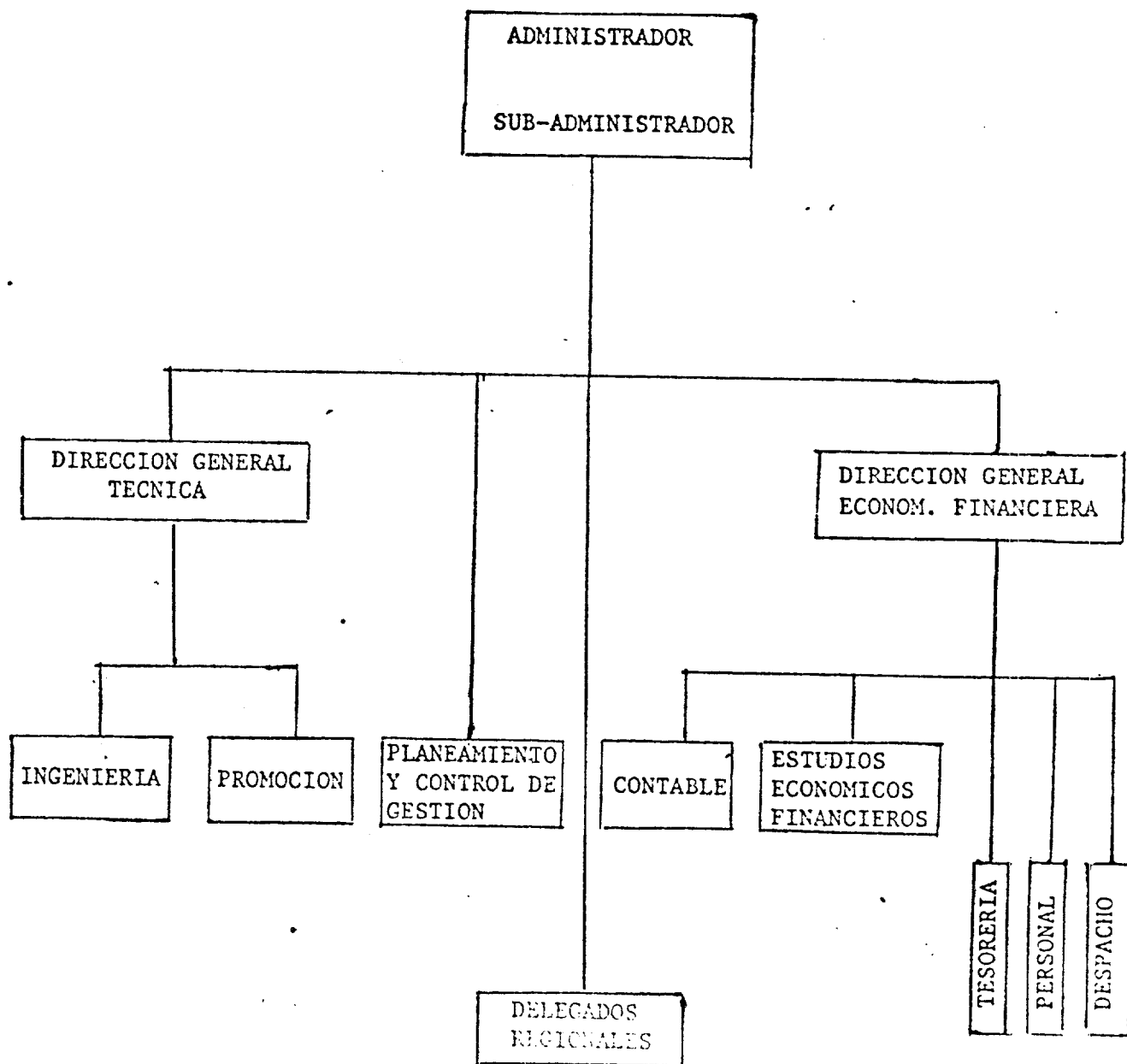
- (2) al precio de las ofertas de productos extranjeros, calculados conforme se estipula en el inciso (iii), y expresados en el equivalente en pesos argentinos, se sumará un margen de preferencia del 15% o el derecho aduanero real, según cual sea menor.
 - (v) Cuando, por aplicación de las normas anteriores, resulte que el precio de la oferta del producto nacional es más conveniente que el del producto extranjero, podrá hacerse uso para su adquisición de las divisas que formen parte del préstamo.
- (b) Margen de Preferencia Regional
- (i) Se considerará que un bien es originario de país miembro de la ALADI cuando: (1) se lo produzca en dicho país y cumpla con los requisitos establecidos en los instrumentos jurídicos que gobiernan esa Asociación en cuanto a origen y otras materias vinculadas con los programas de liberación del comercio regional; y (2) el valor local añadido no sea menor que el 40% del costo total del bien.
 - (ii) Se sumarán al costo CIF del producto ofertado los costos locales referidos en (iii) (1) y (2) del acápite (a) (Margen de Preferencia Nacional) de este párrafo.
 - (iii) Para efectuar el cotejo de precios entre ofertas de bienes originarios de países de la ALADI y las de bienes originarios de otros países extranjeros elegibles, se observará a lo siguiente:
 - (1) se convertirán a su equivalente en pesos argentinos los precios expresados en moneda extranjera, sobre la misma base de cálculo establecida en el inciso (a) (iv) (1) anterior; y
 - (2) se sumará a las ofertas de bienes originarios de países que no sean parte de la ALADI, y expresados en el equivalente de pesos argentinos, un margen del 15%, o bien la diferencia entre los derechos de importación, aplicables a bienes originarios de países que integran esa Asociación, y los derechos aplicables a bienes originarios de países extranjeros elegibles que no sean parte de la ALADI, según cual sea menor.
 - (iv) Cuando, por aplicación de las normas anteriores resulte que el precio de la oferta del producto originario de un país miembro de la ALADI, es más conveniente que el del producto originario de otro país extranjero elegible, podrá hacerse uso para su adquisición de las divisas que formen parte del préstamo.

Artículo 17o.: Pronunciamiento Oportuno del Banco: El Banco deberá pronunciarse sobre los documentos que se someten a su consideración en forma oportuna, para que no sufra perjuicio la marcha normal del Programa y se respeten los calendarios de ejecución oportunamente programados.

Artículo 18o.: Origen de los Bienes: El origen de los materiales y/o equipos a adquirirse, es el país en el cual el material y/o equipo ha sido extraído, cultivado o producido ya sea por manufactura, procesamiento o ensamblable. El origen del artículo "producido", necesariamente es el país en el cual, como resultado de dicho procedimiento, manufactura o ensamble, resulta en otro artículo, comercialmente reconocido, que difiere sustancialmente en sus características básicas, en su propósito o finalidad de cualquiera de sus componentes importados. La nacionalidad de la firma que produce o vende los bienes o el equipo es irrelevante para determinar el origen de tales bienes y equipos.

Artículo 19o.: Criterios Básicos: La aplicación de los anteriores procedimientos se basará en los principios de competencia, publicidad e igualdad entre los oferentes.

ORGANIGRAMA DEL SERVICIO NACIONAL DE AGUA POTABLE Y SANEAMIENTO RURAL



Servicio Nacional de Agua Potable
y Saneamiento Rural
Personal Actual y Previsto

	<u>Número</u>		<u>Plazas</u>
	<u>Previsto</u>	<u>Actual</u>	<u>Vacante</u>
Administración, sub-administración	14	10	4
Dirección General Técnica	2	2	--
Departamento Ingeniería	20	10	10
Departamento Promoción	8	8	--
Departamento Planeamiento y Control Gestión	3	3	--
Delegaciones Regionales	35	15	20
Dirección General Económico-Financiera	1	1	--
Departamento Contable	22	22	--
Departamento de Estudios			
Económico-Financieros	4	2	2
División Tesorería	4	4	--
División Personal	5	5	--
División Despacho	<u>13</u>	<u>7</u>	<u>6</u>
<u>TOTAL</u>	<u>131</u>	<u>89</u>	<u>42</u>

-81/PRS2

SNAP - EJECUCION PRESUPUESTARIA
(equivalente en miles de US\$ constantes
Enero de 1981)

PRESUP-HA

PRESUP. 1978	EJEC. 1978	PRESUP. 1979	EJEC. 1979	PRESUP. 1980	EJEC. 1980	PRESUP. 1981	1978 % EJEC.	1979 % EJEC.	1980 % EJEC.
-----------------	---------------	-----------------	---------------	-----------------	---------------	-----------------	-----------------	-----------------	-----------------

INGRESOS

A-CONT.PRESUP.GOBIERNO
B-PRESTAMO BID
C-RECUPERACIONES SUB-PRESTAMOS
D-OTROS

9818	9115	7909	6128	8490	8139	8746	93	77	
12966	10720	8340	6893	6739	3951	11743	83	93	
766	1597	635	1699	817	1650	1563	209	268	
0	0	0	0	1761	0	1578	0	0	

TOTAL INGRESOS

23550	21432	16885	14721	17808	13740	23629	91	87	
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GASTOS FUNCIONAMIENTO

A-PERSONAL
B-SUMINISTROS Y SERV.

1127	896	1079	1079	1677	1432	2177	79	100	
945	536	774	576	1070	752	1392	57	74	

TOTAL GASTOS FUNCION.

2072	1432	1853	1654	2747	2184	3570	69	89	
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GASTOS CAPITAL

A-TRANSFERENCIA PROVINCIAS
B-SUB-PTMOS.PROVINCIAS
C-ADQUISIC.BIENES
D-PROGRAMA ADIESTRAMIENTO

4470	4467	3707	1920	3099	3023	4200	100	52	
14171	14171	9094	8518	8304	6864	12287	100	94	
26	21	21	15	96	76	134	84	73	
0	0	245	245	1939	383	2037	0	100	

TOTAL GASTOS CAPITAL

18667	18660	13068	10699	13439	10346	18658	100	82	
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SERVICIO DEUDA

2811	1340	1964	1601	1622	1209	1401	48	92	
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TOTAL GASTOS

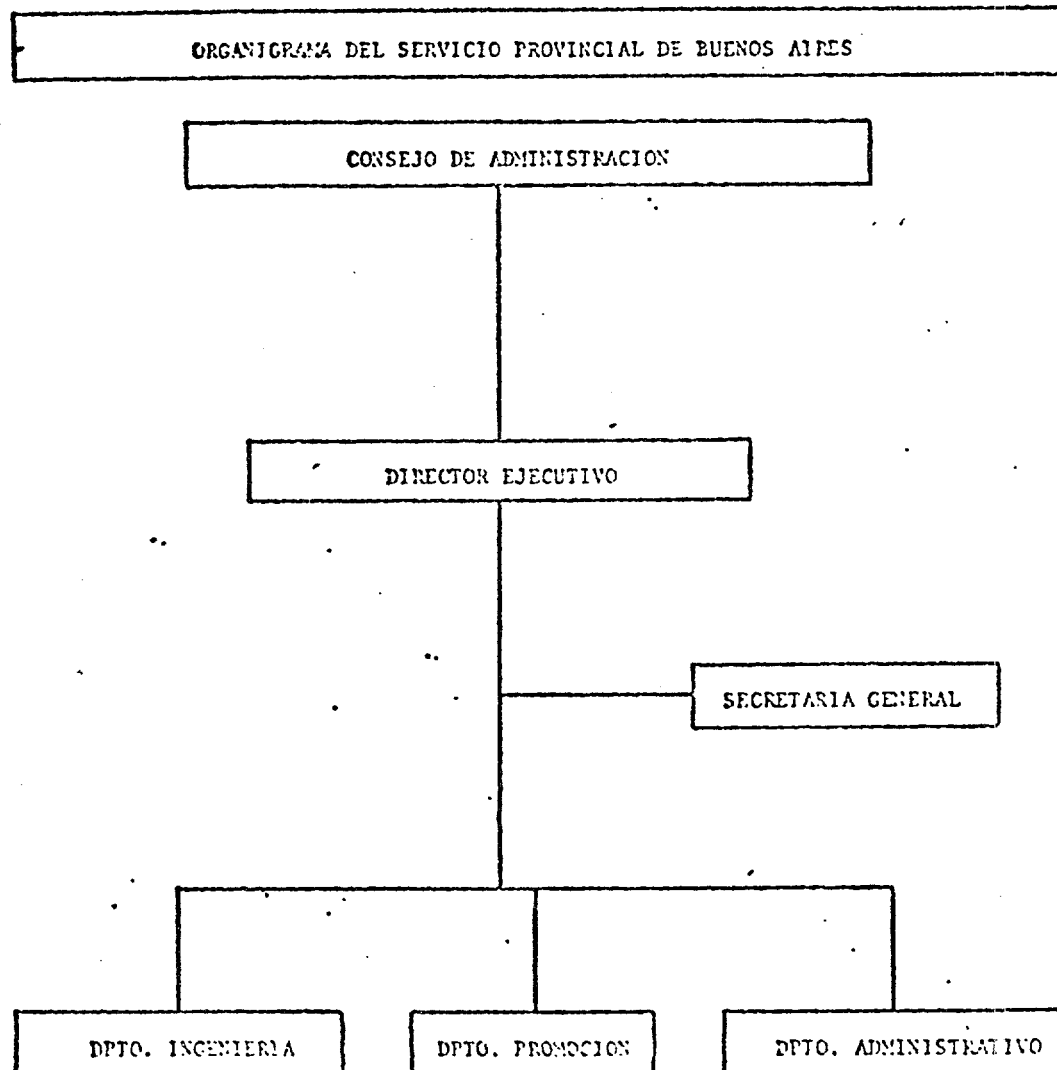
23550	21432	16885	13954	17808	13740	23629	91	83	
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SUPERAVIT(DEFICIT)

0	0	0	766	0	0	0	0	0	
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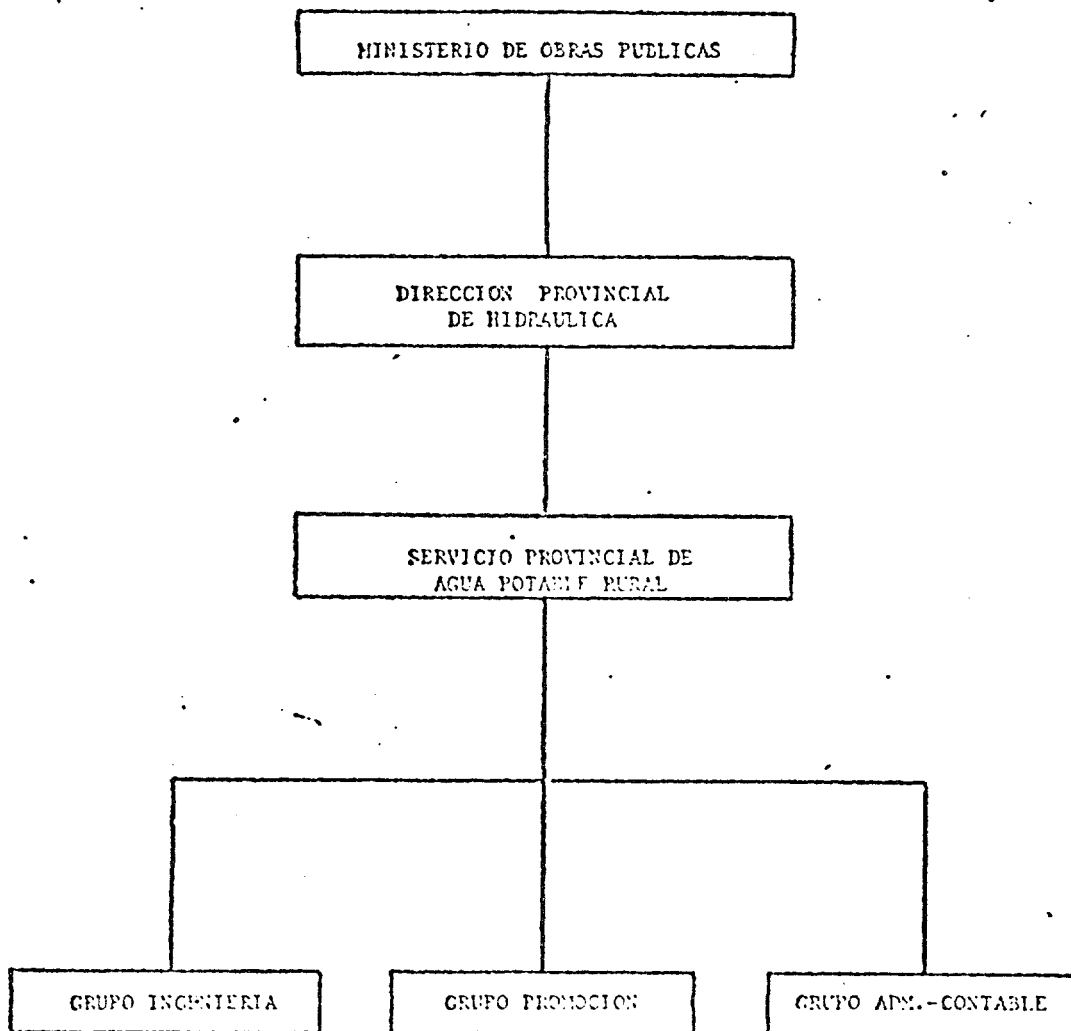
*Secretaría de Estado de Transportes
y Obras Públicas
Servicio Nacional de Agua Potable
y Saneamiento Rural*





*Secretaría de Estado de Transporte
y Obras Públicas
Servicio Nacional de Agua Potable
y Saneamiento Rural*

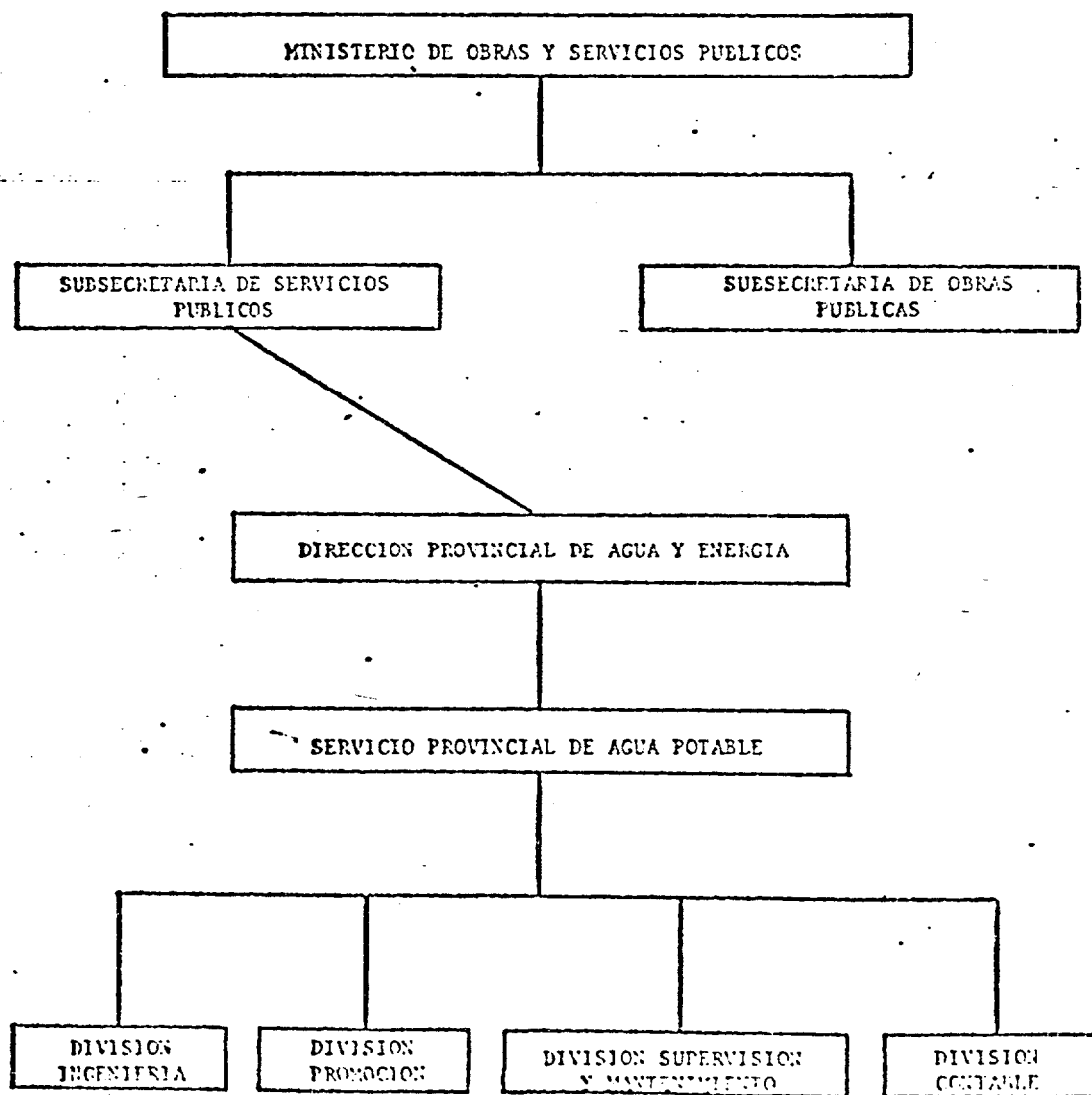
ORGANIGRAMA DEL SERVICIO PROVINCIAL DE CORDOBA





*Secretaría de Estado de Transportes
y Obras Públicas
Servicio Nacional de Agua Potable
y Saneamiento Rural*

ORGANIGRAMA DEL SERVICIO PROVINCIAL DE CORRIENTES





Secretaría de Estado de Transporte
y Obras Públicas
Servicio Nacional de Agua Potable
y Saneamiento Rural

ORGANIGRAMA DEL SERVICIO PROVINCIAL DE JUJUY

ADMINISTRACION GENERAL DE AGUA Y ENERGIA DE LA PROVINCIA

DIVISION AGUA

SERVICIO PROVINCIAL DE AGUA POTABLE RURAL

SERVICIOS GENERALES

INGENIERIA

ADMINISTRATIVO
CONTABLE

PROMOCION SOCIAL

Aportes Locales

I. Programa 526/SF, 14/IC-AR Estado de ejecución del programa

(en miles de US\$)

Fuente de Fondos	Costo Original		Costo actualizado		Inversiones al 31 Dic. 1980	
	Importe	%	Importe	%	Importe	%
BID	37.000	55	37.000	41	13.295	31
Aporte Local	30.000	45	53.596	59	29.188	69
Total	67.000	100	90.596	100	43.083	100
	=====	=====	=====	=====	=====	=====

II. Programa 526/SF, 14/IC-AR. Fuentes de fondos del aporte local

(en miles de US\$)

	Programado	Actualizado	% Aumento	Inversiones 31 Dic. 1980	%
Nación/SNAP	13.300	14.602	8	8.174	27
Provincia/SPAR	6.600	33.756	411	18.757	63
Comunidades	10.100	5.238	(52)	2.857	10
Total	30.000	53.596	79	29.788	100
	=====	=====	=====	=====	=====

III. Requerimientos de aportes locales

(en miles de US\$)

	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>Total</u>
<u>Programa en ejecución</u>						
<u>(526/SF, 14/IC-AR)</u>						
Nación/SNAP	3.524	2.688	216	-	-	6.428
Provincia/SPAR	8.223	6.272	504	-	-	14.999
Comunidades	1.305	996	80	-	-	2.381
	<u>13.052</u>	<u>9.956</u>	<u>800</u>	<u>-</u>	<u>-</u>	<u>23.808</u>

Programa en estudio

Nación/SNAP	430	3.150	4.915	5.005	2.755	16.255
Provincia/SPAR	340	2.445	3.820	3.890	2.150	12.645
Comunidades	190	1.160	1.990	2.200	1.685	7.225
	<u>960</u>	<u>6.755</u>	<u>10.725</u>	<u>11.095</u>	<u>6.590</u>	<u>36.125</u>

Total

Nación/SNAP	3.954	5.838	5.131	5.005	2.755	22.683
Provincia/SPAR	8.563	8.717	4.324	3.890	2.150	27.644
Comunidades	<u>1.495</u>	<u>2.156</u>	<u>1.270</u>	<u>2.200</u>	<u>1.685</u>	<u>8.806</u>
	14.012	16.711	10.725	11.095	6.590	59.133
	=====	=====	=====	=====	=====	=====

DEFINICION DEL PROYECTO
FORMULARIO PMS 4-1

Propósitos (a)	Objetivos (b)	Breve Descripción (c)	Dimensiones Principales (d)	Duración en días (e)	Miles Costo (f)
Reducir los índices de morbilidad y promover el desarrollo de las comunidades rurales entre 100 y 15.000 habitantes.	Abastecer con agua potable, en la mayoría de los casos domiciliaria, a 315.000 habitantes correspondientes a 170 localidades rurales en todo el ámbito del país.	Cada sub-proyecto consta generalmente de una captación, aducción, tratamiento si correspondiere con cloración en todos los casos, almacenamiento en reservas o tanques elevados, red de distribución y conexiones domiciliarias con medidor o regulador de caudal.	Se indicará en cada sub-proyecto	1460	76.7

DESCRIPCION DEL PROYECTO

Se trata de un proyecto de obras múltiples con localizaciones dispersas a través de todo el país.

Proyecto: AGUA POTABLE RURAL	
Prestatario: REPUBLICA ARGENTINA	
Ejecutor: SERVICIO NACIONAL DE AGUA POTABLE	
Preliminar <input checked="" type="checkbox"/>	PLAN DE EJECUCION DEL PROYECTO
Inicial <input type="checkbox"/>	
Revisión <input type="checkbox"/> No.	
Fecha	
Presentado	1/Julio/81
Hoja	1 de 1

NETWORK SCHEDULE APA1 (AR-0180) AGUA POTABLE RURAL IV

WEEKLY BAR CHART REPORT BY EARLY START

FOR ORGANIZATION CODE

WEEKLY BAR CHART REPORT

PROJ BASE DATE 30 AUG 81 DATA DATE 30 AUG 81

PROJ COMP DATE 23 OCT 85 PROP DATA DATE 31 DEC 81

LOWR SPAN DATE 30 AUG 81 RUN DATE 29 JUL 81

UPPR SPAN DATE 23 OCT 85 RUN SEQU 0

PAGE 1 PART 1

WORK ITEM CODE	DESCRIPTION	EARLY START	EARLY FINISH	REMAN	TOTAL	PC1	JL	CMP	FLT	DUR	SE	OC	NO	DE	JA	FE	MA	AP	MY	JU
1000	APROBACION DIRECTORIO EJECUTIVO	30AUG	30AUG	0.0	0.0	0	0	0	0	0	X	X	CCCCCCCC							
1010	SUSCIBIR CONTRATO PRESTAMO	30AUG	18OCT	50.0	0.0	0	0	0	0	0	X	CCCCCCCC								
1700	ENTRADA VIGENCIA CONTRATO	18OCT	18OCT	0.0	0.0	0	0	0	0	0	D									
1100	ELABORAR INFORME JURIBICO	19OCT	17NOV	30.01291.0	0.0	0	0	0	0	0	D		IIIII							
1110	DESIGNAR REPRESENTANTES AUTORIZADOS	19OCT	17NOV	30.01291.0	0.0	0	0	0	0	0	D		IIIII							
2010	DEMOSTRAR SUFICIENCIA RECURSOS ANO I	19OCT	17NOV	30.01291.0	0.0	0	0	0	0	0	D		IIIII							
2100	FORMULAR PLAN CUENTAS	19OCT	17NOV	30.01261.0	0.0	0	0	0	0	0	D		IIIII							
2200	COMPROMISO CONTADURIA NACION AUDITAR	19OCT	2DEC	45.01246.0	0.0	0	0	0	0	0	D		IIIII							
3000	DEMOSTRAR FUNCIONAM ENTIDAD EJECUTOR	19OCT	17NOV	30.01291.0	0.0	0	0	0	0	0	D		IIIII							
3100	ELABORAR PRESENTAR PEP INICIAL	19OCT	2DEC	45.01246.0	0.0	0	0	0	0	0	D		IIIII							
3300	INCORPORAR GRUPO "A" AL PROGRAMA	19OCT	27DEC	435.0	326.0	0	0	0	0	0	D		IIIII							
3310	INCORPORAR GRUPO "B" AL PROGRAMA	19OCT	27DEC	435.0	236.0	0	0	0	0	0	D		IIIII							
3320	INCORPORAR GRUPO "C" AL PROGRAMA	19OCT	27DEC	435.0	134.0	0	0	0	0	0	D		IIIII							
3330	INCORPORAR GRUPO "D" AL PROGRAMA	19OCT	27NOV	403.0	50.0	0	0	0	0	0	D		IIIII							
6200	PROMOC FORMAC ENTES LOCALES GRUPO "A"	19OCT	25FEB	495.0	216.0	0	0	0	0	0	D		IIIII							
6300	PROMOC FORMAC ENTES LOCALES GRUPO "B"	19OCT	27DEC	435.0	186.0	0	0	0	0	0	D		IIIII							
6400	PROMOC FORMAC ENTES LOCALES GRUPO "C"	19OCT	27DEC	435.0	84.0	0	0	0	0	0	D		IIIII							
6500	PROMOC FORMAC ENTES LOCALES GRUPO "D"	19OCT	27NOV	403.0	0.0	0	0	0	0	0	D		IIIII							
2110	APROBACION BID PLAN CUENTAS	18NOV	17DEC	30.01261.0	0.0	0	0	0	0	0	D		IIIII							
2210	APROBACION BID AUDITORIA EXTERNA	3DEC	1JAN	30.01246.0	0.0	0	0	0	0	0	D		IIIII							
3110	APROBACION BID PEP	3DEC	1JAN	30.01246.0	0.0	0	0	0	0	0	D		IIIII							
1500	ELEGIBILIDAD PRESTAMO	2JAN	16APR	105.01246.0	0.0	0	0	0	0	0	D		IIIII							
2001	SOLICITAR PRIMER DESEMBOLSO	17APR	26APR	10.01246.0	0.0	0	0	0	0	0	D		IIIII							
4110	APROBACION BID ESTUDIOS GRUPO "A"	17APR	25JUN	435.0	671.0	0	0	0	0	0	D		IIIII							
4112	APROBACION BID ESTUDIOS GRUPO "B"	17APR	25JUN	435.0	671.0	0	0	0	0	0	D		IIIII							
4114	APROBACION BID ESTUDIOS GRUPO "C"	17APR	25JUN	435.0	671.0	0	0	0	0	0	D		IIIII							
4116	APROBACION BID ESTUDIOS GRUPO "D"	17APR	26MAY	403.0	701.0	0	0	0	0	0	D		IIIII							
4300	LICITAR OBRAS GRUPO "B"	17APR	25JUN	435.0	186.0	0	0	0	0	0	D		IIIII							
4400	LICITAR OBRAS GRUPO "C"	17APR	25JUN	435.0	84.0	0	0	0	0	0	D		IIIII							
4500	LICITAR OBRAS GRUPO "D"	17APR	26MAY	403.0	0.0	0	0	0	0	0	D		IIIII							
4320	ORDEN INICIACION OBRAS GRUPO "B"	16JUN	24AUG	435.0	216.0	0	0	0	0	0	D		IIIII							
4420	ORDEN INICIACION OBRAS GRUPO "C"	25AUG	2NOV	435.0	721.0	0	0	0	0	0	D		IIIII							
4520	ORDEN INICIACION OBRAS GRUPO "D"	25AUG	3OCT	403.0	751.0	0	0	0	0	0	D		IIIII							
6310	PROMOC DURANTE EJEC OBRAS GRUPO "B"	25AUG	21DEC	850.0	186.0	0	0	0	0	0	D		IIIII							
6410	PROMOC DURANTE EJEC OBRAS GRUPO "C"	25AUG	2APR	932.0	84.0	0	0	0	0	0	D		IIIII							
6510	PROMOC DURANTE EJEC OBRAS GRUPO "D"	25AUG	25JUN	1036.0	0.0	0	0	0	0	0	D		IIIII							

Apéndice 14
Pag. 2 de 7

TIME UNITS THIS REPORT = DAYS. X = COMPLETED DURATION D = DATA DATE C = CRITICAL DURATION I = NON-CRITICAL DURATION
 T = EXTENT OF TOTAL FLOAT N = NEGATIVE FLOAT F = EXTENT OF FREE FLOAT

THIS PAGE COVERS THE PERIOD FROM THE WEEK BEGINNING 29 JUN 81 THROUGH THE WEEK ENDING 4 JUL 82

SIST SEGUIM DE PROYECTOS-PMS*

NETWORK SCHEDULE APA1 (AP-0180) AGUA POTABLE RURAL IV

WEEKLY BAR CHART REPORT BY EARLY START

FOR ORGANIZATION CODE

WEEKLY BAR CHART REPORT

PROJ BASE DATE 30 AUG 81 DATA DATE 30 AUG 81

PROJ COMP DATE 23 OCT 85 PROJ DATA DATE 31 DEC 81

LOWR SPAN DATE 30 AUG 81 RUN DATE 29 JUL 81

UPPR SPAN DATE 23 OCT 85 RUN SEOU 0

PAGE 1 PART 2

WORK ITEM CODE	JL	AU	SE	OC	NO	DE	JA	FE	MA	AP	MY	JU	JL	AU	SE	OC	NO	DE	JA	FE	MA	AP	MY	JU
1000
1010
1700
1100
1110
2010
2100
2200
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3100
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3320
3330
6200
6300
6400
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2110
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2001
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4112
4114
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4400
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4420
4520
6310
6410
6510

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THIS PAGE COVERS THE PERIOD FROM THE WEEK BEGINNING 28 JUN 82 THROUGH THE WEEK ENDING 1 JUL 84

SIST SEGUIM DE PROYECTOS-PMS*

NETWORK SCHEDULE APA1 (AR-0180) AGUA POTABLE RURAL IV

WEEKLY BAR CHART REPORT BY EARLY START

FOR ORGANIZATION CODE

WEEKLY BAR CHART REPORT

PROJ BASE DATE 30 AUG 81 DATA DATE 30 AUG 81
PROJ COMP DATE 23 OCT 85 PROP DATA DATE 31 DEC 81LOWR SPAN DATE 30 AUG 81 RUN DATE 29 JUL 81
UPPR SPAN DATE 23 OCT 85 RUN SEQU 0

PAGE 1 PART 3

WORK ITEM CODE	JL	AU	SE	OC	NO	DE	JA	FE	MA	AP	MY	JU	JL	AU	SE	OC	NO	DE	JA	FE	MA	AP	MY	JU
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1010
1700
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2010
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3000
3100
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THIS PAGE COVERS THE PERIOD FROM THE WEEK BEGINNING 25 JUN 84 THROUGH THE WEEK ENDING 29 JUN 86

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NETWORK SCHEDULE APA1 (AR-0180) AGUA POTABLE RURAL IV

WEEKLY BAR CHART REPORT

WEEKLY BAR CHART REPORT BY EARLY START

PROJ BASE DATE 30 AUG 81 DATA DATE 30 AUG 81
PROJ COMP DATE 23 OCT 85 PROP DATA DATE 31 DEC 81

FOR ORGANIZATION CODE

LOWR SPAN DATE 30 AUG 81 RUN DATE 29 JUL 81
UPPR SPAN DATE 23 OCT 85 RUN SEQU 0
PAGE 2 PART 1

ITEM CODE	WORK ITEM DESCRIPTION	EARLY START	EARLY FINSH	REMAN DUR	TOTAL FLT	PCT CMP	3QR1 JL	4Q81 AU	4Q81 SE	1Q82 OC	1Q82 NO	1Q82 DE	2Q82 JA	2Q82 FE	2Q82 MA	2Q82 AP	2Q82 MY	2Q82 JU
	EJECUTAR ESTUDIOS DISENOS GRUPO "B"	14OCT	22DEC	435.0	671.0	0 .		D
	EJECUTAR ESTUDISO DISENOS GRUPO "C"	14OCT	22DEC	435.0	671.0	0 .		D
	EJECUTAR ESTUDIOS DISENOS GRUPO "D"	14OCT	22NOV	405.0	701.0	0 .		D
	ORDEN INICIACION OBRAS GRUPO "A"	24OCT	1JAN	435.0	661.0	0 .		D
	EJECUTAR OBRAS GRUPO "B"	24OCT	19FEB	850.0	186.0	0 .		D
	EJECUTAR OBRAS GRUPO "C"	24OCT	1JUN	952.0	84.0	0 .		D
	EJECUTAR OBRAS GRUPO "D"	24OCT	24AUG	1036.0	0.	0 .		D
	PROMOC DURANTE EJEC OBRAS GRUPO "A"	24OCT	21NOV	760.0	216.0	0 .		D
	EJECUTAR OBRAS GRUPO "A"	23DEC	20JAN	760.0	216.0	0 .		D
	TERMINAC Y CIERRE CONTABLE GRUPO "A"	16JUL	21MAR	615.0	216.0	0 .		D
	TERMINAC Y CIERRE CONTABLE GRUPO "B"	15AUG	20APR	615.0	186.0	0 .		D
	TERMINAC Y CIERRE CONTABLE GRUPO "C"	27AUG	31JUL	705.0	84.0	0 .		D
	EJECUTAR ESTUDIOS DISENOS GRUPO "A"	24SEP	22DEC	90.0	671.0	0 .		D
	TERMINAC Y CIERRE CONTABLE GRUPO "D"	19DEC	23OCT	675.0	0.	0 .		D
	TRAMITAR RECIBIR ULTIMO DESEMBOLSO	24SEP	23OCT	30.0	0.	0 .		D
	FIN DEL PROYECTO	23OCT	23OCT	0.	0.	0 .		D
	TERMINO DE LAS OBRAS	23OCT	23OCT	0.	0.	0 .		D

ME UNITS THIS REPORT = DAYS. X = COMPLETED DURATION D = DATA DATE C = CRITICAL DURATION I = NON-CRITICAL DURATION
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SIST SEGUIM DE PROYECTOS-PMS*

NETWORK SCHEDULE APA1 (AR-0180) AGUA POTABLE RURAL IV

WEEKLY BAR CHART REPORT BY EARLY START

FOR ORGANIZATION CODE

WEEKLY BAR CHART REPORT

PROJ BASE DATE 30 AUG 81 DATA DATE 30 AUG 81
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 UPRR SPAN DATE 23 OCT 85 RUN SEQU 0

PAGE 2 PART 2

WORK ITEM CODE	JL	AU	SE	OC	NO	DE	JA	FE	MA	AP	MY	JU	JL	AU	SE	OC	NO	DE	JA	FE	MA	AP	MY	JU
4102
4104
4106
4220
5300
5400
5500
6210
5200
5210
5310
5410
4100
5510
2999
3800
9999

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 THIS PAGE COVERS THE PERIOD FROM THE WEEK BEGINNING 28 JUN 82 THROUGH THE WEEK ENDING 1 JUL 84

END OF REPORT

Derivation of Demand Curves and Estimation
of Net Economic Benefits

A. Derivation of Demand Curves

As described in Chapter VII, demand curves were estimated on the basis of data from a 14 community sample of past project beneficiaries and from information supplied by SNAP engineers operating in field offices. This community sample was selected on the bases of geographic location and population size, in order to reflect the composition of the 55 community sample developed for the new program. Within the smaller sample, 8 of the 14 communities have metered water. For the metered communities, the consumer sample amounted to around 30% of the connected families. The annual and monthly consumption data for these families was obtained from the meters. In the other communities where water is measured through regulators, the annual consumption data were generally supplied for the system as a whole. For each of the metered communities, monthly tariff data were supplied for 1978-80. The tariff data corresponding to the marginal water price were put in constant 1978 values using the consumer price index. The CPI was comparable for all metered communities, since they are concentrated in the provinces of Buenos Aires and Santa Fe. The marginal price of water is taken as zero for the communities with regulators, since they pay only block rates.

The data for the 14 community sample produced 20 observations which were used in several regression equations, including the following logarithmic forms:

1. $\log Q = a + b \log P + c D$
2. $\log Q = a + b \log P + c D \log P$

where:

Q = Quantity of daily water consumed in liters per capita.

P = Marginal price per cubic meter of water.

D = Dummy variable distinguishing communities according to prevalence of bathrooms.

a, b, and c = Regression coefficients.

These regressions produced the following results presented in the same numerical order as above:

	<u>a</u>	<u>b</u>	<u>c</u>	<u>R²</u>
1. Regression coeff.	4.89	-.0008	.366	.51
t-statistics	(59.58)	(-.0357)	(3.858)	
2. Regression coeff.	5.03	-.07	.128	.76
t-statistics	(92.60)	(-3.364)	(7.015)	

As developed in the text (Chapter VII), the dummy variable corresponds to the availability of bathrooms. Communities in which a majority of consumers have bathrooms were assigned a dummy of 1, while the others were given a zero dummy. This is also an income dummy, since it is the higher income communities which have the high proportion of consumers with bathrooms.

The results of the first regression indicate the importance of the dummy variable but the coefficient for price is very small and has an unacceptable t statistic. Subsequently, the dummy variable was multiplied by log P. This produced the best results, as is evident from the coefficients and t statistics, as well as the R^2 .

The water consumption and cost data developed by the SNAP field engineers added 8 more observations to the data base. As discussed in the text, these data correspond to communities without public water systems. The combined data base, with 28 observations, improves the results from applying equations 2 and 3 above. The results are best for equation 3, however. These results are as follows:

	<u>a</u>	<u>b</u>	<u>c</u>	<u>R²</u>
Regression coeff.	5.18	-.17	.18	.88
t-statistics	(61.32)	(-10.707)	(10.10)	

When the above coefficients are substituted into equation 3, the price elasticity of demand drops to .01 for the communities with a dummy of 1. This is demonstrated as follows:

$$\begin{aligned}\log Q &= a - b \log P + D \log P \\ \log Q &= a - .17 \log P + (1)(.18 \log P) \\ \log Q &= a + .01 \log P\end{aligned}$$

Due to the above results, the gross benefits for the communities with a preponderance of houses with bathrooms were calculated only on the basis of resource savings. Although consistency requires the use of a price elasticity of demand of -.17 for the remaining communities, this elasticity was not used in the calculation of gross benefits. The reasons for this decision are presented in the text (see paragraphs 7.13 - 7.15). Instead, the parameters for calculating the gross benefit for group 2 are derived from the application of

regression equation 2 to the eight observations corresponding to the "without project" situation. This yields:

	<u>a</u>	<u>b</u>	<u>c</u>	<u>R²</u>
Regression coeff.	4.50	-0.46	0.653	0.94
t-statistics	(18.358)	(-3.517)	(2.65)	-

B. Estimation of Net Economic Benefits

The calculation of the present value of net economic benefits for the 29 subprojects in group 1 requires no further explanation since the gross benefits are confined to resource savings. The benefit-cost analysis for the group 2 communities, however, involves the use of a simulation model which solves for water price and consumption in each year in the process of calculating net economic benefits. This model evolves from that developed in 1980 for the economic analysis of the third stage of the rural potable water program in Chile. ^{1/}

The equation for estimating annual water consumption with and without the project emerges from the estimation of demand curves. This and the other equations comprising the model are presented below:

$$Q_t = a_t(P_t)^e \quad (1)$$

$$P_t = \frac{2 [-0.5 (I) + AOM_t]}{Q_t} \quad (2)$$

$$B_t = \int_{Q0_t}^{Q_t} P_t d Q_t \quad (3)$$

$$A_t = c Q0_t \quad (4)$$

$$BT_t = B_t + A_t \quad (5)$$

$$VPN = \sum_{t=1}^{20} \frac{BT_t - C_t}{(1 + .12)^t} \quad (6)$$

^{1/} The analysis of the Argentine rural water project was greatly facilitated by the pioneering work in the Chilean case.

where:

- Q_t = Quantity of water consumed in year t .
- P_t = Marginal water price in year t .
- a_t = Coefficient which will vary with the increases in the connected population.
- e = Price elasticity of demand.
- I_t = Initial subproject investment.
- AOM_t = Administration, operating and maintenance costs in year t .
- B_t = Gross benefit from increased water consumption in year t .
- QO_t = Water consumption without the project.
- A_t = Resource savings in year t .
- c = Marginal cost of water per m^3 .
- BT = Total gross benefits, year t .
- VPN = Present values of net benefits for the subproject investment.
- C_t = Total costs, year t .

The results of applying the simulation model are illustrated by the following table, which shows the output for one of the sixteen projects.

PROYECTO NUMERO 52

ELASTICIDAD PRECIO DE DEMANDA -0.4600

CAPACIDAD DEL SISTEMA ACTUAL(SIN PROYECTO) *** M3 ANUALES

INVERSION (US\$000) 8.200(MATERIALES)

AND:PRECIO: LCD :CANTIDAD: BENEFICIOS(000US\$) : COSTOS: BENEFICIO

	(C/M3)		(000 M3)	AGUA	AHORROS	TOTAL		NETO
1	0.42	134.17	10.068	5.710	6.897	6.304	42.220	-35.916
2	0.42	134.04	10.274	6.034	7.048	13.081	2.300	10.781
3	0.42	133.91	10.459	6.366	7.201	13.567	2.360	11.207
4	0.42	133.76	10.643	6.707	7.358	14.065	2.421	11.644
5	0.42	133.60	10.826	7.056	7.519	14.575	2.482	12.092
6	0.43	133.43	11.007	7.414	7.682	15.096	2.544	12.552
7	0.43	133.26	11.187	7.780	7.850	15.630	2.606	13.024
8	0.42	133.56	11.456	8.270	8.021	16.291	2.669	13.622
9	0.42	133.64	11.724	8.774	8.196	16.969	2.732	14.236
10	0.42	134.09	11.991	9.291	8.375	17.665	5.595	12.070
11	0.34	148.77	13.575	10.317	8.557	18.875	2.459	16.416
12	0.34	148.70	13.840	10.862	8.744	19.606	2.523	17.083
13	0.34	148.62	14.104	11.421	8.934	20.356	2.588	17.767
14	0.34	148.52	14.366	11.994	9.129	21.123	2.654	18.470
15	0.34	148.41	14.626	12.581	9.328	21.909	2.719	19.190
16	0.34	148.29	14.884	13.182	9.531	22.714	2.786	19.928
17	0.34	148.14	15.140	13.797	9.739	23.537	2.853	20.684
18	0.34	148.43	15.495	14.571	9.952	24.523	2.920	21.602
19	0.34	148.69	15.847	15.365	10.168	25.534	2.988	22.546
20	0.34	148.92	16.198	16.180	10.390	26.571	3.057	23.514
VALOR PRESENTE NETO=				60.126				