AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT DATA SHEET

1. TRANSACTION CODE: A (A = Add, C = Change, D = Delete) — Amendment Number: _____ — DOCUMENT CODE: 3

2. COUNTRY/ENTITY: BOLIVIA

3. PROJECT NUMBER: 940-0002.22 PD-AAU-126

4. BUREAU/OFFICE: BUREAU FOR PRIVATE ENTERPRISE

5. PROJECT TITLE (maximum 40 characters): 511582 Loan No. 511-W-068 IP - Bolivian Savings & Loan System

6. PROJECT ASSISTANCE COMPLETION DATE (PACD): MM 09 DD 30 YY 84

7. ESTIMATED DATE OF OBLIGATION (Under "B." below, enter 1, 2, 3, or 4): A. Initial FY 83 B. Quarter 4 C. Final FY 84

8. COSTS ($000 OR EQUIVALENT $1 =)

A. FUNDING SOURCE	FIRST FY B. FX	FIRST FY C. L/C	FIRST FY D. Total	LIFE OF PROJECT E. FX	LIFE OF PROJECT F. L/C	LIFE OF PROJECT G. Total
AID Appropriated Total	1050	1200	2250	1050	1200	2250
(Grant)	(50)	(200)	(250)	(50)	(200)	(250)
(Loan)	(1000)	(1000)	(2000)	(1000)	(1000)	(2000)
Other U.S. 1.						
Other U.S. 2.						
Host Country	-	1000	1000	-	1000	1000
Other Donor(s)						
TOTALS	1050	2200	3250	1050	2200	3250

9. SCHEDULE OF AID FUNDING ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE 1. Grant	C. PRIMARY TECH. CODE 2. Loan	D. OBLIGATIONS TO DATE 1. Grant	D. OBLIGATIONS TO DATE 2. Loan	E. AMOUNT APPROVED THIS ACTION 1. Grant	E. AMOUNT APPROVED THIS ACTION 2. Loan	F. LIFE OF PROJECT 1. Grant	F. LIFE OF PROJECT 2. Loan
(1)		250	2000	0	0	250	2000	250	2000
(2)									
(3)									
(4)									
TOTALS				0	0	250	2000	250	2000

10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each)

11. SECONDARY PURPOSE CODE

12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)

A. Code

B. Amount

13. PROJECT PURPOSE (maximum 480 characters)

To enhance the capability of the Bolivian Savings and Loan System to meet the water and sanitation requirements of Bolivia's poor.

14. SCHEDULED EVALUATIONS: Interim MM YY MM YY — Final MM YY

15. SOURCE/ORIGIN OF GOODS AND SERVICES: ☐ 000 ☐ 941 ☐ Local ☐ Other (Specify) _____

16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of a _____ page PP Amendment)

17. APPROVED BY

Signature

Henry H. Bassford

Title: Mission Director USAID/Bolivia

Date Signed: MM 08 DD 27 YY 83

18. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION: MM DD YY

AID 1350-4 (8-79)

INVESTMENT PROPOSAL

BOLIVIA WATER PROJECT
(Bolivia Savings and Loan System)

$2,000,000 LOAN
$250,000 GRANT

OFFICE OF INVESTMENT
BUREAU FOR PRIVATE ENTERPRISE

SEPTEMBER, 1983

BOLIVIA WATER PROJECT

(Proposal for a Self-sustaining
Potable Water and Sanitation
Systems Project)
(Bolivia)

LIST OF ABBREVIATIONS

BCB	Central Bank of Bolivia
BIAPE	The Inter-American Savings and Loan Bank
CACEN	Caja Central de Ahorro y Prestamo Para La Vivienda
DSA	Environmental Sanitation Division, Ministry of Health
GOB	Government of Bolivia
IDB	Inter-American Development Bank
MOF	Ministry of Finance
PA	Project account maintained by CACEN

Currency Rates

Official:	$1 U.S. = 211.68 Bolivian pesos
Free Market:	$1 U.S. = 400-800 Bolivian pesos

BUREAU FOR PRIVATE ENTERPRISE INVESTMENT PROPOSAL

FOR

BOLIVIA WATER PROJECT

EXECUTIVE SUMMARY

Purpose:

The proposed program will provide the Caja Central de Ahorro y Prestamo Para La Vivienda (CACEN) and the twelve associations that form the private sector Savings and Loan (S&L) System in Bolivia with the financial resources and technical assistance needed to diversify its portfolio into shorter term lending. Shorter term lending will permit the System to address the shelter related needs of low income homeowners and communities--particularly those in peri-urban areas, small towns and villages--for the installation of potable water and/or sanitation services. This diversification strategy is consistent with the recommendations contained in the recent loan agreement the S&L System executed with PRE/Housing (HG).

Discussion:

AID/PRE will lend $2 million at 10% interest per annum to Banco Central de Bolivia (BCB) for 12 years, including 5 years grace, so that it can relend the peso equivalent at the official exchange rate to CACEN on the same terms at 16% interest per annum. The spread BCB will earn on the relending will cover administrative costs and fees for assuming the exchange risk.

CACEN will on-lend to participating mutuales (S&Ls) at 20% for 6 years with a one-year grace period. The S&Ls will lend funds to their customers for 5 years at the highest market rate permitted by law. Project funds will be used by CACEN to finance two-thirds of each loan made by the S&Ls, with the remainder financed with the S&Ls own resources at the prevailing rate they set for their other diversified loans. As the project progresses, the S&L system will finance a larger percentage of each water and sanitation loan it makes with internally generated resources, beginning with 33% of each loan at the start of the project, to a formally designated benchmark of 50% in year 6, and reaching 100% of each loan by the end of the project. The amount lent to consumers in participating communities will depend on their repayment capacity, with the remainder of project costs contributed by the communities

themselves in cash or in kind (and from cooperating government agencies in the case of rural projects).

Since the S&L System's interest rates are variable, the interest rate to consumers will change, consistent with economic circumstances and the improved repayment ability of the borrowers over the next few years as the economy stabilizes.

A significant proportion of the materials and components needed in the construction of water and sanitation are not readily available in Bolivia and have to be imported. Since the availability of such items as PVC, galvanized iron pipe, pumps, meters is uncertain and subject to considerable price fluctuations, CACEN will establish an inventory of imported parts and materials for sale to the consumers borrowing from the S&Ls.

With inflation currently well over 100% in Bolivia, it is in the interest of CACEN that it establish an inventory as soon as possible so that the project can be viable right from the start. Hence, up to $1 million of the $2 million loan from AID to BCB will be drawn down for this purpose after conditions precedent under the loan have been met.

The level of inventory maintained subsequently will be much less than the $1 million purchased initially and will be based upon projected loan demand. Sales of materials acquired by CACEN during the life of the project will be made only in connection with consumer loans financed by the S&Ls for water and sanitation projects. Inventory sales to consumers will be at replacement cost (i.e. dollar replacement cost times the official exchange rate at the time of sale) plus a 30-33% markup in order to recover the costs of carrying the inventory and provide for a profit. Purchases from CACEN's inventory by the consumers will be paid for from the proceeds of water and sanitation loans made by the S&Ls. All profits on sales from the inventory, including any commissions on sales earned by the S&Ls, will accrue, during the life of the project, to CACEN and/or BCB. If the project is terminated for any reason, the inventory will be liquidated promptly and prudently in the local markets, and the proceeds used for repayment to BCB.

CACEN will establish separate project accounts (PA). Initially, the PA's assets will consist of the inventory; and an advance of grant funds by AID/PRE for operating costs and technical assistance (TA). The PA will be kept separate from CACEN's other resources throughout the life of the project until the AID loan is repaid to BCB. The security interest of the participating S&L in water and sanitation loans to consumers may be pledged to CACEN, if so agreed by the parties.

A grant of $250,000 will be made by AID/PRE to CACEN in order to help CACEN execute a Master Implementation Plan to enable the S&Ls to enter a new business. Once the program is operational, it is expected to generate significant reflows. Reflows to CACEN will permit it to continue loaning funds to the S&Ls after the line of credit from BCB is drawn down.

The projected flow of funds through the various intermediaries, resulting from this project, is summarized in the figure below. The remainder of this IP is organized as follows:

-- Section I contains a brief synopsis of the Bolivian economic condition and concludes that in spite of the current crisis, the longer term outlook is more hopeful.

-- Section II gives details of CACEN and the S&L System, showing them to be an experienced and capable organization which is expected to survive its current crisis (brought on by the massive devaluation) with the help of the recent $15 million PRE/Housing loan. The financial analysis of the proposed diversification by the S&L System into loans for water and sanitation, presented in this section shows that the new business is profitable and that it will assist in strengthening the S&L System financially.

-- Section III demonstrates that the loan demand for water and sanitation projects in the target market is very large and growing. Many Bolivian communities will be willing and able to afford the repayments on loans for water and/or sanitation.

-- Section IV gives a sketch of the Master Implementation Plan which the S&L System must adopt to successfully launch the proposed new venture (see also Annex A).

-- Section V cites the developmental impacts of the proposed PRE loan;

-- Section VI provides an outline of the environmental considerations;

-- Section VII contains a summary of the terms and conditions of the proposed loan; and

-- Section VIII, the final section, explains PRE's monitoring efforts in relation to this program.

As a result of the proposed loan, AID will have:

1) strengthened the private sector S&L System in Bolivia, technically and financially, having established it firmly in a new synergistic line of business that is consistent with the diversification strategy recommended in the PRE/Housing PP Loan Number 007;

2) created a novel mechanism, suitable for adoption in other countries, that utilizes the dynamic elements of the private sector to work in cooperation with government agencies and local muncipalities in order to achieve a public purpose i.e., improved health through cleaner water and better sanitation services;

3) provided over the life of the project potable water and/or sanitation services to a number of families greater than the (50,000) families currently receiving services under government programs; and

4) stimulated the private sector market for water and sanitation system supplies and installation, thereby encouraging the indigenous manufacture of selected items (currently imported) or the expansion of local manufacturing capacity.

Status of Negotiations:

The proposed project has been developed with the full cooperation of CACEN, which is ready to proceed as soon as the loan agreement is signed. The project has been fully discussed with the General Manager and staff of the Central Bank. Those conversations centered on the project's viability, the structure of interest rates, and foreign exchange requirements. BCB officials appreciate the benefits the proposed project will bring to Bolivia, i.e. construction of more water and sanitation facilities at less cost to the GOB, the provision of foreign exchange resources, and stimulation for the development of indigenous manufacturers of water and sanitation system materials and equipment. BCB has therefore expressed its full agreement with this loan proposal.

SECTION I: Bolivian Economic Situation

On November 6, 1982, the Siles Government took an initial set of economic measures which represented a significant step forward in putting Bolivia's economic house in order and in setting the stage for an eventual agreement with the IMF on an Extended Fund Facility (EFF). Previous military governments made partial efforts to address Bolivia's serious economic problems, but were unwilling, or politically unable, to adopt the measures necessary to start the economy on the road to recovery. When the Siles Government took power last October the economy was under severe stress. Moreover, the country's different interest groups all had conflicting ideas on essential preconditions for correcting the situation. In less than a month, the Siles Government took an initial set of far-reaching measures which, while implying an immediate deterioration in the purchasing power of the Government's main constitutent groups (urban factory workers, miners and campesinos), at the same time offered hope for economic recovery over the medium term. The economic package was embodied in over 30 decrees which ranged from complete de-indexation to the U.S. dollar of domestic loans and savings accounts (See Annex B for a full discussion of the Bolivian dollar indexation system as it existed up until recently) to major price hikes on a range of basic commodities.

Faced with a debt repayment schedule which could not be met and a potential debt service ratio over 80%, GOB initiated efforts to renegotiate outstanding balances due to Argentina, Brazil and a consortium of international banks.

Over $342 million was renegotiated with Argentina and Brazil, with the former agreeing to renegotiate an additional $250 million. GOB also succeeded in obtaining an extension until October 1983 of a moratorium on payments to a consortium of private banks. After an agreement with IMF is reached, it hopes to renegotiate $400 million of its total outstanding debt due to the private banks.

In addition, in order to prevent continued imposition of sanctions under Section 517 of the FAA (Brooke/Alexander Amendment), GOB has paid over $20 million in arrearages due to the U.S. Government.

In May 1983, a joint IMF/World Bank team completed a one-month visit to La Paz. Its purpose was to lay the groundwork for negotiation of an Extended Fund Facility (EFF) by discussing possible options GOB could adopt to cut the forecasted 1983 budget deficit, increase interest rates, and adjust the exchange rate. Discussions focused on the fiscal deficit. At the time of the team's arrival, the deficit was estimated at 192 billion pesos, or 16 percent of GDP. Initial agreement was reached with the GOB so that at least 70 billion pesos could be cut from the investment budget. Since the Central Bank could finance 50 billion pesos of the projected deficit from anticipated 1983 external resource inflows, the remaining shortfall of 72 billion pesos was to have been covered from increased taxes or further budget cuts to meet IMF requirements.

GOB also gave preliminary consideration to a system for indexing commercial domestic loans to various productive sectors which, if implemented, would result in positive rates of interest. Since the IMF team's departure, GOB has been trying to make final decisions with regard to the budget and other issues discussed with IMF which will enable an agreement to be signed this fall. As indicated previously, that agreement is expected to lead to a rescheduling of the $400 million of Bolivian debt held by its overseas bankers.

The economic measures taken by GOB to date are far from sufficient, and the widespread drought and flooding which have recently affected Bolivia have aggravated the already precarious economic situation. Under the circumstances, it is clear that measures must be taken not only to stabilize the economy in the short to medium-term but also to lay the groundwork for the most significant structural adjustment the country has had to go through since the Revolution thirty years ago. The Siles Government has been forced to make difficult decisions as a result of several years of economic neglect by previous governments. It has begun to do so, but more complex and sensitive issues lie ahead which must be resolved if the economy is to stabilize.

Given the limited progress to date, the financial analysis of the S&L System included in this IP is based on a relatively conservative forecast of Bolivian economic performance over the next several years. Specifically, the official exchange rate is projected to rise from an average of 220 pesos to the U.S. dollar in 1983 to 350 in 1984, and to go up by about 25% per year until 1986 and 10% per year thereafter, when the completion of the gas pipeline to Brazil is expected to increase Bolivia's export earnings by 50%. Further, as the U.S. and Western economies recover, the prices of Bolivia's

export metals are also expected to rise thereby alleviating the balance of payments crunch. Relatively high inflation is expected to continue in the near term, but decline as the IMF stabilization program proceeds.

Since the PRE loan is being made to GOB, its repayment will depend mainly on whether the Bolivian economy will have the required foreign exchange at its disposal when payments are due. Given the long-term repayment period of the PRE loan, it is not feasible to project balance-of-payment statistics to forecast whether adequate foreign exchange will be available to repay the PRE loan 6 to 12 years from now. The GOB's repayment capability will depend upon economic performance at that time. In the short to medium-term, it is clear that the GOB must take the measures necessary to adjust to Bolivia's new economic circumstances and to stabilize the economy.

The recent progress of the Government in initiating negotiation of a stabilization program with the IMF and in renegotiating outstanding debt represents a good start. It is assumed that the GOB will continue addressing the economic problems it faces and support private sector generated growth policies. As such, the repayment risk inherent in the proposed PRE loan is judged reasonable because:

1) Stabilization measures recommended by IMF, such as further devaluations and increases in the prices of hydrocarbons, transportation and utilities, are likely to be adopted soon by GOB, leading to further reductions in imports;

2) Debt due to the private banks is expected to be rescheduled in October;

3) The completion of the gas pipeline to Brazil is expected to increase foreign exchange earnings by as much as 50% from 1987 on; and

4) As the U.S. and Western economies recover, the prices and demand for metals will improve.

SECTION II -- The Savings and Loan System

1. Legal Status

The Bolivian S&L System is the country's most important private sector housing finance institution. The System is composed of the Caja Central de Ahorro y Prestamo para la Vivienda (CACEN), which was established in 1966 to serve as its Central Bank and regulatory agency, and twelve member savings and loan associations, with histories dating back to 1964. Since the early 1970s, the S&L System has been one of Bolivia's most respected institutions as demonstrated by its impressive growth record.

The S&L System is run on a nonprofit basis. CACEN as the regulator of the system is empowered to charter Savings and Loan Institutions and to regulate and audit their operations. Likewise, it provides mortgage insurance for all home buyers. In addition, CACEN trains all savings and loan personnel, conducts institutional advertising and other activities to improve the operational efficiency of the System.

The S&Ls are owned by their depositors and operate under the specific authority of the charters issued to them by CACEN. Each S&L member has a vote, and each operates independent of the others in the System.

2. Management

CACEN is run by 11 professional employees and a support staff of 11. It has a Board of Directors comprised of 4 people, which approves all CACEN operating policies and plans. Mr. Ernesto Wende F. has been President of the CACEN since its beginning.

Each S&L has a rotating board of directors comprised of 9 to 15 people.

3. Principal Activities

As of the end of the System's last fiscal year on December 31, 1982, the S&L System had generated $b 1.7 billion in savings in more than 131,000 accounts, up from $b 22.2 million in 7,700 accounts in 1970. Likewise, the total number of active loans as of December 31, 1982 was 23,434 with a total value of nearly $b 2.5 billion, up from 1,081 loans with a value of $b 58.8 million in 1970. The S&L System's savings

generation represents 11 percent of the total savings held by the entire banking system currently. In addition, the number of housing purchases it has financed represents over 60 percent of all such loans provided by public and private housing institutions combined.

During its 18 years of existence, CACEN has never defaulted on a loan, an enviable record given the unstable political and economic situation which has prevailed in Bolivia.

CACEN also establishes interest rates and lending policies, channels external loan resources to the S&Ls and is the System's principal point of contact with the GOB. Until the recently established requirement that loans to CACEN can be made only through BCB and the regulation requiring that its portfolio be no longer indexed to the U.S. dollar, the System had enjoyed almost complete lack of intervention by the GOB in its affairs. However with the start of the new HG loan, BCB has indicated that it will be monitoring the System's operations more closely, as it does in the case of other Bolivian private financial institutions.

AID has provided assistance to the S&L System at various stages of its development, beginning initially with a seed capital loan in 1965 to help establish the first S&L association in the country. Total AID assistance to date amounts to $ 22 million, which has been used to expand the System both geographically (the 12 S&Ls are located throughout Bolivia's nine departments) and in terms of clientele. In addition to the $22 million provided by AID, the System has also received financial assistance from the Inter-American Development Bank (IDB) and the Inter-American Savings and Loan Bank (BIAPE). In 1976, the IDB provided $2.1 million in emergency shelter relief to victims of a particularly severe flood in the Department of Beni. As part of a regional HG program begun in 1978 and administered by BIAPE, $3.0 million was channelled to CACEN for relending to member associations for low-cost shelter solutions in Bolivia's urban areas.

The S&L System has undertaken a considerable redirection of services toward lower income populations during the last five years. More than 70 percent of the System's total portfolio now serves families with modest and low incomes (at or below the 65th percentile), and a full 30 percent of its lending volume has provided benefits to families below the 40th percentile. AID's HG 005 Program for low-income families in rural areas added greatly to the momentum behind this shift to

a commitment favoring Bolivia's lower income population. The Program financed nearly 3,000 shelters ranging in cost between $500 and $4,500 for families whose incomes ranged from the 5th to the 35th percentiles.

Under the HG 005 Program, the S&L System also was successful in creating a nationwide outreach capability in rural areas, including the establishment of a new S&L association in Guayaramerin, Department of Beni, as well as several branch offices throughout Bolivia. Additional staff was hired by all the System's associations in order to promote the program and attend to the increasing housing needs of their low-income clientele. Low-cost construction designs were developed to make shelter more affordable to the target group, and locally produced materials and supplies were used to the greatest extent possible.

A map of Bolivia indicating the locations of the various S&L associations, together with their branch offices and locations of major projects is shown in Annex C.

4. Current Problems

Over a year ago, after the exchange rate began rising dramatically, and before it became clear that the GOB would begin taking measures to stabilize the economy, the S&L System was the first institution in Bolivia to take steps to adjust to a new economic environment. Since its inception, the System had been operating both its savings and lending activities at a fully readjustable dollar equivalency, given its high level of dollar liabilities. The S&L System's current dollar liabilities total $27 million. Until 1982, it and its member borrowers were jointly able to absorb losses due to declines in the value of the peso relative to the dollar. The 1982 devaluations of the peso, however, were of such a magnitude that they could not be fully passed on to borrowers. Faced with certain failure of the Systems to absorb the entire exchange rate loss or pass it on to the mortgage borowers, the managers determined that a major restructuring of operating procedures was necessary. The restructuring plan contained three main components: conversion from a dollar-adjustable to a peso-denominated system; diversification of lending; and a new $15 million HG loan. Given the drop in the value of the peso and the large dollar liabilities, it was determined that only a partial readjustment of both the assets and liabilities of the System's portfolio could be undertaken.

The Bolivian legislation which established CACEN requires it to consult with the BCB before taking any major financial action. Hence, a Commission with representatives from the BCB, Ministry of Finance, CACEN and USAID/B met in May 1982 to discuss measures that needed to be taken to maintain its viability. The Commission endorsed the restructuring plan, and Supreme Decree 19027, dated June 30, 1982, was issued which authorized the System to make a partial readjustment of both its assets and liabilities before converting from a dollar-readjustable system to one based on the peso. The Decree also authorized the S&Ls to diversify their lending operations into commercial credit for family-oriented and housing-related needs. Following the issuance of this Decree, CACEN directed the individual S&Ls to readjust both their assets and liabilities by 76 percent before converting to a variable interest rate*, peso-denominated system. The 76 percent adjustment was equivalent to the official devaluation of the peso from 25 to 44 to the dollar in effect at the time.

In order to inject more capital for the financing of a larger portfolio of housing loans, HG 007 $15 million Housing Guarantee was approved by AID. The HG loan will enable the system to increase its lending for housing activities with a higher spread which in turn is expected to generate enough revenue to the System in the aggregate with which to repay its dollar loans. The analysis included in the HG Project Paper 007 showed that with the HG loan, the diversificaion of lending, increased savings mobilization, and a guarantee from the BCB to provide CACEN with foreign exchange at the official rate for meeting its existing debt obligations, the S&L System may be expected to remain financially solvent for the foreseeable future.

5. Financial Data

The data illustrated on pp. II-5 thru II-12 as of December 31, 1982 indicate the status of the S&L System.

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* i.e., the interest rate on the unpaid principal may be subject to change by the S&L's, at their discretion, in response to changes in economic conditions.

NUMBER OF SAVERS

Year	No.
1968	4.896
1969	6.427
1970	7.739
1971	11.254
1972	11.965
1973	13.878
1974	24.505
1975	33.941
1976	42.725
1977	54.519
1978	74.113
1979	86.427
1980	104.250
1981	116.436
1982	130.724

NET SAVINGS

Year	No.	% Increase
1968	10950	
1969	16023	46%
1970	22279	39%
1971	30268	36%
1972	29132	4%
1973	35655	22%
1974	81712	29%
1975	98745	21%
1976	190183	93%
1977	296412	56%
1978	381321	29%
1979	550516	44%
1980	689837	26%
1981	832516	21%
1982	1713806	106%

NUMBER OF MORTGAGE LOANS

Year	No.	% Increase
1968	627	
1969	742	18%
1970	1081	48%
1971	1566	45%
1972	2107	35%
1973	2632	25%
1974	3357	28%
1975	3738	11%
1976	4032	8%
1977	4759	17%
1978	5380	13%
1979	6392	19%
1980	12429	28%
1981	16815	35%
1982	23434	39%

AMOUNT OF MORTGAGE LOANS

Year	Amount	% Increase
1968	32,697	
1969	39,102	20%
1970	58,538	40%
1971	81,358	39%
1972	118,654	45%
1973	179,702	51%
1974	264,876	45%
1975	312,716	20%
1976	363,939	25%
1977	497,178	26%
1978	635,492	28%
1979	802,233	26%
1980	1,254,856	27%
1981	1,597,761	27%
1982	2,530,008	50%

BALANCE SHEET

As of December 31, 1982

(In 000's of Bolivian pesos)

ASSETS	Dec. 1982	Dec. 1981
Cash and Banks	262,277	71,669
Loans to Associations	5,457,673	722,945
Interest and Accounts Receivable	340,940	36,348
Fixed Assets	31,661	12,087
Deferred Charges	3,295	5,470
Other Assets	283	2,462
Total Assets	6,096,129	850,981
LIABILITIES AND RESERVES		
Accounts Payable	184,716	23,908
Long term Loan payable	5,467,164	776,643
Other liabilities	7,630	4,743
Reserves and Surplus	436,619	45,687
Total Liabilities and Reserves	6,096,129	850,981

CONSOLIDATED BALANCE SHEET

As of December 31, 1982

(In Bolivian pesos)

ASSETS	1982	1981
Cash and Banks	756,508	215,206,719
Loans Receivable	1,446,827	962,564,398
Interest and Accounts Receivable	313,029	58,239,485
Fixed Assets	1,112,790	71,746,396
Other Assets	37,854	569,957,702
Deferred Assets	4,105,898	20,417,240
Total Assets	7,772,906	1,898,131,940
LIABILITIES AND RESERVES		
Free Savings	1,713,806	834,212,358
Accounts Payable	485,362	95,351,024
Long Term Loans	5,575,589	801,588,760
Other Liabilities	17,559	61,033,517
Reserves and Net Worth	(19,350)	105,946,281
Total Liabilities and Reserves	7,772,906	1,898,131,940

Income Statement - CACEN

(as of December 1982)

$b,000

Income	
Interest from S&L's	b$ 219,132
Interest from Bank Deposits	25,430
Insurance Premiums	2,383
Misc. Income	628
Gross Income	b$ 247,573
Expenses	
Interest	b$ 207,797
Administrative	16,906
Directors Compensation	1,212
Technical Expenses	527
Servicing of Insurance Accounts	644
Training	407
Auditing	108
Advertising	162
General Expenses	4,139
Depreciation	1,854
	233,756
Net Earnings	b$ 13,817

Consolidated Profit and Loss of
the Savings and Loan Association
(Including CACEN)

Income

Interest	b$ 458,794
Commissions	23,298
Other Income	302,268
Gross Income	b$ 784,360

Expenses

Interest	b$ 650,671
Administrative Expenses	96,743
Other Operating Expenses	35,732
Non Operating Expenses i.e. (Depreciation and Fx Losses)	205,762
Total	b$ 988,908

(Net Loss)	b$ 204,548

FIGURE 1

ASSUMPTIONS USED IN THE FINANCIAL ANALYSIS
(Figures in Millions of Bolivian Pesos)

YEARS	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Exchange Rate:	350	400	500	625	688	756	832	915	1007	1107	1218	1340
Int. Rate BCB-Cacen	.16	.16	.16	.16	.16	.16	.16	.16	.16	.16	.16	.16
Remain. Loan Term	GRACE	GRACE	GRACE	GRACE	GRACE	7	6	5	4	4	2	1
Int. Rate to Mutuales	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2
Loans to Consumers	350	350	300	300	300	400	400	400	400	400	400	400
Disbursmnts to Mutuales	231	231	198	198	198	198	198	198	198	198	198	198
Int. Rate Borrowers:												
a) PRE resources	.28	.28	.28	.28	.28	.28	.28	.28	.28	.28	.28	.28
b) Mutuals resources	.6	.6	.6	.6	.55	.5	.45	.4	.35	.3	.27	.25
Final Int. Rate Borrower (1)	.39	.39	.39	.39	.37	.35	.34	.32	.3	.29	.28	.27
Remain. Loan Term	5	4	3	2	1							
Begin. Inv.($MM)	1	1.01	.78	.54	.38	.23	.17	.14	.12	.12	.12	.12
Begin. Inv. MM pesos	350	406	389	336	260	176	138	130	121	133	146	161
Utilization of Inv.	175	175	150	150	150	200	200	200	200	200	200	200
Inventory Purchase	180	80	30	50	50	150	150	180	200	200	200	200
Inv.Adjust to $Chg	51	78	67	24	16	12	12	11	12	13	15	0
End Inv.($MM pesos)	406	389	336	260	176	138	130	121	133	146	161	161
End Inv.($MM)	1.02	0.78	0.54	0.38	0.23	0.17	0.14	0.12	0.12	0.12	0.12	0.12
Inv. Sales	228	228	195	195	195	260	260	260	260	260	260	260

(1) Assumed interest rate for illustrative purposes.

FIGURE 2

CAJA CENTRAL INCOME STATEMENTS
(Figures in Millions of Bolivian Pesos)

Income	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Interest Earned	23	65	94	111	120	121	119	119	119	119	119	119
Inventory Sales	228	228	195	195	195	260	260	260	260	260	260	260
Interest on Cash	0	1	1	1	15	49	59	63	68	69	75	85
Total Income	251	294	290	307	330	430	438	442	447	448	454	464
Expenses												
Interest Paid	77	106	114	114	114	114	98	81	65	49	33	16
Warehousing Expenses	28	32	23	20	16	10	8	8	7	8	9	10
S&L's Commissions	23	23	20	20	20	26	26	26	26	26	26	26
Admin. Expenses	28	33	16	18	18	18	18	18	18	18	18	18
Cost of Inventory	175	175	150	150	150	200	200	200	200	200	200	200
Total Expenses	331	369	323	322	318	368	350	333	316	301	286	270
Operating Profit (loss)	-80	-75	-33	15	12	62	88	109	131	147	168	194
Revaluatione of Inventory	51	78	67	24	16	12	12	11	12	13	15	8
Net Profit (losses)	-29	3	34	9	28	74	100	120	143	160	183	194

FIGURE 3

SAVINGS & LOAN (MUTUALES) INCOME STATEMENTS
(Figures in Millions of Bolivian Pesos)

Income	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Interest Earned	64	173	245	283	296	306	320	327	325	316	302	238
Comm. Sales	23	23	20	20	20	26	26	26	26	26	26	26
Int. on Cash Balance	0	0	0	24	87	167	223	288	357	419	463	517
Total Income	87	196	265	327	403	499	569	641	708	761	791	781
Expenses												
Interest Paid	23	65	94	111	120	121	119	119	119	119	119	119
Admin. Expenses	18	25	29	35	41	52	60	68	76	84	92	100
Total Expenses	41	90	123	146	161	173	179	187	195	203	211	219
Profit (loss)	45	106	142	181	242	326	390	454	513	558	580	562

FIGURE 4

CAJA CENTRAL CASH FLOWS
(Figures in Millions of Bolivian Pesos)
$

Income	Opening 1984	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Dist. f/BCB	350	261	102										
Grant D f/AID		35	40										
Int. f/loans		23	65	94	111	120	121	119	119	119	119	119	119
Princp. Repay.		0	46	92	132	172	211	205	198	198	198	198	198
Inv. Sales		228	228	195	195	195	260	260	260	260	260	260	260
Int. on Cash		0	1	1	1	15	49	59	63	68	69	75	85
Previous Cash		0	3	3	4	43	149	198	237	290	345	416	508
Tot. Income	350	547	485	385	443	545	790	841	877	935	991	1068	1170
Outlays													
Int.on Long Term Debt		56	56	56	56	56							
Int. Credit Line		21	50	58	58	58	114	98	81	65	49	33	16
Repay to BCB		0	0	0	0	0	102	102	102	102	102	102	101
Inv. Purchases	350	180	80	30	50	50	150	180	180	200	200	200	200
Disb. to S&L's		231	198	198	198	198	198	198	198	198	198	198	198
Adm. Cost		28	33	16	18	18	18	18	18	18	18	18	18
Warehouse Cost		28	32	23	20	16	10	8	8	7	8	9	10
Tot.Outlays	350	544	482	381	400	396	592	604	587	590	575	560	543
Cash Balance	0	3	3	4	43	149	198	237	290	345	416	508	627

FIGURE 5

SAVINGS & LOANS MUTUALES--CASH FLOWS
(Figures in Millions of Bolivian Pesos)

Income	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Disbursement from Cacen	231	231	198	198	198	198	198	198	198	198	198	198
Interest from Loans	64	173	245	283	296	306	320	327	325	316	302	238
Princp. Repayment	35	105	170	230	290	325	335	350	370	390	400	400
Interest on Cash	0	0	0	24	87	167	223	288	357	419	463	517
Previous Cash	0	-61	-38	60	217	455	667	959	1337	1794	2316	2870
Total Income	330	448	575	795	1068	1451	1743	2122	2587	3117	3679	4223
Outlays												
Interest to Cacen	23	65	94	111	120	121	119	119	119	119	119	119
Repayment to Cacen	0	46	92	132	172	211	205	198	198	198	198	198
Disb. to Borrowers	350	350	300	300	300	400	400	400	400	400	400	400
Admin. Costs	18	25	29	35	41	52	60	68	76	84	92	100
Total Outlays	391	486	515	578	633	784	784	785	793	801	809	817
Cash Balance	-61	-38	60	217	455	667	959	1337	1794	2316	2870	3406

FIGURE 6

CAJA CENTRAL BALANCE SHEETS
(Figures in MIllions of Bolivian Pesos)

Assets	Open 1984	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Cash Balance	0	3	3	4	43	149	198	237	290	345	416	508	627
Portfolio	0	231	416	522	588	614	601	594	594	594	594	594	594
Inventory	350	406	389	336	260	176	138	130	121	133	146	161	161
Total Assets	350	640	808	862	891	939	937	961	1005	1072	1156	1263	1382
Liabilities													
Long Term Loan	350	611	713	713	713	713	611	509	407	305	203	101	0
Commision Reserve		23	46	66	86	106	132	158	184	210	236	262	289
Retained Earnings		-29	-26	8	17	45	119	219	339	482	642	825	1019
Grant		35	75	75	75	75	75	75	75	75	75	75	75
Total Liabilities	350	640	808	862	891	939	937	961	1005	1072	1156	1263	1382

FIGURE 7

SAVING & LOAN MUTUALES BALANCE SHEETS
(Figures in Millions of Bolivian Pesos)

Assets	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Cash Balance	-61	-38	60	217	455	667	959	1337	1794	2316	2870	3406
Portfolio	315	560	690	760	770	845	910	960	990	1000	1000	1000
Commissions Receivable	23	46	66	86	106	132	158	184	210	236	262	288
Liability												
Long Term Debts	231	416	522	588	614	601	594	594	594	594	594	594
Retain. Earnings	46	152	294	475	717	1043	1433	1887	2400	2958	3538	4100
Tot. Liability	277	568	816	1063	1331	1644	2027	2481	2994	3552	4132	4694

FIGURE 8

CAJA CENTRAL FINANCIAL RATIOS
(Figures in Millions of Bolivian Pesos)

YEARS	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
a) Net Profit/Tot. Income)	-11.55	1.02	11.72	2.93	8.48	17.21	22.83	27.15	31.99	35.71	40.31	41.81
b) Net Profit as % of sales (Sales-Inv. Cost-warehousing expenses- comm. to Mutuales)/Sales %	0.9	-0.9	1.0	2.6	4.6	9.2	10.0	10.0	10.4	10.0	9.6	9.2
c) Return on Equity (Net Profit/Equity) (%)	-483.33	6.12	40.96	9.78	23.33	38.14	34.01	28.99	25.67	22.32	20.33	17.73
d) Liquidity Ratio (Cash+Invt./Long Term Debts)	0.67	0.55	0.48	0.42	0.46	0.55	0.72	1.01	1.57	2.77	6.62	-
e) Debt Service Coverage (Cash Bal.+Int. Paid + Prin. Repy/Intr. Pd. + Prin. Repymt.) Ratio	1.04	1.03	1.04	1.38	2.31	1.92	2.19	2.58	3.07	3.75	4.76	6.36
f) Long-term Risk (Long-term Debt/ Equity) Ratio	101.83	14.55	8.59	7.75	5.94	3.15	1.73	0.98	0.55	0.28	0.11	-

FIGURE 9

SAVINGS AND LOAN MUTUALES FINANCIAL RATIOS
(Figures in Millions of Bolivian Pesos)

YEARS	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
a) Net Profit/Tot. Income)	53.0	54.0	54.0	55.0	60.0	65.0	69.0	71.0	72.0	73.0	73.0	72.0
b) Return on Equity (Net Profit/Equity) (%)	100.0	10.0	46.0	38.0	34.0	31.0	27.0	24.0	21.0	19.0	16.0	14.0
c) Liquidity Ratio (Cash/Long Term Debts)	-0.3	-0.1	0.1	0.4	0.7	1.1	0.6	2.2	3.0	3.9	4.8	5.7
d) Debt Service Coverage (Cash Bal.+Int. Paid + Prin. Repy/Intr. Pd. + Prin. Repymt.) Ratio	-1.6	0.7	1.3	1.9	2.6	3.0	4.0	5.2	6.7	8.3	10.0	11.7
e) Long-term Risk (Long-term Debt/ Equity) Ratio	5.0	2.7	1.8	1.2	0.9	0.6	0.4	0.3	0.2	0.2	0.2	0.1

6. Financial Feasibility of the Proposed Venture

The highlights of the S&L System's financial plan for entering the proposed new marketplace are summarized below.

The assumptions used in the financial analysis (see fig. 1 which follows p. II-15) are that the Bolivia peso is 350/US$ in 1984 and declines to 400 in 1985, 500 in 1986, 625 in 1987 and 10% per year thereafter. The interest rate to CACEN is fixed for the term of the loan at 16% and CACEN will fix the rate at 20% for the S&Ls. The amount of loans made each year is set more by the constraints on available funds than market demand and is assumed to stay stable in nominal terms, falling from 350 million pesos to 300 million pesos in yrs. 3-5 and rising to 400 million from year 6 at which time the S&L's share 50-50 in financing the consumers. The interest rate to borrowers will be the highest market rate permitted by law.

Inventory is sold only to borrowers for the W&S projects and the inventory is sold at wholesale replacement cost + a 30-33 % markup which includes a 10% commission (deferred till 1996) for the S&Ls. The purpose of the initial large inventory of $1 million with a turnover in 1984 of .5, is to seek protection from projected devaluations and is reduced over the years as the economy stabilizes to a turnover of between 1.65 and 1.24.

The S&Ls receive funds from CACEN at 20%. These are blended with their own funds and are expected to earn the highest market rate for consumer loans permitted by law. Loans to consumers are for 5 years. The interest rate to the consumer will vary to some extent with the market interest rates set by the S&Ls on their own funds. Interest rates are expected to decline over the years as the economy stabilizes.

The analysis looks upon the proposed W&S loan program incrementally, as a new line of business analyzing it in isolation, since it is only a small part of CACEN's and S&L's total portfolio, which have been analyzed adequately in the PRE/Housing project paper. (The financial assumptions in this project, however, have been reviewed and found consistent with the Housing Guarantee project paper and the recommended strategy for CACEN and the S&L System.)

Initially, CACEN will obtain up to $1 million of the $2 million AID/PRE facility to finance the acquisition of capital goods in the form of a materials inventory. The sources of funds for

consumer loans come from the peso line of credit established with the remaining $1,000,000 and the S&L's own funds (in the appropriate ratio). The project is expected to be fully operational in 1984 and the line of credit fully used up within the first two years, with the reflows on the loans, profits from the inventory and cash throw-off from reductions in inventory being sufficient to sustain the project.

The charts on the conclusion of this section demonstrate the financial results of the proposed diversification, i.e

Figure 1	Explains the data and the financial assumptions used in the analysis
Figure 2	Outlines the Caja Central (CACEN) Income Statements
Figure 3	The Savings and Loan Income Statements
Figure 4	CACEN Cash flows
Figure 5	The Savings and Loan Cash flows
Figure 6	CACEN Proforma Balance Sheets
Figure 7	The Savings and Loan Proforma Balance Sheets
Figure 8	Financial Ratios for CACEN
Figure 9	Financial Ratios for the Savings and Loan

As shown in the income statements (figs. 2 & 3), both the sponsors expect the project to be highly profitable despite conservative cost and sales assumptions on their part. The financial operations of the S&Ls are unaffected directly by devaluations and CACEN's profits from the inventory of imported materials increases with the size of the devaluation. Increases in interest rates also increase profits for the S&Ls, assuming that the amount of loans (e.g., 350 million pesos in 1984) can be placed.

Net profit as a Percent of Total Income increases steadily from 1% to 42% in 1995 for CACEN. For the S&Ls profitability is very high right from the start, i.e., 53% in 1984, and 72% by 1995. (1)

Return on Equity for both the sponsors is also very healthy, declining gradually from the peaks in early years, with the projected drop in interest rates, to a return of 18% for CACEN and 14% for the S&Ls in 1995.

---

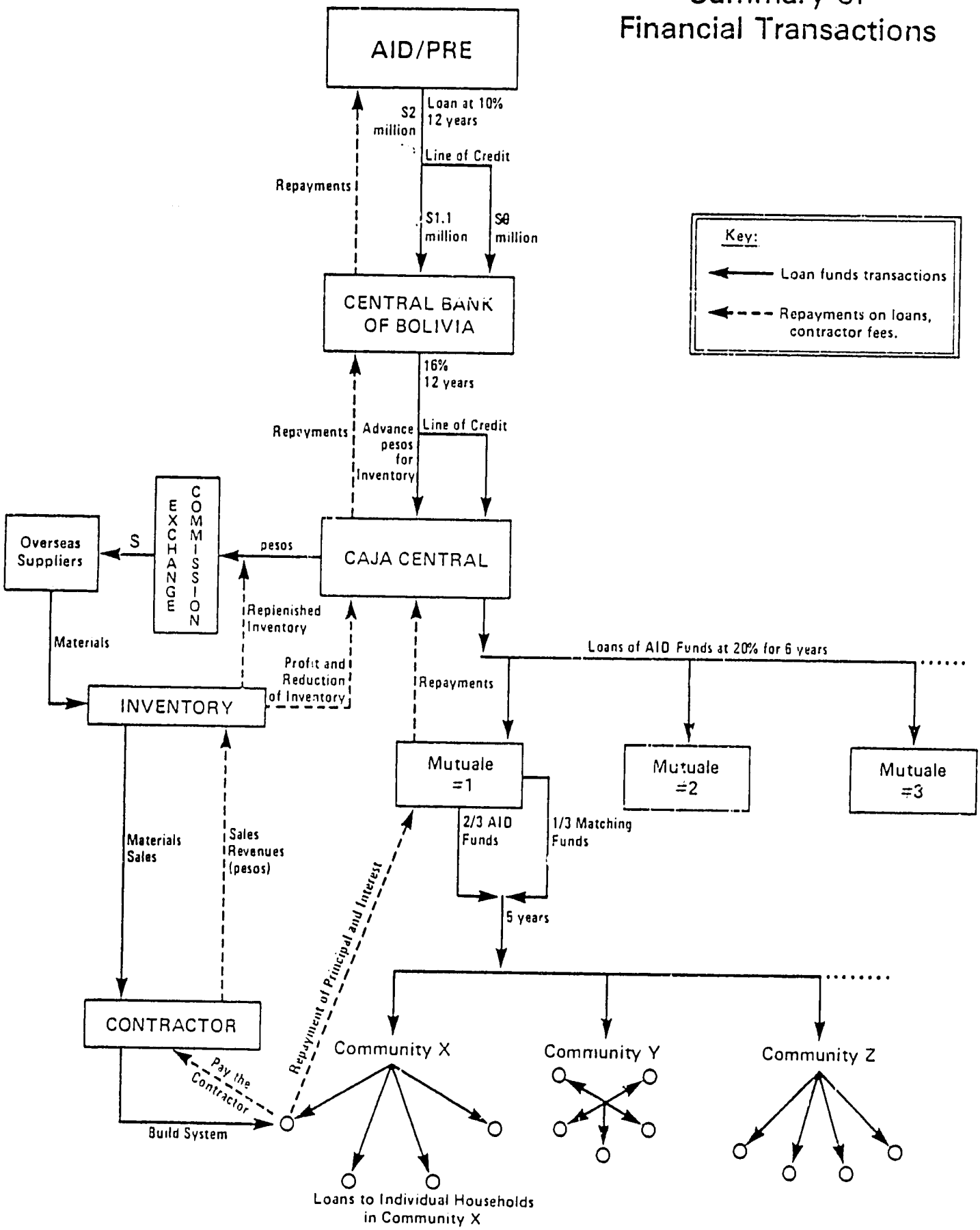
(1) An interest rate of 39% on consumer loans has been assumed for illustrative purposes.

The proposed project is not only profitable but does not call for large investments in cash by either of the sponsors (see figs. 4 and 5). Even though the S&Ls provide only 1/3 of the loan amount (and an equal amount from year 6), the reflows from the loans ensure that the S&L's only need to make a cash investment of 60 million pesos in the first year. From then on, the net cash flows are positive each year in spite of the inflation in administrative costs assumed. CACEN acts merely as a financial intermediary and does not experience any negative cash flows. Consequently, both the sponsors will easily be able to make their repayments of principal and interest on the basis of their cash flows. Debt coverage ratios (see figs. 8 and 9), exceed 2 for CACEN and 3 for the Mutuales in the critical year after the grace period when the first principal payment to BCB is due and the ratios continue to rise from then on.

Both the sponsors are expected to retain the earnings in this new line of business and continue operations after the AID/PRE loan is paid off. Because of the healthy income and cash flows, the debt/equity ratio declines rapidly for both CACEN and the S&L's. Indeed for CACEN, the ratio of (cash and inventory) to long-term debt never drops below .42.

Over the life of the project the S&Ls will have made loans worth more than $6 million to a total of approximately 50,000 families and established themselves in a new line of business, i.e. short term lending for water & sanitation systems that is synergistic with their existing portfolio of housing-related loans. The financial analysis is not very sensitive to differing rates of interest and devaluations since they can be readily passed on to the users. However, as costs escalate, fewer people will be able to afford the loans for the W&S systems (even if incomes rise to some extent). However, the market for W&S system loans is very large as will be demonstrated in the next section.

Summary of Financial Transactions



SECTION III: Target Markets

1. Potential Market

The potential market for the water and sanitation projects are those home owners in rural and peri-urban communities who are willing to act as individual borrowers, in concert with their neighbors, to obtain loans to finance the installation of potable water and sanitation facilities for their use. This includes communities which do not have water or obtain their water currently at considerable cost or inconvenience; i.e., communities served by private vendors, communities which obtain water from streams and rivers at a considerable distance, and communities where people have to walk long distances to a public tap or well. In short, all communities that do not have water faucets in individual homes. Loans for sanitation systems will only be offered in conjunction with loans for water systems, except in the few communities that may need only sewer connections.

The need for water and sanitation (W&S) systems in Bolivia is large and growing. Based on the 1980 census, 3.5 million people did not have access to potable water and 4.5 million people did not have excreta disposal facilities. The total potential market for water and sanitation systems was therefore close to 1 million homes in 1980, based on an average family of 4.5 persons.

According to PLANASBA estimates, since 1976, the number of people served by water (either inside the home or by public taps) has been growing at a rate that is only 1.5% of the population growth. Since the population growth rate for Bolivia is estimated to be about 2.6%, PLANASBA estimates imply that about 32,000 new homes per year are without water. Apart from the limited number of heavily subsidized programs, there are no private institutions providing low cost loans to consumers within a community, for the installation of W&S systems.

The major costs of the construction of W&S systems are fixed and these have to be allocated amongst the individual homes benefiting from the service. Hence, private sector lending to individual homes requires that there be enough subscribers within a community to keep the cost of the system per household affordable.

By providing affordable loans at reasonable interest rates to individual families and adopting a strategy of marketing to entire communities that have been carefully selected, the S&L System expects to capture a significant share of the untapped potential market for providing consumer loans for sanitation systems.

2. Market Segments

Under this program, the S&Ls will make loans to individual households in participating communities for a broad range of potable water and sanitation services. The types of systems for which consumer financing will be provided by the S&L's are as follows:

I. Areas without adequate water

(a) Peri-Urban Areas

Inhabitants of "barrios" on the outskirts of cities need house connections to the city water mains for potable water. All of the major cities in the country have water supply systems serving their central areas. Although ample water is available (or can be made available) in most cities, the existing systems have not been extended to the outlying barrios of the cities. These peri-urban barrios are currently served by a few (often distant) public fountains or, in many cases, exclusively by private water vendors (from trucks). Thus, a major market for consumer lending exists for the extension of the city system to these barrios and the provision of house connections to individual homes. These extensions must be made with the full cooperation and approval of the responsible municipal water authorities who will oversee the construction and be responsible for the maintenance. Peri-urban systems may serve the whole barrio or selected streets in the barrio, as long as the critical number of subscribers are obtained to make the system affordable. The minimum service level desired by a family may be a single yard faucet. In the few cases where extensions of the city system are not feasible, then one of the rural systems described below may be viable.

The people in the "barrio" may also desire connections to the city sewer lines (or septic tanks, if the former is not possible) if they desire indoor plumbing. However, these systems are expensive and most households are likely to choose

pit-latrines or pour flush toilets for their sanitation needs. Since a community is unlikely to be able to afford sewer connections concurrently with the installation of water connections, and water is a higher priority for most families, sewer connections will not be offered, as a rule, in areas without water.

b) Rural Areas

In rural areas, the need is usually for complete water systems rather than extensions of existing systems, although in a few larger villages, there may be sufficient demand for improvements and extensions. Depending on the geology, the type of water source available, accessibility of the village by land transportation, and availability of public funds, one of the following types of systems should meet the needs of a village or town for potable water:

(i) Surface source/gravity systems in villages where a spring, stream or a reservoir is located at a level higher than the village.

(ii) Surface source/pumped systems in villages where a spring, stream, or a reservoir is available but the water has to be pumped to an elevated tank for distribution to the village.

(iii) Hand dug wells in villages where underground water exists at a shallow depth.

(iv) Drilled wells in villages where the above alternatives are not available and underground water is available only at a deeper level.

While the standard household service will be a single yard faucet per household, a cluster of houses may share a faucet (for a 10-20% cost savings). Other families may be able to afford multiple faucets inside the home.

Because of the cost involved, in relation to incomes in the rural areas, the target market selected by the S&L's will be villages where surface source/gravity systems or hand dug wells are feasible. The systems also have the added benefits of low maintenance and operating costs, practically no down-time, and they will not require the importation of expensive components such as pumps, reinforced concrete and galvanized iron for the elevated tanks.

For sanitation, some families will be able to afford septic tanks, but most families will consider either pit latrines or pour flush toilets. In those villages where a risk of seepage and contamination of the water source exists, the construction of sanitation facilities that conform to the environment will be required within the package of services offered to the consumers.

In rural areas, it will be possible to cooperate with government-financed programs in order to expand their impact or to reduce costs for the S&Ls borrowers. Rural village systems supported under government programs, such as those financed by the USAID Rural Sanitation Project (No. 511-U-058) require communities to contribute 30%-40% of the value of the project before construction can be considered. While much of a community's contribution can be met by providing in-kind support, usually labor and locally available construction materials, many communities find that they simply cannot raise the required contribution. Under this project, the S&L's will be able to extend loans to individuals in communities so that collectively, they may meet the community contribution requirement.

From the point of view of government water authorities, loans available to community members from the S&Ls will allow for the construction of a greater number of systems with their limited program budgets.

II. Areas with adequate water systems

No marketing will be conducted in communities believed to have adequate water systems. Although more people in Bolivia are without sanitation services, the S&L system will not try to provide financing for only sanitation systems, except in the few peri-urban communities that may desire and can afford connections to the city sewer lines. This is so because sanitation is not as high a priority in most low income communities and marketing of loans for sanitation would be more difficult. Furthermore, the optimum alternatives for most low income communities, i.e., pit-latrines or pour flush toilets, are too low in cost, making them unsuitable as the sole basis for consumer loans.

3. Size of the Target Market

For the purpose of selecting a target market, the market segments outlined above have been narrowed further in order to make them more operational. For example, the S&Ls will not market the program in:

(i) Localities where the median family income is above the 70th percentile, since these families are likely to already have water connections.

(ii) Localities where the median family income is below 6,000 pesos per month (unless the Government or some other institution is subsidizing the cost partially), since they are unlikely to be able to afford the cost of the system.

(iii) Villages with populations below 500, since the costs of the system per household and the marketing costs would be too high.

(iv) Villages and towns not accessible easily, or entail high transportation costs.

(v) Inner cities, since they already have water.

(vi) Mining towns, because the mining corporation generally installs the systems.

The target markets were selected by screening a list (prepared by PLANASBA, a GOB task force on long range planning for water and sanitation) of potential market communities that do not have water, after considering the above factors and the growth in population. The target markets selected by CACEN may be broken up into 5 segments.

a) Urban market:
   (1) Major cities
   (2) Minor cities

b) Rural market:
   (3) Villages from 1,000-2,000 inhabitants.
   (4) Villages from 500-1,000 inhabitants
   (5) Localities scheduled to receive subsidies for projects from Government agencies or international donors in the next few years.

The size of the various market segments are presented in Table I, p. III-6. The size of the market segments are based on projections of the 1976 census data. To the number of homes without water in 1976 in each selected locality, one adds the increase in the number of homes due to population growth (including migration from rural areas) and subtracts the number of systems installed since 1976 based on GOB supplied data, in order to obtain the number of homes without water in 1983. For further details and estimates for each locality or market segment - see Annex D.

Table I
TARGET MARKET SELECTED BY CACEN

Market Segment	Type	Location	No. of homes without water connections in 1983	No. of homes without water in 1983	Growth Per Year
a) 8 major cities	Urban	National	221,593	77,045	
b) 55 minor cities	Urban	National	42,986	9,110	
I. Subtotal Urban			264,579	86,155	16,000/yr*
c) 24 villages of 1-2000 people	Rural	5 Depart.	-	9,600	240/yr**
d) 91 villages of 500-1000	Rural	5 Depart.	-	18,200	450/yr**
II. Subtotal Rural				27,800	650/yr**

III. Government Co-Financing Projects

The localities selected in arriving at the above estimates exclude for the most part those localities in which the government or an external donor has planned a project. For example, the USAID rural sanitation project for 200 villages (with population less than 800 people) in Cochabamba and Chuquisaca, has a budget of $4 million; CORPAGUAS is requesting a budget of $2.8 million in 1984 and has plans for 17 communities of which it expects to be able to do only 8 even if its budget request is met, unless it can co-finance them with private sector funds from the S&L's. If a 50-50 co-financing arrangement is made, say with CORPAGUAS, then the potential market for co-financing loans with CORPAGUAS alone is = 1 billion pesos in 1984.

* The 16,000/yr growth rate is based upon the assumption that population growth will account for 32,000 new families per year and one-half of these families will be in urban areas.

** Includes projected growth rate in the selected villages only, it does not include the addition of new villages that may become potential candidates in the future. Growth rate per year for villages in segments (c and d) are based on number of homes in the selected villages in 1976 times the average population growth rate.

4. Market Demand and Affordability

A. Amount of Funds Needed per Household

The cost of various types of W&S systems for which financing will be offered are given in Annex F. If we assume that the S&Ls will be willing to make loans up to 100% of the project cost, to qualified borrowers, then the amount of loans needed by households for the more common W&S systems the S&L's expect to provide financing for are:

Table II. System Costs

		1984 cost/home*
I Urban Market:	1. House connections to lines:	42,000 pesos
	2. House connections & latrines/pour flush toilets:	52,000 pesos
	3. Sewer connections:	64,000 pesos
II Rural Market:	1. Surface/gravity system, village of 1,000 people**	50,000 pesos
	2. Surface/gravity system and latrines in a village of 1,000 people**	60,000 pesos
	3. Hand-dug wells and latrines	55,000 pesos
III Government Markets:	In the case of government co-financing at subsidized rates, S&L financing needed may be 3/4 to 1/2 of the cost per house indicated above.	

Estimates of the total potential for loan demand based on the above cost figures, are shown in Table III, pp. III-9 - III-10. The estimates of potential loan demand in Table III were obtained by multiplying the number of homes in each market segment by the cost (given in Table II) corresponding to the type of system expected to be installed in that segment. Hence, for example, we know from Table I, that 265,000 homes in the (8 major and 35 minor) cities do not have water connections. We also know that most of the growth in the cities has been occuring, partly due to rural-urban migration, on the outskirts of cities, i.e. "zonas marginales".

* Assumes 320 pesos to the dollar and 33% markup on imported materials by CACEN.

**Costs for villages of 500 are about 20% higher and those for 2,000 inhabitants are 20% lower.

Consequently, we assume that 70% of homes without home connections are located in the barrios which form our potential market. In urban areas the cost of a water connection from Table II is $b 42,000 and that of a connection and a latrine is $b 52,000. If we assume that 50% of the households will install only water lines ($b 42,000) and 50% will install water lines and pit latrines ($b 52,000) we obtain an average loan per household as $b 47,000. Hence the total potential urban market is:

265,000 homes x .7 (% homes in barrios) x 47,000 = $b 8,718,500,000.

Table III (pp. III-9 - III-10) also assumes that the S&Ls will not be financing both sewer and water connections simultaneously given limited consumer incomes. It also assumes water will take precedence over sewer construction and therefore only homes with water connections will be interested in sewers. The estimated 108,000 homes with water in 8 major cities is based upon projections of 1976 census data which estimate that there are 406,000 homes in these cities--221,000 homes without water connections and 77,000 homes without any water. The 108,000 homes with water is therefore based upon the total number of homes less an estimate of homes without water. It is further assumed here that only 10% of the homes with water will be in the "zonas marginales" and interested in a sewer connection.

To obtain the growth rates in the target market due to population growth we take the growth rate in the number of homes in each market segment given in Table I and multiply it with the average loan per household to obtain the growth in the potential loan demand in each segment. Thus, the growth rate in the urban market is 16,000 homes/yr. x 47,000 pesos = $b 752,000,000. In this example, we have made the added assumption that practically all of the urban growth rate occurs in barrios. In the rural market, only the population growth in the villages selected as targets have been considered. This is conservative because as population increases or the economy improves, additional villages may become attractive as likely target markets. Further, if the projects in rural areas all become eligible to receive additional subsidies from Departmental Development Corporations or other sources, the total market will increase. This will be true even though the size of each loan may be less by the amount of the subsidy..

Table III: Potential Loan Demand

I. - 8 major cities and 55 minor cities:		
1. Among homes without individual connections: 265,000 x .7 (% of urban homes located on the outskirts in barrios) x 47,000 pesos	$b	8,718,500,000
2. Among homes/barrios without water: 86,000 x .7 x 47,000 pesos	$b	2,829,400,000
3. Sewer line connections (8 major cities only): 108,000 (homes with water connection) x .1 (% in barrios) x 64,000 pesos	$b	691,200,000
Urban Market Potential in 1983	$b	12,239,100,000
II. Rural Market		
1. 24 villages of 1-2,000 population in 1976: 9,600 x 50,000 pesos	$b	480,000,000
2. 91 villages of 500-1,000 population in 1976: 18,200 x 60,000 pesos		1,092,000,000
Subtotal Rural Market in 1983		1,572,000,000
3. Co-financing with CORPAGUAS on a 50-50 basis:		1,000,000,000
Total Rural and Urban Market Potential in 1983:	$b	14,629,100,000

Table III (Continued)

Growth Rates in Target Markets:

III. - 8 major cities and 55 minor cities:

1. Among homes/barrios without water:
   Growth rate: 16,000 homes/yr. x 47,000 pesos = $b752,000,000/yr

2. Sewer line connections (8 major cities only):
   Growth rate: 600 x 64,000 = $b 38,400,000/yr

IV. - Urban Annual Growth estimate = $b790,400,000/yr

V. - Rural Market

1. 24 villages of 1-2,000 population in 1976:
   Growth rate: 240 x 50,000 pesos = $b 12,000,000/yr.

2. 91 villages of 500-1,000 population in 1976:
   Growth rate: 450 x 60,000 pesos = $b 27,000,000/yr.

3. Co-financing with CORPAGUAS on a 50-50 basis:
(Future growth: Not available.

Rural Annual Growth rate estimate: $b 36,500,000/yr.

Total Rural and Urban Annual Growth rate: $b826,500,000/yr.

If only 2% of this demand presented in Table III is realized in 1984 or 10% of total demand projected in 1995 is realized over the life of the project, then the assumptions, in the financial analysis, of a loan demand of 350 to 400 million pesos per year will be satisfied.

B. The Capacity to Borrow Funds

The S&Ls will lend to individual households rather than to communities, so that each household is responsible only for its own payment and collection can be enforced. Indeed, the bad debt in existing mortgage programs of the S&Ls is less than 1% compared to 85% and up in some of the government programs.

The amount an S&L association would be willing to lend depends upon the ability of the household to meet the monthly payments from the household's total monthly income. The existing policy of the S&L's for mortgage lending is to lend funds only up to a face amount that requires 25% of the household's income in repayments of principal and interest on

the loan i.e.,:

$$R = .25\ I$$

where R = monthly payments on Loan;
I = monthly income of the household.

In urban areas, while the collection enforcement is easier for W&S projects because of metered connections, disposable incomes are lower, and a more realistic limit on what people would be able to afford would be:

$$R = .10\ I$$

This limit also takes into account that each household would also be paying monthly water usage bills to the municipal water authority.

In rural areas, collection may be more difficult but, total incomes per household are understated because rural areas are only partly in the cash economy, and disposable incomes are consequently expected to be a higher proportion of total income. Thus, borrowers are expected to be able to afford a* greater proportion of their monthly income for water**. Hence:

$$R = .20\ I \quad \text{may be more appropriate}$$

From annuity tables, one obtains the present value of a monthly payment of 1 for 60 months at 39% per year*** compounded semi-annually as: 26.3 This implies, that:

$$26.3\ R = L,$$ where L is the face amount of loan;
R is the monthly payment.

Since, the limits on repayments in terms of monthly income from the preceding discussion are:

R = 10% of I for urban areas
and R = 20% of I for rural areas

In urban areas, $L = 26.3R = 26.3 \times 10\% \times I = \underline{2.6\ I}$

In rural areas, $L = 26.3R = 26.3 \times 20\% \times I = \underline{5.3\ I}$

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* This is a conservative estimate of not only what people can afford but what they would be willing to pay. Many families were already paying more than 1500 pesos/month for 20 liters of water per day delivered, often irregularly, from trucks.

** Indeed, some villages are so much in need of water that two of them have approached CORPAGUAS and offered to pay 50% of the cost of a system as a downpayment.

*** Interest rate assumed for illustrative purposes.

Thus, by knowing the family monthly income, we can calculate the amount of funds a family can borrow for a W&S project and by comparing that to the project cost we can assess if additional funds need to be raised from public sources in order to make the project affordable.

Estimates of the distribution of urban and rural incomes per household are explained in Annex E. Since we can expect that people above the 70th percentile are unlikely to live in the "zonas marginales", the urban income distribution given in the Annex needs to be rescaled to exclude families above the 70th percentile. This is done by dividing the percentile corresponding to each income level in the general urban income distribution by .7, so that the income level for the "5th. percentile" in the former distribution now corresponds to the "7.1th. percentile" and so on. The adjusted distribution, as well as the rural distribution, together with the indicated loan limits are given in Table IV. For example, 25% of the households in the rural areas earn less than $b 6092 per month and the amount the S&Ls expect to lend them based on repayment capacity is $b 32,288.

Table IV

Monthly Income & Affordability of Loans (1)

Zonas Marginales			Rural Areas		
Percentile	Monthly Income	Loan Amount	Percentile	Monthly Income	Loan Amount
%	I	2.63XI	%	I	5.3XI
7.1	14,365	37,780	5	2,903	15,386
10	16,273	42,780	10	3,861	20,463
14.3	19,102	50,238	15	4,602	24,391
25	24,241	63,754	20	5,343	28,318
28.6	26,437	69,529	25	6,092	32,288
43	33,467	88,018	30	6,841	36,257
50	37,478	98,567	40	8,386	44,446
57	41,489	109,116	50	10,270	54,431
71	50,811	133,633	70	15,675	83,078
86	62,272	163,775	90	37,837	200,536
100	+	+	100	+	+

(1) Figures based on an assumed interest rate of 39% for illustrative purposes.

Even though the loans are to individual households, a very large proportion of the individual homes in the community must subscribe, or else the allocation of fixed costs of the system per household go up significantly. For example, using the estimates of fixed versus variable costs per subscriber for each system given in Annex F, one can calculate that if only 75% of the homes in a barrio subscribe, the average cost to each subscriber of installing a water connection is 11% higher than if all subscribe. In rural areas, the fixed costs of dug wells are as low as those for urban connections and so the increase in average cost due to non-subscription by 25% of the households, is the same, i.e., 11%. For surface source/gravity systems, however, the fixed costs are higher and the average cost per subscriber increases by 25% if only 75% of the homes in the village subscribe.

The actual amounts of loans that an S&L may make in a city or village may vary with each household depending upon its income and the additional options installed individually by the household. However, for the basic system, the S&Ls must be able to offer a loan amount that some of the poorest households in the community can afford or else they will not subscribe and the costs of the system per household will increase. Hence, the loan amounts an S&L offers to a community, for the purpose of the market analysis, must be such that the repayments are affordable by at least 75% of the households in the community (or 85% in the case of a community that needs a surface/gravity system). The balance of the cost of the system (i.e., cost in excess of the loan limit set by the S&Ls) must come from elsewhere, i.e. individual contributions of labor or materials, personal savings, or public (or donor) subsidies. (When subsidies are not forthcoming, a community may realize that it may be optimal for them to accept a lower proportion of fixed costs from the poorer households and higher proportion from the more affluent. If this occurs, additional loan demand will result).

C. Amount of Loans Offered by the S&Ls vs. System Costs

Comparing the loan limits for the appropriate income percentile in Table IV with the cost of the systems in rural and urban areas given in Annex F (or Table II), we obtain Table V indicating "affordability". Table V shows in column 4 the deficit arising from the difference between the maximum amount the S&L's could lend to the poorest 25% (15% in the case of villages needing surface source/gravity systems) of the borrowers and the total cost of the system per household.

Table V

Affordability of W&S Systems Through S&L Financing (1)

Market Segment	Type of System to be Installed	Cost	Loan Limit	Deficit* (C-L)	% Deficit*
	Water connection + latrine	52,000	64,000	-	-
	Sewer connection	64,000	64,000	-	-
Rural					
Villages of all sizes	Dug wells and latrines	55,000	32,300	22,700	45%
Villages of 500 pop.	Surface/Gravity Systems	63,000	24,400	38,600	61%
Villages of 1000 pop.	Surface/Gravity Systems	50,000	24,400	25,600	50%
Villages of 2000 pop.	Surface/Gravity Systems	40,000	24,400	15,600	39%
Villages of 2000 pop.	Surface/Pumped	48,000	24,400	23,600	50%

* Increase in deficits due to non-subscription: In urban areas, there is no deficit even if 25% of the homes in a community do not subscribe to the W&S system installation, except in the case of sewer connections, where there would be a 10% deficit if 25% of the residents do not subscribe.

(1) Figures based on an assumed interest rate of 39% for illustrative purposes.

D. Estimates of Expected Loan Demand

a. Peri-Urban Market

In the peri-urban market, one can see from the above table, that all the packages that are likely to be offered are affordable by the average peri-urban "barrio".

However, not all barrios have the same median family income. The distribution of incomes within a barrio, unlike that in a rural village, is expected to be narrower (i.e. smaller range) than that portrayed in the general distribution for all barrios shown in Table IV. Hence, we expect some of the poorer barrios to be unable to afford the financing of W&S systems on their own. On the other hand, should costs escalate in proportion to incomes, the relatively more affluent barrios will still be able to provide a large and growing market for the S&L system for consumer loans for W&S systems.

If one reduces the total urban sales potential in half, in light of the above consideration, one arrives at an estimate of the total realizable market as 6.1 billion pesos in 1983 + 395 million pesos growth/year.

It should be noted that the realization of sales in this market does require co-operation with the city municipal authorities and either the existence of the water main (or sewer main) at the edge of the barrios or the capacity of the municipal authority to extend the water main to the edge of the barrio.* The estimates of loans realizable by the S&L System in the peri-urban market for W&S systems is 18 times their modest capacity of 350 million pesos in 1984 used in the financial analysis. Moreover, the yearly growth rate in the market after adjustment for inflation exceeds the total loans the S&Ls expect to make in each of the years till 1996. Hence the peri-urban market alone justifies the projections of loans made by the S&Ls in 1984 and future years.

In terms of volume, the amount of 300 to 400 million pesos/year available for loans by the S&L's (see financial analysis) corresponds to approximately 6-7000 loans in 1984 (or about 20-25 average barrios of 300 families each), and fewer loans in each succeeding year as inflation or devaluation reduces the loan portfolio in real terms and increases the amount per loan in pesos.

*Muncipal authorities of several major cities have indicated a willingness to cooperate with the S&Ls.

b. Rural Market

In the rural market, one expects the general income distribution for rural areas given in Table IV to hold for households within most villages. And, as one can see from Table V, most villages will not be able to borrow the entire cost of the W&S system installation on their own. However because village systems require more labor and local materials, the community contributions in kind can offset a significant portion of the cost deficit. The rest will have to be subsidized from private voluntary organizations or public sources.

Hence the estimates of rural loan demand in the different market segments are as follows:

1. For villages of population 1000-2000:

Expected Loan Demand =(Total Sales Potential from Table III) x p_1x(1- % deficit) x p_2

Where:

p_1 is an estimate of the probability that the village can be served by a surface system or a dug well = .66 (estimate);
(1-% deficit) = Correction factor to obtain amounts loaned because the S&L's are lending only part of the cost. In this segment, average deficit = 45% from Table V, hence (1-45%) = 55%;
p_2= estimate of the probabilty that the village can raise the deficit from internal or other sources, a function of the size of the deficit. Estimated in this case as .25.

Hence, expected loans to villages of 1000-2000 is:
480 million x .66 x . 55 x .25 = 43 million pesos.

2. For villages of population 500-1000:

For these villages, the deficit is 55% in the case of surface/gravity systems and 45% in the case of hand dug wells plus latrines, from Table V. If one assumes the probability that the target village requires a surface/gravity system = .4 and that the target village requires a hand dug well = .25, then, following the same argument as above:

Expected loans for surface/gravity systems = 1090 million x .4 x (1-.55) x .25 = 49 million

Expected loans for hand dug well systems = 1090 million x .25 (1-.45) x .3* = 45 million

Total expected sales in villages of 500-1000 pop. = 49 + 45 = 94 million

3. For co-financing with projects currently being planned by public agencies and international donors, the estimated loan demand may be calculated as follows:

Planned Projects:

CORPAGUAS: 2.8 million in 1984
AID/DSA : 1.6 " " " and $ 1.5 million in 1985
Known total of Govt. Projects: $4.4 million in 1984 and $1.5 million in 1985.

If one-fourth of these projects totaling $4.4 million are made available for 50-50 co-financing with S&Ls, they amount to a loan demand of 385 million pesos in 1984 at the projected exchange rates.

Hence the total rural demand for loans that can be expected in 1984 is:

1. 43 million pesos
2. 94 million pesos
3. 385 million pesos
522 million pesos in 1984.

It should be noted that the rural market is significant but much smaller than the peri-urban market. Together, with the peri-urban market, and with the growth of new villages that can be added to the target market, the demand is expected to be more than the 300-400 million nominal/pesos per year in loans that the S&Ls expect to make over each of the next 12 years.

* This probability is higher because the % deficit is smaller.

SECTION IV: Master Implementation Plan

CACEN will be required under the terms of the AID/PRE $2 million loan to develop a Master Implementation Plan (MIP) which will be partially funded with a $250,000 AID/PRE technical assistance grant. The MIP must be completed before any drawdowns occur under the loan.

The intent of the MIP is to focus CACEN management and the S&L System on the need for an orderly approach to the new target market, thereby increasing the probability of success.

The MIP will be developed in the following sequence:

1. CACEN will hire a local engineer with professional work experience in the design, construction and maintenance of potable water systems. The engineer will design an MIP which covers the following points.

-- standardized methodology for preparing feasibility studies related to the various water systems;

-- guidelines for conducting environmental impact studies;

-- identification of domestic and imported materials needed for construction of the water systems;

-- assessment of required inventory levels of each domestic and imported item needed in the construction of the systems in light of their availability and/or the lead time required to secure such items;

-- implementation of a Management Information System designed to replenish and/or maintain inventory at optimum levels;

-- an assessment of the warehousing space needed for the inventory in La Paz and other regions or districts; access of such warehouses to the main transportation arteries; and vulnerability of warehouses to pilferage and countermeasures to be employed, etc.;

-- a tentative analysis of transporting requirements associated with the inventory located in warehouses including a list of national and regional firms qualified to transport;

-- a list of national and regional firms qualified to construct and/or install the systems;

-- standards to be employed by construction firms for constructing and/or installing the various water systems;

-- development of standard contracts to be executed by CACEN with construction, transportation and warehousing firms;

-- standards for water quality checks and systems maintenance;

-- a rank ordering of sites selected as most probable target markets, including the economic characteristics of the potential communities, type of water system required, cost, and a preliminary assessment of repayment capability, etc.;

-- co-financing modalities to be employed with SAMAPA in La Paz, SAGUAPAC in Santa Cruz, SEMAPA in Cochabomba, etc.;

-- development of a marketing plan which focus on publicity to be given the program, medium and cost; likely assistance needed by the prospective communities via access to CACEN and/or S&L specialists for choosing the correct system given repayment constraints and other technical considerations;

-- design and implementation of a Management Information System which will enable the S&Ls to monitor the performance of the overall portfolio and focus management attention on problem areas and loans;

2. Concomitant with the elaboration of the MIP, AID, CACEN and the S&Ls will reach agreement as to what specific areas or tasks of the MIP require AID technical assistance grants, with which to contract for needed specialists (e.g., management information system and/or savings and loan specialists, etc.), their likely timing, terms of reference needed per task, etc. A preliminary budget for AID grants will be jointly approved but under no circumstances to exceed U.S. $250,000.

3. The MIP, when completed, will be submitted to USAID/B, AID/PRE, and the Internal Review Committee (convened for IP), AID/PRE for formal approval.

SECTION V: Relation of Project to Government of Bolivia, CDSS, and PRE Priorities

PRE's assistance to seed a diversification by the private sector managed and financed S&L system into the business of consumer lending for construction of water and sanitation systems will support key objectives of GOB, CDSS, PRE, and the Foreign Assistance Act.

A. Relation to GOB Priorities

The provision of water and sanitation facilities is a high priority of the GOB in the health sector. A greater proportion of people in Bolivia are without adequate water and sanitation than in any other Latin American country, and the per capita incidence of death and disease attributed to the poor water and sanitation is among the highest in the world. Unfortunately, as in other poor developing countries, the national budget for health programs does not receive the necessary resources to enable the GOB's water and sanitation goals to be met. This chronic situation has been aggravated by Bolivia's serious current economic crisis. Although, in conjunction with the United Nation's "Decade for Water and Sanitation," the GOB has created a special task force (PLANASBA) in the Ministry of Housing and Urban Affairs to coordinate various GOB programs for the provision of water and sanitation facilities, the agencies in charge of these programs do not have the resources necessary to meet their program objectives. GOB health officials realize that despite the Government's good intentions there is no chance that the public sector can keep up with the demand for water and sanitation services.

Currently, the main governmental agencies involved with water and sanitation programs are CORPAGUAS, (a parastatal corporation which constructs systems in rural areas); the Ministry of Health's Department of Environmental Sanitation (DSA), which receives AID funds under the Rural Sanitation Project (Loan 511-U-058); some Departmental Development Corporations (DDCs) (parastatal organizations charged with undertaking rural development projects within their departments); and municipal water authorities, such as SAMAPA in La Paz.

CORPAGUAS has requested a budget of $2.8 million in 1984, which will finance only 8 of the 17 rural water systems it has

planned. The chances of CORPAGUAS getting even that much money, however, are slim. DSA receives very little in the way of an operational budget beyond the counterpart funds required to complement Loan 511-U-058 funds, which are programmed for use only in the departments of Cochabamba and Chuquisaca, for villages under 800 in population. So far, the involvement of the DDCs in water projects has been very limited, although some have expressed a willingness to fund 25% of the cost of water projects in their department. SAMAPA, the water authority in La Paz, claims to have funds for, and has been installing, only 1900 house connections per year in La Paz, and the deficit in house connections in the city has been growing at the rate of more than 3000 houses per year.

Furthermore, as GOB attempts to put its house in order and to cut its deficit spending, the public sector funds for water and sanitation will diminish. Bilateral aid programs, though on the rise after October 1982, will be limited due to the general trend in donor countries towards lower levels of aid compared to levels reached in past years. Hence, there is a growing recognition in GOB agencies* that alternative private enterprise mechanisms for providing new sources of consumer * loans to communities for W&S systems would be most beneficial and complementary to their own efforts.

The areas most deficient in water and sanitation are the peri-urban zones surrounding Bolivia's departmental capitals, and the rural towns and villages--areas where Bolivia's poor majority lives. These are the very areas in which the S&L System has been successful in extending and concentrating its housing finance operations, and the areas where it will now sponsor water and sanitation construction activities under the proposed program. The communities in these areas should find it affordable and worthwhile to borrow from the S&L System to build a W&S system rather than wait indefinitely for a government sponsored program to respond to their needs.

Thus, the availability of an alternative private sector source for consumer financing of a W&S system is important to the large number of communities excluded in the list of projects (prepared by PLANASBA) planned by GOB agencies up to 1990. Some of these communities will find it affordable and worthwhile to borrow from the private sector for this purpose rather than wait uncertainly and indefinitely for a government subsidy.

Moreover, to the extent that W&S systems have "public" as well as "private" components, the availability of private

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* Personal conversations by project team with heads of CORPAGUAS, PLANASBA, SAMAPA, BCB, etc.

sector on-lending, proposed by the S&Ls, provides synergy and leverage for the public sector programs. For example, a municipal water authority could extend the water/sewer main to the outskirts of a city and the local S&L could provide loans to the individual families in the neighborhood for secondary extensions and house connections. Such a joint venture would make the costs more affordable to consumers and help the water authority increase its revenues from monthly usage rates by adding new customers to its base. (Ample water is available in most city systems to serve more customers.)

Any S&L will only loan amounts to the individuals in a community to the extent of their ability to keep up with the loan repayments. If the amount of the loan the S&L is willing to make falls short of the projected cost of a W&S system for each household, the community members may make up the difference from accumulated savings, if any, or try to petition other donor or government programs for a subsidy. Thus, if the donors adopt a policy of providing a subsidy only as a last resort, they need only subsidize the difference between the private sector loan (less any down payments) and the project cost. Therefore, the existence of a private sector lender in the consumer market for financing W&S systems can provide government and other donor programs with leverage, and permit them to become more efficient by subsidizing only to the extent of real need.

Indeed, both CORPAGUAS and SAMAPA have indicated a willingness to try to work with the private sector. Furthermore, the Mission, in reviving its Rural W&S project with the Department of Environmental Sanitation (DES), also expects to seek a revision of the program design in order to promote increased synergy with the proposed private sector program.

B. Relation to CDSS

The health status of Bolivia is among the worst in Latin America, with diseases attributed to poor water and sanitation contributing significantly to the high rates of morbidity and mortality, and consequently, to the poor industrial and farm productivity. Improving W&S is therefore a major developmental goal in Bolivia.

Further, the lack of economic growth and the current crisis in the Bolivian economy is largely the result of political instability and the lack of a vigorous private sector. Foreign capital has been discouraged by the political risks, the lack of sufficient incentives, and the huge external deficits that bode further devaluations. Concurrently, there has been little

internal capital available for financing private sector growth. Inefficient parastatals have come to dominate major industries and the government controls 80% of economic activity, crowding out private borrowers in capital markets, and creating inflation through unrealistic price controls and a plethora of subsidy programs. Hence, the CDSS considers policy dialogues and programs to strengthen the Bolivian private sector to be of paramount importance in promoting development and economic growth.

The proposed PRE loan will strengthen the only major private sector financial institution in Bolivia that is responsible for more than 10% of the total savings in the country, and a major source of home mortgage loans. The proposed PRE loan will provide the S&L System the needed capital to diversify into a new line of business i.e. consumer loans for W&S, which promises to be profitable, synergistic with their existing business, and consistent with the strategy (for the economic rehabilitation of the S&L System) recommended in the agreement accompanying the recent PRE/HIG loan to the S&L System. The Mission sees the project as a natural complement to the HIG loan and an integral part of their strategy to strengthen the S&L System. It is for these reasons that the mission not only originated the project, but has supported it vigorously with the Central Bank of Bolivia.

C. Relation to PRE's Initiative

Established in 1981 as a key element in AID's response to the Reagan Administration's private sector initiative, PRE exemplifies the President's belief that a vigorous private sector economy can serve as the engine for growth in developing countries just as it has in the United States and other industrial democracies. Evidence of this is persuasive. Third World countries that have encouraged private enterprise have, by and large, registered impressive gains and have weathered economic and political shocks better than many developing countries with controlled, state-run economies.

This program conforms not only to GOB and USAID/Bolivia development goals, but to PRE's charter as well, to generate economic development and growth through stimulation and expansion of host country private enterprise.

Most importantly, this project continues PRE's innovative use of new types of intermediate financial institutions to foster indigenous private capital formation and country development objectives. Moreover, it will expand the focus of PRE's program to an important social sector. The project will

be a new experiment to employ the dynamic aspects of the private sector in cooperation with state and municipal authorities to achieve a public purpose, i.e., improved health.

By incorporating in the loan and grant agreements development criteria with priority attention to potable water and sanitation systems in rural and peri-urban areas of Bolivia, by helping strengthen indigenous financial institutions provide consumer loans and promoting personal savings, by supporting independent suppliers and contractors for W&S systems in Bolivia, by leveraging scarce AID funds through matching commitments from the S&L's, and by supporting an actual on-lending program to consumers for achieving publicly desirable (health) objectives with the potential for replication in other LDCs, the proposed PRE/BCB/CACEN program serves well the development and policy goals of GOB, USAID/Bolivia, and PRE.

D. Relation to the Foreign Assistance Act

The target consumer population is peri-urban neighborhoods on the outskirts of cities and selected rural villages of 500-2000 inhabitants in size, that do not currently have adequate potable water supplies. Excluded are inner cities (they already have access to water lines) and the large numbers of scattered rural villages of populations less than 500 that are likely to be outside the cash economy (and too poor to afford any payment), and prohibitively expensive to access, at least in the start-up phase of what is a new business venture for the S&L System.

The peri-urban neighborhoods or "barrios", which are a major part of the target market, lie mostly outside the city limits, are without water, sanitation or electricity and their population is made up of poor immigrants from the countryside who have arrived recently, who live in adobe houses usually built by themselves and who make or sell handicrafts or hold menial jobs in the city. Several members of a family work if possible; and while one "barrio" may be poorer than another, the distribution of incomes within a "barrio" is expected to be fairly narrow. Currently, many of the inhabitants walk long distances to the few public taps for water and many more purchase water from trucks at 100 pesos (these prices are expected to go up shortly when the gasoline price is increased) per 40 liters or enough for a two day supply. Consequently, many of them are spending as much for water as they are on food. Increased consumption of water through easier access, and the availability of latrines, would have a significant impact on their health.

Rural villages are likely to be even poorer than the barrios and generally need more expensive systems for water, if not for sanitation. They are also harder to access and to educate on the merits of clean water and sanitation systems, in spite of the high potential impact of such systems on the status of their health. Hence in rural areas, co-financing with (and co-operating with) local governments and other donor programs, as much as possible, will be necessary.

In terms of income, those above the 80th percentile in income are most likely to have water systems already, or are unlikely to reside in the selected target market areas. In peri-urban areas, the program is expected to reach families earning a minimum of 12 thousand pesos/month and in rural areas the families have to earn at least 20,000 pesos per month to qualify for loans to finance the total cost of the project. This implies that while 90% of the people in barrios will qualify for the loan, only 20% or so of the villagers will be able to afford a loan for a W&S system on their own and public co-financing may be necessary, particularly in rural areas.(1)

Since the median family income in Bolivia is less than $60 per month at the free market exchange rate, World Bank officials in Bolivia consider 80% of the urban and practically all of the rural population as "absolute poor". Hence the target market is fully consistent with the Bread for the World Amendment to the Foreign Assistance Act of 1964.

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(1) Based on an assumed rate of 39% for illustrative purposes.

SECTION VI: Identification and Evaluation of Environmental Impacts

The Project includes the construction of approximately 90 water systems in communities of different sizes, from rural communities up to 2,000 inhabitants, which are without adequate water, to marginal neighborhoods of principal cities, through which the city has extended, or to which the city is willing to extend, main water lines. Improved waste disposal systems, in particular, approximately 3,000 latrines and pour-flush toilets, will be built in combination with approximately 10% of the water systems. Training and technical assistance to the S&L System will help it to promote W&S systems, develop environmental soundness criteria, and assist communities in selecting certified contractors and monitoring construction performance.

Specific communities will be selected from the target communities which have been determined on the basis of need, accessibility, economic viability, and complementarity with existing water systems, projects and plans. These communities now obtain water for domestic purposes from independent water vendors who sell water by the barrel from community standpipes which are too few for the population served and not conveniently located, or in the rural areas, from surface sources, generally small rivers and streams which risk contamination from ground run-off. All water and sanitation services will be installed by certified and experienced contractors in accordance with national and local laws and regulations. In peri-urban neighborhoods, connections will be made with existing or extended city water supply mains. In the rural communities included, low-cost spring-fed gravity systems and dug wells will be emphasized. Contractors will disinfect any wells, piping and tanks prior to use. No undesirable intrusions or deteriorations of aquifers are anticipated.

It is considered that there will be no negative effects on the environment from these systems (see Annex H). From a standpoint of the effect on human beings, the effect will be beneficial, from the increased consumption of clean water per person and the reduced risk of possible contamination of water

for domestic purposes. Consumer education on proper hygiene, use and maintenance of water systems will be coordinated with local organizations and agencies which provide environmental health education.

The inclusion of pit latrines or pour-flush toilets as integral parts of the loan package in rural areas will be a beneficial factor from an ecological point of view. Latrine seepage will recuperate to an acceptable level in aquifers prior to passage to water wells or springs. By concentrating human excreta in pit latrines, the spread of parasitic and gastroenteric diseases from the rain run-off will be greatly reduced. No water borne waste disposal systems are contemplated.

Plans for monitoring the project by USAID/Bolivia include periodic environmental examinations as the specific projects to be financed are identified and W&S system plans and designs are submitted to USAID/Bolivia for review. Government agencies responsible for potable water will conduct periodic testing of water quality.

SECTION VII: Terms and Conditions

Proposed major terms and conditions for loan/grant to Government of Bolivia (GOB), acting through the Banco Central de Bolivia (BCB) for the self-financing potable water and sanitation systems project.

Amount of Loan: $2,000,000, to be obligated on or before September 30, 1983.

Amount of Grant: $250,000, to be obligated in fiscal year 1984.

Interest Rate on Loan: 10 percent per annum on balance of loan disbursed.

Disbursement Period: 3 years from dated signature.

Repayment Terms: Repayment of loan within 12 years from first disbursement, with grace period of five years.

Terms of Loan/Grant Agreement: Terms of standard AID bilateral loan/grant agreement will apply.

Conditions Precedent to Initial Disbursement for Loan:

(1) Satisfactory loan agreement between the BCB and the Caja Central de Ahorro y Prestamo para la vivienda (CACEN).

(2) Satisfactory loan agreements between CACEN and the twelve Bolivian S&Ls participating in the project.

(3) Satisfactory format for loan agreements between the S&Ls and the individuals who will borrow from them under the Project.

(4) Satisfactory Master Implementation Plan for the Project.

(5) Agreement between BCB and Bolivian Exchange Commission (BEC) that BEC will make available each year until AID loan to BCB is repaid not less than $200,000 per year in foreign exchange for the importation of equipment and materials to replenish inventory.

Additional Terms and Conditions:

(A) BCB to bear foreign exchange risk of loan.

(B) BCB to charge CACEN 16 percent interest rate on loan denominated in Bolivian pesos in amount equivalent to dollar amount of AID money lent to BCB.

(C) CACEN to charge S&Ls 20 percent interest rate on loans denominated in Bolivian pesos in amount equivalent to peso amount lent to CACEN by BCB.

(D) S&Ls to charge individuals the highest market rate permitted by law. Amount attributable to AID will be amount lent to S&Ls by CACEN. S&Ls to provide until January 1, 1990 at least 34 percent of the funds for each subloan from funds other than funds lent from CACEN under the Project and at least 50 percent thereafter.

(E) CACEN to procure inventory of building materials and equipment following procedures in AID HB II, Ch. 3. CACEN to hire with grant funds (grant will be to BCB) construction specialist at each S&L participating in the project, water and sanitation engineer, management information specialist, and inventory and warehouse manager. These individuals must be hired to prepare the Master Implementation Plan which is a Condition Precedent to Initial Disbursement of AID Loan to BCB.

(F) Disbursement for CACEN's procurement of inventory (building materials and equipment) will follow AID's usual disbursement procedures. Condition precedent to disbursement for such procurement will be CACEN's procuring sufficient warehousing space to store the materials inventory.

(G) Disbursement for ultimate on-lending to individuals will be in multiples of $100,000 and will be triggered by evidence of loan commitments made by S&Ls to individuals. Initial $100,000 may be disbursed as advance. For determining amount of pesos which will be on lent to CACEN (and ultimately to the S&Ls and individuals) by BCB, rate of exchange will be highest official rate of exchange in effect as of the date of each disbursement.

(I) CACEN will be permitted a mark-up of not to exceed 33 percent on cost of inventory of equipment and materials to be sold to individuals borrowing from S&Ls under the Project. All proceeds from sale of inventory will be used to replenish

inventory and for additional loans to S&Ls under the Project. AID-GOB loan/grant agreement will contain a covenant that the Bolivian Exchange Commission will make available each year until the loan is fully repaid not less than $200,000 in foreign exchange for the importation of equipment and materials to replenish inventory. If the project is terminated, inventory will be liquidated in local markets and proceeds, to the extent of AID's loan, will be refunded to AID (through repayments to CACEN and BCB). AID-GOB loan/grant agreement will also contain covenant that materials maintained by CACEN may be sold, during the life of the Project, only to individuals borrowing from the S&Ls for use in water and sanitation activity under this Project.

(J) AID-GOB loan/grant agreement will contain a condition precedent for disbursement other than for inventory (i.e. CP for disbursement for on-lending), that AID be provided evidence of cooperative agreements between CACEN and at least two government agencies or city water authorities and evidence of commitment by at least five communities (more than 1,000 home owners in total) to borrow from the S&Ls for water and sanitation activities.

(K) The Master Implementation Plan must specify the geographical areas where the S&Ls will lend to individuals under the Project: peri-urban and rural areas, and that loans must be to individuals falling within the bottom 80 percent of Bolivian income levels.

(M) AID-GOB loan/grant agreement will have a covenant that CACEN will maintain level of overall lending, and water and sanitation lending, existing prior to AID loan.

(N) S&Ls to agree to use reflows for lending to same client base as addressed with loan funds.

SECTION VIII: Monitoring and Control

On site monitoring and control will be the responsibility of the Mission. The PRE will collaborate in six month and annual evaluations and render other forms of assistance on occasion, as may be deemed necessary by mutual agreement, such as the formulation of the Implementation Plan.

The monitoring and evaluation tasks will consist of the following:

1) Reporting: CACEN will submit a detailed report quarterly on existing loans, new loans, delinquent (aged) and any problems encountered in the implementation of the Master Implementation Plan. Concurrently, CACEN will also submit its quarterly and annual financial statements.

2) Site Visits: Site visits will be conducted for the purpose of mid-term and project completion evaluations. It is recommended that over the first two years site visits be made jointly by USAID/Bolivia and PRE once every six months for the purposes of ascertaining the S&Ls progress in project implementation.

3 PRE In House Performance Evaluation: The Project's technical assistance requirements will be evaluated by PRE at the conclusion of the drafting of the Master Implementation Plan.

This office will also review annually the Project's compliance with developmental objectives, outlined in this Investment Proposal, and consult with the Mission on any adjustments it deems necessary to ensure full conformity with AID's developmental objectives.

ANNEX B

Monetary Correction

and the

Bolivian Savings and Loan System

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Washington, D.C.
January, 1977

Monetary Correction and the Bolivian Savings and Loan System

Introduction

The recent upsurge of inflation over much of the world and the persistence of high and variable rates of inflation throughout much of Latin America has resulted in an increased interest in the role that indexation can play in reducing or eliminating the undesirable consequences of inflation.

With high and variable rates of inflation numerous distortions are introduced into the economy. The fact that the rate of inflation is uneven increases the degree of uncertainty as to the value of money and increases the risk associated with contracts involving future financial contracts.

In addition to increased risk high levels of uneven inflation results in a wider range of expectations regarding the future course of prices. This leads to windfall gains and losses by individuals of the various financial contracts. The less informed and the optimistic tend to lose the more informed and the pessimistic tend to gain. Net debtors as well as borrowers, governments and employers tend to gain, while net creditors such as savers, taxpayers and employees tend to lose. Consequently the distribution of income in the economy becomes more of function of inflation and luck rather than the contribution made to the economy.

In addition there are other ways in which the distribution of income is affected indiscriminately by unforeseen inflation. Individuals on fixed income, such as pensioners, and those whose income are adjusted relatively infrequently are affected adversely Also, if income tax brackets are not adjusted with inflation, the tax system becomes more regressive, consequently increasing the real burden of the tax. In addition inflationary conditions create an incentive for taxpayers to delay payment until a later date when the value of money has decreased even further.

However, the arbitrary and undesirable effects of inflation would most likely be less harsh if inflation was not accompanied by government imposed controls which generally have the effect of preventing the necessary market adjustments.

The most common of these controls is the control of nominal interest rates. This can be achieved either directly through usury laws which, however, unfortunately fails to distinguish between real and nominal interest rates; or indirectly through the purchase of government bonds on the open market in an attempt to reduce or stabilize the level of interest rates.

Rather than a remedy to the problem of inflation interest rate controls simply add to the number of distortions. First, the real income of savers is reduced so that both the ability and the incentive to save in the future is reduced. Secondly,

consumption, especially of consumer durables and inventories is encouraged as a hedge against inflation. In addition the governments creation of negative real interest rates through the control of interest rates is a major encouragement to borrowing, either for consumption or for inventory accumulation. Hence, even if there were no reduction in the value of real savings negative real interest rates create an excess demand for funds. This excess demand for funds produces the need for rationing and the judgment of the market place is replaced by the judgment of government officials. There is no assurance that resources will flow into those areas where the economic return is greatest.

In addition there are several other types of controls that governments tend to introduce during periods of inflation. These generally include price controls on all or selected categories of goods as well as control of wages and salaries. Controls may also be imposed on the foreign exchange market that prevents the exchange rate from reflecting the fall in the domestic value of money. This overvaluation of the exchange rate can discourage exports and encourage imports, leading to a reduction in the countries foreign exchange reserves. When devaluation becomes inevitable and domestic interest rates are controlled, domestic savings tend to flow out of the country.

The future is uncertain—the more distant the future period the greater the uncertainty and risk. Under inflationary conditions it is difficult to find savers willing to place their money into long term financial instruments, where the nominal rate is fixed by usury laws which may be at levels that are negative in real terms.

Conversely with nominal interest rates fixed at a high level long-term borrowers may fear a fall in the inflation rate which has the effect of increasing the real burden of their debt. Hence, the borrower is therefore reluctant to commit himself to a very high fixed nominal rate of interest. Under these circumstances the long-term market may be severely restricted by a shortage of funds. However, as long as the nominal interest rate is controlled at a relatively low ceiling, the demand for long-term funds may most likely exceed the supply.

One of the most important sectors of the economy to suffer from the problems associated with long-term finance under conditions of inflation has been the housing sector. The effect has resulted in a serious shortage of funds in many countries throughout the world.

If inflation could be significantly reduced or eliminated the need for indexation in the economy would disappear. However, as long as inflation persists indexation may have two

possible roles to play. First, indexation may help to reduce the rates of inflation; and, secondly, mitigate some of the undesirable side-effects associated with inflation. It is the second of these two possibilities applied to the problem of long-term finance that is the concern of this inquiry.

Chilean Background

After a long history of severe inflation, averaging around 27 percent between 1940-57, Chile became the first Latin American country to introduce indexation on a wide scale in 1957. As in the case of other Latin American countries inflation had lead to a marked decline in the availability of long-term finance and the housing sector was particularly hard hit.

In Chile a new state-controlled housing corporation (CORU) was established in 1957 to provide finance for new low-cost housing. Both savings deposits and mortgages were adjusted according to an index of inflation. In 1960 indexation was extended to a new private savings and loan system (SINAP), which was supervised by the state-controlled Caja Central de Ahorro y Prestamo.

The primary regulatory body for the Chilean S&L system is the state-controlled Caja Central de Ahorro y Prestamo which serves as a central bank for the country's savings and loan associations. The Caja Central obtains most of its funds from the Treasury, through external loans and to a small degree by selling mortgages, promissory notes and readjustable bonds to the public. In addition, the Caja

charters new associations and regulates existing association, provides a system of mortgage and deposit insurance, establishes interest rates and adjustment indices for the savings and loan system.

Bolivian Savings and Loan System

The Savings and Loan industry in Bolivia began in the city of La Paz on June 26, 1964. Since then the system has grown to a total of nine associations. Two associations, accounting for 60 percent of the system's savings, are located in La Paz and the balance are located in principal cities throughout the country. Three of the associations have branch office facilities.

As of December 31, 1975 savings deposits and mortgage loans were as follows:

Table 1

Total Volume of System Savings and Loans

Association	City	Savings		Loans	
		No.	Total	No.	Total
La Primera	La Paz	11,179	$b.45,603,645	1,370	$b.92,080,524
El Progreso	Oruro	3,217	8,904,420	449	33,336.953
La Promotora	Cochabamba	2,397	4,460,819	491	42,579,311
Guapay	Santa Cruz	3,812	10,932,513	420	47,166,537
Tarija	Tarija	1,960	3,822,020	318	28,124,611
Potosi	Potosi	1,589	3,802,569	156	10,069,363
La Plata	Sucre	1,564	2,164,909	123	12,031,916
La Paz	La Paz	5,348	17,299,202	276	29,207,654
Paititi	Trinidad	2,875	1,754,927	125	18,128,727

The Caja Central de Ahorros y Prestamos para la Vivienda (Caja Central) was established by Decree Law No. 07585 in November 1966, to serve as a private central housing bank for the Savings and Loan System of Bolivia. Modeled closely after the Caja Central in Chile, the Bolivian Caja Central was established to operate in the following areas:

Banking

- To act as the borrowing agent for the savings and loan system, both with regard to local and foreign sources of finance.
- To be the primary lending agency for the individual associations comprising the savings and loan system.
- To perform other banking services for individual associations, such as to receive deposits from them, guarantee their borrowings from third parties, do mortgage loan banking, etc.

Insurance

- To provide savings deposit insurance.
- To provide mortgage loan (FHA) insurance.
- To provide individual or group credit life, accident and health, and unemployment insurance; as well as hazards and property insurance.

Promotion

- To charter new associations.
- To promote savings within the system.

Supervision

- To supervise the activities and operations of individual associations.
- To intervene in the management of individual associations as and when warranted by circumstances.

Regulation

- To establish regulations to rule the activities of associations with the system.
- To establish interest rates and other limits affecting the associations.

For the Bolivian Savings and Loan system as a whole table 2 indicates net savings and the percent increases between 1967 and September 1976.

Table 2

Net Savings and Percent Change

Year	Net Savings	Change in Net Savings	Percent Change
1967	7,117,000	7,117,000	—
1968	10,950,000	3,833,000	53%
1969	16,022,000	5,072,000	46%
1970	22,258,000	6,236,000	38%
1971	30,216,000	7,958,000	35%
1972	23,561,000	6,655,000	- 22%
1973	35,653,000	12,092,000	51%
1974	81,712,000	46,059,000	129%
1975	98,745,000	17,033,000	21%
1976	190,000,000	91.255,000	92%

The table indicates, except for 1972 when the Bolivian Peso was devalued and net savings declined by 22 percent, the system has experienced a rapid rate of growth. In current prices growth averaged 49 percent a year.

To determine real growth of the system current prices need to be adjusted for inflation. Table 3, below indicates Bolivia's general index of prices, as reported by the National Institute of Statistics.

Table 3

Bolivia Index of Prices and Percent Change

Year	Index[1/]	Percent Change
1966	100.00	--
1967	111.18	11.0%
1968	117.28	5.5%
1969	119.88	2.0%
1970	124.53	4.0%
1971	129.11	3.7%
1972	137.51	6.5%
1973	180.83	31.5%
1974	294.43	63.0%
1975	317.92	8.0%
1976[2/]	364.00	8.0%

In late 1972 the Bolivian peso was devalued by 65.8 percent. This large devaluation contributed to the higher prices in 1973 and 1974. In addition the Government in 1974 removed the food subsidies which had helped to keep price increases low in the preceeding years.

Adjusting table 2, by the index indicated in table 3 (the GDP price deflator) the real growth of the Bolivian savings and loan system can be determined. This is indicated below in table 4.

1/ Bolivia, National Institute of Statistics.

2/ Estimate.

Table 4

Real Net Savings and Percent Change

Year	Real Savings	Change in Real Savings	Percent Change
1967	6,401,000	6,401,000	
1968	4,336,000	2,935,000	45.8%
1969	13,365,000	4,029,000	43.1%
1970	17,874,000	4,509,000	33.7%
1971	23,403,000	5,529,000	30.9%
1972	17,134,000	- 6,269,000	-26.7%
1973	19,716,000	2,585,000	15.0%
1974	27,753,000	8,037,000	40.7%
1975	31,060,000	3,307,000	11.9%
1976	52,198,000	21,138,000	68.0%

Real growth of the system ranged from a low of a minus 26.7 percent in 1972 to 68 percent in 1976. Each year for the entire period real growth averaged 29.2 percent.

As indicated above one of primary undesirable effects of high and variable rates of inflation is the decapitalization of financial institutions. However, this had not occurred to the Bolivian Savings and Loan system given the 29.2 percent real rate of growth.

The Government Decrees of June 1, 1966, which established the Caja Central contained a provision which required savings

accounts and mortgage debts to be readjusted periodically in accordance with an index provided to the countries savings and loan association by the Caja Central. The index was to be determined by averaging the following three variables: 1) an annual index of wages and salaries; 2) an index of the cost of living; and 3) the dollar peso exchange rate. However, since all of these indices had not been developed the S&L System received approval from the Bolivian Government to use only the dollar/peso exchange rate for readjustment purposes. This provision was contained in Supreme Resolution No. 150706, dated July 23, 1969. The resolution stated:

> WHEREAS: Article 70 of Decree N° 07585 of April 20, 1966 and Article 85 and 86 of its Regulations establish the readjustment system for savings accounts opened in the Savings and Loan Associations and for mortgage debts contracted by its associates in said institutions, fixing an average index which should be established annually by the Caja Central on the basis - of the index of exchange rate variation of the Bolivian Peso compared to the American Dollar and to the indexes of salaries and wages and cost of living, having the later two to be provided by the Statistics and Census Bureau.
>
> That presently, the Statistics and Census Bureau is not in condition to provided periodically the data related to the salary and wages index, and the index on cost of living because this information is not available on a national basi .
> It is Resolved:
>
> To authorize the Caja Central to utilize for the purpose of the System of readjustment which is established in the Title X of Supreme Decree 07585 only the index of exchange

rate variation of the Peso Boliviano in relation to the American Dollar, until the Statistics and Census Bureau may be able to provide the annual necessary data related to indexes of salaries and wages and cost of living.

In October 1972, the Bolivian Peso was devalued in relation to the United States dollar by 65.8 percent. To readjust outstanding mortgage debts as well as savings accounts by this amount was considered by the Caja Central to be impractical. Consequently, an ad hoc arrangement was made to adjust mortgages and other assets of the system upward by 40 percent for balances on deposit as of September 30, 1972. Free savings accounts were readjusted by 11 percent on the balances as of October 26, 1972. If balances remained on deposit for one year an additional 21 percent was paid. For funds remaining on deposit for two years an additional 9 percent was paid. This meant that balances maintained for one year after the devaluation would be readjusted upward by a total of 32 percent and those remaining for two years would be adjusted upward by 41 percent. The pledged savings accounts were readjusted by 32 percent and were then applied to the outstanding mortgage debts. While this readjustment arrangement did not meet the Supreme Decree of 1966, it did meet the Supreme Resolution of July 1969. This adjustment is illustrated below (table 5) in the System's 1972 consolidated balance sheet.

Past experience in Bolivia indicates that while devaluations are infrequent when they do occur the devaluations are

Although there are plans to improve the data collection procedures, the movements of the index since its establishment have reflected the cost of living in La Paz with a reasonable degree of accuracy. The index has been consistently calculated and published regularly. Price changes for the rest of Bolivia diverge somewhat from La Paz, but not to a significant degree. It has therefore been concluded that the index can be used for Bolivia outside of La Paz, at least until such time as reliable nationwide salary and cost of living indices have been developed and put into effect.

In addition, shortly following the devaluation of 1972, the Government of Bolivia issued the following resolution.

Supreme Resolution
Janaury 20, 1973

It is resolved:

1. The maintenance of value of the Bolivian Peso in the existing savings accounts or accounts to be opened in the Banks and which belong to individuals, it is established by the relation between the official exchange rate of Peso Boliviano and the Dollar of the United States of America, beginning January 20, 1975;

2. The benefit proceeding from the maintenance of value to which previous article refers to, will be recognized in Bolivian Peso for the amount of the variation so determined;

3. Said benefit will be applied on the minimum balance registered in each account in the period of 90 days before the modification of the value of Bolivian Peso in relation to the official exchange rate;

4. The Banks are authorized to credit immediately in the savings accounts of savers the amount which corresponds to the benefit of maintenance of value with charge to the Banco Central. This institution will debit these amounts to the National Treasury;

5. The amount resulting from the maintenance of value for savings accounts will be exempt of taxes; and

6. The resources deposited in savings accounts should be used for productive sectors of industry, construction, exports, crafts, agriculture and cattle.

Basically, this resolution extended to individual depositors in Bolivia's commercial and specialized banks, as distinct from the banks themselves the maintenance of value

of deposits based on the dollar/peso exchange rate. Unlike the 1969 Resolution applying to savings and loan associations, this resolution does not require loans to be adjusted inasmuch as the Government is providing maintenance of value.

Summary and Conclusion

While the Supreme Decree in 1966, establishing the Caja Central, included a clause providing for the indexation of savings deposits and mortgage loans, based on an average of wages, consumer prices and the dollar/peso exchange rate, a Supreme Resolution in 1969 authorized the system to index deposits and loans solely on the dollar/peso exchange rate. Consequently, when the Bolivian peso was devalued 65.8 percent in 1972, both asset and liabilities were adjusted. As indicated above, however, the adjustment was approximately 40 percent rather than the 65.8 percent.

The indexation system initially proposed when the Caja Central was founded was designed to accommodate two basic distortions associated with inflation; namely, the decapitalization of financial institutions and a reduction in savings deposits resulting from negative real interest rates. Neither of these distortions have occurred. As indicated in the analysis savings deposits, in nominal terms, increased each year by an average of 49 percent. In real

terms the system grew by 29.2 percent a year. Rather than becoming decapitalized the system exceeded its 1982 savings projections (186 million pesos) in December 1976 when net savings were 190 million pesos.

Consumer prices in Bolivia sine 1966 have increased an average of 14 percent annually. If the extraordinary years of 1973 and 1974 are excluded annual inflation averaged 6.1 percent. To determine the average real rate of interest received by the system's depositors over this same period of time is somewhat more complicated. The problem is that all associations do not pay the same rate of interest. La Primera and La Paz mutual, which account for nearly 70 percent of the system's deposits, had paid a rate of interest ranging from 8 to 10 percent on free saving. Based on an average of 9 percent, including adjustments following the 1972 devaluation, depositors received a 13 percent average nominal rate of interest. In real terms this is a negative real rate of one percent. On a year to year basis a positive real rate of interest was received by savers in all but two years. In part, this has contributed to the remarkable growth of the system's deposits.

Recommendations

In conclusion it is recommended that:

1. The Caja Central officially adopt the system of indexing based on the dollar/peso exchange rate as contained in the Supreme

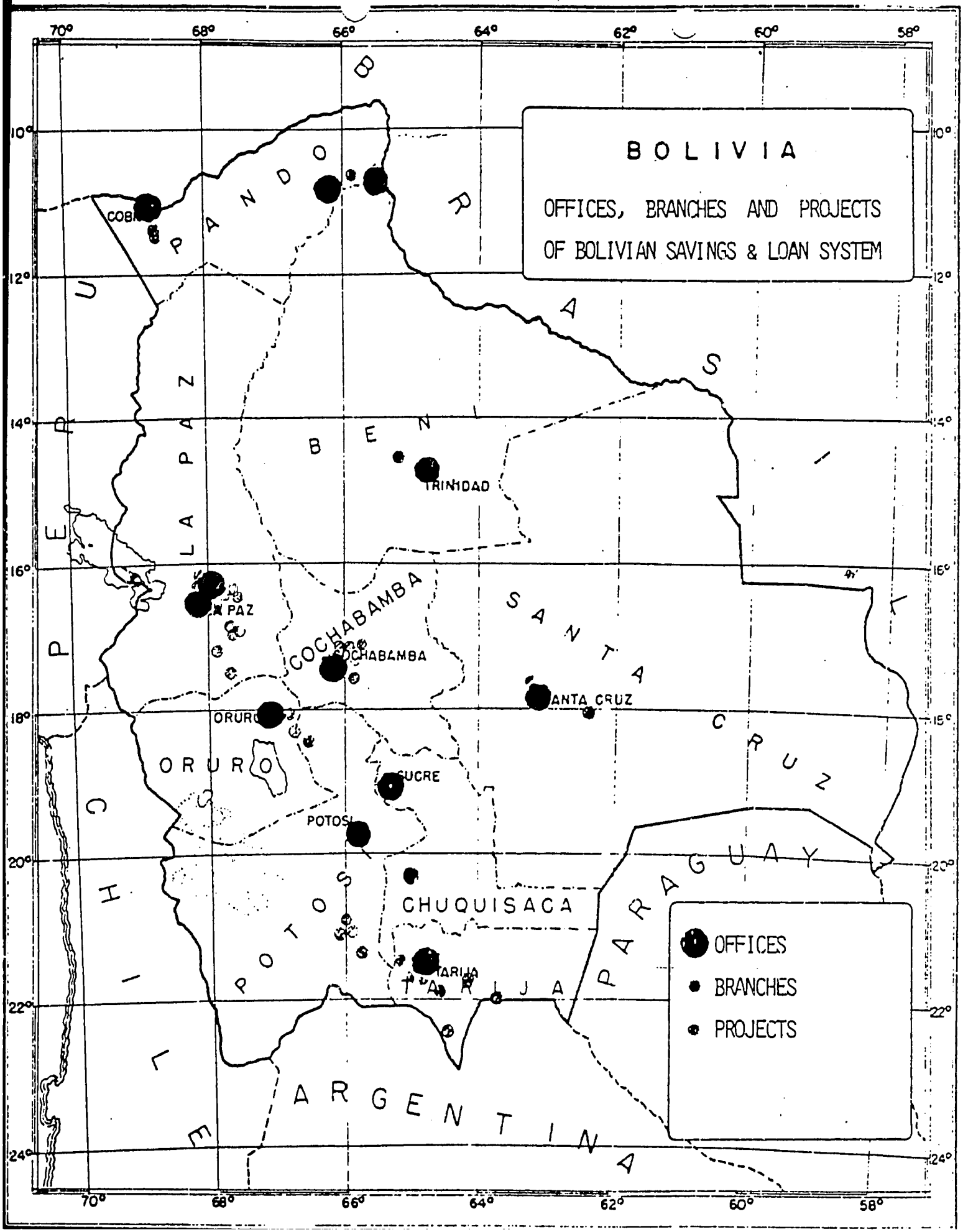
Resolution, indicated above, dated January 20, 1973. Justification is based on: (a) the relatively low rate of inflation in Bolivia and the GOB's commitment to price stability; (b) the large percentage of system liabilities denominated in dollars ($15.6 million); (c) domestic inflation and wage increases are reflected in a country's foreign exchange rate; (d) unavailability of all indices as contained in initial provision; (e) competitive with maintenance of value clause enjoyed by Bolivian banking system; (f) system is easy for associations to administer and customers to understand. Furthermore, it is recommended that:

2. The Government of Bolivia assume responsibility for the maintenance of value, as indicated in No. 1 above, of individual deposits in savings and loan associations as it does for depositors in the country's commercial and specialized banks--also included in January 20, 1973 resolution. This can be justified on grounds that: (a) investment in the housing sector is as important to the Bolivian economy as investment in the other sectors is to the economy; (b) generally, depositors in savings and loan associations represent the "less affluent" or working class families for whom the cost of shelter represents a larger percentage of budget expenditures. If this recommendation is not adopted:

3. The Caja should assess each borrower, an interest surcharge similar to the FHA and mortgage insurance charge, to provide a reserve for borrowers in the event of devaluation. If devaluation did not occur while an individual mortgage was outstanding the amount

paid-in would be applied against final payments. This alternative would replace the present system of using pledged savings accounts as a reserve. If this alternative is not chosen it is suggested that:

4. The Caja Central continue the present system of pledged accounts to serve as a reserve in the event of devaluation. While this alternative does restrict the lending activities of the associations it is--given the magnitude of Bolivian devaluations, when they occur, and in the absence of recommendations two or three above--essential for the long-run viability of the system.


BOLIVIA
OFFICES, BRANCHES AND PROJECTS
OF BOLIVIAN SAVINGS & LOAN SYSTEM
70°
68°
66°
64°
62°
60°
58°
10°
12°
14°
16°
18°
20°
22°
24°
PANDO
BENI
SANTA CRUZ
LA PAZ
COCHABAMBA
ORURO
POTOSI
CHUQUISACA
TARIJA
PERU
CHILE
ARGENTINA
PARAGUAY
BRAZIL
TRINIDAD
PAZ
COCHABAMBA
SANTA CRUZ
ORURO
SUCRE
POTOSI
TARIJA
OFFICES
BRANCHES
PROJECTS

ANNEX D

The Potential Market for Basic Water and Sanitation Services:

To estimate the potential market for water and sanitation loans, the market was subdivided into five segments:

Urban: A) Large cities - La Paz, Santa Cruz, Cochabamba, Oruro, Potosi, Torija, Trinidad and Sucre

B) 35 Medium Sized Cities of more than 2,000 inhabitants

Rural: C) 24 Small Rural Towns - between 1,000 to 2,000 inhabitants

D) 91 Rural Villages - between 500 to 1000 inhabitants

E) Planned Government Projects in Rural Areas

Methodology

The number of homes without water in each of the cities, in 1983, was estimated from te following 1976 census data:

I. Number of homes in the city in 1976.
II. Number of homes in the city without water in 1976 (or connections).
III. Population growth rate for the city.
IV. Average number of people per family in that city.

Additional data necessary for the estimation was:

V. Number of water connections installed in the city since 1976 (data supplied by the municipal authorities in many cases, and estimated on the basis of PLANASBA's study for others.)

To obtain the number of homes without water in 1983 in La Paz, for example, the 1976 population of 151,684 homes was multiplied by the rate of growth of population in La Paz to project 186,028 homes in 1983. The increase in the number of homes from 1976 to 1983 was 34,344.

In 1976 there were, from census data: 100,099 homes without water connections. To this was added the increase in number of homes since 1976, i.e., 34,344 less the number of connections installed by SAMAPA, the water authority in La Paz, since 1976, i.e., 10,305. The resulting total of 124,138 is the number of homes estimated to be without water.

(In the cities, it will be necessary for the S&L's to have agreements and coordinte their activities with the local municipal water and sanitation authorities since they regulate all connections and extensions of the city's system. These authorities, e.g., SAMAPA in La Paz, SAGUAPAC in Santa Cruz, SEMAPA in Cochabamba have expressed an interest in working with the S&L's.)

In rural areas, the list of villages without water in 1983 was supplied by PLANASBA. From tis list, villages with populations of more than 500 according to the 1976 census were selected provided they were not located in regions too poor or inaccessible by land, or regions where a local mining corporation of a parastatal was active in providing water and sanitation to the people. The total population in the 24 villages with population between 1000-2000 and in the 91 villages with population between 500-1000 that were selected was divided by 4.5 (average family size) to obtain the number of homes in each of these segments in 1976. These totals were then corrected for the increase in population to obtain 1983 estimates of the number of homes without water in each of these segments.

Market Potential by Segment

A) Large Cities

City	Number of homes in 1983	without water connections in the home	without water sources	without sanitation facilities
La Paz	186,028	124,138	38,984	114,300
% Deficit		67%	21%	61%
Santa Cruz	76,550	43,331	16,941	24,631
% Deficit		57%	22%	32%
Cochabamba	55,934	10,101	16,303	19,177
% Deficit		18%	29%	34%
Oruro	34,691	19,865	3,519	19,843
% Deficit		57%	10%	57%
Potosi	19,810	11,947	868	9,153
% Deficit		60%	4%	46%
Sucre	16,372	6,225	-	4,545
% Deficit		38%	-	28%
Tarija	10,507	3,166	430	3,144
% Deficit		30%	4%	30%
Trinidad	6,551	2,820	-	1,024
% Deficit		43%	-	16%
Total Deficit	406,443	221,593	77,045	195,817
		55%	19%	98%

B) Medium Sized Cities

The 35 minor cities selected as part of the target market are listed below. The cities listed by department and the list, include the estimated number of homes in 1983 in the targeted cities in each department. Excluded in the selection process were towns where there were oil or mining settlements or towns known to be too poor or difficult to access. Some of the cities have been underlined to denote that the S&L's already have some operating experience.

Medium Sized Cities:

Chuquisaca	2 localities with 3,616 homes: Villa Serrano, and Torabueo
La Paz	9 localities with 8,748 homes: Viacha, Ochocohei, Coronavi, Copacabana, Ququile, Vinto, Clizo, Droni, Torato, Valle Hermosa, Capinoto, Ucureno, Tolato, Independeia
Oruro	4 localities with 7,965 homes: Challapata, Eucaliptus, Hauri, Huanuni
Potosi	5 localities with 15,275 homes: Llallagua, Villazon, Tupeza, Uyuni, Betanzos
Tarija	5 localities with 8,998 homes: Yacuiba, Villa Montes, San Jose de Pocitos, San Lorenzo
Santa Cruz	7 localities with 16,334 homes: Montero, Portachuelo, Minero, Warnes, la Belgica, Villa, Busch-Yacacan, Savedras
Beni	3 localities with 7,591 homes: Riberalta Sudyoromerin, San Ignacio de Veloseo

Total number of homes	Without water connections	Without local water sources	Without Sanitary Resources
86,069 Deficit	42,986 50%	9,110 10%	29,648 35%

C) Small Rural Towns

Twenty-four localities were selected with an estimated 7,200 homes. These areas have neither potable water nor governmental assistance:

La Paz	Collano, Hohuachaca, Hicomo
Cochahamba	El Paso, Irpa-Irpa, Puerta Villareal, Histeria, Moshe Rancho, Toco Porotoni, Sipe Sipe.
Oruro	No applicable sites
Potosi	Buen Retiro, Salaco, Santa Ana, Puna, Rovela, Huco, Coiza
Tarija	Polmor, Chico, Concepcion

Santa Cruz	No applicable sites (Government i.e., Cordecruz) supplies water to the smaller towns.
Beni	Huocoroje, Bello Visto, San Lorenzo
Pando	No applicable sites

D) Villages 91 villages with an estimated total of 18,200 homes in 1983.

La Paz	28 villages
Santa Cruz	8 villages
Potosi	14 villages
Oruro	5 villages
Cochabamba	29 villages
Beni	5 villages
Tarija	no applicable sites
Chuquisaca	2 towns
Pando	no applicable sites
Total	91 villages

E) Government Projects in Rural Areas

The selection of target localities listed above excluded those towns and villages in which a government agency was planning to install water and sanitation systems on a subsidized basis. One GOB agency that has extensive plans for building water and sanitation systems in rural areas is CORPAGUAS. However, CORPAGUAS, even if it obtains its full appropriations request of $2.8 million from GOB, it will have funds to build only half of the 17 systems it has planned, if it were to build them on its own. Hence, it would be possible for the S&L to enter into agreements with this governmental parastatal. The 17 projects planned by CORPAGUAS are:

La Paz	Guanay Ocoloyo, Moso, Compiloyo
Chuquisaca	Monteogudo, Rovelo, Podillo, Compargo, hos Caneros
Cochabamba	Villa Rivero, Tachachi Muelo, Tapocari, Mizque, Puerto Villaroll
Potosi	Huancaroni
Torija	Entre Rios, Bermejo

TRANSPORTATION COSTS

Note: All water supply and sanitation systems construction costs are calculated for the La Paz area. Therefore the cost of systems built in other areas of the country require the addition of transportation costs as estimated below.

1. For gravity and pumped systems supplied by a spring source:
   a. If accessible only by air transportation, add 10% to project cost.
   b. If accessible by land, add 5%.
2. For gravity and pumped systems supplied by a surface (stream) source:
   a. If accessible only by air transportation, add 15% to project cost.
   b. If accessible by land, add 7 1/2%.
3. For pumped system supplied by a hand-dug well course:
   a. If accessible only by air transportation, add 7 1/2% to project cost.
   b. If accessible by land, add 4%.
4. For pumped system supplied by a drilled well source:
   a. Do not build if accessible only by air transportation since drilling rig cannot be flown to site.
   b. If accessible by land, add 4%.

METHODOLOGY USED IN ESTIMATING URBAN INCOME DATA*

The methodology used in estimating urban income data relies on macroeconomic statistics published by the Bolivian Central Bank and the National Institute of Statistics (i.e. national accounts and population statistics) to indirectly estimate average family income and income distribution. It is based on the report "Preliminary Description of Methodology for Estimating Household Incomes", August 1978, AID which was further redefined by the National Savings and Loan League in January 1980 and, at present time, is being applied in countries with data problems similar to those encountered in Bolivia.

The basic equations used in the estimation are the following:

1. $NUI = \frac{GNP - GNPag}{GNP} * NI$

2. $UHU = \frac{Pop}{Avg\ UHU} * \frac{EAP - EAPag}{EAP}$

3. $Avg\ UFI = \frac{NUI}{UHU}$

4. $Median\ UFI = Avg\ UFI * .66$

where:

NUI = National Urban Income

GNP = Gross National Product

GNP ag = Gross National Product - Agricultural Sector

---

* Methodology is taken from PRE/HG Project Paper, 1983 data has been revised based on August 1983 projections by GOB.

NI = National Income

UHU = Number of Urban Household Units

Pop = Population of the Country

Avg UHU = Average size of the Urban Household Unit

EAP = Economically Active Population

EAP Ag = Economically Active Population - Agricultural Sector

Avg UFI = Mean Urban Family Income/yr.

Median UFI = Median Urban Family Income/yr.

The statistics utilized in the estimation of the family income are as follows:

	1981	1982	1983
GNP 2/ in millions of pesos	180,772	460,115	1,006,204
GNP Ag 2/ in millions of pesos	32,538	66,257	203,313
NI 2/ " " " "	164,608	342,325	905,583
NUI " " " "	134,979	366,287	724,000
Population 3/ in millions	5,755	5,916	6.07
Average UHU 3/	4.5	4.5	4.5
EAP in millions	1,842	1,893	1,855
EAP 3/ Af in millions	.829	.852	.790
UHU in thousands	703	723	783
Avg. UFI in thousands	192	507	920
Median UFI/yr. in thousands	128	337	610
Median UFI/month in thousands	10.6	28.1	50.8

2/ Source: Bolivian Central Bank, National Accounts Department
1981 figures, estimates
1982 figures, preliminary estimates
1983 figures, projections in August 1983 by (INE - see below)

3/ Source: National Statistics Institute (INE), Department of Demography Figures based on the 1976 National Census and projections based on subsequent surveys.

The Income Distribution is based on a study carried out by the United Nations entitled "Informe sobre Política de los Asentamientos Humanos en Bolivia", 1977, which estimated the income distribution around the mean income. This study in itself is based on an income distribution study of an area in Brazil with conditions similar to the ones found in Bolivia.

ESTIMATED DISTRIBUTION OF MONTHLY INCOME IN URBAN AREAS

Percentage of families by income level	Distribution of income as related to the mean
Percentiles:	
5	0.188
10	0.250
20	0.346
30	0.438
40	0.543
50	0.665
60	0.815
70	1.015
80	1.346
90	2.045
100	+

Source: Informe sobre Política de los Asentamientos Humanos en Bolivia. Report prepared jointly by U.N. Foundation for Housing and Human Settlements and the Ministry of Housing, Bolivia, March 1977.

It should also be noted that income figures estimated according to this methodology represent Urban Household Unit income and do not represent monthly salaries received by the average worker. Monthly salaries understate income since formal sector workers receive extra paychecks in the form of bonuses during the year. By law, employees must pay an equivalent

of 14 monthly salaries per year; and some up to 18 monthly salaries. At the level of 14 salaries, a worker earns about 17 percent more per year than the regular monthly wage would indicate. At 16 salaries, the additional income is equivalent to 33 percent and rised to 50 percent with 18 salaries. Also, INE estimates that there are 1.48 salaried workers per household. Informal sector participation would make this ratio even higher and some estimates place the number of working members between 1.7 and 2.0 per household. In synthesis, total household income should be about 50% higher than simple wage scale distribution might indicate. In that context, the household incomes in the previous chart seem to be in the indicated range.

ESTIMATED DISTRIBUTION OF ANNUAL AND MONTHLY INCOME IN URBAN AREAS (1982 AND 1983)

Percentage of Families by Income Level Percentiles	Distribution of Income as Related to the Mean 1982 Annual	1982 Monthly	1983 Monthly
5	95,245	7,937	14,365
10	126,655	10,555	19,102
20	175,291	14,608	26,437
30	221,900	18,492	33,467
40	275,095	22,925	41,489
50	412,896	34,408	50,811
60	412,896	34,408	62,272
70	514,220	42,852	77,554
80	681,912	56,826	102,845
90	1,036,040	86,337	156,253
100	+	+	+

Rural Areas

The median monthly income per household in the rural market segment of interest, i.e. villages of population exceeding 500, may be assumed (for lack of data) to be about 20%. This assumption is consistent with the estimate arrived at by using the same methodology as for the urban income distribution and making the assumptions that people in villages of population less than 200 are outside the cash economy and those in villages of population between 200 to 500 are only partially so.

Knowing the median, and during the same general distribution, one obtains, for the rural market segment:

ESTIMATED DISTRIBUTION OF MONTHLY INCOME IN VILLAGES WITH OVER 500 INHABITANTS (1983)

Percentile	Monthly family Income in 1983
5	2,903
10	3,861
20	5,343
30	6,841
40	8,386
50	10,270
60	12,587
70	15,675
80	20,787
90	37,837
100	+

COST OF WATER SYSTEM EXTENSIONS IN PERI-URBAN AREAS (barrios)

Assumptions

1. Central water system has additional capacity to supply the barrios.
2. City water mains are brought to the edge of the barrio by the municipality
3. The standard barrio consists of 10 city blocks, each 100 x 100 meters; 2 blocks deep by 5 blocks wide.
4. The standard barrio has a population of 1,500 people consisting of 300 families distributed evenly at 30 families per block.
5. The standard lot size is approximately 12.5 x 25 meters.
6. The standard street width is 10 meters.

Type I (Using G.I. pipe)

Cost of Imported Materials (US$)

Primary distribution pipe:

2 1/2" G.I. pipe @ $6.80/M x 650 M = $ 4,420

Secondary distribution pipe:

1 1/2" G.I. pipe @ $ 3.20/M x 2100 M = $ 6,720

Service and house connection:

3/4" PVC pipe @ $ 0.55/M x 20 M x 300 = $ 3,300

Water meters @ $25.00 x 300 = $ 7,500

Faucets @ $ 2.00 x 300 = $ 600

1/2" G.I. pipe @ $1.00/m x 1.5 M x 300 = $ 450

Total materials = $ 22,990

Labor (excavation, fill, plumber) in $b (pesos)

System Extension:

@ $b 420/M x 2750 M = $b 1,155,000

Service house connection:
@ $b 125/M x 20 x 300 = $b 750,000

Total labor = $b 1,905,000

Dollar conversion to Pesos @ 320 to 1

$ 22,990 + 10% contingency + 33% markup x 320	=	$b	10,763,000
Total		$b	12,668,000
Per household		$b	42,226

Type II (Using PVC pipe)

Cost of imported materials (US$)

Primary distribution pipe:

3" PVC pipe @ $ 2.50/M x 650 M	=	$	1,625

Secondary distribution pipe:

2" PVC pipe @ $ 1.50/M x 2100 M	=	$	3,150
		$	4,775

(Note: All other costs remain the same.)

		$	11,850
Total materials		$	16,625
Total labor		$b	1,905,000

Dollar conversion to Pesos @ 320 to 1

$ 16,625 + 10% contingency + 33% markup x 320	=	$b	7,783,160
Total		$b	9,688,160
Per household		$b	32,294

SUMMARY TABLE OF RURAL SYSTEM COSTS

TYPE	SOURCE	TRANSPORT MODE	COST (PESOS) 500 pop.	1000 pop.	2000 pop.
Gravity	Spring	Total	6,214,694	9,943,510	15,909,616
		Per Fam.	62,147	49,718	39,774
	Stream	Total	6,417,642	10,268,227	16,429,163
		Per Fam.	64,176	51,341	41,073
Pumped	Spring	Total	7,360,868	11,777,388	18,843,820
		Per Fam.	73,609	58,887	47,109
	Stream	Total	7,615,817	12,185,306	19,496,489
		Per Fam.	76,158	60,926	48,741
Pumped	Dug Well	Total	4,496,555	8,993,110	17,986,220
		Per Fam.	44,966	44,960	44,960
	Drilled Well	Total	8,825,900	14,121,440	22,594,304
		Per Fam.	88,259	70,607	56,486

GRAVITY SYSTEM CONSTRUCTION COSTS (PESOS & DOLLAR)

(POPULATION 500 = 100 FAMILIES)

SYSTEM COMPONENT		SPRING	STREAM
Spring box	imports	17.60	-
	local	57.410	-
	labor	10.870	-
Stream Diversion	imports	-	88.00
	local	-	189.440
	labor	-	48.830
Surface tank (4 x 4 x 2)	imports	176.00	176.00
	local	466.720	466.720
	labor	87.210	87.210
Transmission Pipeline (2.000 M)	imports	5.000.00	5.000.00
	local	-	-
	Labor	840.000	840.000
Distribution Network (1.000 M)	imports	1.500 00	1.500.00
	local	-	-
	Labor	420.000	420.000
House connections (40 M x 100)	imports	2.550.00	2.550.00*
	local	-	-
	labor	5.000	5.000
	US $	9.243.60	9.314.00
	Pesos	1,887.210	2,057.200
	US$x1.1x1.33x320	4,327.484	4,360.442
	Total cost	$b 6,214.694	$b 6,417.642
	Cost per family	$b 62.147	$b 64.176

* Includes G.I, pipe riser and faucets at $ 3.50

PUMPED (SURFACE) SYSTEM CONSTRUCTION COSTS (PESOS & DOLLARS)

(POPULATION 500 = 100 FAMILIES)

SYSTEM COMPONENT		SPRING	STREAM
Spring box	imports	17.60	-
	local	57,410	-
	labor	10,870	-
Stream Diversion	imports	-	88.00
	local	-	189,440
	labor	-	48,830
Elevated tank (3 x 3 x 3 : 5)	imports	880.00	880.00
	local	430,400	430,400
	labor	55,800	55,800
Transmission Pepeline (2000 M)	imports	5.000.00	5.000.00
	local	-	-
	labor	840,000	840,000
Distribution Network (1000 M)	imports	1.500.00	1.500.00
	local	-	-
	labor	420,000	420,000
House connections (40 M x 100)	imports	2.550.00	2.550.00
	local	-	-
	labor	5,000	5,000
Pump and motor	import	2,000	2,000
	Pesos	1.767.480	1.989.470
	US $	11,947.60	12,018
	x1.1x1.33x320	5,593,388	5,626,347
TOTAL COST		$b 7.360.868	$b 7.615.817
COST PER FAMILY		$b 73,609	$b 76,158

PUMPED SYSTEM CONSTRUCTION COSTS (PESOS & DOLLARS)

(POPULATION 500 = 100 FAMILIES)

SYSTEM COMPONENT		DUG WELL	DRILLED WELL
Dug well (1.50 x 10)	imports	78.00	-
	local	172,990	-
	labor	38,540	-
Drilled well (8" x 40)	imports	-	1.379.00
	local	-	48,420
	labor	-	6,280 600,000
Elevated tank (3 x 3 x 3 : 5)	imports	880.00	880.00
	local	430,400	430,400
	labor	55,800	55,800
Transmission Pipeline (500 M)	imports	1.250.00	1.250.00
	local	-	-
	labor	210,000	210,000
Distribution Network (1000 M)	imports	1.500.00	1.500.00
	local	-	-
	labor	420,000	420,000
House connections (40 M x 100)	imports	2.550.00	2.550.00
	local	-	-
	labor	5,000	5,000
Pump and motor		2,000	7,500
Pesos		1,332,730	1,775,900
US $		6,758	15,059
	x1.1x1.33x320	3,163,825	7,050,000
TOTAL COST		$b 4,496,555	$b 8,825,900
COST PER FAMILY		$b 44,966	$b 88,259

WATER AND SANITATION SYSTEMS

COMPONENT COSTS (US$)

1. Pit Latrine with reinforced concrete slab	
Reinf. concrete slab (1.20 x 1.20 x 0.10)	16.00
Pit excavation (1.00 x 1.00 x 3.00)	5.00
Superstructure allowance	10.00
	$ 31.00
2. Pour-flush toilet (Colombian model)	
Pour-flush toilet	10.00
Plain concrete slab (1.10 x 0.90 x 0.05)	2.00
Pit excavation (1.00 x 1.00 x 3.00)	5.00
Pit cover (wire mesh reinforced)	3.00
PVC pipe 3" Ø x 2 meters	6.00
Superstructure allowance	10.00
	$ 36.00
3. Conversion from Pit to Pour-Flush	
Pour-flush toilet	10.00
Plain concrete slab (1.10 x 0.90 x 0.05)	2.00
PVC pipe 3" Ø x 2 meters	6.00
	$ 18.00
4. Soak away (for yard faucet)	
Pit excavation (1.00 x 1.00 x 2.00)	3.50
Brick lining (250 pieces)	10.00
Gravel fill (1M3)	3.00
	$ 16.50
5. (a) Septic Tank	
Reinforced concrete (1.75 M^3)	192.50
Excavation (4 M^3	6.75
PVC pipe (4" Ø x 6 M)	24.00
	$ 223.25

(b)	Leach Field	
	Excavation (10 M^3)	17.50
	Concrete pipe with perforations or laid with open joints (4" Ø x 40 M)	32.00
	Gravel fill (10 M^3)	30.00
	Concrete distribution box (0.30 x 0.50 x 0.40)	5.00
		$ 84.50
	Complete septic system	$ 307.75
6.	Water Supply System Extension	
	PVC pipe (3" Ø), excavation with backfill	4.50/ML
7.	House connections (w/o meters)	
	PVC pipe 3/4" Ø, excavation & backfill (25 ML)	$ 50.00
	Yard faucet 1/2" Ø	2.00
	G.I. pipe riser 1/2" Ø x 1.50	3.00
		$ 55.00
8.	Serves Connection to existing system	
	Excavation (1.50 x 0.60 x 25 = 22.5 M^3)	40.00
	Concrete pipe (4" Ø x 25 ML at 1.20/ML)	30.00
	Water closet	90.00
	Installation cost	10.00
		$ 170.00
	Additional sanitary fixtures	
	Wash basin	80.00
	Shower	9.00

CONSTRUCTION COSTS IN PESOS BOLIVIANOS AND DOLLARS

(AS OF AUGUST 2, 1983)

Commodity	Concrete Masonry (M^3)	Reinforced Concrete (M^3)	Brick Walls (M^2)	Transmission Pipeline (M)	Distr. Network (M)	Household Connection (M)
Cement	2,640	7,200	348	-	-	-
Sand, rock, gravel	2,240	1,920	80	-	-	-
Form Lumber	-	12,400	-	-	-	-
Brick	-		1,400	-	-	-
Labor	975	2,790	250	420	420	125
Rebar, wire, nails	-	44.00	-	-	-	-
PVC Pipe	-	-	-	2.50	2.50	.55
G.I. Pipe (1.5 M)	-	-	-	-	-	(1.50)
Faucet (each)	-	-	-	-	-	(2.60)
Sub-Totals						
$b.	5,855	24,310	2,048	420	420	125
US $	-	44.00	-	2.50	1.50	.55 (3.50)

ITEMIZED COMPONENT COSTS (PESOS & DOLLARS)

Component	Imported Materials	Local Materials	Labor	Drilling
	US$			
Sping box	17.60	57,410	10,870	-
Stream Diversion	88.00	189,440	48,830	-
Dug well (1.50 x 10)	78.00	172,990	38,540	-
Drilled well	1,379.00	48,420	6,280	600,000
Surface tank (4 x 4 x 2)	176.00	466,720	87,210	-
Elevated tank (3 x 3 x 3 - 5)	880.00	430,400	55,800	-
Transmission Pipeline (M)	2.50	-	420	-
Distribution Network (M)	1.50	-	420	-
House connection (M)	.55 (3.50)*	-	125	-
Pump & motor (a) Gas C. (b) Electric (c) Gast T.	 2,000.00 4,000.00 7,500.00			

* 1.5 m x 1/2 " G.I. pipe plus faucet.

UNITED STATES INTERNATIONAL DEVELOPMENT COOPERATION AGENCY
AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D.C. 20523

ANNEX H

LAC/DR-IEE-83-45

ENVIRONMENTAL THRESHOLD DECISION

Project Location	:	Bolivia
Project Title and Number	:	Private Sector Potable Water 940-0002.22
Funding	:	$2,000,000 L $250,000 G
Life of Project	:	Four years
IEE Prepared by	:	Nazir Baghat, PRE
Recommended Threshold Decision	:	Negative Determination
Bureau Threshold Decision	:	Concur with Recommendation
Copy to	:	Henry Bassford, Mission Director
Copy to	:	Peter Bittner, LAC/DR
Copy to	:	Peter Orr, LAC/DR
Copy to	:	Jim Berezin, PRE/I
Copy to	:	IEE File

James S. Hester Date 9/2/83

James S. Hester
Chief Environmental Officer
Bureau for Latin America
and the Caribbean

Annex H

H. INITIAL ENVIRONMENTAL EXAMINATION (IEE)

1. IEE Recommendation

Project Location	:	Bolivia
Project Title	:	Private Sector Potable Water
Funding	:	Total $2,250.000
		Loan 2,000,000
		Grant 250,000
Life of Project	:	FY 1983-1986
IEE Prepared by	:	Nasir Baghat
		PRE

a. Description of Project

See Section II of Investment Proposal

b. Identification and Evaluation of Environmental Impacts

The Project includes the construction of approximately 90 water systems in communities of different sizes, from rural communities up to 2,000 inhabitants, which are without adequate water, to marginal neighborhoods of principal cities, through which the city has extended,or to which the city is willing to extend, main water lines. Improved waste disposal systems, in particular, approximately 3,000 latrines and pour-flush toilets, will be built in combination with approximately 10% of the water systems. Training and technical assistance to the Savings and Loan (S&L) System will help it to promote water and sanitation (W&S) systems, develop environmental soundness criteria, and assist communities in selecting certified contractors and monitoring construction performance.

Specific communities will be selected from the target communities which have been determined on the basis of need, accessibility, economic viability, and complementarity with existing water systems, projects and plans. These communities now obtain water for domestic purposes from independent water vendors who sell water by the barrel from community standpipes which are too few for the population served and not conveniently located, or in the rural areas, from surface sources, generally small rivers and streams which risk contamination from ground run-off. All water and sanitation services will be installed by certified and experienced contractors in accordance with national and local laws and regulations. In peri-urban neighborhoods, connections will be made with existing or extended city water supply mains. In the rural communities included, low-cost spring-fed gravity systems and dug wells will be emphasized. Contractors will disinfect any wells, piping and tanks prior to use. No undesireable intrusions or deteriorations of aquifers are anticipated.

It is considered that there will be no negative effects on the environment from these systems. From a standpoint of the effect on human beings, the effect will be bneficial, from the increased consumption of clean water per person and the reduced risk of possible contamination of water for domestic purposes. Consumer education on proper hygiene, use and maintenance of water systems will be coordinated with local organizations and agencies which provide environmental health education.

The inclusion of pit latrines or pour-flush toilets as integral parts of the loan package in rural areas will be a beneficial factor from an ecological point of view. Latrine seepage will recuperate to an acceptable level in aquifers prior to passage to water wells or springs. By concentrating human excreta in pit latrines, the spread of parasitic and gastroenteric diseases from the rain run-off will be greatly reduced. No waterborne waste disposal systems are contemplated.

Plans for monitoring the project by USAID/Bolivia include periodic environmental examinations as the specific projects to be financed are identified and W&S system plans and designs are submitted to USAID/Bolivia for review. Government agencies responsible for potable water will conduct periodic testing of water quality.

To this effect, it is recommended that the Environmental Officer, Bureau for Private Enterprise find that the proposed project has a negative environmental impact determiantion.

Date :

Concurrence :

8/27/82

Henry H. Bassford
Mission Director
USAID/Bolivia

2. IEE Checklist

Impact Identification and Evaluation Form

	IMPACTS
LAND USE	
1. Changing the character of land trough	
a. Increasing the population	N
b. Extracting natural resources	N
c. Land clearing	N
d. Changing soil character	N
2. Altering Natural Defenses	N
3. Foreclosing Important Uses	N
4. Jeopardizing Man and His Works	N
5. Other Factors	-
WATER QUALITY	
1. Physical State of Water (positive)	H
2. Chemical and Biological States (positive)	M
3. Ecological Balance	N
4. Other Factors	-
ATMOSPHERIC	
1. Air Additives	N
2. Air Pollution	N
3. Noise Pollution	N
4. Other Factors	-
NATURAL RESOURCES	
1. Diversion, Altered Use of Water	T.

2. Irreversible Inefficient Commitments	N
3. Other Factors	-
CULTURAL	
1. Althering Physical Symbols	N
2. Dilution of Cultural Traditions	L
3. Other Factors	-
SOCIO-ECONOMIC	
1. Changes in Economic /Employment Patterns	N
2. Change in Population	N
3. Changes in Cultural Patterns	N
4. Other Factors	-
HEALTH	
1. Changing a Natural Environment (positive)	H
2. Eliminating an Ecosystem Element	N
3. Other Factors	-
GENERAL	
1. International Impacts	N
2. Controversial Impacts	N
3. Larger Program Impacts	N
4. Other Factors	-

Symbols used are: N: No Environmental Impact

L: Little Environmental Impact

M: Moderate Environmental Impact

H: High Environmental Impact