[redacted]

PROJECT PAPER

Proposal and Recommendations
For the Review of the
Bilateral Assistance Subcommittee

PAKISTAN - RURAL CLEAN WATER SUPPLY

AID/BAS-034

UNCLASSIFIED

DEPARTMENT OF STATE
AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D.C. 20523

UNCLASSIFIED
AID/BAS-034
July 26, 1978

MEMORANDUM FOR THE BILATERAL ASSISTANCE SUBCOMMITTEE

SUBJECT: Pakistan - Rural Clean Water Supply

Attached for your review are recommendations for authorization of a loan for Twenty Million United States Dollars ($20,000,000) and a grant for One Million Five Hundred Thousand United States Dollars ($1,500,000) to the Government of Pakistan (the "Cooperating Country") to help in financing certain foreign exchange and local currency costs of goods and services required for the project.

This loan/grant proposal is scheduled for consideration by the Working Group on Bilateral Assistance on Thursday, August 3, 1978, at 2:30 p.m., in Room 3886 New State. If you are a voting member, a poll sheet has been enclosed for your response.

Working Group on Bilateral Assistance
Office of Policy Development and Program Review

Attachments:
Summary and Recommendations
Project Analysis
Annexes A & B

AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT PAPER FACESHEET

1. TRANSACTION CODE: [A] (A = ADD, C = CHANGE, D = DELETE)

PP

2. DOCUMENT CODE: 3

3. COUNTRY/ENTITY: PAKISTAN

4. DOCUMENT REVISION NUMBER: NA

5. PROJECT NUMBER (7 digits): 391-0406

6. BUREAU/OFFICE: A. SYMBOL: ASIA; B. CODE: 04

7. PROJECT TITLE (Maximum 40 characters): RURAL CLEAN WATER SUPPLY

8. ESTIMATED FY OF PROJECT COMPLETION: FY 82

9. ESTIMATED DATE OF OBLIGATION: A. INITIAL FY 78; B. QUARTER 4 (Enter 1, 2, 3, or 4); C. FINAL FY 78

10. ESTIMATED COSTS ($000 OR EQUIVALENT $1 - Rs. 9.90)

A. FUNDING SOURCE	FIRST FY 78 B. FX	C. L/C	D. TOTAL	LIFE OF PROJECT E. FX	F. L/C	G. TOTAL
AID APPROPRIATED TOTAL	1,500	20,000	21,500	1,500	20,000	21,500
(GRANT)	(1,500)		(1,500)	(1,500)	(-)	(1,500)
(LOAN)	(-)	(20,000)	(20,000)	(-)	(20,000)	(20,000)
OTHER U.S. 1. Mondale Rs.		1,403	1,403		1,403	1,403
OTHER U.S. 2.						
HOST COUNTRY	-	769	769	-	10,905	10,905
OTHER DONOR(S)						
TOTALS	1,500	22,172	23,672	1,500	32,308	33,808

11. PROPOSED BUDGET APPROPRIATED FUNDS ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE C. GRANT	D. LOAN	E. 1ST FY 78 F. GRANT	G. LOAN	H. 2ND FY 79 I. GRANT	J. LOAN	K. 3RD FY 80 L. GRANT	M. LOAN
(1) HE	510	545	545	1,500	20,000				
(2)									
(3)									
(4)									
TOTALS				1,500	20,000				

A. APPROPRIATION	N. 4TH FY 81 O. GRANT	P. LOAN	Q. 5TH FY ___ R. GRANT	S. LOAN	LIFE OF PROJECT T. GRANT	U. LOAN
(1) HE					1,500	20,000
(2)						
(3)						
(4)						
TOTALS					1,500	20,000

12. IN-DEPTH EVALUATION SCHEDULED: MM 04 YY 80

13. DATA CHANGE INDICATOR. WERE CHANGES MADE IN THE PID FACESHEET DATA, BLOCKS 12, 13, 14, OR 15 OR IN PRP FACESHEET DATA, BLOCK 12? IF YES, ATTACH CHANGED PID FACESHEET.

[1] (1 = NO, 2 = YES)

14. ORIGINATING OFFICE CLEARANCE

SIGNATURE: Hasan A. Hasan

TITLE: Chief, Project Development & Monitoring

DATE SIGNED: MM 05 DD 10 YY 78

15. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION: MM 05 DD 15 YY 78

AID 1330-4 (3-78)

PROJECT PAPER
PAKISTAN: RURAL CLEAN WATER SUPPLY LOAN AND GRANT

ANNEXES

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* On file in ASIA/PD Office

* **C - Social Soundness Annex**
  C - Social Soundness Analysis - Part I
  - Social Soundness Assessment - Part II

* **H - Institutional Analysis**
  H - Description of GOP Administrative Structure

* **I - 612(b) Cable**
  I - Islamabad 2748

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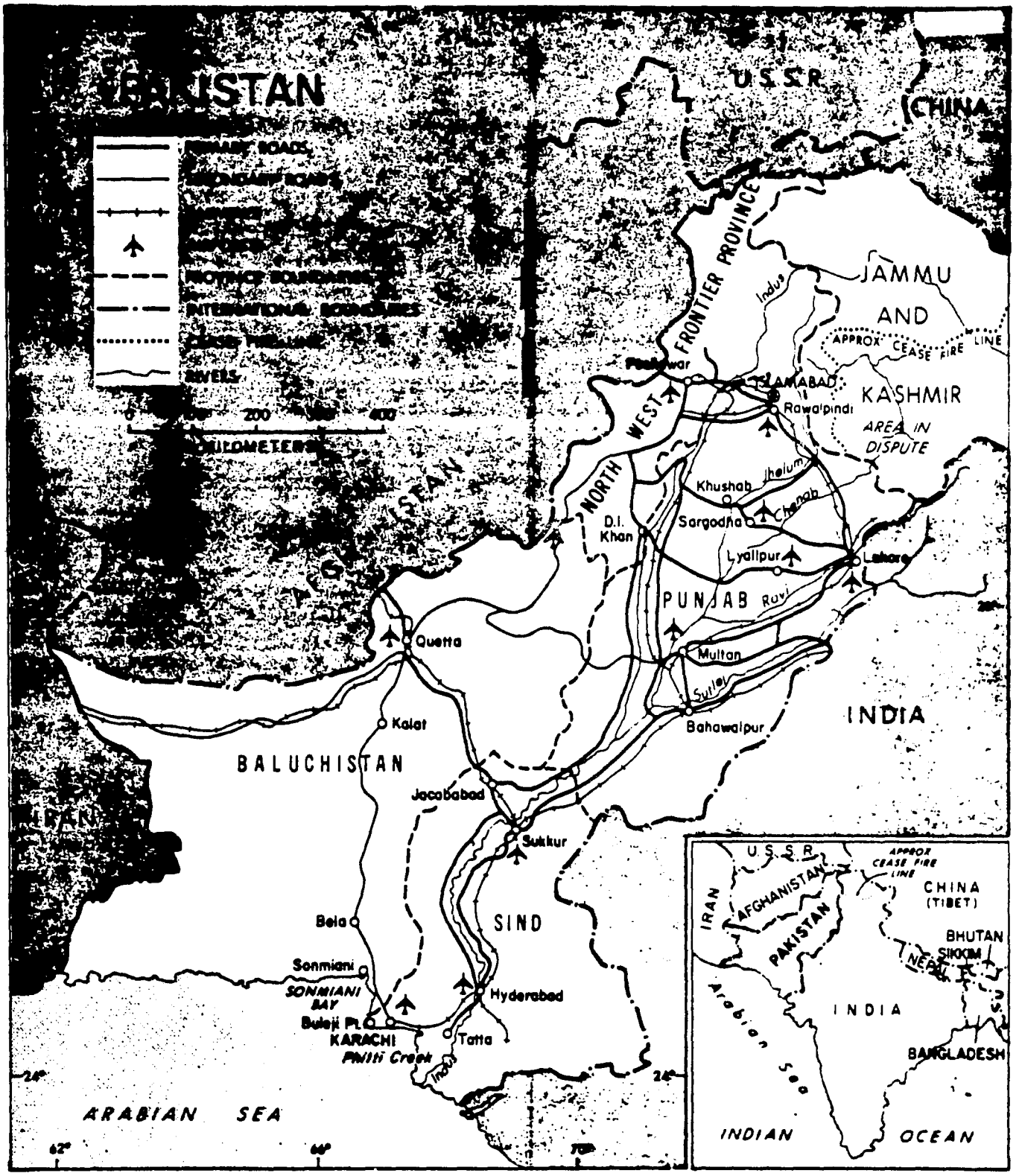
* On file in ASIA/PD Office

GLOSSARY

1. **Basic Health Services**	A USAID assisted project under which the GOP plans to train and deploy medical and para-medical personnel to a three tiered rural health care delivery system.
2. **Deputy Commissioner**	The executive/administrative head of a district.
3. **District**	A geographical sub-division within the administrative hierarchy, somewhat akin to a county, headed by a deputy commissioner. Several districts form a division and several divisions constitute a province.
4. **District Council**	A locally elected government body at the district level.
5. **EOPS**	End of Project Status
6. **FAR**	Fixed Amount Reimbursement - Method of reimbursing host country whereby the amount of reimbursement is fixed in advance based on reasonable cost estimates reviewed and approved by AID. Reimbursement is made upon physical completion of a project or sub-project.
7. **Guinea Worm**	A debilitating water-based disease common in several water-short areas of Pakistan.
8. **GOP**	Government of Pakistan
9. **IPHER**	Institute of Public Health Engineering Research, Punjab
10. **IPD**	Irrigation and Power Department, Baluchistan.
11. **Karez**	A water system used in Baluchistan under which a well is dug at the base of a hill and water brought to a community through an underground channel.

12. **Markaz (Plural Marakaz)**	The focal point in a rural area having facilities for marketing agricultural produce, fertilizer depots, medical assistance, literacy centers, etc.
13. **NWFP**	Northwest Frontier Province, one of Pakistan's four provinces.
14. **PHED**	Public Health Engineering Department
15. **Province**	See "District" above.
16. **Purdah**	Practice of seclusion of women.
17. **PVC Pipe**	Polyvinyl chloride pipe
18. **PWP**	Peoples Works Program
19. **RDW**	Rural Development Wing
20. **Tehsil/Taluka**	A sub-division of a district. See "District" above.


PAKISTAN
U.S.S.R.
CHINA
INTERNATIONAL BOUNDARIES
RIVERS
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KILOMETERS
NORTH WEST FRONTIER PROVINCE
Indus
JAMMU AND KASHMIR
APPROX CEASE FIRE LINE
AREA IN DISPUTE
Peshawar
ISLAMABAD
Rawalpindi
Khushab
Jhelum
Chenab
Sargodha
D.I. Khan
Lyallpur
Lahore
PUNJAB
Ravi
Multan
Sutlej
Bahawalpur
INDIA
Quetta
Kalat
BALUCHISTAN
Jacobabad
Sukkur
IRAN
Bela
SIND
Sonmiani
SONMIANI BAY
Hyderabad
Buleji Pt.
KARACHI
Phitti Creek
Tatta
Indus
ARABIAN SEA
62°
64°
66°
24°
U.S.S.R.
AFGHANISTAN
IRAN
PAKISTAN
CHINA (TIBET)
BHUTAN
SIKKIM
NEPAL
INDIA
BANGLADESH
Arabian Sea
INDIAN OCEAN

PART I - SUMMARY AND RECOMMENDATIONS

A. FACE SHEET DATA

(See preceding page)

B. RECOMMENDATIONS

Approval is requested in principle of an AID-assisted 9 year rural clean water program supported by $60 million in loan funds and $3.0 million in grant funds. Authorization is requested in FY 78 for an AID Loan of $20 million (Terms: 40 years, 10 years grace, 2% during grace, 3% thereafter) and an AID Grant of $1.5 million.

Approval is also requested of a grant of $1.4 million equivalent in US owned Mondale rupees.

A 612(b) determination is requested to permit dollars to be used to finance a portion of the local costs of the project. Justification is given in Islamabad 2748 dated March 2, 1977 (copy attached as Annex I).

C. THE PROJECT

The AID-assisted Rural Clean Water project will provide increased quantities of water to the rural poor for drinking, washing and bathing in areas where the available supplies are insufficient, and an improvement in the quality of water which is used for these purposes in those rural areas where water is abundant but of poor bacteriological quality.

D. SUMMARY FINDINGS

The results of the technical and financial analyses done for this PP indicate that the design of this project is technically sound and the cost estimates are not excessive and are reasonably firm. Economic, social, and environmental analyses indicate that significant benefits should accrue to Pakistan's rural poor and that no major damage to the environment is foreseen as a result of this project. No major issues remain.

This project meets all applicable statutory criteria as shown in Annex A3, attached hereto. The Mission Director has certified that Pakistan has the capability to effectively maintain and utilize the project. A copy of the 611(e) certification is attached as Annex A1.

E. PROJECT ISSUES

Project issues raised in the AID Project Review Paper approval cable (attached as Annex A5) are addressed in the body of this PP. One option which was discussed in the PRP, contemplated the subsidized cash or credit sale of handpumps to private households. This approach has been considered but is not included in the design of this project because we and the GOP were unable to identify procedures to ensure that the neediest potential beneficiaries would take advantage of such a program.

It was also originally planned that, because technical and institutional issues were somewhat different for handpump and village water systems projects, two PPs would be prepared and separate loans authorized for the two activities. However, it was determined during intensive review that the institutional and technical issues were, in fact, similar, and the GOP has expressed a strong preference for combining the two activities into one project.

F. USAID PROJECT DEVELOPMENT COMMITTEE

Arthur M. Handly, Assistant Director, Development Policy
Elinor G. Constable, Capital Development Officer, Chairperson
David A. Oot, Public Health Advisor
Gerald H. Zarr, Regional Legal Advisor
W. Douglas Robbins, Deputy Controller
Francis K. Lyvers, Assistant Agriculture Development Officer
Robin Raphel, Assistant Program Economist
Rifaq Ahmed Ismail, Public Health Advisor
Thomas R. Mahoney, Assistant Program Officer
Andrew P. Haynal, Population Officer

OTHERS

Hasan A. Hasan, Capital Resources Development Officer
Hugh S. Plunkett, Social Science Research Specialist
Howard B. Keller, Public Health Advisor

G. TDY ASSISTANCE

Victor W. R. Wehman, Jr. Sanitary Engineer, AID/W

PART II. BACKGROUND AND DESCRIPTION

A. BACKGROUND

1. Priority and Relevance

In Pakistan, inadequate or contaminated water supplies are a major source of significant public health problems. The majority of Pakistanis who live in rural areas do not have access to a safe or convenient source of water. Current GOP estimates are that only 14% of its rural population of 55 million is served by Government efforts to provide adequate supplies of clean water.

Contaminated water is a primary vector for a number of serious water-related diseases, and lack of adequate quantities of water for washing and bathing makes personal hygiene difficult and also contributes to a variety of illnesses. In Pakistan existing systems for collecting, analysing and reporting vital statistics are deficient, but the evidence that water-related diseases are widespread in the rural areas of the country is clear. A 1975 study[1/] of proportional deaths due to different illnesses indicated that in rural areas two thirds of all deaths were due to infective and parasitic diseases (exclusive of malaria). Diarrheal disease is a leading cause of infant mortality, and other water-related diseases are endemic.

2. GOP Strategy

The Government of Pakistan is aware of this problem and has identified improved rural water supply as a high priority sector in its rural development effort. It plans to substantially increase investments in this area as indicated in its current development plan (1978-1983).

The development budget for 1977-78 allocated Rs. 168.9[2/] million for rural water supply, an increase of more than 100% over 1976-77figures, and the GOP hopes to support a total investment of Rs. 966 million in rural water and sanitation activities between now and 1983. Given the limited public funds available to the GOP and the needs of competing sectors (agriculture, health, education, infra-structure and industry) for these funds, these figures clearly demonstrate the GOP's commitment to the rural water sector.

1/ Planning Division, Health and Health Related Statictics
2/ Rate of exchange: 9.9 Rupees = U.S. $1.00

The GOP plans to provide increasing funds to government organisations which have experience in constructing piped water supply schemes in urban areas and in larger villages, such as the provincial Public Health Engineering Departments. These departments will be expected to expand their coverage to medium sized villages in rural areas. In addition, the GOP plans to include the provision of improved water supplies to smaller villages as an important activity under its reorganized and expanded integrated rural development program. The GOP anticipates that these combined efforts will increase the percentage of rural inhabitants with access to clean, convenient water supplies from 14% to 36%. Specific GOP targets during the revised Fifth Plan period (1978-83) are as follows:

	1977-1978	1982-1983	Increment
Population, urban (in millions)	21.14	26.37	5.23
Population, rural	54.48	60.53	6.05
Population, total	75.63	86.9	11.28
Rural population with water supply: number	7.66	21.81	14.15
Percentage of total rural population	14.06%	36%	21.94%
Rural population with sanitation: number	0	2.0	2.0
Percentage of total rural population	0	3.3%	3.3%

Planned GOP investment during the same period are as follows:

	Total Cost (million Rs.)	Persons Benefitted (millions)	Investment Per Beneficiary(Rs)
Rural water supply	766	14.15	54.13
Rural sanitation (drainage)	200	2	100
Sub-total, rural sector	966		
Urban water supply	2312	18.25	126.68
Urban sewerage	1229	5.86	209.73
Sub-total, urban sector	3541	-	-
Total investment, water supply and drainage	4507	-	-
Percentage allocated to rural sector		21.43%	

The above figures show that more persons will benefit from water supply in the rural than in the urban sector, although the majority of investments will occur in the urban sector. Urban per capita costs are substantially greater due to higher standards (up to 40 gallons per consumer per day (gpcd) for urban house connections as against 10 gpcd for rural yard connections), and the fact that simple, low-cost systems, such as handpumps and gravity flow systems, are used for many village projects.

3. AID Role and Relation to AID Strategy

a. AID Strategy

Consistent with the DAP, USAID/Pakistan has adopted a strategy for a long term involvement in the rural water supply sector. This strategy was outlined in the Mission's 1979 ABS which was approved by AID/W in June, 1977. The USAID effort proposes to provide $60 million in loan funds and up to $3.0 million in grant funds over a six year period.

The rural clean water program will thus be a major element of the USAID development assistance to Pakistan over the next six years. It will complement other proposed activities which support the GOP strategy to promote the economic and social advancement of its rural population by improving their health and meeting other basic needs. Among other projects the Mission is supporting are activities to improve on-farm water management, rural primary education, rural health, rural electrification and other power availabilities, and rural roads. This program will develop special linkages with the Basic Health Services Project and the Mission expects it to provide the base for a future rural sanitation project.

b. AID Focus

AID proposes to increase the numbers of the rural poor served by clean, convenient water supplies by reimbursing the GOP under a modified FAR method for expenditures for installed rural water schemes. The program is also expected to improve the ability of the GOP to address the following important problems which have limited the success of its rural water supply program.

(1) Systems maintenance

Rural water supply systems in almost all countries are plagued by serious operation and maintenance problems, and Pakistan is no exception. At the present time implementing organizations either do not have sufficient resources or manpower to handle maintenance, or communities who are expected to assume maintenance responsibilities

are unable to do so because of organizational and administrative difficulties, funding problems and lack of technical expertise. Their inability to levy and collect sufficient water user charges to support the systems once installed is a particular problem. The development and implementation of a more effective maintenance plan is therefore viewed as a critical element of this program.

(2) Focus on Health Issues

The rationale for undertaking massive investments in the rural water supply sector -- and for this specific program -- is that the provision of safe water in sufficient quantities will improve health. And yet, little is known about exactly how, why and to what extent water supplies affect health levels. The following is a good recent summary of the state of current knowledge:

> "We know that good domestic water supplies in every home are a vital part of the wide ranging environmental improvements which, together with wealth, have caused such a dramatic reduction in infectious disease in Europe and North America in the last 100 years.
>
> We know that if it were possible to transform the socio-economic, and environmental conditions (including water supply) of the poor in developing countries into those enjoyed in Europe or North America, a very dramatic reduction in infectious disease would follow.
>
> We know that improvements in environmental conditions must include good water supplies if they are to have their full effect on community health.
>
> We do not fully understand the role of partial and limited improvements in environmental quality as opposed to comprehensive improvements.
>
> We suspect that replacing dirty water by clean water in the absence of other inputs, will often have little effect on health.
>
> We know that it is difficult to induce changes in hygiene and water use practices but we suspect that such changes may be essential if improved water supplies are to improve health." 1/

Thus while clean water is a basic necessity if health levels are to be raised, other conditions are also required such as improved health practices, hygiene education and the adoption of safe excreta disposal and related sanitation measures. In Pakistan experience with successful efforts in any of these areas is virtually non-existent, rural sanitary conditions are extremely poor, age old socio-cultural

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1/"Domestic Water Supplies, Health and Poverty: A Brief Review", Richard Feachem, 1977.

practices related to sanitation and personal hygiene continue to contribute to the spread of water-related diseases, and the relationship between these conditions and practices and health is not well understood.

This program will provide for the phased development of appropriate health and sanitation measures to maximize its positive impact on the health status of the rural poor. Under the first $20 million loan, limited but practical health and sanitation measures will be carried out, and technical assistance will be provided to enable the Government to strengthen its health focus and to identify those health and sanitation activities which will best complement the provision of an improved water supply. These activities will be incorporated in the project to be supported by a second $20 million loan, tentatively planned for 1981.

(3) Institutional Issues

The GOP has identified expanded training at both the technical and professional levels as an important need, and this program will assist with the improvement of Pakistan's capability to provide such training. This program will also focus on certain other institutional and technical issues which will enable the GOP to improve systems selection and design.

4. Prior AID Experience

a. Rural Water Supplies

AID assisted the Government of Pakistan with the installation of 45,000 handpump tubewells in areas affected by the 1973 floods, with $2.5 million out of the total Flood Relief and Rehabilitation Grant of $27.5 million. UNICEF and UNDP also contributed $1.5 million. The project uncovered problems in handpump design, installation and maintenance which have been addressed in the development of the present Clean Water Project.

From 1962 to 1967 USAID provided Rs. 7.5 million (about $1.5 million at the then exchange rate of Rs. 4.76=$1) of counterpart rupee funds in support of the rural water supply budget of the Government of West Pakistan. USAID's funds were attributed to eighty completed systems in villages in which rural health centers were constructed. UNICEF contributed pipes and fittings for these systems. In each system water was supplied to the rural health center and to a battery of taps in public places. An AID audit in 1967 found that maintenance of these systems was generally inadequate.

b. Urban Water Supplies

AID made a loan for $3.6 million in 1964 (Loan 391-H-079) to help (i) develop the technical and administrative capacity to plan, design, install, manage, operate and maintain municipal water and sewerage

systems; (ii) encourage development of manufacturing capabilities in the private sector for supplying most of the equipment required for urban water and sewerage systems;and (iii) construct five urban water supply systems.

The consultants under the loan developed standard designs that are also applicable to rural water supply systems and worked with several Pakistani engineers who are now in responsible positions and adapting the experience they gained on that project to current problems.

c. Training

A number of engineers who are still active in the Public Health Engineering Departments studied in the U.S. under AID auspices. Others have studied elsewhere under sponsorship of the World Health Organization and other bilateral donors.

5. Other Donor Activities

a. UNICEF

UNICEF is currently the most active foreign donor in the rural water supply sector. In 1974 UNICEF, along with UNDP, provided $1.5 million for the installation of handpumps in flood affected areas. Since 1975 over $2 million of assistance has been provided, and a further $2.5 million is under discussion.

UNCEF assistance has financed the installation of handpumps in Punjab and Moyno-type rotary handpumps in Baluchistan; equipment and materials for 16 deep tubewell schemes in Baluchistan; technical assistance in well drilling, drilling rigs, and submersible pumps for NWFP; and equipment for several slow sand filter schemes and the costs of a test project in horizontal well drilling in Azad Kashmir.

In July 1976 UNICEF assigned a water supply engineer to its Islamabad office to establish a water section, primarily to work on water supply projects. AID and UNICEF coordinate closely in these efforts, and will continue to do so. UNICEF has, for example, financed costs of two studies, Water Quality and Water Use Patterns, which were conducted in connection with this project.

b. Others

The GOP has approached the World Bank and the Asian Development Bank (ADB) for loans for urban water supply, sewerage and drainage projects in Karachi, Lahore, Hyderabad and Faisalabad (Lyallpur). Two loans, $26.6 million by the World Bank for Lahore water and sewerage and $22 million by the ADB for Hyderabad water supply, were approved in 1976. A third loan for $39.5 million was authorized

by the ADB in 1977 for improvement of the Faisalabad sewerage system.

WHO and UNDP assisted the GOP in its planning on rural water supply through the preparation (1974) of a sector study on water supply and sewerage. They have also provided advisors and technical assistance to the Institute of Public Health Engineering Research (IPHER) in Lahore to improve its training and water quality testing programs. A new project, under which UNDP would provide an additional $739,000 in technical assistance and training to IPHER, is under discussion.

c. Bilateral Assistance Programs

The Government of the Netherlands (GON) has agreed to provide a loan of approximately of $7 million to the GOP to finance rural water supply schemes. The program is currently under discussion with the GOP, and GON representatives have been consulting with the Mission to ensure that GON and U.S. assistance efforts are complementary.

B. DETAILED PROJECT DESCRIPTION

1. Multi-Year Program

The AID-assisted program will take approximately nine years to implement, although it is expected that all funds will have been authorized by 1983. The first tranche for $21.5 million ($20 million loan and $1.5 million grant) will be authorized in 1978 and will take about 4 years to implement. The second tranche is tentatively programmed at a $20 million loan and a $1.5 million grant and scheduled for authorization in 1981. It will also take about four years to implement. The third and final tranche, a $20 million loan, is planned for authorization in 1983 and is planned to take four years to implement. Thus all activity under the $63 million program should be completed by 1987. A time-phased plan for the program is shown below:

Calendar Year	78	79	80	81	82	83	84	85	86	87
Program Year	0	1	2	3	4	5	6	7	8	9
1st Tranche ($21.5 million)	xxxxxxxxxxxxxxx									
2nd Tranche ($21.5 million)				xxxxxxxxxxxxxxx						
3rd Tranche ($20 million)						xxxxxxxxxxxxxxx				

Each tranche will support piped rural water supply projects in the neediest districts of the country. Resource constraints will limit coverage to approximately 30% of the 62 districts, or about 1/3 of the settled areas. (Several districts in the northern sections of the country are too hilly or sparsely settled to make the provisionof either handpumps or piped water schemes feasible.) Simple water schemes and handpumps will be installed in smaller communities throughout the country.

a. Rationale for Tranching

The program is being tranched due to AID funding constraints and the fact that the program period is too long to be accommodated in a single tranche. Furthermore, the capacity of GOP implementing organizations may be taxed if the entire program is carried out in one package. It is not intended that the first tranche serve as a pilot for the whole program and authorization of successive tranches will not be conditioned upon the completion and evaluation of previous ones. However, to the extent that experimental pilot projects funded under the first tranche provide useful data or identify measures that should be adopted to further strengthen the rural water supply effort, these will be incorporated in sub-projects to be financed by future tranches. Further, in-depth evaluations are planned for each tranche and their conclusions regarding modifications in project design will be adopted.

b. Program Development Strategy

This project paper describes the main elements of a nine-year multi-tranche program to obtain general AID approval to proceed with the overall program. This paper, however, requests the authorization of only the first program tranche, i.e. $20 million in loan funds and $1.5 million in grant funds. These funds will assist the GOP in carrying out rural water supply activities in the neediest 1/3 of the settled districts of the country. Future tranches will support GOP efforts in most of the remaining districts. However, it is anticipated that some overlapping will occur as target districts for each tranche will be selected in accordance with their need for an improved water supply. The loans will not finance piped water systems in areas where the present level of service is high.

The Mission will present brief project papers for each future loan tranche. Each project paper will focus on the ways in which water supply systems selection, design and construction can be improved, those complementary health and sanitation measures which should be added, and an analysis of experience gained from prior tranches.

2. Goal

The goal of the overall program is to improve the health status and quality of life of the rural population in Pakistan. More specifically,

the program should result in a reduction in the incidence of water related (water borne, water-washed and water-based) diseases among the country's rural poor.

Other AID assistance programs which are designed to have a direct impact on health levels in rural areas are the on-going Basic Health Services and Malaria Control projects, and planned activities in population and nutrition.

3. Purpose

The purpose of this project is to (1) increase the quantity of water which is available to and used by the rural poor for drinking, washing and bathing in areas where the available supplies are insufficient, and (2) to improve the quality of water which is used for these purposes in those rural areas where water is abundant but of poor bacteriological quality.

For each $20 million loan, end of project status (EOPS) will be achieved when projected beneficiaries are enjoying a clean, convenient and dependable water supply, e.g., are collecting and using a minimum of 40 litres per person per day of uncontaminated water from a distribution point which is located, on the average, one-fourth of the distance between the current water source and their home.

Achievement of the purpose will result in the removal of a major constraint to the improved health status of the rural poor: the lack of adequate supplies of clean, convenient water. The changes in the water supply are expected to affect different groups of diseases in different ways: an increase in the quantity of water for washing and bathing will reduce water washed diseases (e.g. typhus, trachoma, skin diseases), while a change in the water source and an improvement in water quality should protect individuals against a number of water-borne diseases (e.g. cholera, typhoid, dysentery, hepatitis).

4. Project Focus

a. Geographic

The project will be carried out in the four provinces of Pakistan: Sind, Punjab, Northwest Frontier and Baluchistan. Within each province priority districts have been identified for the installation of piped water systems to be financed under the first loan. The number of districts has been broken down as follows:(See map, Annex B2).

	Priority Districts	Total No. of Districts
Punjab	7	21
Sind	4	12
NWFP	4	19 1/
Baluchistan	3	10
Total	18	62

The total of 18 districts represents slightly over one-third of the settled area of Pakistan. The number of districts covered under each loan is being limited to facilitate project monitoring and ensure that project funds are directed towards the neediest potential beneficiaries. The target districts have been jointly identified by AID and the GOP on the basis of a preliminary determination of the number of communities whose inhabitants do not have reasonable access to uncontaminated water at the present time. Most of them are in areas where the provision of improved water supplies has been particularly difficult due to hilly terrain, arid conditions or other technical and logistical constraints.

The project will focus on piped water systems serving communities in the 1000-5000 population range. As can be seen from the following table, most of Pakistan's 43,000 villages have populations of less than 5000, and over 30% fall within the 1000-5000 range. These communities have received only limited attention in the past as the Government's rural piped water supply programs have focused on communities in the 10,000 to 25,000 population range.

The approximate distributionof these population centers by Province is as follows: 1/

	Punjab	Sind	NWFP	Baluchistan
Over 10,000	.4%	.1%	.7%	.03%
5,000 - 10,000	1.9%	1.0%	2.8%	.03%
1,000 - 5,000	33.3%	55%	31.7%	7.8%
Less Than 1,000	64.4%	43.9%	64.8%	91.9%

Systems which serve communities with populations of up to 10,000 will be selected for reimbursement on a case-by-case basis. It is anticipated that in a few cases where water source development poses serious technical problems, a single system may include a distribution network which serves more than one community.

Handpumps will be installed throughout the country where they represent the most feasible approach from a technical and economic point of view. This includes most areas of Punjab and Sind, but only a few areas in NWFP and Baluchistan where soil and water table conditions limit the feasibility of handpump installation. Most handpumps would be installed in villages with populations of less than 1500. Priority will

1/ Source: 1972 Pakistan Census.

be given to areas where handpumps are technically and economically feasible but are not now in abundance. In small villages where the installation of handpumps is not feasible, other simple water improvement schemes will be undertaken.

b. Target Group

The primary beneficiaries of the project will be the estimated 2.4 million rural Pakistanis who will be provided with clean water and drainage facilities during the four year life of the project. The beneficiaries primarily reside in population centers of 1000-5000, although a few water supply schemes may be financed in larger villages (up to 10,000) and handpump installation and other small water improvement schemes will be undertaken in communities with populations under 1500. Direct beneficiaries will also include over 1500 technical personnel who will receive short-term training and 32 engineers who will be sponsored for graduate level courses in sanitary engineering.

An estimated 74% of Pakistan's 75 million people live in areas which are categorized as rural. The most recent income estimates show that rural per capita income is roughly $100 at 1970 prices. This is about one third lower than per capita income in urban areas. The project is expected to benefit rural inhabitants at all income levels, but the great majority of the beneficiaries will be among the poorest income groups who live in small rural villages and who have not been able to secure for themselves access to convenient clean water supplies. Target districts which have been identified for the installation of piped systems are those in the greatest need of an improved water supply. These districts tend to be less prosperous and in the past have received a lower level of public services than, for example, the irrigated areas of Punjab and Sind. Also, in these areas private households with sufficient resources have been able to provide for their water supply needs through the purchase of handpumps. Further, public water distribution points will be located so that maximum access is provided to the poorest income groups within each village. Handpumps and simple water improvement schemes will be installed in smaller communities where income levels are particularly low.

The project will significantly benefit rural women. In most of the rural areas of Pakistan, it is the women who draw water for household use. The provision of water at or near the home will reduce or eliminate the physically exhausting task of carrying water which often consumes several hours per day of the already overburdened rural woman's time.

5. Outputs

a. Piped Water Systems

Under this project it is anticipated that approximately 200 village piped water supply and drainage systems will be constructed. All

systems will include provision for draining away wastewater. Designs will generally conform to those now in use in Pakistan, but the GOP will receive advice and information on improved systems design through the technical assistance component of the project.

b. Small Water Improvement Schemes

The project will finance approximately 400 simple water supply improvement schemes. These will be undertaken in small communities where installation of handpumps is not feasible, and more costly schemes are impractical. These schemes will include karez 1/ improvement, protection of open wells, and the provision of small storage tanks with filters for spring water.

c. Handpumps

The project will finance the installation of approximately 28,000 handpumps in rural areas wherever soil and water table conditions are appropriate, where handpumps are the most logical water supply solution in economic terms, and where water quality is acceptable.

d. Selection Criteria

The selection of individual water supply schemes being built by the GOP is based on community need and economic and technical feasibility. However, there is no standardized objective procedure in use for determining project priorities among schemes. Under this project a set of explicit criteria will be agreed to by the GOP and AID and used for the ranking and selection of sub-projects. The criteria, which will be jointly developed prior to disbursement of loan funds, will emphasize local participation in systems installation and maintenance as well as need and technical and economic feasibility.

e. Maintenance

This project will result in improved maintenance of water supply systems. A maintenance plan is being jointly developed by AID and the GOP which will define both government and community responsibilities in this area. Past experience indicates that, at least in the short run, government organizations must continue to assume some responsibility for maintaining recently installed systems and that funds must be budgeted for this purpose. However, these systems clearly cannot rely on external funds and services for their proper functioning in the long run, and involvement of the local population is therefore considered to be absolutely essential.

This project will also assist the GOP in addressing the problem of systems maintenance by providing information about new low operation

1/ A traditional water system under which a well is dug at the base of a hill and water brought to consumers through an underground channel.

and maintenance designs which are being developed for rural water supply systems outside of Pakistan, and technical assistance in adapting them for use in Pakistan. Feasibility studies will be carried out to determine whether these designs can be manufactured and utilized locally. The first such study will examine the feasibility of local manufacture of one or more low maintenance handpump designs now being developed and field tested. Other studies will be carried out under future loans.

f. Institutional Capability

The institutional capability of implementing organizations will be strengthened through the assistance of short term and long term foreign advisors.

In the four provinces the following organizations will implement the project and will thus benefit from this assistance:

Punjab	-- The Public Health Engineering Department: village water supply schemes
	-- The Department of Rural Development and Local Government: handpumps
Sind	-- The Public Health Engineering Department: village water supply schemes and handpumps
NWFP	-- The Public Health Engineering Department: village water supply schemes
	-- The Department of Rural Development and Local Government: handpumps; simple water supply schemes in smaller villages
Baluchistan	-- The Irrigation and Power Department: village water supply schemes
	-- The Department of Rural Development and Local Government: handpumps; simple water supply schemes

The project will provide both short and long term advisors to work directly with these organizations to improve their capability to develop simple, low-cost, low maintenance water supply schemes, and expand their ability to work with beneficiary communities and design and carry out appropriate health and sanitation measures. Efforts to increase community involvement in project construction and maintenance will be enhanced through a pilot project which will test several alternative methods of stimulating successful community motivation and participation.

g. Training

The project will include a substantial training element for technical and professional personnel. Support will be provided to approximately 32 engineers to attend a post-bachelor's level program of academic and competency based training in sanitary engineering which is being established at a local engineering university with assistance from UNDP. In addition, approximately 1,500 technical personnel will receive short-term pre and in-service training in sanitation, systems maintenance and related topics.

Most of the engineers who are working with implementing organizations have received only limited training in the areas of public health and sanitation. One institution in Pakistan, the Institute of Public Health Engineering Research of the University of Engineering and Technology in Lahore (IPHER), does offer a master's degree in public health engineering, but attendance is limited and course offerings need to be expanded. Under a proposed UNDP project the IPHER program will be augmented to provide academic and competency based training in the areas of engineering sanitation, expedient engineering of source and storage facilities, wastewater treatment, water and food hygiene and general sanitation. This project will sponsor attendance by engineers from the four provinces. In order to provide sufficient incentive for engineers to attend the training, a local currency grant will be provided so that stipends can be paid to participants over and above normal salary levels, and successful completion of the course will be taken into consideration in making recommendations for promotion or assignment to certain responsible positions in the rural water supply sector. It is expected that approximately 8 engineers would complete the program each year, for a total of 32 engineers over the life of the project.

The project will also help finance the training of sanitarians and other technical personnel. One foreign advisor sanitarian will work to develop a program to strengthen pre-service and in-service training for sanitarians to be carried out at a local institute of hygiene and preventive medicine. This training will be designed to equip sanitarians, assigned to PHED or Rural Development Departments, to assist beneficiary communities with the health and sanitation aspects of improved water supply, with special emphasis on the implementation of practical measures to reduce or eliminate drainage problems.

At present there exists no systematic training for water systems operators in the maintenance of pumps, motors, distribution systems and other specialized water works equipment. This lack of training is an important cause of the poor state of maintenance of rural water systems. Therefore, four provincial level training centers will be established in which mechanics, fitters, plumbers, and other waterworks operators serving government organizations and local authorities will receive pre-service and inservice training in the operation and maintenance of rural water systems.

h. Health Measures

Recognizing that the provision of increased and improved water supplies alone is not sufficient to improve health levels, this project will help

the Government of Pakistan identify and implement a series of related health and sanitation measures to ensure the maximum positive health impact. During the first two years of the project limited health/hygiene and sanitation activities will be undertaken, and pilot research and development projects will be carried out to identify those complementary health and sanitation measures which would be effective in Pakistan and could therefore be integrated into the project at a later stage.

(1) Health/Hygiene Education

Health/hygiene education is essential to improve health practices, but appropriate materials and effective delivery systems have yet to be developed in Pakistan. Therefore, during the first two years of the project community education efforts will focus on the following limited areas (but will be expanded to cover additional topics during the third and fourth years of project activity):

-- The definition of "clean" water and the basic relationship between water, sanitation and health;

-- The installation, operation and maintenance techniques which are necessary to maintain the quality of the water supply (well sealing, source protection, well location, attention to leaking pipes, regular cleaning of filtration systems, storage tanks, and drains, disinfection of the water supply during the monsoon season and other measures.)

-- Practices related to the collection of water from the distribution point and its storage in the home which must be improved to avoid contamination of the water after it leaves the distribution point, such as cleaning and covering water vessels.

During the first two years of the project health/hygiene pilots on general hygiene and sanitation practices will be designed and carried out by provincial implementing organizations assisted by project funded technical advisors. Materials and delivery systems which have been successful in other countries will be adapted and field tested in Pakistan. Any approaches which are found to be effective will be replicated during the third or fourth years of the project, and will be incorporated in the design of sub-projects financed by future loans.

(2) Sanitation

No systematic sanitation efforts have yet been undertaken in rural Pakistan, but the Government has indicated its interest in improving sanitation in connection with its expanded rural water supply program.

An immediate improvement which will be carried out is the inclusion of drainage measures for the disposal of waste water as part of every water supply sub-project which is eligible for reimbursement

under the loan. Drainage has received low priority in the past, but the health hazards associated with waste water accumulation are widely recognized and the GOP is committed to improving the situation. In addition, local technology is available for the design and construction of simple drainage schemes.

Safe excreta disposal measures, however, are not followed and efforts to introduce simple methods, such as pit latrines, have not been successful. Excreta disposal is generally not perceived to be a problem. Therefore, during the first two years of the project, pilot projects will be financed designed to identify effective, economical and socially acceptable techniques for the safe disposal of excreta, so that any successful methods may be replicated. The pilots will be designed and executed with project financed technical assistance.

6. Project Inputs

a. AID Loan Funds ($20 million)

AID loan funds will be used to finance approximately 75% of the costs of the construction and installation of water supply and drainage systems using a modified Fixed Amount Reimbursement (FAR) method. FAR amounts will be agreed to in advance and will cover equipment, materials, (including spare parts) and some contract labor, based on cost estimates which will be developed for each system. It is anticipated that certain unskilled labor will be contributed by beneficiary communities. Inflation and contingency factors will be built into the cost estimates. The loan will reimburse for the costs of water source development and distribution, but not for the cost of individual yard connections.

b. AID Grant Funds ($1.5 million)

Grant funds will be used to finance a total of 187 work months of short and long term technical assistance. An estimated 108 work months of the total will be the services of a sanitary engineer and two sanitarians to assist implementing organizations in developing low cost, low maintenance water supply and drainage schemes and in strengthening their health focus. In addition 79 work months of short term advisory services will be provided to assist with the design and execution of 4 pilot projects and the impact studies which will be conducted as part of the project evaluation.

c. AID Local Currency Grant ($1,403,000 equivalent)

Local currency funds will be used to improve in-country training and capability for sanitary engineers, sanitarians and other technical personnel, provide support costs for foreign advisors, and local

costs for pilot projects. A total of $605,000 equivalent will be used to finance the establishment of four provincial level training centers (one in each province) to provide pre-service and in-service training in the operation and maintenance of rural water supply systems. Local currency grant funds of $45,000 equivalent will finance the attendance of engineers at an expanded graduate level training program in public health and sanitation at a local engineering university. Support costs for foreign advisors will be $375,000 equivalent and local costs for pilot projects will total $278,000 equivalent.

d. GOP Cash Contribution ($6.667 million equivalent)

The GOP will provide 25% of the cost of equipment, materials and contract labor for installed water supply and drainage systems.

e. GOP In-Kind Contribution ($2.348 million equivalent)

The GOP will also provide:

-- salaries and per diem for professional and support personnel, including costs of health department staff working on health education efforts, and related operational expenses, including personnel transport, systems repair and maintenance, and warehousing estimated at $1.369 million equivalent.

-- equipment and materials for systems operation and maintenance for 4 years estimated at $0.979 million equivalent.

f. Community Contribution ($1.89 million equivalent)

Participating communities will contribute the equivalent of approximately $.8 million in local materials (gravel, sand), land and unskilled labor. Communities will also contribute a share of the operating and maintenance costs during the life of the project estimated at $.962 million equivalent and the costs of yard connections ($.128 million equivalent).

7. Project Design Linkages

a. Purpose-Goal Linkage

Achievement of the project purpose, which is to increase the quantity of water made available in water scarce areas, and to improve the quality of water which will be provided in areas where water is abundant but of relatively poor bacteriological quality, should contribute to improving the health and quality of life of the rural populace in Pakistan. The changes in water supply are expected to affect different

groups of diseases in different ways: an increase in the quantity of water used for washing and bathing will improve personal hygiene and reduce the incidence of water washed diseases, while improvements in water quality should protect individuals against a number of serious water-borne diseases.

At the same time, recognizing that an improved water supply is essential for improved health, but should be accompanied by other measures for the maximum positive health impact to occur, it is assumed that other GOP programs designed to complement this effort will be carried out as planned, e.g., rural health and nutrition activities and education programs.

AID is currently supporting a major GOP effort to expand health activities in rural areas of Pakistan. Further, the project design includes certain limited but focused activities in health education and sanitation (the provision of drainage for piped water supply schemes) and project funds will finance studies to identify additional health and sanitation measures which might complement an improved water supply. The results of these studies will be incorporated in activities financed by future loans.

b. Output-Purpose Linkage

The development hypothesis which forms the output-purpose linkage of this project is that the proper installation of handpumps and village water and drainage systems at carefully selected locations will, when these are adequately maintained and when people are educated in their proper use, lead to a measurable increase in the quantity and quality of water used by the rural poor for drinking, washing and bathing. The linkage depends on the crucial assumption that the improved water supply systems, once installed, will be used by the project beneficiaries. The water use patterns study carried out as part of the planning for this project found that the most important constraint to the use of increased quantities of water in rural areas was the convenience of the water source. All water systems under the project will be located in such a way as to minimize the hauling distance of water from the source to the home. In areas where water availability has been a problem it is reasonable to assume that beneficiaries will use the more conveniently located sources, and consequently use increased amounts of water for drinking, washing and bathing.

In areas where water is abundant but of poor bacteriological quality, the improved water supply distribution points will be located so that they are closer to the home than the traditional but contaminated sources. Other water use patterns findings will also be taken into

account in locating the distribution points. In addition, the appearance of the water will in most cases be improved through filtration of muddy surface water or the substitution of clear groundwater. Finally, care will be taken to ensure that the taste of the improved supply is acceptable.

It is also important that the quality of the water source be maintained throughout the distribution system. For this reason, the project pays particular attention to systems maintenance and health/hygiene education.

c. Input-Output Linkage

The resources described herein must be made available on a timely basis in order to realize project outputs. Other conditions for assuring the realization of outputs are the availability of technology at the village level and the commitment of the different institutions and communities to the project.

These conditions are expected to be met. AID loan and grant funds will be readily available and so will the technical assistance consultants. GOP inputs are also available, since this effort is an expansion of their regular program. The required technology is neither unique nor complex and has been practiced in the rural areas of Pakistan for many years. Materials are available and are not expected to be a constraint. It is therefore felt that the provision of inputs will result in the outputs without delay.

We expect that the village level commitment needed to ensure that the systems will be utilized and maintained can be accomplished through the application of the screening and selection process described in the project paper and Annex C3. Uncertainties regarding this assumption remain, however, and for this reason a pilot study to identify effective ways of ensuring community participation will be carried out during the first two years of project activity.

III. PROJECT ANALYSIS

A. TECHNICAL AND ENGINEERING ANALYSIS

1. Description of Technology

a. General

The engineering and construction phase of the project will entail the planning, design and construction of relatively simple community water systems to serve minimum domestic needs of rural communities in Pakistan. The target populations will range from several hundred to about 5,000 people in all four provinces of the country.

In order to minimize the cost of such systems, a basic strategy of the project is to seek naturally protected water sources where that is possible and economically feasible in order to obtain relatively potable, clean water without relying on treatment. When a protected source is not available, collection and storage facilities will be constructed. In all cases, water supplies will be provided through a standpipe or public tap at central locations in populated areas.

b. Types of Systems

Five basic types of schemes will be financed under the project:

(1) Where groundwater of sufficient quantity and reasonable quality is available, the systems will be based on deep borings, pumps with electrical or diesel motors and a clear-water surface tank. For smaller communities, the surface tank will be equipped with taps and no further distribution system will be constructed. For larger communities the systems will also include an overhead reservoir, main line and distribution system consisting of surface tanks or public standposts and provision for optional yard connections for households willing and able to pay for them. (The loan will not finance the cost of making yard connections);

(2) Where canal water is the obvious source because of salinity of ground water or some other reason, the schemes will be based on intake facilities, settling or sedimentation tanks, slow-sand filters and surface clear-water tanks equipped with taps. Pumping facilities, overhead reservoirs and distribution systems will be added where appropriate;

(3) Where surface water such as a spring is available, infiltration galleries will be constructed and water will be run by gravity to one or several collecting tanks, equipped with taps, in or near villages to be served. These systems will generally not include more elaborate distribution networks;

(4) Handpumps will be installed where soil and water table conditions permit, where this is the most economical solution and where salinity at relatively shallow depths is not a problem; and

(5) In a few communities, where installation of handpumps is not feasible, and more costly schemes are impractical, measures to improve existing water sources will be undertaken. These would include Karez improvement, protection of open wells, and small storage tanks with filters for spring water.

c. Appropriateness of Selected Technology

The technology adopted for this project is currently in wide use in the rural areas by both public and private entities. Handpumps have been a part of the rural scene in Pakistan for over fifty years, and their manufacture, installation and use is widely known all over the country. Appropriate improvements to existing handpump designs will be introduced during the course of the project to lengthen their serviceable life and make them more maintenance free. Piped water supply systems, based on different types of water sources, also have a long history in Pakistan. There is little question that the implementing entities will be able to apply this technology and operate and maintain the systems that will result.

2. Design Standards

a. Per Capita Consumption

All systems will be designed to allow average daily consumption of 40 liters per capita. This compares with an estimated average of ten liters per day being consumed at present (by contrast, U.S. daily consumption per capita is estimated at 500 liters). This design standard of 40 liters falls on the lower end of the spectrum of the consumption range of 40-80 liters per capita per day recommended by international health organizations.

Pumping and storage capacities of most systems will be designed on the basis of this consumption figure, with the exception of systems with provision for yard connections which will allow for consumption of up to 60 liters per day.

b. Water Quality Standards

The quality of water will be improved over current quality standards in all cases. The Mission's water quality study (Annex C1) which was conducted in project areas indicated that the mean number of E. Coli and coliforms per 100 milliliters of water was 38 and 321

for handpumps and 460 and 4446 for open wells. This tremendous difference is due primarily to the fact that handpump water originates from relatively protected sources. (However, these counts for handpumps are still high when compared with the United States Environmental Protection Agency standards for drinking water quality which stipulates zero E.Coli and less than 1 coliform colonies per 100 ml.) The importance of the protection of the water source was further demonstrated through a questionaire which was administered in an attempt to identify those characteristics of the water system that were most apt to affect water quality in Pakistan. Regression analysis of these variables indicated that the presence of a polluting source near to the water source, (e.g., pond, standing water from the pump, etc.), leakage around the pipes, the need to prime the pump, and the age of the pump and filter were significant determinants of water quality.

Although the project will not attain the high international and U.S. water quality standards[1/] it will be possible to make dramatic improvement in existing water quality levels. This will be achieved primarily through the design of protection measures for water sources and the proper installation and maintenance of water systems. By taking these simple measures alone, it is estimated that water quality will be measurably improved, in some cases by several hundred percent.

Water quality will further be improved through some treatment such as filtration and chlorination and the introduction of health education measures will help ensure that water remains clean after it is collected from the distribution point.

c. Handpump Design

Handpumps being utilized in Pakistan have been developed over the past 50 years and represent a high degree of adaptation to local conditions. However, while handpumps of acceptable durability and design are currently manufactured in-country, it is possible that new handpump designs now being tested, such as the Moyno rotary or the AID Batelle pump, may prove to be superior in terms of operation and maintenance. Therefore, while a version of the existing handpump design will be utilized during the first year of project activity, feasibility studies will be carried out during this period to determine whether one or more of these new designs would be appropriate for manufacture and use in Pakistan.

1/ See Annex C-2.

Specifications for both galvanized iron (GI) and cast iron handpumps will be agreed to by USAID and the GOP. The GI pump specifications will be based on the handpump design which was used in the AID-assisted flood rehabilitation program with some modifications which are needed to lengthen handpump life and reduce maintenance requirements.

d. Water Supply Systems Design

The design specifications for all systems will be agreed to by the GOP and USAID, and will generally conform to those now being used in Pakistan. Those are based on European and American standard designs, slightly modified to meet local conditions. The water supply schemes currently being installed in Pakistan are sturdily built and generally use native and locally made materials, but are often too sophisticated for the communities they are designed to serve in terms of the level of technical expertise and financial commitment required for their successful operation and maintenance.

While existing designs for water supply schemes are satisfactory and will not be substantially modified during the initial stages of the project, a number of research activities are underway out side of Pakistan which seek to identify lower cost construction methods, more appropriate technologies for small communities, and designs which minimize operation and maintenance problems. Under the loan, AID will ensure that the program in Pakistan benefits from the results of these research efforts as they become available by providing such data to the Government along with recommendations for any design changes. It is expected that during later stages of the project improved designs can be utilized in many of the schemes. In all cases, the emphasis will continue to be on local production, using local materials.

Supply mains for all systems will be installed with an adequate capacity and provisions for individual yard connections where appropriate. Such connections would be at the owner's expense, but will be in conformity with specifications stipulated by the PHEDs. Community standposts will be provided at convenient locations.

e. Drainage

Only systems which includes adequate provisions for draining away waste water generated by the AID-assisted systems will be eligible for FAR reimbursement under the loan. Because of serious funding constraints and the absence of community pressure for drainage schemes, little has been done to develop rural drainage systems in Pakistan and accumulated wastewater continues to be a serious health hazard. However, the Government at both the

federal and provincial levels has indicated its interest in improving this situation.

Handpumps and isolated public standposts will have a cement drain with an adequate slope which will be sufficiently long to drain waste water into a soak pit, a public drainage system, an irrigation or drainage channel or a water body which will carry the water away from the vicinity of the distribution point.

Larger water systems will include a basic drainage system consisting of a network of brick and cement plaster drains to carry the water to small oxidation ponds outside the boundaries of the community and at least 150 feet downhill from the water source.

Under the loan AID will encourage the Government to experiment with various drainage alternatives, including leaching fields, and selective paving of village paths with bricks, through the provision of technical assistance to implementing organizations.

f. Water Treatment

The preferred water source under the project will be a reliable, naturally clean and relatively potable source within a reasonable distance from the community to be served. Where such a source is available, no water treatment will be introduced and the only requirement will be the protection of the source and the supply system. This will be true in the case of all deep tubewells and some springs.

In cases where the only source is canal, open channel, or an unprotected source of water, a filtration/sedimentation process will be used between the collection and distribution elements of the system. Sand and rock filtration beds are widely used in Pakistan, and the project envisions the utilization of such filters or others using relatively inexpensive, native materials.

Chlorination of systems will be done at the time of installation and when the risk of contamination is particularly high such as during floods, and where other methods of treatment are not effective. Chlorination will be accomplished through the introduction of a dosage of calcium hypochlorite in a pre-mixed and measured solution. In these cases, a considerable effort will be made in the instruction and supervision of villagers to ensure that proper use and storage of the chemical is well understood. This will be checked on a periodic basis during visits by PHED technicians.

3. Engineering and Construction

a. Planning

The PHEDs and IPD have tentatively identified the 18 districts of Pakistan where project activities will take place and which are considered to be the neediest inthe country. In some of these districts water is scarce and in others water is available in adequate quantities, but of poor bacteriological quality. Target communities and population centers within each district will be identified using a screening process outlined in Annex C3.

b. Design

Once these target communities are identified, the implementing agencies at the provincial level will examine their water supply requirements and will decide on an appropriate solution. The resulting water supply system may include handpumps only, a piped water system or a combination of both.

Listings of communities to be served will be prepared in order of priority based on these selection criteria. The main elements of these criteria are outlined in Annex C3.

Plans, specifications and estimates of costs will be prepared for each system in conformance with current practices of implementing agencies. PHEDs and IPD have standard designs already prepared which, with proper modifications, will be used in all cases. These agencies have adequate engineering and technical talent to prepare and modify these plans as may be required.

c. Construction

Construction will be done by contract. Bids will be received on the basis of prepared plans, and construction will be completed in accordance with the plans and specifications. This is the current practice of all on-going water system construction in all four provinces of Pakistan.

The technology for installation of handpumps is well known at the village level as demonstrated by the thousands of such pumps which are installed annually all over the country. There also is an adequate number of contractors in project areas to undertake this construction. Consequently, no construction will be undertaken directly by the personnel of implementing organs, but all such work will be done by the private sector.

d. Maintenance

All four provinces recognize improved maintenance as a critical need. In two, NWFP and Baluchistan, government organizations have assumed full responsibility for this task and have budgeted funds for maintenance. This became necessary because organizational and administrative difficulties, funding problems and lack of technical expertise, resulted in communities not being able to successfully operate and maintain their schemes.

Maintenance is therefore viewed as a critical element of this project. Past experience indicates that, at least in the short run, government organizations must continue to assume some responsibility for maintaining installed systems and that funds must be budgeted for this purpose. However, these systems clearly cannot rely on external funds and services for their proper functioning in the long run, and involvement of the local population is considered to be absolutely essential. A maintenance plan is being developed which will define both government and community responsibilities in this area. The basic elements of the plan are that PHEDs and IPD will assume immediate responsibility for maintenance of most new systems, with the community gradually taking over this responsibility within a 3 to 5 year period. In the interim the implementing agencies will provide the required training for local personnel to assume these duties.

4. Estimates of Cost

The cost estimates of all activities under the project were carefully developed using currently prevailing prices of labor, materials and equipment. The total estimate was based on a detailed cost breakdown of a typical water supply system for each of the schemes to be employed by the project. The total number of systems was broken down by type in each province, and the total construction cost represents the aggregate cost of all systems. Added to that were the costs of technical assistance, training, along with engineering and design and office overhead costs to be provided by Pakistani implementing organizations. These costs include an escalation allowance to cover expected increases in price levels due to inflationary influences, and a contingency provision to cover unforeseen additions and adjustments that may be required.

The cost estimate was developed on the assumption that construction will commence about June, 1979 and terminate approximately three years later. Minor deviations from this schedule will not render this estimate invalid. A major deviation however, such as a year's delay in project implementation, will most likely require that the estimate be adjusted upwards.

Detailed estimates of projects costs are shown in Annex F.

A brief summary of these costs follows:

Item	Quantity	$ Unit Cost	($000) Total Cost
Handpumps	28,324	235	6,667
Small Schemes (not piped)	417	5,885	2,453
Piped systems w/standposts	144	60,560	8,787
Piped systems w/standposts and provision for yard connections	56	169,814 to 144,688	8,760
Design, engineering(host country)	Lump sum	Lump sum	820
Total Construction			27,487
Training (See details Annex F)			650
Research and Development Pilots 4 (with field locations in each province)			479
Technical Assistance (Advisory Services) (187 workmonths - $10-12,000)			1,875
Host country contribution (staff salaries, overhead etc.)			3,317
Grand Total:			33,808

5. Engineering and Technical Conclusions

It is considered that this project is feasible from an engineering and technical standpoint. The estimates of costs were realistically developed based on current, reliable price data as provided by the Public Health Engineering Departments of Pakistan and independently checked and modified by the Mission. The technology required to carry out the different project components is tried and well known, and there exist no technical constraints that may hamper project implementation. Materials and equipment are available in ample supplies. It is therefore the judgement of the Project Committee that the requirements of Section 611 (a) (1) of the Foreign Assistance Act of 1961, as amended, have been met.

B. SOCIAL SOUNDNESS ANALYSIS SUMMARY

1. General

This project is intended to provide more water, more conveniently, and of better quality to households in rural areas of Pakistan. Water will be provided by a variety of means, suited to the conditions specific to each area. Institutional support will be provided by selected provincial organizations, supported by technical assistance advisors. Community participation will be elicited for installation and maintenance of water systems, to the extent practicable. Assessment of the social and cultural impacts of this project as designed indicates that positive benefits for the level of living, quality of life, and overall health status of rural households participating in this project will be significant, and that few if any adverse changes in rural patterns of living will result from project implementation.

2. Target Groups

The major beneficiaries and participants in this project are rural households in Pakistan. Three-quarters of Pakistan's population live in rural areas, clustered primarily along the watercourses of the world's largest irrigation system. Where water is scarce, population densities drop precipitously; residents of water-scarce regions constitute in many cases the neediest of a very poor rural population.

The major concern of this project is provision of domestic water supplies which are more abundant and of better quality. Prime target social units affected will be households. Communal water distribution points such as at schools, mosques, and bus-stands will also be established or improved through specific variants of project implementation procedures.

Participation by local community residents will be encouraged in the planning, construction, and especially the maintenance of rural water systems to the extent that technical considerations and resource constraints will allow.

3. Sociocultural Compatibility

The implementation of the Rural Clean Water Project will involve adjustments to the technical, ecological, and social conditions of a wide variety of target areas in each province of Pakistan. However, the type of clean water interventions to be provided will, in all cases, conform to current water use patterns and the social roles associated with obtaining and utilizing water for domestic purposes in rural communities. Handpumps, piped water systems,

and other innovations in water supply systems will simply make more water, of better quality, more conveniently available to rural inhabitants for necessary household purposes. It is expected that, as a consequence of improved availability, increased usage for drinking, bathing, washing clothes and utensils, and watering livestock will result. Effects of this intervention should be more pronounced in areas of relative water scarcity -- where a large number of the target districts are to be located -- than in regions where water is available in relative abundance.

Constraints on effective implementation of this project lie in rural communities' lack of felt needs for drainage accompanying improved water supplies, and the generally held view that those who install a water system should be responsible for its maintenance. Households drain waste-water outside their compounds into village streets; from there, waste-water is left to stagnate and breed insects. The installation of drainage facilities accompanying the improved water source may alleviate this problem, and may, in fact, alert villagers to the need for dealing with it.

Maintenance needs vary with the type of system and with local technical and social factors. Community residents will be asked to participate in maintenance efforts, but responsibility for some aspects of maintenance will remain in the hands of the implementing agencies. Over time, and with effective education on health, increasing involvement in these activities by rural community members may take place.

4. Spread Effects

Beyond the direct benefits which will result from the project, a variety of indirect, but equally important, effects should occur. Improvement of the quality, as well as quantity and convenience of domestic water supplies is a project purpose. This direct benefit should result, over a relatively brief period of time, in a reduction of water-borne diseases. In addition, diseases, such as skin rashes and boils, which are due to inadequate water supplies for washing and bathing, should become less frequent in target households and communities. Diseases due to inadequate drinking water availability in desert areas -- such as kidney and bladder stones -- should also decrease. Drainage facilities in target communities should reduce standing water sources for insect breeding, and reduce mosquito and other pests.

Innovations associated with technical solutions of a variety of local problems in provision of water supplies have a high potential for diffusion as they may apply to similar conditions in other areas.

New types of pumps, piped-water systems, and drainage measures -- as well as socio-technical innovations involving local residents in planning construction and maintenance of systems suited to their needs -- may be transferred to areas outside the initial target districts as the project develops over time.

Where seasonal water shortages force migration to where water may be found, new water sources may result in increased sedentarization or, more probably, selective migration by working-age men only while women, children, and the elderly remain in the village to tend crops and livestock. Other shifts in social role activities may result in water-scarce regions as women take over water-carrying duties from more convenient sources, replacing men who formerly brought large quantities from distant wells or rivers. In such situations, existing strict purdah restrictions on women may be slightly relaxed. The pattern of sexual segregation may become more like that found in villages with abundant water, where women may use water-associated activities as social occasions. With more adequate water, villages may become more desirable places to send a daughter in marriage as well.

5. Benefit Incidence and Equity Issues

As this project is designed, the incidence of benefits deriving from better water supplies is likely to be equitable in most types of proposed systems. Public handpumps are to be installed where access is easy: in mosques, schools, and bus-stands. Piped water systems are to be located conveniently for all segments of rural communities and water in most parts of Pakistan is freely shared. Wealth and income of rural households is not likely to be directly affected by this intervention, but the general quality of life, at household and community levels, is likely to improve.

Certain benefits of this project will increase, both quantitatively and qualitatively, in direct correlation with pre-existing water scarcity in a community. As better water is supplied, seasonal and long-term migration is likely to be reduced, and investments in the productive potential of the local area are likely to increase. Morever, conflicts which stem from water scarcity in some areas are likely to decline. Knowledge of, and concern with, health care related to water-borne diseases will result from associated efforts at health education. Children as well as adults (and livestock) will not only become more healthy, but more aware of water as related to health, as the project continues.

The project anticipates development of community participation in water supply systems. This may provide a focus for community action in a context which has clear benefits for all and minimum potential for factionalism and discord. Leadership which emerges in connection with this activity in a village may enhance the community's ability to articulate demands for development to local government and line department officials.

6. Effects of the Project on Women

The effects of this project upon rural women are direct and immediate. Women constitute prime beneficiaries since most water-related activities in the home are considered part of their duties. Provision of more convenient water sources will reduce the amount of labor involved in carrying water to the home, will make easier the work of washing clothes and utensils and watering livestock, and will allow more frequent bathing. Provision of handpumps and other sources may also allow greater opportunity of social interaction among women's work groups in some areas of the country, where privacy from men, and the prestige of enhanced purdah, become possible.

C. SUMMARY ECONOMIC ANALYSIS

The economic feasibility of the proposed investment in rural water systems needs to be justified on three levels: for the economy as a whole, in comparison with other health projects, and on the project level. First, for the economy as a whole, investments in the health sector have been low in recent years, amounting to only one per cent of GNP. Since it is generally agreed that a minimum level of health is essential to the development process, and the Government has decided to focus its development efforts to emphasize rural health and well being, AID should support investments in the health sector.

Second, investments in rural water supply need to be compared with investments in other health sector activities. Difficulties with quantification hinder comparison of rates of return on these investments. On a cost per person served basis, however, the proposed project compares favourably with other projects with the same goals, such as the Basic Health Services project. In addition, the Government is already involved in other health sector activities, many of them AID supported, such as basic health services, nutrition education, and malaria control. Finally, in the past, water systems investment has overwhelmingly favored the urban areas, an imbalance which the Government has now decided to correct.

On the project level, the traditional technique of cost-benefit analysis is not appropriate here where the benefits are largely non-marketed, difficult to quantify, and accrue over the longer term. A recent World Bank Study 1/ concluded that the cost of quantifying the benefits of rural water projects is generally prohibitive, that the provision of some minimal amount of water is a government responsibility, and that, if the benefits could be calculated, the benefit - cost ratio would be an acceptable one. Similarly, a rigourous cost-effectiveness analysis of the project would need to define alternative strategies which offer the same health impact, again an expensive task. However, we have identified the beneficiaries and major benefits of the project, examined the project costs to see if they are reasonable, and determined that the project will lead to a rational allocation of resources.

The primary beneficiaries of the Project will be the 2.4 million rural dwellers, particularly women, who will have access to adequate supplies of rural drinking water when the Project is completed.

1/ For this and other references, see Annex D.

They will benefit from the time saved in water collection, and the additional availability of clean water. The latter will improve health status, and stimulate village economic activity. Other benefits include the increased awareness of their development needs on the part of the communities which participate in the Project, and the income distribution arising from the implied Government subsidy to the rural areas.

The Project strategy will maximize the benefits derived from project activities by focusing resources on a limited number of target districts where adequate water supplies are not currently available, and ensuring that the most cost-effective water system is selected for each community. By requiring the beneficiary communities to contribute to the support of their water systems, resources will be mobilized that might not otherwise have been invested. Finally, the Project will provide complementary inputs such as technical advisory services, in-country training, drainage systems, health and hygiene education, and pilot research and development efforts to increase community involvement. All of these will contribute to progress toward the Project goal. Ongoing efforts in basic health, nutrition, malaria control, and general rural development will also have a beneficial affect. (See Annex D for detailed Economic Analysis).

D. FINANCIAL ANALYSIS AND PLAN

1. Project Costs and Financial Plan

The total cost of activities to be undertaken under this tranche is estimated to be $33.8 million (see Tables 1 and 2). Of this total, AID will provide a $20 million loan and grant fund $1.5 million for technical advisory services, and $1.4 million equivalent in U.S. owned rupees for a total of $2.9 million in grant funds. The host country will provide $10.9 million in cash and in kind. AID's funds will constitute 68% of project costs, and the host country's 32%.

All of the $20 million loan funds will be used to finance the construction of rural water systems through a modified fixed amount reimbursement (FAR) procedure. These funds are tentatively allocated among the provinces on the basis of the Government's allocation of development funds for the rural water sector in the draft of the current fifth plan.[1/] This essentially follows the population distribution among the provinces with an upward revision for NWFP and Baluchistan which are considered to be less developed than the other two provinces. Similarly, the tentative division of the AID loan funds among the four basic types of water systems (handpumps, piped systems with public standposts, piped systems with provision for optional yard connections, small water improvement schemes) follows the government plan guidelines.[2/]

Grant funds will be used to finance nine work-years of long term and 79 work-months of short term expatriot advisory services.[3/] A Mondale rupee grant of $1.4 million will be used to finance the local support costs of these services ($375,000 or about 20% of the total), the total costs of in-country training for sanitary engineers and technical personnel ($650,250)[4/], and the local costs of four research and development pilot projects ($378,000).[5/] (If the Mission's proposal for a Mondale rupee grant for general consultant support is approved, separate funds for this purpose will not be needed for this project.)

The host country will provide a total of $10.9 million in cash and kind.[6/] The GOP will provide approximately $6.7 million of the total cash costs of installed water systems and an estimated $979,000 for operations and maintenance of piped water systems. The GOP will also provide $1,268 million for design, engineering, implementation staff salaries and overhead costs over the life of the project. Beneficiary communities will maintain handpumps and small water systems at a cost of about

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1/ Annex F-1
2/ Annex F-2, Annex F-3
3/ Annex F-4, F-5
4/ Annex F-6, F-7, F-8
5/ Annex F-9, F-10
6/ Annex F-11, F-12

$962,000 over the project period. In addition, individual households are estimated to spend about $128,000 on yard connections.

The estimated systems costs used for planning purposes are based on actual costs of individual systems from which estimated costs of typical systems of each type were constructed.7/ It is expected that the total and per capita cost of each individual system constructed under the project will vary widely because of the variation in such cost determining factors as location and type of water source, and population density. In addition to the cash costs shown in the individual cost estimates against which AID will reimburse, it is expected that an additional 3 percent of capital costs or $800,000 will be contributed by the beneficiary communities.

The costs used represent the average estimated cost over the period. Cost estimates were inflated 18 per cent to arrive at an average current cost over the project period. This of course means that the estimates are high for the early part of the period, and low for the later years. The construction schedule8/ assumes a slow start-up, with activities reaching a peak in project-year three. Annual maintenance costs for the small water systems and piped water systems are estimated at 5 per cent of capital costs.

Water systems with provision for yard connections are more expensive than those which provide for standposts primarily because the drainage systems for individual houses are more elaborate. Also larger-capacity and more pipe must be laid per capita for distribution and slightly larger capacity pumping and storage facilities are required. The per system cost used to calculate total costs of systems with yard connections represents an average of the costs of the two systems shown in Annex F-16 and Annex F-17.

Individual yard connections are estimated to cost about $15. These costs are not included as part of the construction costs because AID funds will not be used to reimburse for them. Rather they are included as part of the community contribution to overall project costs.

2. Financial Plan/Budget Tables

Below is an estimate of the total financing necessary to complete the project analyzed by source and use of funds ($1 = Rs. 9.90).

7/ Annex F-13, F-14, F-15, F-16, F-17.
8/ Annex F-3.

Table 1. SUMMARY COST ESTIMATE & FINANCIAL PLAN*
(All Project Years)

(U.S. $000s or equivalent)

Uses \ Source	AID FUNDS $ FX	AID FUNDS $ LC	AID FUNDS Rupees	AID FUNDS Total	HOST COUNTRY Rupees	HOST COUNTRY Total	HOST COUNTRY $ FX	HOST COUNTRY $ LC	HOST COUNTRY Rupees	HOST COUNTRY Total
1. Construction:										
Cash										
Handpumps	-	5,000	-	5,000	1,667	1,667	-	5,000	1,667	6,667
Small Systems	-	1,840	-	1,840	613	613	-	1,840	613	2,453
Standposts	-	6,590	-	6,590	2,197	2,197	-	6,590	2,197	8,787
Systems w/provision for yard connections	-	6,570	-	6,570	2,197	2,197	-	6,570	2,190	8,760
Sub-Total:	-	20,000	-	20,000	6,667	6,667	-	20,000	6,667	26,667
In Kind:	-	-	-	-	800	800	-	-	800	800
Total:	-	20,000	-	20,000	7,467	7,467	-	20,000	7,467	27,467
2. Training	-	-	650	650	-	-	-	-	650	650
3. Pilot Projects	-	-	378	378	101	101	-	-	479	479
4. Advisory Services	1,500	-	375	1,875	-	-	1,500	-	375	1,875
5. Other host country contribution (staff, O&M, etc.)	-	-	-	-	3,337	3,337	-	-	3,337	3,337
6. Total:	1,500	20,000	1,403	22,903	10,905	10,905	1,500	20,000	12,308	33,808
% Total:				68		32				

*Inflation and contingencies included in individual cost estimates.

(U.S. $000s equivalent)

Table 2. SUMMARY OF PROJECT COSTS

	YEAR 1			YEAR 2			YEAR 3			YEAR 4			TOTAL		
	$	Rupees	Total	$	Rupees	Total	$	Rupees	Total	$	Rupees	Total	$	Rupees	Total
I. Systems Construction: Cash:	1265	-	1265												
USAID	1265	-	1265	6107	-	6107	7147	-	7147	5481	-	5481	20000	-	20000
GOP	-	422	422	-	2034	2034	-	2385	2385	-	1826	1826	-	6667	6667
Sub-Total	1265	422	1687	6107	2034	8141	7147	2385	9532	5481	1826	7307	20000	6667	26667
In Kind:	-	51	51	-	244	244	-	286	286	-	219	219	-	800	800
Total:	1265	473	1738	6107	2278	8385	7147	2671	9818	5481	2045	7526	20000	7467	27467
II. Advisory Services (USAID Only)	128	32	160	536	134	670	532	133	665	304	76	380	1500	375	1875
III. Training (USAID Only)	-	220	220	-	186	186	-	152	152	-	92	92	-	650	650
IV. Pilot Projects:															
USAID	-	-	-	-	184	184	-	194	194	-	-	-	-	378	378
GOP	-	-	-	-	101	101	-	-	-	-	-	-	-	101	101
Total:	-	-	-	-	285	285	-	194	194	-	-	-	-	479	479
V. Other Host Country Contributions:															
Community	-	-	-	-	77	77	-	352	352	-	661	661	-	1090	1090
GOP	-	296	296	-	355	355	-	635	635	-	961	961	-	2247	2247
Total:	-	296	296	-	432	432	-	987	987	-	1622	1622	-	3337	3337
VI. TOTAL (I-V)															
USAID	1393	252	1645	6643	504	7147	7679	479	8158	5785	168	5953	21500	1403	22903
% Total			70			72			69			62			68
GOP/Communities	-	769	769	-	2811	2811	-	3658	3658	-	3667	3667	-	10905	10905
% Total			30			28			31			38			32
Total:	1393	1021	2363	6643	3315	9958	7679	4137	11816	5785	9836	9680	21500	12308	33808
% Total Project Costs			7			29			35			28			100

3. Ability of GOP to Meet Project Costs

It is anticipated that the Government of Pakistan will find its share of project construction and equipment costs well within its planned expenditures for the project period. Expenditures for rural water systems have been increasing rapidly in recent years.9/ The Government contribution, averaging $1.67 million per year, is only about ten per cent of the current level of development expenditure on rural water supply systems. This draft of the current fifth plan calls for an average development expenditure for rural water of $18.8 million. The Government can maintain its current level of expenditure, cover project development costs, and still stay within that figure. However, with the current emphasis on rural development, the upcoming revised draft of the plan is likely to provide more funds for rural water systems.

The Government provision for implementation staff and overhead should also pose no problem. As mentioned in Section E, the staff of the implementing organizations are sometimes not working to full capacity because of funding constraints. Few new personnel will have to be hired to carry-out the project, so additions to the non-development budget on this account will be slight.

The provincial governments will have to increase their non-development budgets to provide for operations and maintenance of the new piped water systems constructed under the project. The project budget shows provincial governments paying for roughly half of the total maintenance costs of the systems constructed during the project period. However, since the project is focusing on low maintenance systems, these costs of roughly $245,000/year amount to less than 3% of total project costs, and will not prove an undue burden on the Government. Government budgeting for operations and maintenance is not expected to continue indefinitely. During the project period a maintenance plan will be developed which provides for the gradual shifting of maintenance responsibilities to the communities served.

In addition, provincial entities must provide all project funding at the outset to commence project activities since aid reimbursements will follow completion of construction under the modified FAR procedures. The funding requirements for each project year (see Table-2) are well within the regular water supply budgets of these entities. Therefore, this is also not expected to be a problem.

9/ Annex F-19.

4. Costs to Communities and Individuals

Beneficiary communities are expected to contribute $800,000 worth of labor and materials for construction of water systems under the project. This amounts to less than $0.35 per person. It is also planned that the communities pay the operating costs of handpumps and small water systems. These costs are less than $0.50 per person per year. Individual households which elect to put in a yard connection will pay the estimated installation charges of $15. They will pay less than $10 per year for their water under the current water rate structure. If 40 per cent of the eligible households install yard connections, water rates will cover about 20 per cent of maintenance costs of the systems which provide for yard connections. It is planned that the maintenance plan under the project will provide for increasing water rates to cover a more substantial portion of operational costs.

The financial burden for communities and individuals under the project is easily affordable even by the low income target group. The obstacles to insuring their contribution will be social and organizational rather than financial.

5. Summary Opinion

This financial plan attempts to include all costs applicable to the project. Inputs and costs have been developed using GOP cost figures, independently verified by Mission staff and reviewed by the Mission project committee. The disbursement schedule represents a realistic projection, based on present capability of GOP implementing organizations and past levels of activity in the rural water supply sector. The figures shown in this financial section reflect our best estimates of cash and in-kind contributions. We do not anticipate that the additional resources required to implement the project will impose an undue burden on implementing organizations or beneficiary communities in either the short or long run.

E. INSTITUTIONAL ANALYSIS

1. An Overview of Institutional Arrangements

Pakistan has no single federal-level entity with responsibility for the development of water supply programs. The task of developing overall targets for populations to be served is done jointly by federal and provincial planning departments, but the responsibility for executing projects rests with the provinces. Most piped water supply schemes are planned and constructed by provincial Public Health Engineering Departments (PHEDs) (in Baluchistan, Irrigation and Power Department (IPD)). These organizations are charged with the planning, design and construction of all rural water supply schemes and with urban water and sewerage schemes in smaller towns. Water supply and sewerage systems in large cities are the responsibility of independent urban development authorities.

Until recently, the emphasis on water supply development has been in urban areas and larger rural communities in the 10,000-25,000 population range. The ability of provincial organizations to extend their activities into smaller rural communities has been limited by fund shortages, but also by the absence of political and institutional organizations in these communities which can work effectively with PHEDs in providing for their water supply needs. The PHEDs in turn have had some difficulties in developing low cost, simple facilities which such rural communities are able to operate and maintain. Further, these organizations have not placed sufficient emphasis on the health and sanitation aspects of rural water supply. Finally, little coordination takes place among the four provinces on these problems and possibilities for their resolution.

Against this background, a nation-wide rural clean water effort faces certain institutional problems. One such problem is coordination at the national level. Another is the interchange of technical and other information between provinces. A third is the development of community participation in constructing and maintaining rural water supply systems.

The principal organizations which will be involved in the implementation of this project are, at the federal level, the Rural Development Wing of the Division of Rural Development and Local Government, Ministry of Rural Development and Local Government; at the provincial level, the Public Health Engineering and Irrigation and Power Departments, along with the newly organized Rural Development and Local Government Departments; and the beneficiary communities themselves. (See Annex H1 for a general description of the GOP administrative structure).

2. Federal Level

a. Organizational Structure

The GOP has assigned responsibility for overall federal level coordination and support of the Rural Clean Water project to the Rural Development Wing of the Ministry of Rural Development and Local Government. In line with the decision of the GOP to place increased emphasis on rural development activities, the Wing has recently been reorganized and strengthened. The Wing currently has 31 positions for permanent professional officers of which 80% have been filled, including a Joint Secretary and 3 Deputy Secretaries. The Wing also has approximately 90 sub-professional, secretarial and support personnel.

b. Management Capability

The Rural Development Wing has not had experience in the field of rural water supply but has had a limited involvement in coordinating other AID financed projects. Special administrative arrangements are therefore being established within the Wing to manage this and other AID assisted activities.

c. Role in the Project

The Rural Development Wing will, as in the Rural Roads Project, assume overall responsibility for planning, inter-provincial coordination, monitoring and evaluating the clean water project. Provinces will submit proposals for activities to be financed by AID to the Rural Development Wing for review along with periodic progress reports, and the Wing will play an important role in project monitoring (as described in Section IV). A separate Engineering Cell with a staff of seven professionals is being established within the Wing to perform these functions for both projects.

3. Provincial Level - Public Health Engineering and Irrigation and Power Departments

a. Organisational Structure

At the provincial level, the Public Health Engineering Departments (PHED) of Punjab, Sind and NWFP and the Irrigation and Power Department (IPD) of Baluchistan as well as the four provincial Departments of Local Government and Rural Development are involved in water supply activities.

The capabilities of these organizations vary somewhat, but as this analysis will demonstrate, are relatively strong. The PHEDs and IPD have sufficient staff adequately trained in water supply technology to design and construct water supply and drainage projects which conform to international standards. These organizations have sufficient field personnel and both the logistical and management capability to execute this project.

Each organization is managed at the provincial level by a Chief Engineer or Director, several of whom have received graduate training in the United States. The headquarters staff includes design engineers, geologists, research officers and other professional and technical support personnel.

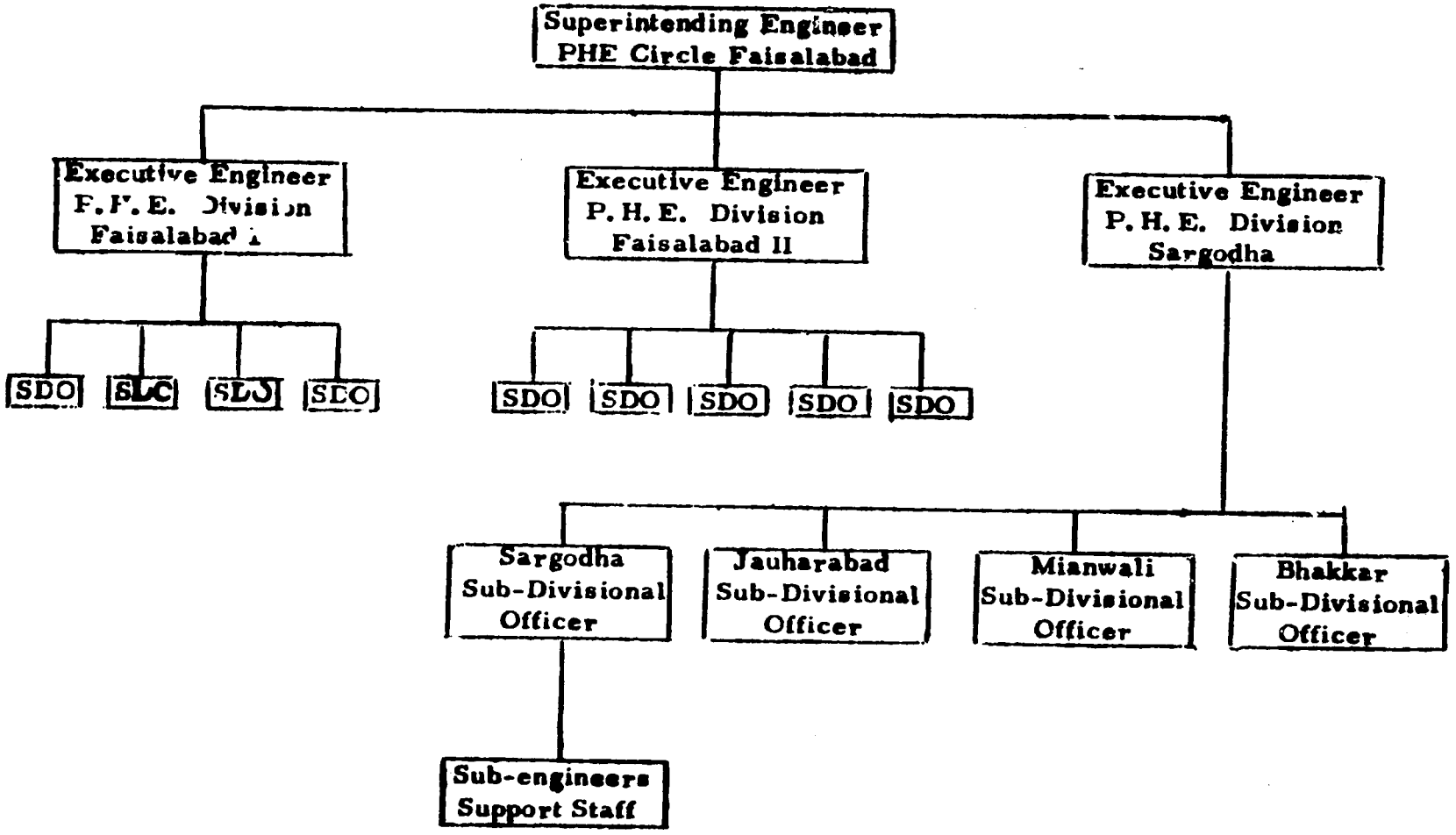
In the field, the work of sub-divisional officers and assistant engineers is managed by executive engineers at the District Level, with several Districts grouped together to form a circle under the direction of a Superintending Engineer. The following chart illustrates the organization of a typical circle in Punjab, while the table shows the present staffing of these agencies.

Staff of Executing Agencies, 1978

Headquarters	PHED-Punjab	NWFP	Sind	Irrigation & Power Baluchistan 1/
Chief Engineer	1	1	-	1
Director(s)	4	3	1	1
Design Engineer(s)	4	2	1	3
Other Professionals	40	8	8	7
Total:	49	14	10	12
Field				
Superintending Engineers	6	2	3	5
Executive Engineers	19	8	7	14
Sub-Divisional Officers	73	27	23	42
Sub-Engineers	210	91	65	120
Total:	308	128	98	181

1/ Staff spends approximately 60% of its time on water supply activities, 40% on irrigation.

Organization of Faisalabad Circle, PHED, Punjab



b. Resources

Between 1973 and 1978 the budgets for provincial rural water supply and drainage projects have increased over 39 times in Sind, 16 times in Punjab, 48 times in NWFP, and 46 times in Baluchistan (See Annex F-10). Almost all of these funds are allocated to PHED and IPD. At the same time, the percentage of the total budget allocated to the rural sector as a share of all budget allocations for both rural and urban water supply has been growing rapidly. During the period 1973-78, the rural share has increased from 2% to 31% in Sind,1/ 16% to 57% in Punjab and 18% to 76% in NWFP. In Baluchistan the percentage has remained constant at 90%. These organizations thus have a policy of increasing their rural focus and the capability of doing so. Project funds will help to orient an even greater share of their activity towards the rural sector.

During 1977-78 the total budget for water supply and sewerage was Rs. 338.61 million of which Rs. 168.8 million were directed to the rural sector. Under this project an average of about $3.3 million would be allocated each year to rural water systems which would represent less than a 20% annual increase in construction and water improvement activities. At present, the design and supervision staff of several of these organizations is under-employed because construction on many projects is interrupted for considerable periods of time due to funds shortages. It is therefore considered that these organizations could execute an increment of $3.3 million per year in construction activity without a significant increase in personnel.

The Public Health Engineering and Irrigation and Power Departments have not been able to give sufficient priority to maintenance of installed systems or health education and related health and sanitation issues, partly because of budget constraints, but also because staffs have not received needed training in health and operation and maintenance procedures. The training and technical assistance components of this project, along with the proposed maintenance plan, are designed to address both of these constraints.

c. Role in Project

The PHEDs and the IPD will be responsible for the planning and execution of sub-projects involving water source development and

1/ Part of this increase is explained by the establishment of the independent Hyderabad Development Authority in 1976 which reduced PHED's urban budget substantially.

distribution systems such as slow sand filters, electric tubewells, and systems with provisions for optional yard connections. These organizations will assume full responsibility for the design and construction of the systems, and will work, with the support of Rural Development personnel, on community education and outreach efforts.

Sub-projects will be selected in accordance with procedures and specific criteria which will be jointly developed by AID and the GOP prior to the disbursement of loan funds. They will include the following features (see Annex C-3 for a more detailed description).

Requests for sub-projects will originate in the communities to be served, but can be solicited by PHED or IPD representatives. Sub-projects which will be considered for financing must meet the following minimal criteria:

-- the community does not presently have an adequate supply of clean water;

-- the population is between 1000 and 5000 (requests from communities with populations of up to 10,000 will be considered on a case by case basis;

-- the community has indicated its interest and willingness to help in improving its water supply.

In determining the appropriate system for an individual community and in ranking sub-projects for construction, community interest in the project and community willingness to participate in construction and maintenance of systems will be key factors, along with determinations of need and economic and technical feasibility.

After a sub-project has been selected in accordance with these criteria, but before construction begins, PHED and IPD staff will visit communities to be served and meet with whatever local organization has indicated its willingness to participate in the execution of the project. At that time each party will agree to undertake certain responsibilities. These will vary depending on community size, resources and type of system. In all cases, the community role in maintenance will be emphasized.

PHED and IPD staff will be responsible for determining the technical feasibility of proposed schemes, systems design and construction and the provision of technical assistance, training and resources to local beneficiaries to enable them to eventually assume responsibility for operation and maintenance. PHEDs and IPD will provide most of the

personnel, materials and resources needed to manage, operate and maintain piped water systems during the first 3 to 5 years after installation.

PHED and IPD staff will also be responsible for carrying out certain health/hygiene education measures in connection with the provision of water supply schemes. The process of education will start during the early stages of sub-project preparation. When proposals for water supply systems are solicited from individual communities, government representatives will explain the importance of clean water and the ways in which an improved water supply may impact on health. During, and shortly after systems installation, instruction in correct operation and maintenance will be given to end-users. Finally, follow-on efforts will be conducted on proper water collection and storage practices.

Materials will be developed by PHEDs and IPD with assistance from provincial Health Departments. It is expected that the mid-level and community health workers who are being trained under the AID-financed Basic Health Services project will carry out the continuing education activities at the community level when they are deployed. Their training will include specific instruction in water/health issues and sanitation practices. In the meantime, these activities will be carried out by PHEDs, IPD and Rural Development staffs.

4. Provincial-Rural Development/Local Government Departments

a. Background

The Government of Pakistan is in the process of reorganizing the provincial Rural Development, Local Government and Peoples Works Program staffs into a single rural development organization. The rural development and local government staffs have not been as active as had been hoped, and the PWP, established in 1972 to carry out small rural development projects, has encountered numerous problems. These problem areas as defined by a GOP group of experts in 1975 included (1) little actual involvement of local people in project formulation and implementation; (2) diversion of resources to projects that tended to benefit small, powerful groups rather than the people at large; and (3) lack of coordination with other government departments.

b. Organizational Structure: The Markaz

The reorganization, which will take effect on July 1, 1978, is designed to strengthen the rural focus of GOP programs through the establishment of a rural service center or "markaz" somewhere

between the existing tehsil or taluka level (covering 1/3 of a district) and the old but long moribund "union council" organization which was responsible for about 10 villages.

Each markaz is to be responsible for the area that was covered by about 3 to 4 union councils, or 30 to 40 villages, with a total population of from 50 to 100 thousand. Over 600 markaz are to be established, 288 in Punjab alone. Working under the general direction of the District Councils and Deputy Commissioner (the administrative head at the district level) the markaz will be responsible for providing information and facilitating the provision of materials (such as fertilizer) to farmers, improving the delivery of social services to the rural sector, and undertaking modest infrastructure projects, such as the installation of handpumps. Each markaz will be staffed by a Project Manager, 7 or 8 rural development workers and a sub-engineer, in addition to representatives of line organizations such as health and agriculture.

The staff of the People's Works Program, Punjab , which installed about 30,000 handpumps under the flood relief program, will be redeployed to the markaz on July 1. This staff has sufficient engineering expertise to carry out the installation of 18,000 additional handpumps in Punjab over a four year period. Past organizational and program weaknesses should be minimized under the rural development reorganization.

In Sind, Baluchistan and NWFP the rural development organizations have sufficient planned personnel to carry out the rural outreach and education functions under the project. They also have the technical and organizational capability to execute the project, under which each markaz would be responsible for carrying out a maximum of one small water supply improvement scheme per year. In Sind PHED plans to concentrate on handpumps during the first year of project activity. Approximately 15,000 pumps were installed under the flood relief program, and the installation of less than 3,000 pumps per year under this project can be handled without difficulty.

c. Role in Project

The four Provincial Departments of Local Government and Rural Development will plan and carry out the installation of handpumps and other simple water supply activities such as karez improvement, small filtration tanks for spring water, gravity flow schemes and others. In Sind this will be handled by the PHED. These activities will generally be carried out in communities with populations of less than 1500, although it is assumed that there will be some cases

where installation of handpumps in larger communities will be appropriate. The Rural Development staffs at the markaz level will be responsible for working with beneficiary communities in the development and execution of small water improvement schemes and the installation of handpumps in the same way that the PHEDs and IPD will work to develop community participation for large piped water schemes. Health education efforts will also be carried out. These staffs, because of their deployment at the markaz level, will also be responsible for assisting PHEDs and IPD with rural outreach and community education efforts. PHEDs and IPD technical personnel will, in turn, provide engineering advice to Rural Development staffs for certain projects.

5. Beneficiary Communities

a. Background/History

At the present time no formal political or institutional organizations exist at the village level in Pakistan. The absence of such organizations makes effective delivery of government services to rural areas extremely difficult, and AID has found that it makes the implementation of "new directions" projects at the village level more difficult. The lack of an institutional frame-work is undoubtedly the principal reason for the inadequate operation and maintenance of piped water supply systems in rural areas.

The GOP decision to reorganize its rural development effort and locate over 600 service centers, or markaz, in rural areas, is an ambitious effort to remedy this situation. This project will indirectly support that effort, and will focus on the creation of ad-hoc local organizations to deal with the range of issues related to the provision of improved water supply.

b. Project Role

The involvement of beneficiary communities in planning for, constructing, operating and maintaining their own water supply improvement schemes is absolutely essential for the success of these schemes. Under this project, each community which is to receive assistance in this area will be required to form some sort of organizational entity which can work with PHEDs, IPD or Rural Development staffs in carrying out the project. These organizations may consist primarily of informal village leaders, but should be representative of the community. They will be expected to perform one or more of the following tasks:

-- provide an assessment and expression of the community's need for an improved water supply;

-- help to identify the water supply system best suited to the community's need;

-- assist with the construction of the system and/or drainage scheme through the provision of land, labor or local materials;

-- agree to assume responsibility for systems operation and maintenance on a phased basis;

-- help to identify water user charges which the community can and will pay and agree to collect and increase these charges over a period of time until they are sufficient to cover operation and maintenance;

-- assume full responsibility for operation and maintenance after a designated period (three to five years).

These local organizations will be expected to assume immediate responsibility for operation and maintenance of simple water supply systems such as handpumps, protected wells, or karez and spring filtration tanks, cleaning drains and cleaning or replacing soakage pits.

6. Technical Assistance/Training

Technical assistance and training will be provided to provincial PHEDs, LPD and Rural Development Departments in the following areas:

-- Foreign advisors will provide them with information about improved, low cost, low maintenance systems which are being developed outside of Pakistan. Under the first loan a study will be conducted to examine the feasibility of local manufacture of an improved handpump design currently being field tested by AID. Future studies, to be carried out under follow-on loans, will determine whether other systems designs can be manufactured in-country and/or adapted to local conditions.

-- Foreign advisors will facilitate the expansion of the informal exchange of information on water supply problems among provinces, and will help develop a mechanism under which such an exchange can continue on a formal basis.

-- Assistance will be provided in identifying appropriate materials and delivery systems for health/hygiene education. Foreign advisors will help design and carry out small pilot studies to identify such systems for use in Pakistan.

-- Advice will be provided on practical methods of water source development and simple but effective drainage arrangements.

-- Pilot projects will be undertaken to identify and test appropriate excreta disposal measures which would be both effective and utilized by the rural poor in Pakistan.

-- Efforts to expand community involvement in project design and maintenance will be enhanced through a pilot project which will test several alternative methods of stimulating successful community motivation and participation.

-- Stipends will be provided to civil engineers to enable them to attend a post-graduate level program for training in sanitary engineering.

-- Local currency funds will be provided to train approximately 1500 technical level personnel.

It is estimated that 15 workyears of TA will be provided over the life of the project at a total cost of $ 1.87 million. Of this total, $ 1.5 million will be provided by the AID grant, and $ 375,000 in local costs will be provided by a grant of U.S. Government owned rupees. Foreign advisors will work under the general direction of the Engineering Cell of the Rural Development Wing, but will work directly with the staffs of provincial implementing organizations.

F. ENVIRONMENTAL CONCERNS

The project will essentially service rural agricultural areas which are ecosystems significantly modified by man. Major components of those systems are man, and his associated infrastructure, the crops cultivated in the region, the topography and climate, and those wild flora and fauna of the area able to adapt to a "man-modified" environment.

The environmental impacts of clean water activities are expected to be largely positive. The project will not result in the extraction of great volumes of groundwater and therefore will not decrease tubewell allocations. Moreover, it is not expected to change land use patterns or preclude future use of a land area as the water is intended only for washing, drinking and bathing. Water extracted by this project may be considered a renewable resource. The productivity of the water resource is expected to be maintained over long periods of low volume use.

The construction of the project systems (pumps, wells, standposts, tanks, drainage systems) will require the use of certain materials: brass, iron, steel, etc. Cement and bricks will also be required which cannot be reused. However, scrap material may be reused as a foundation or base in road building or other construction.

The project is not expected to cause any significant negative physical impacts. It will not change the vegetation of the area due to the small amount of water taken away from the groundwater and surface water reserves and added to the surface hydrologic system. The project is not expected to alter the physical or chemical characteristics of the groundwater aquifer, canal or stream. Nor is the project expected to alter the biological state of the water by fecal contamination provided the well, tank, or standpost is properly installed, operated and maintained and adequate drainage facilities are supplied. The systems are expected to have no impact on waterlogging and salinity problems because they are not expected to significantly depress the water table. The introduction of adequate supplies of clean water is expected to have important positive social, economic and health impacts. The project will shorten the water collection journey and expand per capita water consumption. Secondary economic impacts from the project

are expected to be beneficial. A clean water supply for bathing, washing, and drinking is expected to decrease local disease problems and thereby increase the number of days available for productive work. Provision of basic amenities to rural communities may change rural to urban migration patterns. An adequate supply of clean water can be a contributing factor in this change.

Potential adverse impacts include contamination of the groundwater as a result of improper installation or maintenance, contamination of the water supply as a result of improper maintenance, and drainage problems. A series of installation and maintenance procedures have been included in the project design to minimize these impacts. Regarding drainage, the project does not expect to add significant amounts of wastewater to the village system where water has previously been available. However, in those villages where water supply is minimal, public handpumps or standposts and their basins may provide a reliable source of water for mosquito breeding populations. This is especially true during the dry season. Therefore, adequate safeguards have been included in the project design to prevent drainage problems.

An environmental assessment is attached as Annex E.

PART IV. IMPLEMENTATION PLAN

A. MAJOR EVENTS

Events	Action by	Time (from signature of Project Agreement in Months)
Advertise for TA	RDW	-1
Signature of Project Agreement	USAID/GOP	0
Receive TA Proposals	RDW	+1
Engineering Cell established and staffed within RDW	RDW	+1
Evaluate TA Proposals	RDW	+2
Selection Criteria Developed	RDW/Provinces/ AID	+3
Maintenance Plan Developed	RDW/Provinces/ AID	+3
Final selection of priority districts	RDW	+3
TA Contract Awarded	RDW	+5
Initial CPs met	RDW	+5
Advertise for local procurement/ construction	Provinces	+5
Provincial implementation agreements signed	AID/Provinces	+5
Provincial plans of operation submitted and approved	Provinces	+5
Long term TA team arrives	Provinces	+7
Local material contracts awarded	Provinces	+7
Handpump installation begins	Provinces	+9
Baseline data for impact evaluation collected	Provinces/TA team	+9
Construction of piped systems begins	Provinces	+9
First short term consultants arrive	RDW/TA team	+9
Pilot projects begin	Provinces/TA team	+12
Training begins	Provinces	+12
5% of all systems completed	Provinces	+12
First annual review/evaluation	RDW/AID	+18
First impact evaluation completed	AID/RDW	+24
35% of all systems completed	Provinces	+24
In-depth evaluation completed	AID/RDW/Outside Consultants	+28

Events	Action by	Time (from signature of Project Agreement in Months)
Second annual review evaluation	AID/RDW	+30
70% of all systems completed	Provinces	+36
Third annual evaluation	AID/RDW	+42
100% of all systems completed	Provinces	+48

B. PROVINCIAL IMPLEMENTATION AGREEMENTS

Because of the considerable autonomy each province has in developing and implementing projects, AID plans to execute separate implementation agreements with each province (in coordination with the Federal Government) in addition to the project agreement with the Federal Government. These agreements should help ensure that each province understands and adheres to the important design elements of the project and that they will participate in meeting Conditions Precedent and Covenents applicable at the province level.

C. DISBURSEMENT PROCEDURES

1. Foreign Exchange Costs

AID will use dollar grant funds to finance 100% of the Project's direct foreign exchange costs for short and long term technical assistance. These costs will be financed through letters of commitment and/or letters of credit in accordance with standard AID procedures.

2. Local Costs

a. Systems Construction and Installation

A modified fixed amount reimbursement (FAR) method will be used for disbursement for all systems constructed and installed. AID will use dollar loan funds to reimburse the Government of Pakistan approximately 75% of the estimated rupee costs of rural water supply systems which have been selected and are being maintained in accordance with agreed upon specifications and criteria. Reimbursement amounts will be agreed to beforehand and will be based on the average estimated installed costs for specific systems components (handpumps, tubewell motors, tubewell borings per foot, distribution networks per installed foot of pipe of specified dimensions, etc.) For schemes with capital costs of over $100,000, individual cost estimates will be submitted for review and approval by the Rural Development Wing. AID will selectively review a portion of these designs. Actual amounts for reimbursement will be specified in Project Implementation letters.

Reimbursement will be made for completed and inspected work whenever accumulated payments have reached $250,000 or more, assuming relevant CPs have been met. The GOP will certify that work has been completed in a satisfactory manner. Prior to approving requests for reimbursement, AID will inspect all installed systems with a capital cost of $100,000 or more, and will inspect smaller systems on a sample basis.

b. Training

AID will finance 100% of the rupee costs of in-country graduate training for civil engineers and 100% of the rupee costs of training 1500 technical personnel in-country through a Mondale Rupee Grant.

c. Other Local Costs

Mondale Rupees will be used to finance in-country support costs of foreign consultants. These costs are estimated to be 20% of the total TA costs.1/ Local costs of conducting pilot projects on health education, sanitation, and a handpump manufacture feasibility study will be directly reimbursed using a Mondale Rupee Grant.

D. PROCUREMENT PLAN

1. Availability of Commodities

The major commodities needed for the Project are: handpumps, electric motors for tubewells, electric fittings, pipes (asbestos cement, cast iron, galvanized iron and P.V.C.), pipe fittings, cement, sand, and bricks. With the exception of pipe fittings, which normally comprise less than 1% of systems costs, all other items are fabricated in-country. Some raw materials (steel strips, zinc ingots) are imported for the manufacture of galvanized iron pipe. It is expected that all items will be available in time and in sufficient quantity to meet the project's requirements.

2. Procurement Procedure

Provincial implementing organizations will contract with local construction firms for the installation of handpumps, the boring of tubewells, laying and jointing of pipe and other aspects of the construction of rural water supply facilities. These firms will be required to arrange for the procuremet of all required material from the local market. Standard GOP and provincial procurement regulations will cover this procurement. Such practice is consistent with AID's general policy for FAR projects which allows the imple-

1/ If the Mission proposed Mondale grant for consultant support is approved, this item will be reduced or eliminated.

menting agency to follow the customary procurement regulations, subject to AID Mission Director's review. Implementing organizations will furnish to USAID/Islamabad all pertinent documentation relating to the purchase of goods or services to be financed under the project loan. This will include documentation relating to the prequalification and selection of contractors, and to the solicitation of bids and proposals.

3. Procurement Source

No goods will be imported specifically for this project. All items required for this project will be available off the shelf locally, or can be manufactured in-country. The estimated imported shelf item procurement will be substantially less than the 25% of the commodity element of the project permitted by chapter 20 of Handbook 1B.

E. PROJECT MONITORING AND EVALUATION PLAN

1. USAID Monitoring Arrangements

A full-time project manager in USAID/Islamabad's Division of Health and Nutrition will be charged with managing the Project for AID and working with the GOP implementing organizations at the federal and provincial levels. He will be assisted by a USAID project committee. Field monitoring of construction activity will be the responsibility of USAID engineers. The Mission has recruited two local engineers who will backstop this and other projects. General project oversight will be provided by USAID's Project Development and Monitoring Division which has three qualified Capital Development Officers, two direct hire engineers, two local hire engineers, and two local hire officers who were responsible for monitoring the Flood Relief and Rehabilitation Project and who are familiar with FAR procedures.

2. GOP Monitoring Responsibilities

A GOP rural clean water project committee has been formed to oversee all phases of project planning and implementation. The Committee is chaired by the Joint Secretary for Rural Development, and includes representatives from all provincial implementing organizations, as well as Federal Planning, Economic Affairs, Health and Finance Divisions. Meetings of the committee will be held periodically with USAID to review progress and implementation problems. The Rural Development Wing and USAID will jointly monitor the project through field visits and review of project proposals, quarterly reports, and project completion reports. The Wing will screen all project proposals and requests for disbursement and concur in them before they are forwarded to AID for

approval. A member of the Wing's Engineering Cell, which is being established to coordinate/monitor this and other AID projects, will certify that projects have been completed in accordance with approved plans and agreed upon specifications.

3. Evaluation Plan

a. Annual Evaluations

In addition to the continuous project monitoring and joint reviews carried out by AID and the GOP, regular annual evaluations will be conducted beginning one year after initiation of project implementation. A joint review will be scheduled to discuss and implement evaluation findings. The evaluation held before preparing the project paper for the second tranche will be an in-depth evaluation utilizing outside consultants. The periodic joint reviews could precipitate special evaluations.

The evaluations will determine whether systems are being completed on time, whether health education efforts are being conducted, the extent to which community participation is being achieved and applicable water charges are being collected, the quality of training which is being provided, the effectiveness of installed systems and maintenance arrangements and the appropriateness of systems design. The evaluation team will include AID/W and/or contract consultants.

b. Water Quality and Water Use

During the project a study will also be carried out to measure the extent to which the project has resulted in increased per capita consumption of water and/or an improvement in the quality of water used by the rural poor. The study will be designed and executed with assistance from AID/W and/or contract consultants. It is expected to involve the collection of baseline data on water quality/use patterns in a sample of villages which have been selected as sites for the installation of different types of water systems. This data would be collected within 12 months after the project agreement is signed. After the completion of the water schemes, data will be collected at regular intervals in an effort to measure the impact of the project on water quality and use patterns.

c. Health Impact

The Mission has concluded that an impact evaluation designed to measure the changes in health status which result from the introduction of improved and expanded water supplies in Pakistan is not feasible at this time, given the fact that a methodology for accurately monitoring

health benefits has yet to be developed. The Mission believes that an evaluation of the rural water supply program which focuses on the effectiveness of the program in delivering clean water to the rural poor can produce valuable information for improved program planning and execution. In the meantime, as better information is developed on the relationship between clean water and health, the Mission will ensure that it is made available to the GOP for incorporation in sub-project designs.

F. CONDITIONS, COVENANTS AND NEGOTIATING STATUS

1. Conditions and Covenants

The following are the Conditions Precedent and Covenants that AID will negotiate with the Government of Pakistan. Although it is understood that the Government is generally in accord with these, the final texts cannot be determined until the project agreement has been negotiated.

a. 5.1 Initial Conditions Precedent for Disbursement under the Grant.

Prior to the first disbursement of AID funds for Technical Assistance, the Government will furnish:

(1) Legal Opinion.
(2) Designation of Government's Authorized Representatives.
(3) Evidence that firm Federal and Provincial budget allocations have been made of funds necessary to carry out the project during the GOP FY 1978-79, that the Government plans to allocate sufficient funds to carry out the project in subsequent years of project implementation, and that such funds for rural water projects are in addition to amounts normally expended for these activities in each province before the project, plus a reasonable inflation factor.
(4) Evidence that a Federal level Engineering Cell has been formed within the Rural Development Wing with sufficient qualified personnel to adequately monitor the project.
(5) Evidence that priority districts have been selected for the installation of piped water schemes.
(6) Evidence that a contract for technical assistance, approved by AID and the Government of Pakistan, has been entered into with one or more organizations or other entities satisfactory to AID and the Government of Pakistan for the provision of technical advisors.
(7) Procedures for monitoring and evaluation.

b. 5.2 Conditions Precedent to Commencing Water Supply Schemes Construction/Improvement

Prior to the commencement of construction of water supply schemes or the installation of handpumps in a province for which reimbursement will be sought under the loan, in addition to the Conditions Precedent in Section 5.1 having been fully satisfied, the Government shall, except as AID may otherwise agree in writing, furnish to AID in form and substance satisfactory to AID for that province to which the reimbursement is applicable:

(1) A comprehensive plan of operations for the project which, among other things, identifies the roles of all implementing agencies and includes (a) AID/GOP jointly agreed criteria for selection of sub-projects; (b) an AID/GOP jointly agreed upon maintenance plan; (c) general design specifications; (d) general construction requirements; (e) provision for drainage arrangements; (f) other installation criteria; (g) a health/hygiene education plan.
(2) A list of water supply schemes to be carried out under the loan giving details of work, location, and estimated cost.
(3) An organizational and staffing plan for project implementation and maintenance, with special emphasis on community education functions, and evidence that qualified staff have been appointed to fulfill these functions in accordance with the plan of operations.
(4) Execution of an acceptable Project Implementation Agreement between the province and AID.
(5) Arrival of the TA team in Pakistan.
(6) General contract format, bidding and contracting procedures to be used for the construction work.

c. 5.3 Conditions Precedent to Fixed Amount Reimbursement (FAR) Payments for Water Supply Schemes/Handpump Installation

Except as AID may otherwise agree in writing, the Borrower shall be entitled to FAR payments as prescribed in Project Implementation Letters for completed water supply schemes or installed handpumps only if: the Conditions Precedent in Section 5.1 shall have been fully satisfied and the Conditions Precedent in Section 5.2 shall have been satisfied for the province to which the FAR payment is applicable; and the Borrower's Authorized Representative has certified in writing to the following effect:

(1) The sub-projects for which reimbursement is being sought were selected, designed, and implemented in accordance with the plan of operations submitted to, and approved by, AID pursuant to Section 5.2.
(2) A maintenance program is being implemented in accordance with the plan submitted to, and approved by, AID pursuant to Section 5.2.
(3) The organization and staffing plan submitted to AID pursuant to Section 5.2 remains in effect and qualified personnel continue to be serving in these positions.

d. Special Covenants by the Government of Pakistan

(1) The Government agrees to record during the life of this loan fiscal and physical data on water supply schemes construction, improvement and maintenance.
(2) The Government agrees that funds expended to finance rural water supply construction/improvement and maintenance under this project shall be in addition to amounts normally expended annually for these activities in each province before the project, plus a reasonable inflation factor.
(3) The Government agrees that maintenance of water supply systems is an essential component of any water supply program and will, therefore, budget sufficient funds to cause systems to be maintained in accordance with plans approved by AID, work with beneficiary groups to enable them to assume responsibility for operation and maintenance of installed systems, and take necessary steps to ensure the collection of sufficient water charges to allow systems with yard connections to become financially self-sustaining.
(4) The Government agrees to carry out, or cause to be carried out, research projects in improved systems design, health/hygiene education community participation, and sanitation and incorporate appropriate results into the design of individual water supply sub-projects.
(5) The Government will assure that the terms and conditions of each province's project implementation agreement with AID are observed by the provinces.
(6) The Government agrees to the importance of an adequate monitoring and evaluation program to the success of the project and agrees to:
   i. Carry out a monitoring program acceptable to AID, including periodic site visits to ensure the proper implementation of the various project elements.
   ii. Hold semi-annual review meetings beginning no later than 12 months following the execution of this Agreement. Project committee members including AID representatives will be invited to participate in the reviews, and provincial

officials responsible for project implementation will also be invited to participate. The Borrower agrees that an in-depth evaluation supplemented by U.S. consultants will be completed no later than 28 months following execution of this Agreement.

2. Negotiating Status.

The project design as outlined in this project paper has been jointly developed by AID and the Government of Pakistan. The Conditions Precedent and Covenants have been discussed with the appropriate GOP authorities and have been accepted in principle by them. It is expected that negotiation of the Project Agreement will be completed in sufficient time to allow execution of the Agreement within the 120 days after AID authorization specified in AIDTO Circular A-24. We expect that the initial Conditions Precedent will not be met until five months after signing of the Agreement because of the complexities in the Government negotiating a host country contract for technical services. The Mission plans to exercise its delegated authority under AIDTO A-24 to allow the GOP this extra time to meet the initial Conditions Precedent.

Annex A1

PAKISTAN - RURAL CLEAN WATER
CERTIFICATION PURSUANT TO SECTION 611(e) OF THE FOREIGN ASSETANCE ACT OF 1961, AS AMENDED

I, Richard M. Cashin, principal officer of the Agency for International Development in Pakistan, having taken into account among other things the maintenance and utilization of projects in Pakistan previously financed or assisted by the U.S. and the commitment of the Government of Pakistan to carry out an effective Rural Clean Water Project, do hereby certify that in my judgment Pakistan has the financial and human resources capability to implement, maintain and utilize effectively the subject capital assistance project for Rural Clean Water.

R. M. Cashin

Richard M. Cashin, Director
USAID/Pakistan

5/10/78
Date

COPY

Department of State

TELEGRAM

PAGE 01 ISLAMA 05911 181804Z

ACTION AID-29

INFO OCT-01 NEA-11 EB-08 CIAE-00 DODE-00 [illegible]

P 181230Z JUN 76
FM AMEMBASSY ISLAMABAD
TO SECSTATE WASHDC PRIORITY 7715

UNCLAS ISLAMABAD 5911

AIDAC

FOR LOVE, AGIT/PD

E.O. 11652:N/A
SUBJ: PROPOSED RURAL CLEAN WATER PROJECT

1. GOP LETTER OF REQUEST FOR SUBJECT PROJECT WAS RECEIVED BY USAID JUNE 16, 1976. TEXT IS AS FOLLOWS:

2. QUOTE MY DEAR DR. SOLTER, THE GOVERNMENT OF PAKISTAN AND AID HAVE BEEN WORKING COLLABORATIVELY OVER THE PAST YEAR ON THE PREPARATION OF A RURAL CLEAN WATER PROJECT TO BE FINANCED IN PART WITH AN AID LOAN AND TECHNICAL ASSISTANCE GRANT. THE GOVERNMENT BELIEVES THAT MAJOR EFFORTS MUST BE MADE TO IMPROVE THE QUANTITY OF WATER SUPPLIES AVAILABLE TO RURAL PEOPLE FOR THEIR THE RURAL POOR FOR DRINKING, WASHING AND BATHING, TO IMPROVE THEIR OVERALL HEALTH STATUS AND QUALITY OF LIFE. FOR THIS REASON, THE GOVERNMENT HAS GIVEN A HIGH PRIORITY TO THE PROVISION OF CLEAN RURAL WATER SUPPLIES IN THE CURRENT FIVE YEAR PLAN.

3. WITH AID'S ASSISTANCE WE PROPOSE TO BEGIN CONSTRUCTION OF BILLIONS PIPED WATER SUPPLY AND DRAINAGE SYSTEMS AND SIMPLE WATER SUPPLY IMPROVEMENT SCHEMES AND THE INSTALLATION OF HANDPUMPS IN ELIGIBLE DISTRICTS. WE PLAN TO DEVELOP STANDARDIZED CRITERIA FOR THE SELECTION OF RURAL WATER SUPPLY PROJECTS, FORMULATE A MAINTENANCE PLAN THAT WILL DEFINE BOTH GOVERNMENT AND COMMUNITY RESPONSIBILITIES IN THIS AREA, AND STRENGTHEN THE INSTITUTIONS CONCERNED IN IMPLEMENTING RURAL WATER PROJECTS THROUGH THE PROVISION OF SHORT AND LONG TERM EXPERT ADVICE. WE PROPOSE THAT THE PROJECT INCLUDE A SUBSTANTIAL DOMESTIC TRAINING EFFORT FOR TECHNICAL AND PROFESSIONAL PERSONNEL.

4. THE PRINCIPAL ORGANIZATIONS WHICH WILL BE INVOLVED IN THE IMPLEMENTATION OF THIS PROJECT ARE AT THE FEDERAL LEVEL THE RURAL DEVELOPMENT WING OF THE [illegible] DEVELOPMENT AT THE LOCAL GOVERNMENT, MINISTRY OF RURAL DEVELOPMENT AND LOCAL GOVERNMENT, AT THE PROVINCIAL LEVEL THE PUBLIC HEALTH ENGINEERING DEPARTMENTS OF PUNJAB AND NWFP PROVINCES AND IRRIGATION AND PUBLIC [illegible] IN BALUCHISTAN, ALONG WITH THE REORGANIZED RURAL DEVELOPMENT AND LOCAL GOVERNMENT DEPARTMENTS, AND THE BENEFITED COMMUNITIES THEMSELVES.

5. ACCORDINGLY, ON BEHALF OF THE GOVERNMENT OF PAKISTAN I HEREBY REQUEST THE UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT TO EXTEND A TWENTY MILLION DOLLAR ($20,000,000) LOAN AT THE MOST CONCESSIONAL TERMS, A ONE MILLION FIVE HUNDRED THOUSAND DOLLAR ($1,500,000) GRANT AND A FOUR MILLION EQUIVALENT U.S. GOVERNMENT OWNED RUPEE GRANT TO SUPPORT A RURAL CLEAN WATER PROJECT. THE INITIAL TRANCHE OF THE PROJECT WILL BE CARRIED OUT IN THE NEEDIEST DISTRICTS OF PAKISTAN. IF THIS INITIAL TRANCHE PROVES SUCCESSFUL WE ALSO PLAN TO SEEK AN ADDITIONAL TWENTY MILLION DOLLAR ($20,000,000) LOAN AND A ONE MILLION FIVE HUNDRED THOUSAND DOLLAR ($1,500,000) GRANT IN US FY 1981 AND A SIMILAR LOAN IN US FY 1983. THESE AMOUNTS WILL ASSIST US IN EXTENDING RURAL CLEAN WATER COVERAGE TO ADDITIONAL AREAS IN

UNCLASSIFIED

COUNTRY CHECKLIST

A. GENERAL CRITERIA FOR COUNTRY

1.	FAA Sec. 116. Can it be demonstrated that contemplated assistance will directly benefit the needy? If not, has the Department of State determined that this government has engaged in a consistent pattern of gross violations of internationally recognized human rights?	Yes; to first question.
2.	FAA Sec. 481. Has it been determined that the government of recipient country has failed to take adequate steps to prevent narcotics drugs and other controlled substances (as defined by the Comprehensive Drug Abuse Prevention and Control Act of 1970) produced or processed, in whole or in part, in such country, or transported through such country, from being sold illegally within the jurisdiction of such country to U.S. Government personnel or their dependents, or from entering the U.S. unlawfully?	No.
3.	FAA Sec. 620(b). If assistance is to a government, has the Secretary of State determined that it is not controlled by the international Communist movement?	The Secretary of State has determined that Pakistan is not controlled by the International Communist movement.
4.	FAA Sec. 620(c). If assistance is to government, is the government liable as debtor or unconditional guarantor on any debt, to a U.S. citizen for goods or services furnished or ordered where (a) such citizen has exhausted available legal remedies and (b) debt is not denied or contested by such government?	No.

5.	FAA Sec. 620(e)(1). If assistance is to a government, has it (including government agencies or subdivisions) taken any action which has the effect of nationalizing expropriating, or otherwise seizing ownership or control of property of U.S. citizens or entities beneficially owned by them without taking steps to discharge its obligations toward such citizens or entities?	The nationalization of schools potentially affects one American Church organization which owns substantial property in Pakistan. The Church organization is holding discussions with the government on the matter. Other nationalization actions taken in recent years which have affected U.S. citizens have either been resolved satisfactorily or reversed.
6.	FAA Sec. 620(f); App. Sec. 108. Is recipient country a Communist country? Will assistance be provided to the Socialist Republic of Vietnam, Cambodia, Laos, Cuba, Uganda, Mozambique, or Angola?	No.
7.	FAA Sec. 620(i). Is recipient country in any way involved in (a) subversion of, or military aggression against, the United States or any country receiving U.S. assistance, or (b) the planning of such subversion or aggression?	No.
8.	FAA Sec. 620(j). Has the country permitted, or failed to take adequate measures to prevent, the damage or destruction, by mob action, of U.S. property?	No.
9.	FAA Sec. 620(l). If the country has failed to institute the investment guaranty program for the specific risks of expropriation, inconvertibility or confiscation, has the AID Administrator within the past year considered denying assistance to such government for this reason?	Pakistan has instituted the investment guaranty program for the specific risks of expropriation, inconvertibility and war risks.

10.	FAA Sec. 620(o); Fishermen's Protective Act. Sec. 5. If country has seized, or imposed any penalty or sanction against, any U.S. fishing activities in international waters,	
	a. has any deduction required by Fishermen's Protective Act been made?	Not Applicable.
	b. has complete denial of assistance been considered by AID Administrator?	Not Applicable.
11.	FAA Sec. 620(q); App. Sec. 504. (a) Is the government of the recipient country in default on interest or principal of any AID loan to the country? (b) Is country in default exceeding one year on interest or principal on U.S. loan under program for which App. Act appropriates funds, unless debt was earlier disputed, or appropriate steps taken to cure default?	No.
12.	FAA Sec. 620(s). What percentage of country budget is for military expenditures? How much of foreign exchange resources spent on military equipment? How much spent for the purchase of sophisticated weapons systems? (Consideration of these points is to be coordinated with the Bureau for Program and Policy Coordination, Regional Coordinators and Military Assistance Staff (PPC/RC).	During the current fiscal year 1978 Pakistan's known defense expenditures are projected to be about Rs. 9,150 million 20% of the consolidated Federal government budget. Last year defense expenditures were about Rs. 8,000 million, about the same percentage of the total budget. We have no precise estimate of foreign exchange resources utilized to acquire military hardware and other defense equipment, but believe these to be about $200 million annually largely to replace and maintain obsolescent equipment, much of its supplied by the U.S. as military aid during the 1950's

(... Contd. from page 3)
and early 1960's. Pakistan has purchased sophisticated weapon systems from abroad, including Mirage jet fighters from France, armored personnel carriers from the U.S. and tanks and jet fighters (many on concessional terms) from the Peoples Republic of China.

13. FAA Sec. 620(t). Has the country severed diplomatic relation with the United States? If so, have they been resumed and have new bilateral assistance agreements been negotiated and entered into since such resumption?

Diplomatic relations with the United States have never been severed.

14. FAA Sec. 620(u). What is the payment status of the country's U.N. obligations? If the country is in arrears, were such arrearages taken into account by the AID Administrator in determining the current AID Operational Year Budget?

Pakistan is not delinquent in any obligations to the United Nations.

15. FAA Sec. 620A. Has the country granted sanctuary from prosecution to any individual or group which has committed an act of international terrorism?

Not to our knowledge.

16. FAA Sec. 666. Does the country object, on basis of race, religion, national origin or sex, to the presence of any officer or employee of the U.S. there to carry out economic development program under FAA?

No.

17. FAA Secs. 669 and 670. Has the country, after August 3, 1977, delivered or received nuclear enrichment or reprocessing equipment, materials, or technology, without specified arrangements or safeguards? Has it detonated a nuclear device after August 3, 1977 although not a "nuclear-weapon State" under the nonproliferation treaty?

Pakistan has contracted with France for the purchase of a nuclear reprocessing plant. USAID/Pakistan has no knowledge as to whether deliveries of equipment, materials or technology under the agreement have been made since August 3, 1977.

18, FAA Sec. 901. Has the country denied its citizens the right or opportunity to emigrate?	Not to our knowledge.

B. FUNDING CRITERIA FOR COUNTRY

1. Development Assistance Country Criteria

a. FAA Sec. 102(c), (d). Have criteria been established, and taken into account, to assess commitment and progress of country in effectively involving the poor in development, on such indexes as: (1) small-farm labor intensive agriculture, (2) reduced infant mortality, (3) population growth, (4) equality of income distribution, and (5) unemployment.	Pakistan has been taking measures to improve its system for measuring progress in precisely these areas, pulling together into one improved operation the organizations responsible for the Agricultural Census, the Population Census, vital statistics and the measurement of current status and changes in employment and well being. In determining the need for this loan, and projecting its impact the available data and the improved information expected have been major factors in consideration.
b. FAA Sec. 104(d)(1). If appropriate is this development (including Sahel) activity designed to build motivation for smaller families in programs such as education in and out of school, nutrition, disease control, maternal and child health services, agricultural production, rural development, and assistance to urban poor?	Improved sanitation from increased, more convenient supplies of water (partly made possible by new energy sources for pumping) is a major factor in reducing infant mortality, overall morbidity and improving disease control.

c. FAA Sec. 201(b)(5), (7) & (8); Sec. 203; 211(a)(4), (7). Describe extent to which country is:

1. Making appropriate effort to increase food production and improve means for food storage and distribution.

The Government has made agricultural development a number one priority, and within agriculture food production. The Government has supported this priority by adopting a price policy for wheat, allocating large amounts of domestic credit for farmers and implementing rural credit campaigns. It has removed restrictions on the domestic sales and distribution of fertilizer, continues to invest major amounts in farm mechanization, improved irrigation, domestic fertilizer production and fertilizer imports. It has requested and is now receiving technical assistance in food grain storage.

Since 1972, domestic fertilizer sales have increased from 381,000 nutrient tons to an estimated 625 thousand tons in 1977/78. This increase has been over 10% per year. It is making significant efforts to adapt appropriate technology, and increase production, build new fertilizer plants, better distribute high-yielding seed varieties, extend irrigated acreage, and improve the use of water.

2. Creating a favorable climate for foreign and domestic private enterprise and investment.	Over the last eight years, the nationalization of domestically owned banks and a number of major industries in fulfillment of election pledges by the Government of Pakistan created uncertainties for investors that have retarded private investment in large scale industries. A formula for the payment to investors has been publicly adopted, and a clearer demarcation of the industrial role of private and public investors has now improved the climate. Government's leaders have publicly affirmed that a substantial degree of domestic and foreign private investment is essential to the country's economic development. The nationalization of food grain processing and distribution has been reversed, and mills and other facilities returned to private hands.
3. Increasing the public's role in the developmental process.	The fledgling Integrated Rural Development Program incorporates a local government plan of action, which is to mobilize local resources for local needs, and involves active participation at the village level.
4(a). Allocating available budgetary resources to development.	Development investment expenditures account for about 42% of the consolidated Government budget in FY 1978.
4(b). Diverting such resources for unnecessary military expenditure and intervention in affairs of other free and independent nations.	There have been no significant increases in Pakistan's defense budget in recent years, the increases in nominal amounts being those needed to meet increases in costs resulting from national and worldwide inflation. There has as yet been no significant increase observed following (a) India's detonation of a nuclear device, (b) the continuing strain in Afghan-Pakistan relations, (c) the

(-------Contd. from page 7)
lifting of the U.S. embargo on sales of lethal defense items to Pakistan, or the coming to power of a caretaker military government.

5.	Making economic, social and political reform such as tax collection improvements and changes in land tenure arrangements, and making progress toward respect for the rule of law, freedom of expression and of the press, and recognizing the importance of individual freedom, initiative, and private enterprise.	The Government of Pakistan has continually promulgated a succession of different land, labor, banking, education, health, and law reforms, which are making significant contributions to social, economic and political development as they are being implemented. The rule of law is publicly endorsed, and there has been a definite improvement in the freedom allowed the press since the coup d'etat of July 1977. However, permission for public meetings and demonstrations, and other forms of expression are controlled because of the fear that disruptive violence will be introduced by certain elements of political opposition. The government has announced its intention to strengthen democratic local government.
6.	Otherwise responding to the vital economic, political, and social concerns of its people, and demonstrating a clear determination to take effective self-help measures.	Pakistan has recently offered attractive terms to interested oil exploration firms to step up the search for oil in the country. Self-help is a major commitment of the government, which does not wish to be dependent upon foreign aid to implement measures needed to meet the peoples' demands for development.

d. FAA Sec. 201(b), 211(a).
Is the country among the 20 countries in which development assistance loans may be made in this fiscal year, or among the 40 in which development assistance grants (other than for self-help projects) may be made?

Pakistan is among the countries for which development assistance loans and grants may be made in this fiscal year.

e. FAA Sec. 115. Will country be furnished, in same fiscal year, either security supporting assistance, or Middle East peace funds? If so, has Congress specifically authorized such use of funds, or is assistance for population programs, humanitarian aid through international organizations, or regional programs? — Not Applicable.

2. Security Supporting Assistance Country Criteria

a. FAA Sec. 502B. Has the country engaged in a consistent pattern of gross violations of internationally recognized human rights? Is program in accordance with policy of this Section? — Not Applicable.

b. FAA Sec. 531. Is the Assistance to be furnished to a friendly country, organization, or body eligible to receive assistance? — Not Applicable.

c. FAA Sec. 533(c) (2). Will assistance under the Southern African Special Requirements fund be provided to Mozambique, Angola, Tanzania, or Zambia? If so, has President determined (and reported to the Congress) that such assistance will further U.S. foreign policy interests? — Not Applicable.

d. FAA Sec. 609. If commodities are to be granted so that sale proceeds will accrue to the recipient country, have Special Account (counterpart) arrangements been made? — Not Applicable.

e. App. Sec. 113. Will security assistance be provided for the purpose of aiding directly the efforts of the government of such country to repress the legitimate rights of the population of such country contrary to the Universal Declaration of Human Rights? — Not Applicable.

f. FAA Sec. 620B. Will security supporting assistance be furnished to Argentina after September 30, 1978? — Not Applicable.

PROJECT CHECKLIST

A. GENERAL CRITERIA FOR PROJECT

1. App. Unnumbered; FAA Sec. 653(b)

(a) Describe how Committees on Appropriations of Senate and House have been or will be notified concerning the project.	This project was included in the FY 1978 Congressional Presentation.
(b) Is assistanace within (Operational Year Budget) country or international organization allocation reported to Congress (or not more than $ 1 million over that figure)	Assistance is within operation year budget.
2. FAA Sec. 611(a)(1). Prior to obligation in excess of $100,000 will there be (a) engineering, financial, and other plans necessary to carry out the assistance and (b) a reasonably firm estimate of the cost to the U.S. of the assistance?	Yes. See Sections III and IV of PP.
3. FAA Sec. 611(a)(2). If further legislative action is required within recipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of the assistance?	No legislative steps are required. The administrative steps needed have been discussed with the Federal Government and those of the Provinces, and the Project Paper has been circulated by them. Progress has been satisfactory to date and timely completion of needed action is expected.
4. FAA Sec. 611(b); App. Sec. 101. If for water or water-related land resource construction, has project met the standards and criteria as per the Principles and Standards for Planning Water and Related Land Resources dated October 25, 1973?	Not Applicable.

5.	FAA Sec. 611(e). If project is capital assistance (e. g., construction), and all U.S. assistance for it will exceed $1 million, has Mission Director certified the country's capability effectively to maintain and utilize the project?	Yes.
6.	FAA Sec. 209, 619. Is project susceptible of execution as part of regional or multilateral project? If so, why is project not so executed? Information and conclusion whether assistance will encourage regional development programs. If assistance is for independent country, is it furnished through multilateral organizations or plans to the maximum extent appropriate?	Not Applicable.
7.	FAA Sec. 601(a); and Sec. 201(f) (for development loans). Information and conclusions whether project will encourage efforts of the country to; (a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions.	Not Applicable.

8.	FAA Sec. 601(b). Information and conclusion on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance program (including use of private trade channels and the services of U.S. private enterprise).	This project is not expected to directly foster U.S. private trade and investment abroad.
9.	FAA Sec. 612(b); Sec. 636(h). Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized to meet the cost of contractual and other services.	The host country will provide agreed amounts of local currency expenses of the project. A 612(b) determination is requested in the PP to permit dollars to be expended to finance a portion of the local costs of the project.
10.	FAA Sec. 612(d). Does the U.S. own excess foreign currency and, if so, what arrangements have been made for its release?	The U.S. owns excess Pakistani rupees that are programed for use in a number of projects and these rupees will be used to finance certain local costs. See Annex F.
11.	ISA 14. Are any FAA funds for FY 78 being used in this project to construct, operate, maintain, or supply fuel for nuclear pwerplant under an agreement for cooperation between the United States and any other country?	Not Applicable.

B. FUNDING CRITERIA FOR PROJECT

1. Development Assistance Project Criteria

a.	FAA Sec. 102(c); Sec. 111; Sec. 281a. Extent to which activity will (a) effectively involve the poor in development by extending access to economy at local level, increasing labor-intensive production, spreading investment out from cities to small towns and rural areas; and help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward better life, and otherwise encourage democratic private and local governmental institutions?	Not Applicable.

b.	FAA Sec. 103, 103A, 104, 105, 106, 107. Is assistance being made available [include only applicable paragraph -- e.g., a, b, etc. -- which corresponds to source of funds used. If more than one fund source is used for project, include relevant paragraph for each fund source].	Not Applicable.
(1)	[103] for agriculture, rural development or nutrition; if so, extent to which activity is specifically designed to increase productivity and income of rural poor.	Not Applicable.
(2)	[104] for population planning or health; if so, extent to which activity extends low-cost, integrated delivery systems to provide health and family planning services, especially to rural areas and poor.	Lack of convenient access to regular supplies of potable, or often any, water is a major problem for many of Pakistan's rural poor. This project will provide more convenient, regularly available water for large numbers of settlements and people who have not had them, improving their health status and the quality of their lives.
(3)	[105] for education, public administration, or human resources development; if so extent to which activity strengthens non-formal education, makes formal education more relevant, especially for rural families and urban poor, or strengthens management capability of institutions enabling the poor to participate in Development.	Not Applicable.

(4) [106] for technical assistance, energy, research, reconstruction, and selected development problems; if so, extent activity is:	Not Applicable.
(a) Technical cooperation and development, especially with U.S. private and voluntary, or regional and international development, organization;	Not Applicable.
(b) to help alleviate energy problem;	Not Applicable.
(c) Research into, and evaluation of, economic development processes and techniques;	Not Applicable.
(d) reconstruction after natural or manmade disaster;	Not Applicable.
(e) for special development problem, and to enable proper utilization of earlier U.S. infrastructure, etc., assistance;	Not Applicable.
(f) for programs of urban development, especially small labor-intensive enterprises, marketing systems, and financial or other institutions to help urban poor participate in economic and social development.	Not Applicable.
(5) [107] by grants for coordinated private effort to develop and disseminate intermediate technologies appropriate for developing countries.	Not Applicable.
c. FAA Sec. 110(a); Sec. 208(e). Is the recipient country willing to contribute funds to the projects, and in what manner has or will it provide assurances that it will provide at least 25% of the cost of program, project, or activity with respect to which the assistance is to be furnished (or has the latter cost-sharing requirement been waived for a "relatively least-developed" country)?	The project agreement will specify a host country contribution that is at least 25% of the cost of the entire activity.

d.	FAA Sec. 110(b). Will grant capital assistance be disbursed for project over more than 3 years? If so, has justification satisfactory to Congress been made, and efforts for other financing?	Grant assistance in this project will be limited to technical assistance. Capital assistance will be by loan.
e.	FAA Sec. 207; Sec. 113. Extent to which assistance reflects appropriate emphasis on; (1) encouraging development of democratic, economic, political, and social institutions;(2) self-help in meeting the country's food needs; (3) improving availability of trained worker-power in the country; (4) programs designed to meet the country's health needs; (5) other important areas of economic, political, and social development, including industry; free labor unions, cooperatives, and Voluntary Agencies; transportation and communication; planning and public administration; urban development, and modernization of existing laws; or (6) integrating women into the recipient country's national economy.	This project will assist the Government of Pakistan to meet the country's food and health needs. It is designed to decentralize decision making and bring it closer to the people,
f.	FAA Sec. 281(b). Describe extent to which program recognizes the particular needs, desires, and capacities of the people of the country; utilizes the country's intellectual resources to encourage institutional development; and supports civic education and training in skills required for effective participation in governmental and political processes essential to self-government.	The project recognizes the needs of the rural population and the desire for participation in the country's economic development and will facilitate this participation. By decentralizing certain decisions, it makes a modest contribution to civic education and training in skills needed for increased civic participation.

g.	FAA Sec. 201(b)(2)-(4) and (8); Sec. 201(e); Sec. 211(a)(1)-(3) and (8). Does the activity give reasonable promise of contributing to the development: of economic resources, or to the increase of productive capacities and self-sustaining economic growth; or of educational or other institutions directed toward social progress? Is it related to and consistent with other development activities, and will it contribute to realizable long-range objectives? and does project paper provide information and conclusion on an activity's economic and technical soundness?	Yes. The project paper is complete and examines the project's consistency with Pakistan's major development plans, since it will contribute to the achievement of all other major development objectives, and its technical and economic soundness.
h.	FAA Sec. 201(b)(6); Sec. 211(a)(5), (6). Information and conclusion on possible effects of the assistance on U.S. economy, with special reference to areas of substantial labor surplus, and extent to which U.S. commodities and assistance are furnished in a manner consistent with improving or safeguarding the U.S. balance-of payments position.	The project's technical assistance will come from U.S. sources.
2.	Development Assistance Project Criteria (Loan only).	
a.	FAA Sec. 201(b)(1). Information and conclusion on availability of financing from other free-world sources, including private sources within U.S.	Although Pakistan has received and expects to continue to receive substantial assistance from other countries, this financing is largely committed to other high priority uses. Many of the projects financed by this other assistance are complementary to the project to be assisted here, and this combination results in a synergism that will substantially increase their total contribution to Pakistan's productivity, economic and

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social development, and repayment capability. A.I.D. is not now aware of any U.S. private sector interest in investing or otherwise contributing to this project activity.

Necessary plans to carry out the assistance will be developed prior to signing the project agreement. A reasonably firm cost estimate of the project has been made.

b. FAA Sec. 201(b)(2); 201(d). Information and conclusion on (1) capacity of the country to repay the loan, including reasonableness of repayment prospects, and (2) reasonableness and legality (under laws of country and U.S.) of lending and relending terms of the loan.

The repayment prospects of this loan are reasonable.

c. FAA Sec. 201(e). If loan is not made pursuant to a multilateral plan, and the amount of the loan exceeds $100,000, has country submitted to AID an application for such funds together with assurances to indicate that funds will be used in an economically and technically sound manner?

An application has been received, and a joint USAID/GOP committee has developed the project paper. Analysis of the economic and technical soundness of the project is included. The program as proposed is considered technically and commercially sound.

d. FAA Sec. 201(f). Does project paper describe how project will promote the country's economic development taking into account the country's human and material resources requirements and relationship between ultimate objectives of the project and overall economic development?

Yes.

e. FAA Sec. 202(a). Total amount of money under loan which is going directly to private enterprise, is going to intermediate credit institutions or other borrowers for use by private enterprise, is being used to finance imports from private sources, of is otherwise being used to finance procurement from private sources? — Not Applicable.

f. FAA Sec. 620(d). If assistance is for any productive enterprise which will compete in the U.S. with U.S. enterprise, is there an agreement by the recipient country to prevent export to the U.S. of more than 20 of the enterprise's annual production during the life of the loan? — Not Applicable.

3. Project Criteria Solely for Security Supporting Assistance

a. FAA Sec. 531. How will this assistance support promote economic or political stability? — Not Applicable.

b. FAA Sec. 533(c)(1). Will assistance under the Southern African Special Requirements Fund be used for military, guerrilla, or paramilitary activities? — Not Applicable.

4. Additional Criteria for Alliance for Progress

[Note: Alliance for Progress projects should add the following two items to a project checklist.]

a. FAA Sec. 251(b)(1), -(8). Does assistance take into account principles of the Act of Bogota and the Charter of Punta del Este; and to what extent will the activity contribute to the economic or political integration of Latin America? — Not Applicable.

b. FAA Sec. 251(b)(8); 251(h). For loans, has there been taken into account the effort made by recipient nation to repatriate capital invested in other countries by their own citizens? Is loan consistent with the findings and recommendations of the Inter-American Committee for the Alliance for Progress (now "CEPCIES," the Permanent Executive Committee of the OAS) in its annual review of national development activities?	Not Applicable.

STANDARD ITEM CHECKLIST

A. PROCUREMENT

1.	FAA Sec. 602. Are there arrangements to permit U.S. small business to participate equitably in the furnishing of goods and services financed?	Small U.S. firms should have an opportunity to compete for the technical assistance contract.
2.	FAA Sec. 604(a). Will all commodity procurement financed be from the U.S. except as otherwise determined by the President or under delegation from him?	All commodities for the project will be procured locally.
3.	FAA Sec. 604(d). If the cooperating country discriminates against U.S. marine insurance companies, will agreement require that marine insurance be placed in the U.S. on commodities financed?	Yes.
4.	FAA Sec. 604(e). If offshore procurement of agricultural commodity or product is to be financed, is there provision against such procurement when the domestic price of such commodity is less than parity?	No agricultural commodity or product is involved in this project.
5.	FAA Sec. 608(a). Will U.S. Government excess personal property be utilized wherever practicable in lieu of the procurement of new items?	Yes.
6.	MMA Sec. 901(b). (a) Compliance with requirement that at least 50 per centum of the gross tonnage of commodities (computed separately for dry bulk carriers, dry cargo liners, and tankers) financed shall be transported on privately owned U.S.-flag commercial vessels to the extent that such vessels are available at fair and reasonable rates.	Not applicable because there are no imported commodities.

7. FAA Sec. 621. If technical assistance is financed, will such assistance be furnished to the fullest extent practicable as goods and professional and other services from private enterprise on a contract basis? If the facilities of other Federal agencies will be utilized, are they particularly suitable, not competitive with private enterprise, and made available without undue interference with domestic program?	Yes to be covered in project agreement.
8. International Air Transport. Fair Competitive Practices Act, 1974 If air transportation of persons or property is financed on grant basis, will provision be made that U.S.-flag carriers will be, utilized to the extent such service is available?	Yes.

B. CONSTRUCTION

1. FAA Sec. 601(d). If a capital (e.g., construction) project, are engineering and professional services of U.S. firms and their affiliates to be used to the maximum extent consistent with the national interest?	Services of local construction firms will be used for the project.
2. FAA Sec. 611(c). If contracts for construction are to be financed, will they be let on a competitive basis to maximum extent practicable?	Yes, but for the local construction firms.
3. FAA Sec. 620(k). If for construction of productive enterprise, will aggregate value of assistance to be furnished by the U.S. not exceed $100 million?	Yes.

C. OTHER RESTRICTIONS

1. FAA Sec. 201(d). If development loan, is interest rate at least 2% per annum during grace period and at least 3% per annum thereafter?	Yes.

2.	FAA Sec. 301(d). If fund is established solely by U.S. contributions and administered by an international organization, does Comptroller General have audit rights?	Not Applicable.
3.	FAA Sec. 620(h). Do arrangements preclude promoting or assisting the foreign aid projects or activities of Communist-Bloc countries, contrary to the best interests of the U.S. ?	Yes.
4.	FAA Sec. 636(i). Is financing not permitted to be used, without waiver, for purchase, long-term lease, or exchange of motor vehicle manufactured outside the U.S. or guaranty of such transaction?	Yes.
5.	Will arrangements preclude use of financing:	Not Applicable.
	a. FAA Sec. 114. to pay for performance of abortions or to motivate or coerce persons to practice abortions, to pay for performance of involuntary sterilization, or to coerce or provide financial incentive to any person to practice sterilization?	Not Applicable.
	b. FAA Sec. 620(g). to compensate owners for expropriated nationalized property?	Not Applicable.
	c. FAA Sec. 660. to finance police training or other law enforcement assistance, except for narcotics program?	Not Applicable.
	d. FAA Sec. 662. for CIA activities?	Not Applicable.
	e. App. Sec. 103. to pay pensions, etc.	Not Applicable.
	f. App. Sec. 106. to pay U.N. assessments?	Not Applicable.

g.	App. Sec. 107. to carry out provisions of FAA Sections 209(d) and 251(h)? (transfer to multilateral organization for lending).	Not Applicable.
h.	App. Sec. 112. to finance the export of nuclear equipment, fuel, or technology or to train foreign nationals in nuclear fields?	Not Applicable.
i.	App. Sec. 501. to the used for publicity or propaganda purposes within U.S. not authorized by Congress?	Not Applicable.

AGENCY FOR INTERNATIONAL DEVELOPMENT
PROJECT AUTHORIZATION AND REQUEST FOR ALLOTMENT OF FUNDS PART I

1. TRANSACTION CODE: A (A = ADD, C = CHANGE, D = DELETE) — PAF

2. DOCUMENT CODE: 5

3. COUNTRY/ENTITY: PAKISTAN

4. DOCUMENT REVISION NUMBER: NA

5. PROJECT NUMBER (7 digits): [391-0406]

6. BUREAU/OFFICE: A. SYMBOL: ASIA; B. CODE: [04]

7. PROJECT TITLE (Maximum 40 characters): [RURAL CLEAN WATER]

8. PROJECT APPROVAL DECISION — ACTION TAKEN: A (A = APPROVED, D = DISAPPROVED, DE = DEAUTHORIZED)

9. EST. PERIOD OF IMPLEMENTATION: YRS. 04 QTRS. 0

10. APPROVED BUDGET AID APPROPRIATED FUNDS ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE C. GRANT	PRIMARY TECH. CODE D. LOAN	E. 1ST FY 79 F. GRANT	E. 1ST FY 79 G. LOAN	H. 2ND FY ___ I. GRANT	H. 2ND FY ___ J. LOAN	K. 3RD FY ___ L. GRANT	K. 3RD FY ___ M. LOAN
(1) PH	510		545	1,500	20,000				
(2)									
(3)									
(4)									
TOTALS				1,500	20,000				

A. APPROPRIATION	N. 4TH FY ___ O. GRANT	N. 4TH FY ___ P. LOAN	Q. 5TH FY ___ R. GRANT	Q. 5TH FY ___ S. LOAN	LIFE OF PROJECT T. GRANT	LIFE OF PROJECT U. LOAN
(1)						
(2)						
(3)						
(4)						
TOTALS						

11. PROJECT FUNDING AUTHORIZED (A. GRANT, B. LOAN) — ENTER APPROPRIATE CODE(S): 1 = LIFE OF PROJECT, 2 = INCREMENTAL LIFE OF PROJECT

C. PROJECT FUNDING AUTHORIZED THRU FY 82

12. INITIAL PROJECT FUNDING ALLOTMENT REQUESTED ($000)

A. APPROPRIATION	B. ALLOTMENT REQUEST NO. ___ C. GRANT	D. LOAN
(1)	1,500	20,000
(2)		
(3)		
(4)		
TOTALS	1,500	20,000

13. FUNDS RESERVED FOR ALLOTMENT

TYPED NAME (Chief, SER/FM/FSD)

SIGNATURE

DATE

14. SOURCE/ORIGIN OF GOODS AND SERVICES: [ ] 000 [X] 941 [X] LOCAL [ ] OTHER ___

15. FOR AMENDMENTS, NATURE OF CHANGE PROPOSED

FOR PPC/PIAS USE ONLY	16. AUTHORIZING OFFICE SYMBOL	17. ACTION DATE (MM DD YY)	18. ACTION REFERENCE (Optional)	ACTION REFERENCE DATE (MM DD YY)

AID 1330-4 (7-78)

PROJECT AUTHORIZATION AND REQUEST FOR ALLOTMENT OF FUNDS

PART II

Name of Country/Entity: Pakistan Name of Project: Rural Clean Water
Number of Project: 391-0406

Pursuant to Part I, Chapter 1, Section 104 of the Foreign Assistance Act of 1961, as amended, I hereby authorize a loan of not to exceed Twenty Million United States Dollars ($20,000,000) and a grant of not to exceed One Million Five Hundred Thousand United States Dollars ($1,500,000) to the Government of Pakistan (the "Cooperating Country") to help in financing certain foreign exchange and local currency costs of goods and services required for the project as described in the following paragraph.

The project is designed to (1) increase the quantity of water which is available to and used by the rural poor for drinking, washing, bathing in areas where the available supplies are insufficient, and (2) to improve the quality of water which is used for these purposes in those rural areas where water is abundant but of poor bacteriological quality. The project will consist of construction/improvement of rural water systems, including handpumps, piped water schemes, and small water improvement schemes.

The entire amount of the AID financing herein authorized for the project will be obligated when the project agreement is executed. I hereby authorize the initiation of negotiation and execution of the project agreement by the officer to whom such authority has been delegated in accordance with A.I.D. regulations and delegations of authority, subject to the following terms and covenants and major conditions; together with such other terms and conditions as A.I.D. may deem appropriate.

a. Interest Rate and Terms of Repayment.

The Cooperating Country shall repay the loan to A.I.D. in United States Dollars within forty (40) years from the date of first disbursement of the loan, including a grace period of not to exceed ten (10) years. The Cooperating Country shall pay to A.I.D. interest from the date of first disbursement of the loan at the rate of (a) two percent (2%) per annum during the first ten (10) years, and (b) three percent (3%) per annum thereafter, on the outstanding disbursed balance of the Loan and on any due and unpaid interest accrued thereon.

b. Source and Origin of Goods and Services.

Goods and services financed by A. I. D. under the project shall have their source and origin in the Cooperating Country or in the countries included in A. I. D. Geographic Code 941 except as A. I. D. may otherwise agree in writing.

c. Conditions and Covenants.

Except as A. I. D. may otherwise agree in writing:

1) Prior to the first disbursement of A. I. D. funds for Technical Assistance the Cooperating Country shall submit, or cause to be submitted in form and substance satisfactory to A. I. D. evidence of the designation of Government's Authorized Representatives, firm budget allocations and acceptable funding arrangements, and procedures for monitoring and evaluating the project.

2) The Cooperating Country shall covenant to agree: (a) to record during the life of this loan fiscal and physical data on water supply schemes construction, improvement and maintenance; (b) budget sufficient funds to cause the water supply systems to be maintained, work with beneficiary groups to enable them to assume responsibility for operation and maintenance of installed systems, and ensure the collection of sufficient water charges to allow the systems with yard connections to become financially self sustaining; (c) carry out research projects in improved system design, health/hygiene education, community participation, sanitation and incorporate appropriate results into the design of individual water supply subprojects; and (d) carry out an adequate monitoring and evaluation program acceptable to A. I. D.

3) The project agreement shall contain other terms and conditions as A. I. D. may deem advisable.

_____

Administrator

_____

Date

FM SECSTATE WASHDC
TO AMEMBASSY ISLAMABAD 2386
BT
UNCLAS SECTION 1 OF 2 STATE 018472/1
AIDAC
E. O. 11652: N/A
TAGS:
SUBJECT: RURAL CLEAN WATER SUPPLY PRP
REF: (A) STATE 189931 (B) SMALL VILLAGE WATER SYSTEMS PID (C) RURAL POTABLE WATER SUPPLY PRP

1. AFAC REVIEWED SUBJECT PRP ON NOVEMBER 30 AND APPROVED MISSION PROCEEDING WITH PP SUBJECT TO THE FOLLOWING GUIDANCE.

2. WHILE REF A (ISSUE 1) REQUESTED FULLER EXAMINATION OF THE TOTAL GOP PROGRAM IN RURAL CLEAN WATER AND SUGGESTED MISSION CONSIDER A SINGLE PP FOR REF B AND C, ISSUES WHICH EMERGE IN SUBJECT PRP INDICATE MISSION SHOULD SEPARATE HAND PUMP ACTIVITY FROM SMALL VILLAGE PIPED SYSTEMS. IN TERMS OF FUTURE PROJECT DEVELOPMENT AND DOCUMENTATION. WE PERCEIVE EACH ACTIVITY WILL REQUIRE DIFFERENT GOP INSTITUTIONAL ARRANGEMENTS AND REFLECT VARYING AMOUNT OF DIFFICULTY WITH REGARD FEASIBILITY ISSUES SO THAT SINGLE PP WOULD NOT BE APPROPRIATE ESPECIALLY IN VIEW OF THE PROPOSED APRIL SUBMISSION DATE. CONSEQUENTLY, MISSION SHOULD DEVELOP AND SUBMIT A PP FOR THE ENTIRE HAND PUMP ACTIVITY (DOLS 15 MILLION) FOR AN APRIL 77 AUTHORIZATION TARGET AND PREPARE SEPARATE DOCUMENTATION FOR SMALL VILLAGE WATER SYSTEMS SUBJECT TO PARA 4 BELOW.

3. AID HAS SEPARATE CP DATA SHEETS FOR EACH ACTIVITY. FY 78 CP FOR HAND PUMPS, TITLED RURAL CLEAN WATER SUPPLY - PHASE I (391-0406), WILL SHOW OUTPUT LEVEL AT 100,000 PUMPS AND U.S. FUNDING OF DOLS 15 MILLION LOP. LOAN MUST BE TRANCHED IN VIEW OF PRESENT DOLS 5 MILLION OYB FOR THIS ACTIVITY. FY 78 CP FOR PIPED SYSTEMS, TITLED RURAL CLEAN WATER SUPPLY - PHASE II (391-0425), WILL SHOW DOLS 15 MILLION LOP FOR AUTHORIZATION IN FY 78. WHILE PHASE I (0406) AND PHASE II (0425) ARE HIGHLY COMPLEMENTARY PROJECTS, THERE SHOULD BE NO FUNDING FOR PIPED SYSTEMS IN PHASE I AND NO FUNDING FOR HAND PUMPS IN PHASE II. THIS FORMULA DETERMINED IN PART TO AVOID POSSIBLE FAA SECT. 611(A) PROBLEMS WHICH COULD HAVE EMERGED FROM FLEXIBLE IMPLEMENTATION APPROACH

PROPOSED P.8 OF PRP AS WELL AS REASONS STATED IN PARA 2 ABOVE.

4. APPROVAL TO PREPARE PP FOR PIPED SYSTEMS IS RESERVED PENDING MISSION SUBMISSION OF INTERIM REPORT DEALING WITH FEASIBILITY ISSUES DISCUSSED IN SEPTEL.

5. THE REMAINDER OF THIS MESSAGE CONCERNS GUIDANCE FOR PP FOR HAND PUMPS ACTIVITY. IN ADDITION TO FEASIBILITY ISSUES IDENTIFIED IN PRP, PP SHOULD ADDRESS THE FOLLOWING:

(A) PP SHOULD INCLUDE FULL DESCRIPTION OF REGULAR GOP EFFORT TO PROVIDE HAND PUMPS TO RURAL HOUSEHOLDS AND HOW THIS PROJECT AUGMENTS THAT EFFORT. DESCRIPTION SHOULD IDENTIFY WHICH GOP DEPARTMENT(S) (IF ANY) USUALLY SUPPLIES, INSTALLS AND FINANCES PUMP INCLUDING CREDIT ARRANGEMENTS. ALSO,HOW GOP DETERMINES AREAS TO RECEIVE PUMPS AND WHAT WOULD BE ACTIVITY LEVEL IF THIS PROJECT HAD NOT BEEN REQUESTED. PLEASE CLARIFY AMOUNT OF INCREASE FROM 17 PERCENT TO 34 PERCENT (PAGE 2, PENULTIMATE PARA, SUBJECT PFP) IS ATTRIBUTABLE TO THIS PROJECT. IN ADDITION OTHER DONOR AND PRIVATE SECTOR ACTIVITY SHOULD BE INCLUDED IN DESCRIPTION.

(B) PROJECT IS NOW PRESENTED ON IMPROVED HEALTH RATIONAL - HOWEVER, PRESENT GOAL/PURPOSE LINKAGE IS WEAK. PP NEEDS TO DEVELOP THIS MORE FULLY IN TERMS OF THE RELATIONSHIP AMONG PUMP LOCATION, INCREASED USE OF WATER AND IMPROVED HEALTH. PRESUME GOAL ASSUMPTION REFERS TO BASIC HEALTH SERVICES PROJECT INTER ALIA. PP SHOULD SHOW RELATIONSHIP BETWEEN THESE TWO PROJECTS MORE EXPLICITLY AND IDENTIFY AREAS OF MUTUAL REINFORCEMENT ESPECIALLY IF ACTIVITY ON BOTH PROJECTS WILL BE GEOGRAPHICALLY COINCIDENT. IN AREAS WHERE GOAL ASSUMPTION NOT VALID (I.E. OTHER HEALTH AND NUTRITION ACTIVITIES DO NOT MATERIALIZE) PP SHOULD INDICATE EXTENT PROJECT WILL STILL ACHIEVE GOAL. MISSION SHOULD SERIOUSLY CONSIDER ADDING A HEALTH PROMOTION COMPONENT WHICH WOULD PROVIDE INFORMATION ON THE VALUE OF CLEAN WATER WHEN THE PUMPS ARE BEING INSTALLED IN AREAS NOT BENEFITTING BY ANY OTHER HEALTH IMPROVEMENT ACTIVITY.

(C) THIS PROJECT WILL CONTRIBUTE TO REDUCING THE WORKLOAD OF WOMEN. THIS ASPECT NEEDS TO BE CAREFULLY INVESTIGATED AND EXPLAINED IN THE PP.

(D) INSTITUTIONAL ARRANGEMENTS IN THE PROVISION AND MAINTENANCE OF THE HAND PUMPS (I.E. PUMP OWNERSHIP, REPAIR RESPONSIBILITIES, WATER CHARGES, ETC.) ARE VAGUE AND OUGHT NOT BE AN INPUT ASSUMPTION AS SHOWN IN THE LOG FRAME. THESE SHOULD BE EITHER NEGOTIATED PRIOR TO THE LOAN OR AN ACTIVITY OF THE PROJECT IN WHICH TECHNICAL ASSISTANCE IS BEING PROVIDED. IF PROJECT DOES NOT PLAN TO INCLUDE ANY TECHNICAL ASSISTANCE ESPECIALLY FOR IMPROVING MAINTENANCE SKILLS, PP SHOULD CLEARLY ESTABLISH THAT SUCH TA IS UNNECESSARY.

(E) PROJECT AS NOW DESCRIBED IS WHOLLY LOCAL CURRENCY FINANCED. IN VIEW OF OBVIOUS NEED FOR SUBSTANTIAL IMPORTED MATERIALS IN MANUFACTURE OF PUMPS, MISSION SHOULD CONSIDER WHETHER U.S. SHOULD DIRECTLY FINANCE FX COSTS OF REQUIRED IMPORTED MATERIAL AND A PORTION OF THE LOCAL COSTS. THIS APPROACH WOULD MINIMIZE POTENTIAL PROBLEMS IN DETERMINING SOURCE AND ORIGIN OF COMPONENTS. IN THIS REGARD AID/W POUCHING TO CHESTER BELL TWO COPIES OF PP FOR SMALL SCALE IRRIGATION, BANGLADESH. APPROACH USED IN THIS PP MAY PROVE USEFUL FOR SUBJECT PROJECT.

(F) FURTHER TO PARA (E), AID/W NOTES PRICE OF PUMPS CONSIDERABLY CHEAPER IN BANGLADESH THAN IN SUBJECT PRP.

(G) WILL THERE BE A PROBLEM WITH CONTAMINATION OF GROUND WATER AS A RESULT OF INCREASE IN NUMBER OF PUMPS? PP SHOULD DISCUSS.

VANCE

UNCLASS STATE 196974
AIDAC
E.O. 11652:N/A
SUBJECT: RURAL POTABLE WATER SUPPLIES - PROJECT IDENTIFICATION DOCUMENT (PID)

1. SUBJECT PID REVIEWED AND APPROVED BY NESA ADVISORY COMMITTEE ON AUGUST 6 - APPROVAL, HOWEVER, IS FOR LOAN PROPOSAL AT LEVEL OF DOLLARS FIVE MILLION AND FACE SHEET IS HEREBY REDUCED FROM DOLLARS FIFTEEN MILLION ACCORDINGLY. SHOULD LOAN ULTIMATELY BE APPROVED, AND INITIAL PHASE SUCCESSFULLY IMPLEMENTED, ADDITIONAL AMOUNTS COULD BE CONSIDERED IN SUBSEQUENT YEARS. FOLLOWING COMMENTS/QUESTIONS ARE PROVIDED FOR USAID'S GUIDANCE IN PREPARATION PRP.

2. RELATIONSHIPS BETWEEN PROPOSED PROJECT AND ANY ASSESSMENTS OF HEALTH SECTOR, RURAL DEVELOPMENT STRATEGY, AND MISSION'S DEVELOPMENT ASSISTANCE PLAN (DAP) ARE, AT BEST, INSUFFICIENTLY DEFINED. PRP SHOULD SPELL OUT SUCH RELATIONSHIPS OR, AT A MINIMUM, EXPLAIN HOW PROPOSED LOAN WOULD AFFECT RELEVANT GOP POLICY/STRATEGY FOR HEALTH AND RURAL DEVELOPMENT, OTHER THAN BY SIMPLY UNDERWRITING A PORTION OF EXPANDED AVAILABILITY OF POTABLE WATER. PROPOSED PROJECT'S RELATIONSHIP TO OTHER HEALTH AND RURAL DEVELOPMENT ACTIVITIES SHOULD BE EXPLAINED SO THAT THE QUESTIONS OF FOCUS VERSUS SCATTERATION CAN BE ASSESSED.

3. WITH REGARD TO HEALTH SECTOR GOAL OF PROPOSED PROJECT, THERE IS QUESTION WHETHER POTABLE WATER PER SEE NECESSARILY EQUALS BETTER HEALTH, PARTICULARLY IN RURAL AREAS WHERE GENERAL SANITATION CONCEPTS AND CONDITIONS ARE LIKELY TO BE LOW AND CONTAMINATION OF SMALL WATER SYSTEMS FROM HUMAN AND ANIMAL WASTE IS CONSTANT PROBLEM. PRP SHOULD THEREFORE ANALYZE RELATIONSHIP OF PROJECT TO OTHER RURAL HEALTH ACTIVITIES AND PROBLEMS, E.G., MALARIA CONTROL, INTEGRATED HEALTH SERVICES, NUTRITION, ETC. PROJECT TECHNICAL DESIGN SHOULD ADDRESS HEALTH-RELATED ISSUES OF WATER AND WASTE DISPOSAL SO THAT POTENTIAL CONTAMINATION, INCLUDING MALARIA VECTOR SITES IS MINIMIZED.

4. EQUITY CONSIDERATIONS SHOULD BE ADDRESSED IN CONSIDERABLY MORE DETAIL. PID SEEMS TO ASSUME THAT ALL RURAL PAKISTANIS ARE, BY DEFINITION, THE MOST DISADVANTAGED ELEMENTS OF THE POPULATION. HOW IS "RURAL" DEFINED?

WHAT CRITERIA WILL BE USED BY GOP IN SELECTING VILLAGES FOR INSTALLATION OF NEW SYSTEMS? ARE SYSTEMS TO BE FOR VILLAGES OF 100 TO 1,000 PEOPLE OR 5,000 TO 50,000 PEOPLE? ALSO FOR ANY PARTICULAR SYSTEM, HOW WILL EQUITY IN TERMS OF COST OF WATER AND TYPE OF SERVICE BE OBTAINED?

5. PRP SHOULD CONTAIN DETAILS OF SIZE AND FEATURES OF PROPOSED SYSTEMS AND HOW THAT RELATES TO CAPABILITY OF GOP'S IMPLEMENTING AGENCY TO CONSTRUCT AND OPERATE SUCH SYSTEMS. EXPERIENCE OF SAID AGENCY, AS TO NUMBER OF SYSTEMS CONSTRUCTED AND OPERATED SUCCESSFULLY OVER PAST, SAY, FIVE YEARS SHOULD BE DISCUSSED. THAT GOP HAS ADMINISTRATIVE AND TECHNICAL RESOURCES FOR INITIATING AND MANAGING PROJECT SHOULD NOT BE ASSUMED, BUT INVESTIGATED AND THOROUGHLY DISCUSSED IN PRP.

6. GOP's ABILITY TO MAINTAIN AND REPLICATE SYSTEMS IS CONSIDERED TO BE CRITICAL ASPECT OF PROJECT. WHAT IS GOP RECORD IN THIS AREA? HOW MANY SYSTEMS HAVE BEEN TURNED OVER TO LOCAL INSTITUTIONS FOR OPERATION AND MAINTENANCE AND WHAT IS RECORD OF SUCH SYSTEMS? HOW IS MAINTENANCE BEING FINANCED AND HOW WILL IT BE FINANCED IN FUTURE? IF ANY SYSTEMS INVOLVE HOUSEHOLD HOOKUPS, WHO WILL PAY COST, AND HOW? PRP SHOULD EXAMINE AVAILABILITY NOT ONLY OF INITIAL FINANCING OF SYSTEM, BUT FINANCING WHICH WILL BE NEEDED ONCE SYSTEM IS IN PLACE - THIS SHOULD INCLUDE AUTHORITY OF LOCAL INSTITUTION TO TAX USERS AND/OR ASSESS WATER USER CHARGES.

7. WE ASSUME FAR OR SOME VARIATION THEREOF WILL BE METHOD OF AID FINANCING, BUT PRP SHOULD DISCUSS THIS ASPECT IN DETAIL.

8. WE RECOGNIZE THAT SOME OF ABOVE ISSUES WERE IDENTIFIED IN PID - THEY ARE REPEATED HERE IN CONTEXT OF ADVISORY COMMITTEE'S REVIEW.

9. COMPLEXITY OF ISSUES WILL REQUIRE CONSIDERABLE EFFORT IN PROJECT DESIGN AND DEVELOPMENT. MISSION REQUESTED IDENTIFY NEEDS FOR ASSISTANCE AT EARLY DATE SO THAT AID/W MAY BE AS RESPONSIVE AS POSSIBLE TO SUCH NEEDS.

KISSINGER

PCI 72-6

LOGICAL FRAMEWORK FOR SUMMARIZING PROJECT DESIGN

Project Title: Rural Clean Water Supply

Est. Project Completion Date: _____

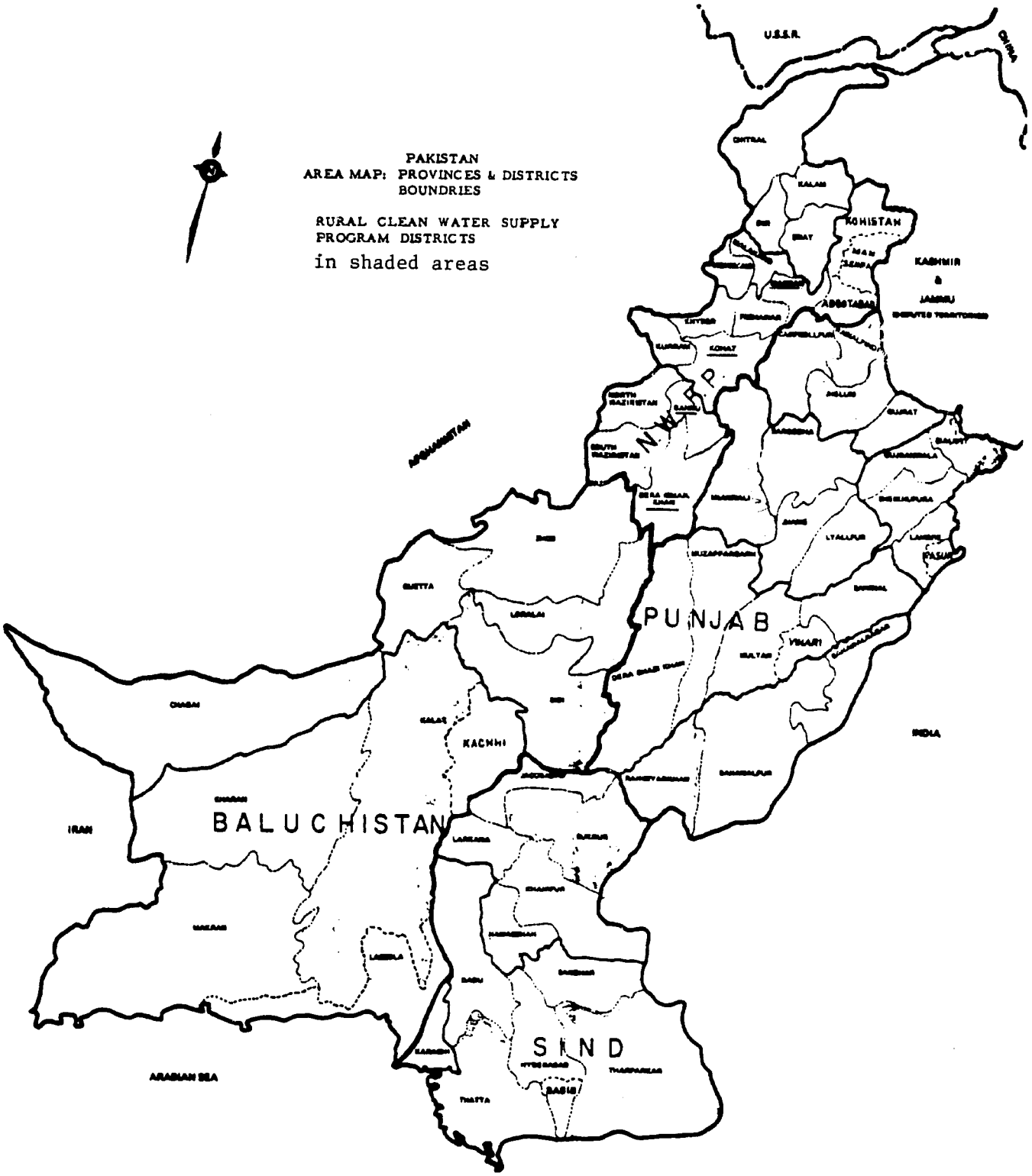
Date of this Summary: Mar 8, 1978

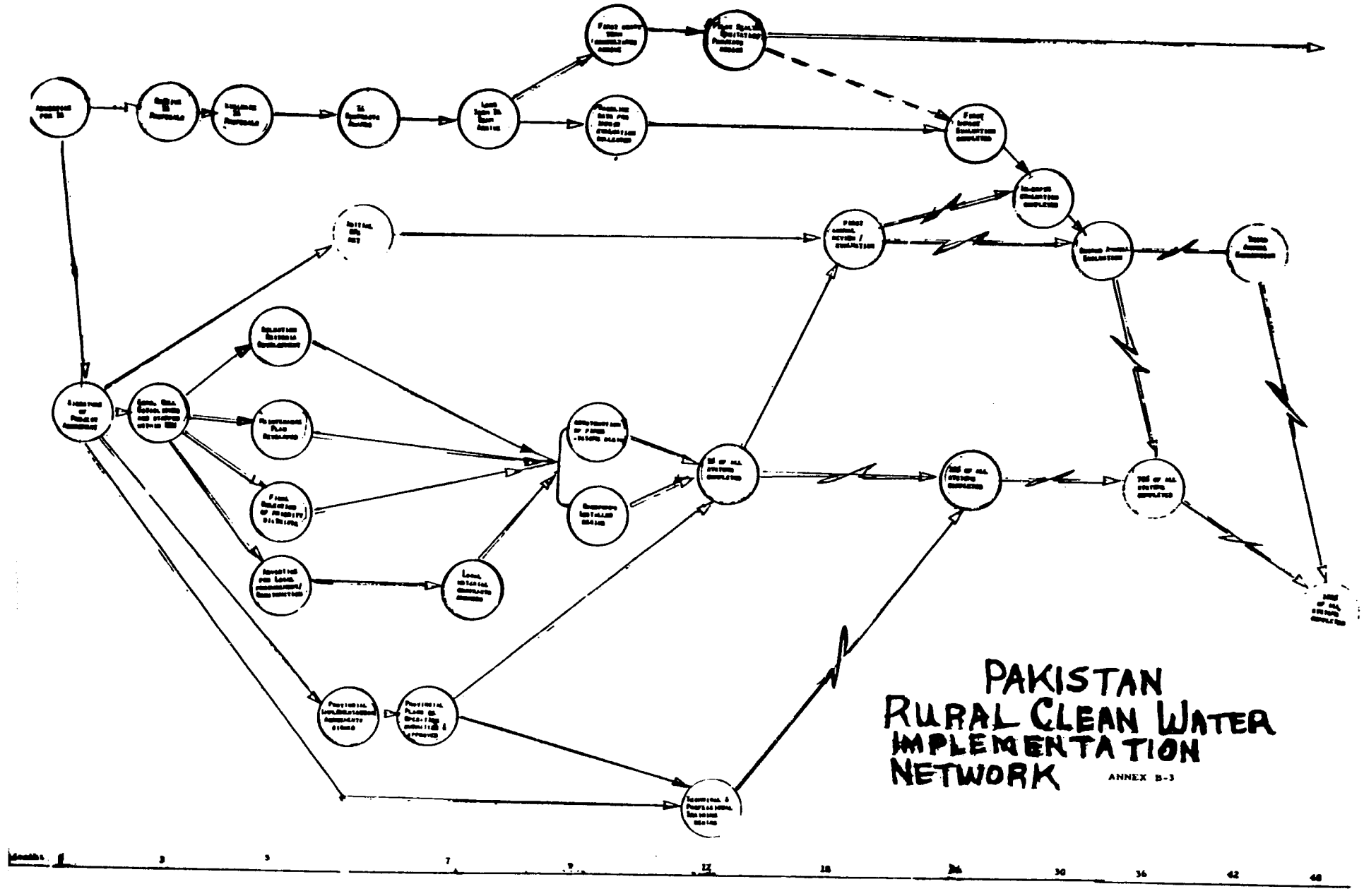
DEVELOPMENT HYPOTHESES

MANAGEABLE INTEREST

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Program Goal: The broader objective to which this project contributes: Overall improvement in the level of health in Pakistan	Measures of Goal Achievement: Significant improvements in all key health indicators.	GOP health statistics	Concerning long term value of program/project: Other necessary health and nutrition activities will be undertaken.
If Purpose, Then Goal Project Goal: Reduction in the incidence of water-related illnesses among the rural population of Pakistan.	A decrease in the indicators of cholera, dysentery, typhoid, amoebiasis, hepatitis, intestinal parasites, eye, skin and genito-urinary infections.	GOP health statistics	Other necessary health and nutrition activities will be undertaken.
If Outputs, Then Purpose Project Purpose: (1) Increase the quantity of water available to and used by the rural poor in Pakistan for drinking, washing and bathing in areas where available supplies are insufficient and (2) improve the quality of water which is used for these purposes in those rural areas where water is abundant but of poor bacteriological quality.	Conditions that will indicate purpose has been achieved: end of project status. In project areas after 4 years of implementation 1. Average daily water utilization is at least 40 liters per capita. 2. Average distance to potable water supply reduced by 75 percent. 3. Measurable reduction in mean number of E. coli and coliforms in water supply.	GOP statistics and GOP/AID special impact evaluation	Affecting purpose-to-goal link: GOP will expand health focus as planned
If Inputs, Then Outputs Outputs: --Handpumps --Village piped water and drainage schemes --Small water improvement schemes --Waterworks operators training centers --Graduate program in sanitary engineering --Pilot studies carried out --Selection criteria and maintenance plan adopted	Magnitude of Outputs necessary and sufficient to achieve purpose. -- 28,000 handpumps installed -- 200 piped water and drainage systems for 652,800 persons constructed -- 400 water improvement schemes carried out for 333,600 persons -- 4 waterworks operators' training centers installed and operating with 375 trainees per year -- 8 trainees per year in sanitary engineering program -- Selection criteria used for sub-projects and maintenance plan implemented -- Four rural pilots carried out	GOP records, USAID observations, inspections and records, and scheduled evaluations.	Affecting output-to-purpose link: -- Facilities will be used by rural inhabitants -- GOP will maintain emphasis on rural outreach activities -- Strengthened community participation is feasible in Pakistan
Inputs: Activities and Types of Resources USAID: 1. Loan funds for systems construction improvement 2. Technical assistance 3. U.S.-owned local currency grant for training, research and development GOP: 1. Funds for construction/improvement provided on timely basis 2. Administrative and technical support	Level of Effort/Expenditure for each activity. See Financial Plan	USAID and GOP records	Affecting input-to-output link: --Inputs will be provided as planned --Required TA is available --GOP resources to support project will be forthcoming

ANNEX B 1


PAKISTAN
AREA MAP: PROVINCES & DISTRICTS BOUNDRIES
RURAL CLEAN WATER SUPPLY PROGRAM DISTRICTS
in shaded areas
U.S.S.R.
CHINA
AFGHANISTAN
INDIA
IRAN
ARABIAN SEA
N.W.F.P.
PUNJAB
BALUCHISTAN
SIND
KOHISTAN
KASHMIR & JAMMU DISPUTED TERRITORIES
ABBOTTABAD
KACHHI



PAKISTAN
RURAL CLEAN WATER IMPLEMENTATION NETWORK

ANNEX B-3

Annex E

ENVIRONMENTAL ASSESSMENT

RURAL CLEAN WATER SUPPLY

PAKISTAN

MAY 1978

Annex E

ENVIRONMENTAL ASSESSMENT
RURAL CLEAN WATER PROGRAM
PAKISTAN

TABLE OF CONTENTS

INTRODUCTION

By their nature, rural water supply programs have a positive impact on the human environment. This assessment examines both direct and secondary benefits of the proposed AID-assisted nine-year rural clean water program in Pakistan.

The major part of the Environmental Assessment was prepared by Vickie L. Traxler, Environmental Planner, under a USAID contract. Ms. Traxler's educational background includes a Master of Science from Colorado State University in Regional Resource Planning and a Bachelor of Science degree from Grand Valley State Colleges, Michigan, in Environmental Science. Her experience includes work on a highway impact study for Oceana County, Michigan and Western Michigan Regional Shoreline Development Commission,and special training in the preparation of environmental impact statements at Colorado State University.

In addition, Ms. Traxler prepared the Mission's Environmental Assessment for the Rural Roads project which was authorized in FY - 1977, and an Environmental Assessment for the Rural Electrification program which is scheduled for authorization in FY - 1978. Several members of the Mission staff worked with Ms. Traxler assisting her with the technical description of the program and in reviewing her drafts and suggesting modification and additions.

PREFACE

The Environmental Assessment of the Rural Clean Water Supply Program will provide USAID and the Government of Pakistan with a comprehensive understanding of the reasonably forseeable positive and negative environmental effects of the proposed program. Once identified, these impacts may be brought into the decision-making process in the same manner that traditional elements are considered. Note that an assessment is not a panacea for all of the program's problems but rather ensures a "common-sense" approach to problem solving efforts. An assessment proposes reasonable alternatives so that their respective impacts may be weighed and the best possible course of action determined. Environmental assessments identify appropriate protection and mitigation measures for negative impacts so that these may also be incorporated into the program design. The Rural Clean Water Supply Program Environmental Assessment fulfills the above objectives.

The environmental assessment for the Rural Clean Water Supply Program draws its framework from the following guidelines: USAID "Environmental Procedures" (Regulation 216.1-8), World Bank Environmental, Health and Human Ecologic Considerations in Economic Development Projects, and USAID Environmental Assessment Guidelines Manual. Local experts were consulted for discussion of potential environmental impacts of the proposed project and mitigation measures for adverse impacts. Dr. Nawaz Tariq and Mr. Tauseef Ahmad Qureshi of the Institute of Public Health Engineering and Research provided much useful information on handpump water quality and also assisted with a tour of handpumps in several villages in Punjab. The Public Health Engineering Department, Government of the Punjab, also provided tours of rural water supply schemes in several districts in Punjab Province. Mr. Bertoni of UNICEF and Dr. W.K. Reisen of Pakistan Medical Research Center provided information on water supply systems, structures and impacts.

I. SUMMARY AND CONCLUSIONS

Based on the discussion of potential impacts and their respective mitigation measures, the environmental costs of the proposed program are considered to be minimal. Lack of protection of water supplies during the monsoon season is a potential adverse impact which cannot be mitigated.

The program is not expected to generate significant negative environmental impacts providing the recommendations and guidelines in Section IV are followed. The program is expected to produce the positive impacts of increased health and sanitation benefits.

II. PROGRAM DESCRIPTION

A. Purpose and Relationship to National Development

The Rural Clean Water Program is one of a cluster of proposed activities which support the Government of Pakistan's (GOP) strategy to promote the economic and social advancement of its rural population. In rural areas of Pakistan only an estimated 14% of the population is served by adequate supplies of clean water. The GOP, aware of the serious health problem which results from the use of inadequate or contaminated water, has identified improved rural water supply as a high priority sector in its rural development program. In its current draft Development Plan (1978-1983) it proposes to increase water supply coverage from 14% to 36%. The Rural Clean Water Program will assist this effort by providing assistance to the GOP to (1) increase the quantity of water which is available to and used by the rural poor for drinking, washing and bathing in areas where the available supplies are insufficient, and (2) improve the quality of water which is used for these purposes in those rural areas where water is abundant but of poor bacteriological quality.

The Institute of Public Health Engineering and Research has been conducting studies on water quality from surface and groundwater sources to establish baseline environmental data for future environmental programs. Currently there

are no national standards regulating water quality for drinking. However, proposals are now under consideration which would organize a national body to review and propose environmental quality standards. Current efforts in this respect are coming from the Environmental and Urban Affairs Division, Ministry of Housing, Works and Urban Development.

By encouraging consideration of environmental impacts at the program formulation stage, the USAID mission provides a role model for Government of Pakistan Project Review Procedures. An Environmental Assessment assures that environmental considerations are taken into account in the decision making process. An assessment also assures that remedial measures are incorporated into the project design where necessary. USAID's environmental review procedures inform GOP officials of AID's concern and increase awareness of specific environmental problems generated and ecosystems impacted by individual projects and government programs.

B. Design and Outputs

The program will be carried out in rural areas throughout Pakistan, and will focus on villages with less than 5000 population. It will be implemented over a nine year period, with an initial loan of $20 million and a grant of $1.5 million scheduled for 1978, and obligations completed by 1983.

Under the program, loan funds will be used to finance the construction of piped water systems based on deep tubewell borings, treated canal water or filtered spring water. Distribution systems will include public standposts and, in some cases, provision for optional yard connections (to be paid for by the consumer). In addition, loan funds will finance the installation of handpumps and small water improvement schemes in villages where piped water systems are not feasible. All systems will include provision for draining away waste water, and health/hygiene education will be carried out before and during construction. The systems will be constructed according to design specifications jointly agreed to by AID and the GOP. The

type of system which is provided for an individual community will depend on its technical feasibility (suitability of the terrain for well development, the characteristics of the groundwater aquifer), economic feasibility, consumer need, and consumer willingness and ability to operate and maintain the scheme.

III. DESCRIPTION OF ENVIRONMENT

The Rural Clean Water Supply Program will be instituted in all four provinces of Pakistan; Punjab, Sind, Northwest Frontier and Baluchistan. For this reason, the environment of the provinces will be discussed in general terms while those components of the ecological system particularly affected will be described in greater detail in this section and in Section IV., Environmental Impacts.

A. Description of the Provinces

Pakistan's four provinces roughly correspond to three distinct geographic regions. Baluchistan Province is a high plateau with a base elevation of 4-5000 feet. Less than five inches of rain per year favor the growth of xerophytic vegetative types except where the land is irrigated. Wind blown deposits (loess) are common among the soils of Baluchistan.[1]

The Northwest Frontier Province includes parts of the high plains and the mountain ranges and foothills of the Himilayan system. The mountain systems of Pakistan are the result of geologically recent lifting, folding, and faulting of old sedimentary rocks. The sedimentary rocks include shales, slates, sandstone and limestone. The high plains are the result of an ancient period of erosion, alluviation and loessal deposition, and rest on the structural depression of the Potwar Plateau. The Potwar and its associated landforms extend into Punjab Province. Vegetation varies but is generally heavier than elsewhere due to the increased rainfall ranging from 20 to 50 inches per year.[2]

The Indus Plains (Sind and Punjab Province) consists of sand, silt, and clay alluviums hundreds to thousands of feet thick overlying old sedimentary rocks. The pedocal soils of the plains, high in calcium carbonate and low in organic matter, have resulted from the gradual deposition of sediment from the River Indus and its five main tributaries, Ravi, Sutlej, Chenab, Jhelum and Beas. Rainfall ranges from less than 10 inches in Sind Province in the south to 40 inches in the northern areas of Punjab Province. Although forests once covered most of the plains, due to extensive cultivation and low rainfall, existing vegetation consists of hardy grasses, bushes and scrub trees.[3]

B. General Description

The climate of Pakistan is characterized by scarce and irregular rainfall, low relative humidity and extreme temperatures. The relatively low rainfall falling mostly in high-intensity rainstorms, associated with a very high evapotranspiration rate determines an essentially arid regior[4]

The primary use of land in Pakistan is agriculture and grazing. At least 80% of Pakistan's agricultural land is irrigated in some form to supplement low rainfall. Runoff water from rainfall and surface water supplies most irrigation canals. Irrigation has transformed the Indus Basin into a highly productive agricultural area. However, the Indus Plain has a seaward slope averaging less than one foot per mile and improper irrigation practices and poor drainage have resulted in salinized and waterlogged lands in large parts of Punjab and Sind Provinces.[5]

Groundwater is a valuable resource in Pakistan and is also used for irrigation purposes. The irrigated plains of Punjab and Sind, extending from the edge of the mountains in the north and west to the Arabian Sea in the south, as well as parts of Peshawar and Bannu basins, are underlain by an extensive groundwater aquifer. The extent of the aquifer is on the order of 40 million acres, and it probably exceeds 1,000 feet in thickness under most of the area. About 14 million acres of the Indus Plains are underlain by fresh groundwater, with less than 1000 parts per million (ppm) total dissolved solids; about five million acres have groundwater of moderate salinity with 1000 to 3000 ppm, and the remainder is very saline, containing more than 3000 ppm

total dissolved solids.[6]

The total population of Pakistan is more than 75 million with an annual rate of increase of about 3%. Projections from the 1972 population census indicate that in 1977 the population densities of the various provinces were Punjab 530 people/square mile; NWFP 328/sq. mi.; Sind 288/sq.mi.; Baluchistan 20/sq.mi. and the Tribal Areas were 268/sq.mi.[7]

During the 1960's the urban population increase was greater than any previous decade. Estimates predict that the country will be 2/3 urbanized by the year 2000. Despite this predicted trend, 74% of Pakistan's population was classified as rural in 1972. Nearly 55 million of Pakistan's estimated 75 million people live in rural areas and are directly or indirectly dependent on agriculture for a livlihood. About 50% of the total labor force is employed directly in crop and livestock production and nearly 20% in marketing and processing of agricultural service activities. In addition to its importance as an employer, the agricultural industry is the major foreign exchange earner, in a typical year accounting for over one-half of the total value of exports.[8]

C. Geology and Hydrology

Twenty-five million years ago the great ranges of the Himilayan mountains began forming. Between the Himilayas and the Indian Peninsula there existed about 300,000 square miles of depression which was filled with sea water at that time. The depression has been filled by alluvium and silt washing down from the mountain systems and is now the present plains of the Indus and Ganges River systems. This alluvial debris constitutes a geologic formation with great capacity for groundwater storage. Water infiltrates from surface resources into the air spaces and pockets between the individual grains or particles of the formation and accumulates over time to form an underground reservoir or "aquifer".[9] The water bearing formations of Pakistan can be divided into four broad divisions:

1. Unconsolidated nearly saturated formations lying under the plains below the Salt Range and extending to the Arabian Sea (Punjab and Sind Provinces).

2. Unsaturated, unconsolidated areas of the Potwar Depression (Northwest Frontier Province and Punjab Province).

3. Regions on the right bank of the River Indus in the Valleys of Peshawar, Mardan, Kohat, Bannu, and Dera Ismail Khan (Northwest Frontier Province).

4. The high valleys of Baluchistan and NWFP and tribal areas containing small intermittant lenses of groundwater (Baluchistan, Northwest Frontier and Tribal Areas).[10]

The Rural Clean Water Supply Program will tap the extensive groundwater resources of these four aquifer regions.

IV. ENVIRONMENTAL IMPACTS

A. Summary List

The following list describes the environmental impacts likely to occur from the Rural Clean Water Supply Program.

1. Envrionment/Resource Linkage.

   a. Changes in water resource allocations.
   b. Population distribution and migration.
   c. Short-term use vs. long-term productivity.
   d. Irreversible and irretrievable resource commitments.

2. Physical Impacts

   a. Changes in vegetation and ecosystems.
   b. Alteration of physical, chemical and biological characteristics of the groundwater.
   c. Impact on control of waterlogging and salinity problems.

3. Socio-Cultural Impacts.

   a. Problems with wastewater.
   b. Contamination of the well and water source.
   c. Impact on transmission of water related diseases.
   d. Impact on natural immunological processes.

Specific design and installation standards have been developed to minimize negative environmental impacts of the proposed program. These are discussed throughout the following Section (IVB) and also in Section IVD, mitigation measures and other recommendations.

B. Discussion of Impacts

The program will essentially service rural agricultural areas which are ecosystems significantly modified by man. Major components of those systems are man, and his associated infrastruture, the crops cultivated in the region, the topography and climate, and those wild flora and fauna of the area able to adapt to a "man-modified" environment.

1. Environment/Resource Linkage

The program impacts are expected to be largely positive. The program will not extract great volumes of groundwater and,therefore,will not decrease tubewell allocations. The program is not expected to change land use patterns or preclude future use of a land area as the water is intended only for washing, drinking, and bathing.

Provision of basic amenities to rural communities may change rural to urban migration patterns. An adequate supply of clean water can be a contributing factor in this change.

The Rural Clean Water Supply Program will tap groundwater by handpumps and tubewells, and surface water from canals, springs, and streams. In most irrigated areas of Pakistan the depth of the groundwater has risen to within a few feet of the surface as a direct result of irrigation. This increase in the water table height has caused problems with waterlogging and salinity of the plant-root zone in the soil. Extraction of the water resource will be replenished immediately in these areas. In higher alpine and/or arid zones, without irrigation, available aquifer storage areas are replenished annually by surface water from snowmelt or rainfall. The program will not extract groundwater which cannot be replenished by natural surface water recharge annually.

Water extracted by this program may be considered a renewable resource. The productivity of the water resource is expected to be maintained over long periods of low volume use.

The construction of the program systems (pumps, wells, standpoints, tanks, drainage systems) will require the use of certain materials; brass, iron, steel, etc. Cement and bricks will also be required which cannot be reused. However, scrap material may be reused as a foundation or base in road building or other construction.

2. Physical Impacts

The Rural Clean Water Supply Program is not expected to cause any significant negative physical impacts. The program will not change the vegetation of the area due to the small amount of water taken away from the groundwater and surface water reserves and added to the surface hydrologic system.

The Clean Water Supply Program is not expected to alter the physical or chemical characteristics of the groundwater aquifer, canal or stream. Nor is the program expected to alter the biological state of the water by fecal contamination provided the well, tank, or standpost is properly installed, operated and maintained and adequate drainage facilities are supplied.

The systems are expected to have no impact on waterlogging and salinity problems because they are not expected to significantly depress the water table. This is best explained by discussing aquifers and the phenomena of drawdown. An aquifer is a rock body capable of transmitting water freely and storing it in substantial quantities. The water table is the surface of the groundwater aquifer. Below that level all openings are filled with water. Pumping of water from a well commonly exceeds the rate at which water can enter the well. The water level then drops progressively lower in the immediate vicinity of the well in the form of an inverted cone centering on the well (a cone of depression). Hard pumping by many wells in an area may cause the water table to lower as the individual cones of depressions of the various wells overlap. The objective of the Salinity Control and Reclamation Project (SCARP) wells is exactly

that; to lower the water table in an area to control waterlogging and salinity problems in an area. The average SCARP tubewell pumps continuously from 2 cubic feet per second (cfs) per 500 acre watercourse command area up to 5 cfs per 1000 acre command area in order to accomplish that task. Most pumps used by this program (handpumps, tubewells) would pump less than .25 cfs for intermittant periods of time. Therefore, while this program will not assist in the control of waterlogging and salinity problems, neither will the program deter efforts in this area.[11]

3. Socio-Cultural Impacts

The introduction of adequate clean water is expected to have important positive impacts. The rural water supply program is expected to shorten the water collection journey and expand per capita water consumption.

Secondary economic impacts from the program are expected to be beneficial. A clean water supply for bathing, washing, and drinking is expected to decrease local disease problems and thereby increase the number of days available for productive work.

4. Impacts on Public Health

On the whole the program is expected to have positive impacts of increased health and sanitation benefits.

a. Problems with Wastewater. The Rural Clean Water Supply Program does not expect to add significant amounts of wastewater to the village system where water has previously been available. A World Bank Study states that rural communities use averages 35-90 litre/capita/day. This study assumes that the amount of wastewater generated would be substantially less than this amount.[12]

Buffalo ponds, farmers' irrigation canals and other sources of stagnant water exist for water-breeding insects. However, in those villages where water supply is minimal, public handpumps or standposts and their basins may provide a reliable source of water for mosquito breeding populations. This is especially true during the dry season. The ecology of this microhabitat may be described as follows. The water supply mechanism is operated to

fill the catch basin for watering of buffalo, goats, etc. The animals trample the soft earth around the basin and where the water drains away, small puddles are formed in the impressions left by the hooves of the animals. Manure, mixed with decaying vegetation forms a rich nutrient mixture on which micro-flora and fauna live. A small ecological system is thus created and maintained which provides sufficient habitat for different varieties of mosquitos to live and maintain breeding populations. Obviously this is a small source of wastewater compared to the omnipresent buffalo ponds. Yet as only shallow water provides suitable mosquito habitat much of the area of the village pond is unsuitable for this purpose. Clearly adequate safeguards must be included in the program design to prevent drainage problems.[13]

Rural Water Supply Systems (tanks, filters, pumps, posts, etc.) are likely to be affected by summer monsoons. Most areas receive the majority of the annual precipitation over a two month period in the summer. The intensity of the rainfall and lack of natural surface drainage is likely to result in ponding of excess water. The ability of the system drains to handle excess waste water will decrease and the groundwater and the water supply system may be particularly susceptible to contamination at this time.

b. Contamination of the Well and Water Source. Normal surface water percolating down to an aquifer is purified by the filtering action of the soil medium. Groundwater flows very slowly through an aquifer at rates of less than several meters per year. The water is purified also as it moves horizontally through the aquifer. This natural filtering process usually disallows contamination of the aquifer outside of a radius of 50 feet of the source. United States Federal standards recommend a minimum distance of 50 feet from a source of fecal contamination.

In many villages, there have been large numbers of handpumps installed. These pumps have the potential to contaminate the groundwater within 50 feet of the pump location. Pumps may contaminate groundwater by allowing material to flush back down the pump casing into the aquifer below. Improper sealing of the pump and priming methods allow for this contamination. It is important

then that pumps need not be primed and that they are properly sealed. However, it is also important to note that regardless of the number of pumps in an area, a village, once contaminating its respective supply area, should not be able to pollute groundwater areas beyond a radius of fifty feet.

Alternatively wells, tanks, and standposts may be contaminated by certain sources including buffalo, duck or fish ponds, surface run off from concentration of livestock in an area, contaminated groundwater and human fecal wastes. The Summary Section recommends methods to prevent contamination of the water supply from outside sources.

Nitrate contamination has not proven to be a problem. Studies by the Institute of Public Health Engineering Research in the Punjab and the Pakistan Medical Research Center cite low concentrations of nitrates in groundwater, streams and canals.[14]

c. Impact on Transmission of Water Related Diseases. Programs of this nature often claim the beneficial impact of better health and increased productivity as water is no longer the main source of transmission of disease. However, the research is quite contradictory on this subject and some studies report that nutrition and infection play leading roles in diarrheal disease and morbidity. Others report rather that it is a combination of factors; nutrition, clean water, increased water, and sanitary practices. However, the very premise that water may play some role in diarrheal disease encourages improvements in this area.[15]

d. Impact on Natural Immunological Processes. One potential impact of clean water supplies is the alteration of the natural immunization process. Water provides a continual source of disease agents to which the body must maintain a high resistance. Pure water supplies fail to provide disease sources for the body's natural immunization process. Thus a population's resistance is lowered and is vulnerable to diseases when a major source of infection occurs. However, while this program increases availability of cleaner water, in the short run the program does not anticipate that rural water supplies will be able

to completely satisfy World Health Organization water quality standards. All pathogenic agents cannot be removed given program objectives and limitations. Therefore the natural immunization process will continue to operate to some extent. However, potential health benefits may still be achieved by increased water consumption.[16]

C. Adverse Impacts and Mitigation Procedures

Most potential adverse impacts of the program will be mitigated by the procedures discussed below. However, lack of protection of water systems from contamination due to flooding during the monsoon season is an unavoidable adverse aspect of the program. Other potential adverse impacts include:

1. Water supply systems will be improperly installed, repaired and maintained causing contamination of the water source.
Mitigation: All systems will be constructed to exacting standards in accordance with approved plans and specifications. Protection against contamination will be a part of the design. Implementing organizations will arrange for maintenance and repair of all water supply systems. Upon installation, a single person, family, or organization will be responsible for maintenance checkups and repair. The program will also include provision for drainage of wastewater and a health education aspect concerning the cleaning of water containers.

2. Water supply systems will be improperly installed and subject to contamination of groundwater and will also be contaminated from other sources.
Mitigation: Pumps and well distribution posts will be safeguarded by installation of a cement platform as a seal and a foundation. The cement base will be circular with a four foot diameter and having a 4" lip and 6" apron, and seal 12" above the surrounding land. Each handpump or well-post will have a drainage arrangement to drain away wastewater.

Tanks used should be covered, sealed and raised above ground level by several feet to prevent contamination of the water reservoir from outside sources. Filtering systems should also be covered and sealed to prevent overload of the filtering system. Pipes should be properly

jointed to prevent leakage.

All systems should be disinfected after installation and prior to use by the public.[17]

3. Accumulation of excess wastewater from increased water supplies will result in ponded water increasing insect and parasite breeding habitat.
Mitigation: All systems will include adequate provision for draining away wastewater.

D. Other Recommendations

1. The project should include experimentation with various drainage alternatives. Covered soak pits constructed with various sizes of layered rock or broken brick to a 10-15 foot depth may provide an alternative drainage procedure for isolated handpumps or water distribution posts. These pits would function similarly to a small septic tank system. Combinations of various alternative methods of disposal of wastewater (soakpits, oxidation ponds, leaching fields, crop disposal, etc.) may prove suitable to local needs.

2. Various sealing and sanitary protection measures should be tested to determine most effective methods for purifying water supplies. Individual household chlorination tanks may provide an answer in some areas. Chlorination of public storage tanks may also be feasible. However, innovative mechanical safeguards should not be overlooked.

V. ALTERNATIVES TO THE PROPOSED PROGRAM

A. No Program

The no program "do nothing" alternative would have no direct environmental impact. This alternative would not change existing conditions of lack of clean water for drinking, bathing, and washing; and lack of drainage facilities to alleviate excess water problems. This report considers the "no program" alternative unacceptable.

B. Untreated Open Water Sources

Open water sources include canals, reservoirs, rivers and streams, and open wells. Development of these water sources without adequate filtration or treatment would increase availability of water supplies but would not provide water of a higher quality (i.e. cleaner drinking water). Thus untreated water source alternatives are not acceptable due to their low potential to improve community.

FOOTNOTES

1. Richard F. Nyrop, Area Handbook For Pakistan, pp. 66-74.
2. Nyrop, pp. 66-74
   Nazir Ahmad, Groundwater Resources For Pakistan, pp. 19-22.
3. Nyrop, pp. 66-74. Ahmad, pp. 19-22.
4. FAO, Soil Survey Project Pakistan, pp. 37-40.
5. Nyrop, pp. 66-74.
6. FAO, pp. 51-52.
7. Nyrop, pp. 76-83.
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9. Ahmad, pp. 19-21, 31.
10. Ahmad, pp. 39-40.
11. Field Surveys. Dr. John Reuss, Mr. Tom Trout, Colorado State University Farm Water Management Program, personal communication
12. Robert J. Saunders and Jeremy J. Warford, Village Water Supply, p. 43.
13. Dr. William K. Reisen, Pakistan Medical Research Center, Personal Communication.
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16. Dr. Dinesh P. Sinha, John Hopkins University, Dept. of Public Health, Letter to Mr. David Oot. January 13, 1977.
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