

# Punjab

---

Strategic Provincial Investment Plan  
and Project Preparation for  
Rural Water Supply,  
Sanitation and Health.

8 2 2

P K . P U 89

## Draft Investment Plan

July, 1989

Wardrop - Acres  
Cowater International  
NESPAK.

822-PKPU89-6014

# Punjab

---

Strategic Provincial Investment Plan  
and Project Preparation for  
Rural Water Supply,  
Sanitation and Health.

## Draft Investment Plan

LIBRARY, INTERNATIONAL REFERENCE  
CENTRE FOR COMMUNITY WATER SUPPLY  
AND SANITATION (IRC)  
P.O. Box 93190, 2509 AD The Hague  
Tel. (070) 814911 ext. 141/142  
RN: ISN 6014  
LO: 822 PK Pa 89

July, 1989

Wardrop - Acres  
Cowater International  
NESPAK.

PROVINCIAL INVESTMENT PLAN  
TABLE OF CONTENTS

LIST OF TABLES .....	v
LIST OF FIGURES .....	vi
LIST OF ACRONYMS .....	vii
EXECUTIVE SUMMARY .....	ix
1. INTRODUCTION .....	1
2. SECTOR STATUS AND NEEDS .....	2
2.1 Rural Water Supply .....	2
2.1.1 Water Resources and Technologies .....	2
2.1.2 Status of Water Supply Technology and Coverage .....	4
2.2 Drainage and Ponds .....	7
2.3 Disposal of Human Wastes .....	8
2.4 Institutions .....	9
2.4.1 Public Health Engineering Department (PHED) .....	9
2.4.2 Local Government and Rural Development Department .....	11
2.4.3 Education Department .....	13
2.4.4 Health Department .....	14
2.4.5 District and Union Councils .....	14
2.4.6 Non-Government Organizations (NGOs) .....	15
2.4.7 Planning and Development (P&D) .....	16
2.5 Social and Cultural Considerations .....	16
2.5.1 Social Groupings in Punjab .....	16
2.5.2 The Role of Women .....	17
2.5.3 Community Participation .....	17
2.5.4 Practices and Beliefs Related to Hygiene .....	18
2.6 Human Resource Development and Training .....	19
2.6.1 Public Health Engineering Department (PHED) .....	19

2.6.2	Local Government and Rural Development Department (LGRDD) .....	19
2.6.3	Primary Education .....	20
2.6.4	Technical Education .....	21
2.6.5	The University of Engineering and Technology, Lahore .....	21
2.6.6	District Councils .....	22
2.6.7	Union Councils .....	22
2.6.8	Health .....	23
2.6.9	Communities .....	23
2.7	Hygiene Education .....	24
2.8	Private Sector .....	26
2.8.1	Hand pumps .....	26
2.8.2	Latrines .....	27
2.8.3	PHED Water and Drainage Scheme Contractors .....	27
2.8.4	Consultants .....	28
2.8.5	Credit Arrangements for Rural Water Supply Schemes .....	28
3.	POPULATION AND DEMAND .....	29
3.1	Population .....	29
3.2	Effective Demand for Services .....	29
3.2.1	Water Supply .....	29
3.2.2	Drainage .....	32
3.2.3	Latrines .....	32
3.3	Population to be Served .....	33
3.4	Proposed Service Levels .....	33
3.4.1	Water Supply .....	33
3.4.2	Drainage .....	33
3.4.3	Disposal of Human Waste .....	35
4.	INVESTMENT STRATEGY .....	36
4.1	Objectives .....	36
4.2	Strategy .....	37
4.2.1	Introduction .....	37
4.2.2	Priority Areas .....	37
4.2.3	Integrated Schemes .....	38
4.2.4	Water Scheme Viability .....	38

4.2.5	Increased Coverage through Rehabilitation .....	38
4.2.6	Water Scheme Extensions .....	39
4.2.7	Coordination Between Agencies and the Community .....	39
4.2.8	Priority Villages .....	39
4.2.9	Training .....	39
4.2.10	Hygiene Education .....	39
4.2.11	Utilization and Management of External Funds .....	40
4.3	Investment Criteria .....	40
4.3.1	District Selection Criteria .....	40
4.3.2	Village Selection Criteria .....	41
4.4	Methodology .....	41
4.4.1	Strengthening the Process of Community Involvement and Hygiene Education .....	41
4.4.2	Organizations Involved in the Process .....	43
4.4.3	Hygiene Education .....	44
5.	INVESTMENT PLAN .....	48
5.1	Present Situation .....	48
5.2	Investment Plan 1990/91 to 1992/93 .....	48
5.2.1	Annual Development Programme Allocation .....	50
5.2.2	Donor Allocation .....	50
5.3	Investment Plan 1993/94 to 1997/98 .....	56
5.3.1	Annual Development Programme Allocation .....	57
5.3.2	Donor Allocations .....	57
5.4	Disbursement Schedule Summary .....	58
5.5	Summary of Donor Costs .....	59
5.6	Government Recurring Costs for Donor Project .....	60
6.	FINANCIAL RESOURCE AVAILABILITY .....	61
6.1	Macro Resource Availability .....	61
6.2	Sector Resource Availability .....	66
6.3	Existing Donor Agency Involvement .....	70
6.4	Recurrent Budget Implications .....	71
6.4.1	Operations and Maintenance .....	71
6.4.2	Affordability and Willingness to Pay .....	71
6.4.3	Community Financing Mechanisms .....	72

7.	PROJECT MANAGEMENT AND IMPLEMENTATION .....	74
7.1	Community Involvement and Hygiene Education .....	74
7.1.1	Objectives .....	74
7.1.2	Additions to LGRDD's Provincial Water and Sanitation Unit .....	75
7.1.3	District Water and Sanitation Units .....	76
7.1.4	Community Representatives Promoting Water and Sanitation .....	77
7.2	Human Resource Development and Training .....	78
7.2.1	PHED .....	78
7.2.2	Primary Education .....	79
7.2.3	LGRDD .....	80

## LIST OF TABLES

TABLE 2.8.1	HAND PUMP CAPITAL AND OPERATING COSTS .....	26
TABLE 2.8.2	CONTRACTOR CLASSIFICATION SCHEME .....	27
TABLE 4.4.1	ORGANIZATIONAL INVOLVEMENT .....	45
TABLE 5.2.1	RECOMMENDED AVERAGE INVESTMENT ALLOCATION ...	50
TABLE 5.3.1	RECOMMENDED INVESTMENT ALLOCATION .....	57
TABLE 5.4.1	INVESTMENT PLAN DISBURSEMENT SCHEDULE .....	59
TABLE 5.5.1	DONOR COSTS - LOCAL/FOREIGN .....	60
TABLE 6.1.1	REAL ADP EXPENDITURES .....	62
TABLE 6.1.2	REAL SECTORAL ADP EXPENDITURES .....	64
TABLE 6.1.3	RECURRING EXPENDITURE .....	66
TABLE 6.2.1	PAST ADP ALLOCATIONS AND EXPENDITURES .....	68
TABLE 6.2.2	RECURRING BUDGETS AND ACTUAL EXPENDITURES .....	69
TABLE 6.2.3	PHED OPERATIONAL EXPENDITURE .....	70

## LIST OF FIGURES

FIGURE 2.1.1	PHYSIOGRAPHY OF PUNJAB .....	3
FIGURE 2.1.2	BRACKISH AND SALINE GROUND WATER AREAS .....	5
FIGURE 2.4.1	PHED ORGANIZATION CHART .....	10
FIGURE 2.4.2	LGRDD ORGANIZATIONAL CHART .....	12
FIGURE 3.1.1	DIVISIONS AND DISTRICTS OF PUNJAB .....	30
FIGURE 3.1.2	DISTRIBUTION OF POPULATION AND VILLAGES .....	31
FIGURE 3.3.1	ESTIMATED COVERAGE OF WATER SUPPLY .....	34
FIGURE 5.1.1	EXISTING INVESTMENT PLAN 1989/90 .....	49
FIGURE 5.2.1	ANNUAL INVESTMENT PLAN 1990 TO 1993 .....	51
FIGURE 5.2.2	ANNUAL DONOR INVESTMENT 1990/91 TO 1997/98 .....	53



## LIST OF ACRONYMS

ADP	Annual Development Plan.
BPS	Basic Pay Scale.
LGRDD	Local Government and Rural Development Department.
NGO	Non-Government Organization.
O&M	Operation and Maintenance.
P&D	Planning and Development.
PHED	Public Health Engineering Department.
UNICEF	United Nations Children's Fund.
WAPDA	Water and Power Development Authority.



## EXECUTIVE SUMMARY

This draft Investment Plan has been prepared for the Punjab rural water supply, sanitation and health sector. The Investment Plan is for the remainder of the Seventh Plan period (1990 to 1993) and for the Eighth Plan period (1993 to 1998). A strategy for implementation is also presented.

The Investment Plan is designed around the primary objective of improving the health and overall quality of life of the rural population through increased coverage achieved by more cost effective and sustainable water, sanitation and hygiene initiatives. The intent is to provide acceptable service at an operating and maintenance cost that the community can afford.

The Investment Plan has been prepared on the basis that the annual expenditures will be Rs. 1040 million annually with the Annual Development Programme funding should continue at the 1989/90 level of Rs. 940 million annually throughout the Plan period. In real terms this is a reduction of approximately 30% from the previous year. The Annual Development Programme contribution should be supplemented with a Donor financed contribution of Rs. 100 million annually for eight years. This represents a total contribution over eight years of US\$ 39.2 million. Approximately 23% of this contribution will be applied to training, hygiene education and testing procedures for enhancing the community's involvement in the decision-making process for new water and drainage schemes. The remaining 77% will be applied to integrated water and drainage schemes utilizing the proposed Investment Plan strategy. In 1993, the Donor project community involvement process will be evaluated, refined as necessary and expanded incrementally to Annual Development Programme financed investments.

The strategy applied to implement the Investment Plan, will involve applying the present process for implementing schemes to Annual Development Programme funds. Donor funds however would be applied to test improvements to LGRDD's existing mechanisms for community involvement.

The strategy proposed will:

- provide integrated water and drainage schemes to a village with hygiene education as an integral component;
- within guidelines, provide levels of service acceptable to the community. Include the installation of water distribution piping necessary to permit households to easily obtain house connections if a clear commitment and capacity to operate and pay for operation and maintenance can be demonstrated by the community;
- permit review of the proposed water and drainage scheme by the community before detailed design begins;
- use LGRDD and District Council staff to select villages willing to accept responsibility for a scheme;
- use LGRDD and District Council staff to coordinate the presentation of PHED's proposed water and drainage scheme concept to the community for acceptance before detailed design begins;
- use an advisory group to assist with the establishment of these activities in each District;
- train water scheme operators at a new training course established at the LGRDD training centre in Lalamusa;
- use PHED to prepare scheme designs and administer construction and start-up;
- strengthen PHED's technical capability; and
- use department of health staff at the local level to provide hygiene education in villages in conjunction with the provision of a new scheme.

The Donor project proposed to implement this strategy has four components. The first two are hardware components, supported by the next two which provide community

involvement support, hygiene education and training. The four project components and their projected cost over eight years are as follows:

- provide integrated water and drainage schemes in the Potwar Plateau Districts (Rs. 370 million);
- provide integrated water and drainage schemes as well as rehabilitation of existing schemes in the high need Districts of south Punjab (Rs. 246 million);
- provide support to LGRDD in enhancing the community involvement process for the project and provide hygiene education at each village receiving a water scheme (Rs. 136 million); and
- provide technical training for PHED, and extensive training for water scheme operators (Rs. 48 million).

## 1. INTRODUCTION

The Government of Pakistan has undertaken to expand coverage of water supply, sanitation and drainage facilities to people living in rural settlements. Resources for these services are provided by the Government through the Annual Development Programme and by the private sector.

The Seventh Five Year Plan set the target of increasing water supply coverage from 40% of the rural populace to 75%. Priority was to be given to areas where sweet ground water is not available at reasonable depths and to areas where people rely on untreated surface water. In areas where people have their own hand pumps, priority would be given to drainage schemes.

A National Policy Conference on Rural Water Supply and Sanitation was held in Islamabad in April, 1988. Delegates to the Conference proposed a strategy for future investments in the sector which would expand the role of the beneficiaries in the development of projects, including financing of operations and maintenance costs, integrate water supply, sanitation and hygiene education, strengthen and coordinate institutions, enhance the role of the private sector, use technologies which are technically appropriate, sustainable and affordable and which would provide service levels which beneficiaries want and can afford, with the Government assisting in the provision of a basic level of service.

Following agreement between the Government of Pakistan, the World Bank and CIDA, this project was established to prepare a strategic Investment Plan for the sector, including enhancement of the effectiveness of existing institutions and mechanisms. The revised investment strategy will include the balance of the Seventh Five Year Plan with recommendations for the Eighth Plan period which reflect the principles outlined above and which will maximize the benefit of the investments being made. The strategy has been developed by a team of Government staff and Pakistani and international consultants with frequent inputs by senior staff in various departments.

## 2. SECTOR STATUS AND NEEDS

### 2.1 Rural Water Supply

#### 2.1.1 Water Resources and Technologies

Punjab can be divided into relatively distinct physiographic areas where the type and source of drinking water available are quite distinct. These areas are the barani Potwar Plateau of the north, the Thal and Cholistan deserts, the south western barani plains and hills of Dera Ghazi Khan and Rajanpur, and the irrigated plains (Figure 2.1.1).

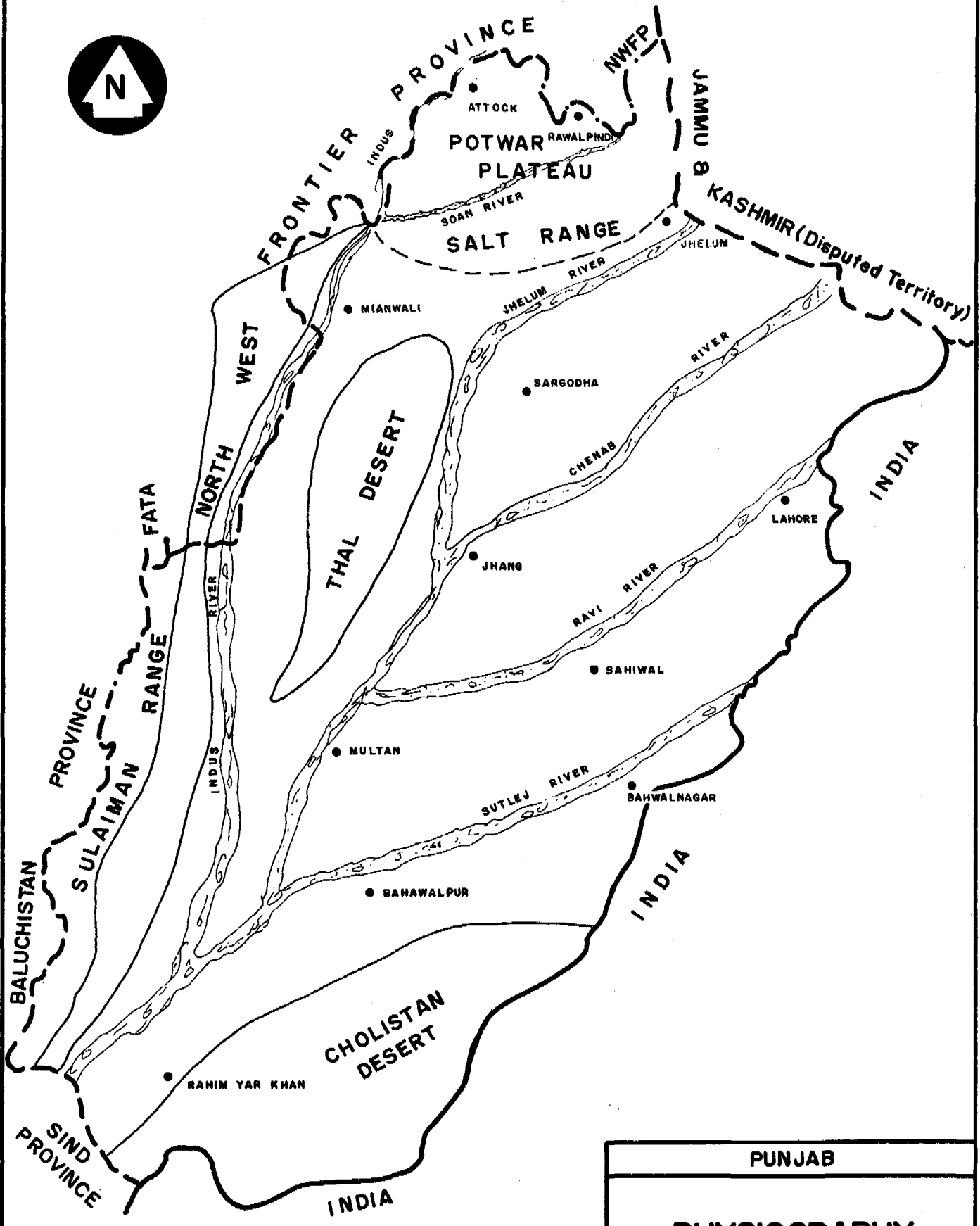
##### Barani and Desert Areas

In the northern Potwar Plateau, access to drinking water is difficult, as the terrain often provides irregular and low capacity sources of ground water at varying depths. Open dug wells, hand pumps, tube wells, and percolation wells sometimes combined with infiltration galleries, are used to bring the ground water to the surface. Low capacity springs are a frequent source of drinking water but they are often a long distance from the village. Small irrigation dams occasionally provide a source of water for slow sand filtration treatment schemes.

Although ground water surveys have been performed by Water and Power Development Authority (WAPDA) and other agencies, locating reliable ground water sources for drinking purposes is still a major obstacle to providing acceptable water supplies. The British Overseas Development Agency is presently initiating work on further ground water investigations in this area.

The Thal desert has areas of sweet water available at shallow well and deep well depths. In the Cholistan desert to the south, the ground water is often brackish although areas of sweet water have been located at depths of about 50 meters. The limited annual rainfall of 150 to 200 mm is often collected in dugouts and used as drinking water by nomads and their cattle.

In the south-west hills of Dera Ghazi Khan & Rajanpur, springs and ground water at deeper depths provide a source for drinking water where sweet water is available.



PUNJAB	
PHYSIOGRAPHY	
DATE JUN. 1989	FIGURE NO. 2.1.1

SCALE 1:3,000,000  
50 0 50 100 KMS



Unfortunately large areas of the barani plain are saline (Figure 2.1.2). Seasonal torrents represent a water resource which is presently being harnessed for irrigation but it would be difficult to use this source for drinking water.

### Irrigated Plains

Central Punjab consists of a large irrigated plain. Five major rivers provide water for the network of irrigation canals which represent the foundation of Punjab's rural economy. Although large areas of the plains have sweet ground water available at shallow depth which can be easily withdrawn with hand pumps, there are significant areas of saline or brackish ground water. In these areas brackish ground water is being used as drinking water or in severe cases canal water is used directly. The Public Health Engineering Department (PHED) draws on canals as a source of water for sedimentation tank and slow sand filter plants used to provide water for distribution to rural communities.

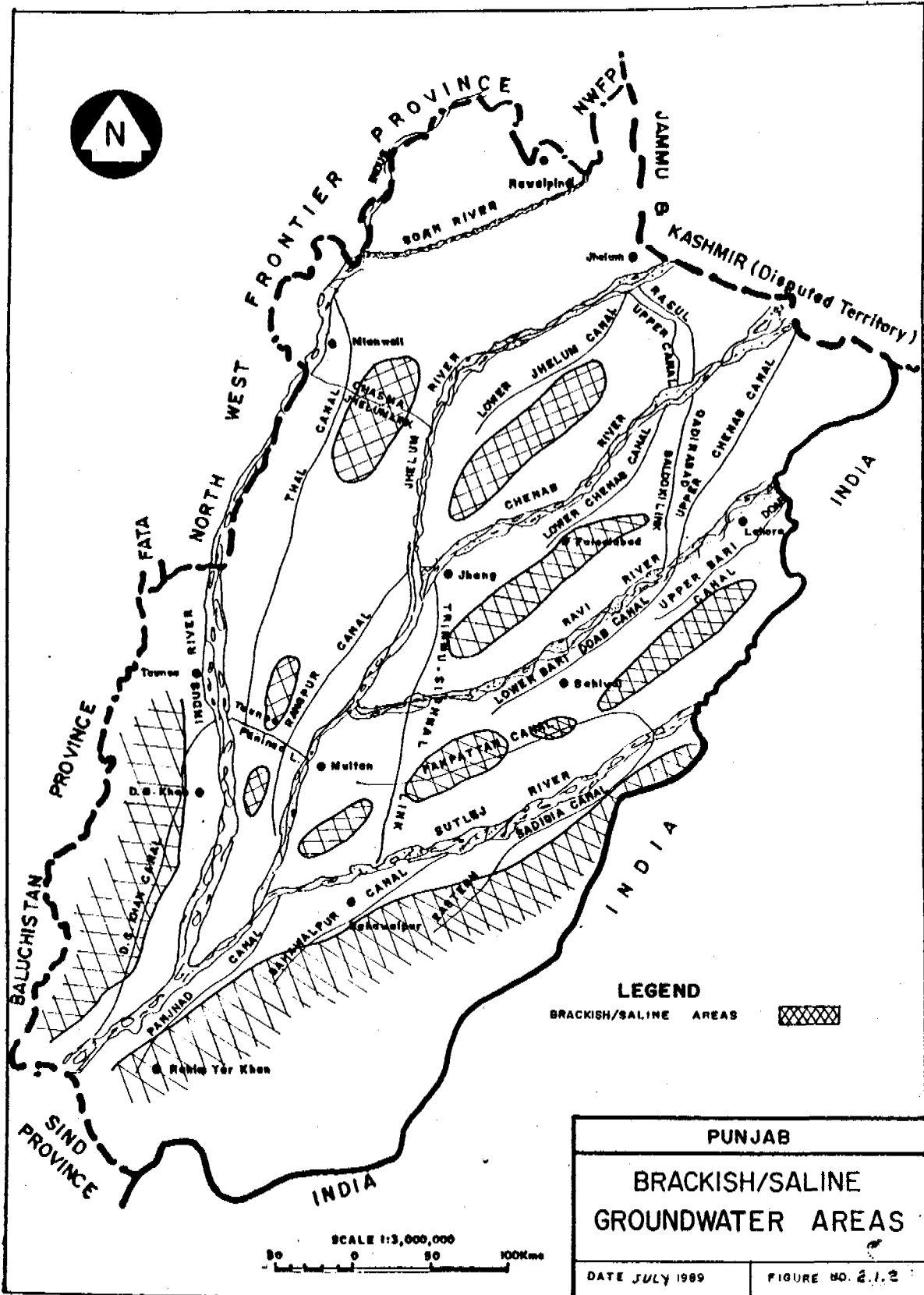
In the brackish areas of the plains, seepage water from the canals provide an excellent source of pre-treated water. This seepage water floats on the saline water. With proper engineering care this sweet water can often be withdrawn in sufficient quantities for community drinking water schemes. On smaller canals, lower pumping rates and more cautious design is required to prevent the intrusion of saline water into the water supply.

## 2.1.2 Status of Water Supply Technology and Coverage

### Potwar Plateau

In the Potwar Plateau water is most commonly provided by springs, tube wells or percolation well schemes. Most water schemes surveyed in this area are functioning although occasional short-term shut-downs due to operational difficulties were reported.

Many of the schemes which require motorized pumping distribute water to stand-posts or ground level tanks in the village. This distribution method has not resulted in significant community payments for the operating and maintenance (O&M) costs of the scheme. Villagers often request house connections and state their desire to pay for operation and maintenance costs if the additional service is provided. The benefit of this additional service is confirmed in many villages where operation and maintenance costs are being recovered



**LEGEND**

BRACKISH/SALINE AREAS



successfully from households with house connections. PHED is presently providing most schemes with distribution piping, permitting home owners to install house connections.

In half of schemes surveyed, the major concern was the low quantity of water available from the source. A second problem, particularly in the Salt Range hills is the wide variations in pressure and volume of water available from the distribution system in different parts of the village. Variations in height of different parts of the village, combined with low supply pressure results in an unequal distribution of water, sometimes to the extent that certain sections of a village do not receive any water. In an effort to deal with this, water is often supplied to the village in zones with each receiving water at different times of the day.

With many of the villages located on high ground and the water supplies located on low ground, the power costs of lifting water up into the village is substantially higher than on the plains.

#### Plains - Sweet Water Areas

Hand pumps provide the major share of drinking water in these areas. They are generally of low quality but maintenance costs appear manageable. Although there are quality hand pumps available in Pakistan they are generally not used because of their higher cost. An estimated 3% to 4% of hand pumps have been equipped with electric motors to automate the pumping process.

Although contamination of hand pump water supplies is known to exist, the magnitude of this problem is unclear. The source of contamination may be improper installation or location of the hand pump. The Pakistan Rural Water and Sanitation Sector Review (June, 1988) suggested that half the hand pumps are contaminated.

#### Plains - Saline Areas

Many people in the saline areas are drinking brackish water from hand pumps and have become accustomed to its taste. Those near canals install seepage water hand pumps for their own or community use. PHED has provided some canal seepage wells but has not fully utilized this resource.

Although seepage wells generally use vertical turbine pumps which are expensive and difficult to maintain, most seem to work. Increased use of centrifugal and submersible pumps, which are less expensive to purchase and easier to maintain, could lower overall costs.

Approximately half of the slow sand filter plants inspected do not function to design level. The most common problem is lack of maintenance of the sand filters and many of the schemes have leaking sedimentation tanks, faulty valves and other minor maintenance problems. A lack of spare parts prevents timely repair.

Schemes with deep tube wells perform well although minor problems such as leakage from the rising main and distribution network reduce the quality and pressure of available water and increases power consumption unnecessarily.

PHED has designed a number of multi-village schemes where economies of scale permit. This is feasible in Punjab because communities are large and frequently close together, yielding high population densities especially in Districts such as Lahore, Faisalabad, Bahawalnagar, Bahawalpur and Rawalpindi. Connecting small communities to the water supply of a nearby larger village could be explored in some cases as a possible method of increasing coverage.

A program to inspect the quality of water produced by schemes has been initiated by PHED. Initial results indicate that some schemes are supplying contaminated water. This issue requires further investigation before conclusions can be reached and recommendations made.

## 2.2 Drainage and Ponds

Coverage of basic sullage water drainage facilities in Punjab is estimated to be 10%. Drainage schemes are being installed mostly by PHED, with some input from LGRDD and District Councils. There is a felt need and demand for proper drainage, particularly in those villages where water supplies are available in the home resulting in increased water consumption and waste water. The health benefits of providing a water scheme can be reduced by the lack of drainage to carry the sullage water away.

Drainage schemes generally consist of concrete open drains along both sides of the street with some schemes incorporating bricked streets as well. The drains are designed for rainwater and sullage water flows but the present design, only capable of handling rainfall of less than 1 mm per hour, is not realistic and most rainfalls flood the drains. With bricked streets, the drains still permit much faster draining of the streets and standing water is eliminated.

Many existing drainage schemes discharge into ponds and from there the pond effluent is frequently used for irrigation. One village received payment for use of the pond water for irrigation. Improved pond design is required to permit more treatment to take place. More time should be devoted at the design stage to exploring alternatives in an effort to achieve maximum benefits.

### 2.3 Disposal of Human Wastes

Often effluent from septic tanks discharges into the drains. This appears to be a method of human waste disposal presently being used in many villages. Installation of latrines has been left almost exclusively with the private sector. There is however a small scale programme by the Environmental Protection Authority to install demonstration latrines in villages. LGRDD and UNICEF recently initiated a programme in seven Districts where active promotion of latrines and support in the form of materials is provided. Previous attempts at latrine promotion through the UNICEF sponsored Punjab Sanitation Project using a revolving fund encountered implementation problems and were withdrawn.

Surveys of latrine ownership found that in the absence of a water supply in the home, a relatively low average coverage of 5 to 10% was observed. In villages with in-home water supplies the coverage increased to an average of 15 to 25%. In exceptional cases, latrine coverage as high as 60% was observed.

There appears to be a greater number of latrines in villages where house connections and drainage schemes are installed. The overwhelming preference appears to be for the pour flush latrine combined with a septic tank discharging to the drainage system. Septic tanks frequently do not have openings for pump-out and most solids are likely flushed through into the drainage system.

The key interest in latrines is for convenience and privacy. Dry pit latrines do not appear to be of interest to most villagers for reasons of smell, flies and the need for periodic sludge removal. Almost all villagers rate latrines as a third priority item, following water supply and drainage.

## 2.4 Institutions

### 2.4.1 Public Health Engineering Department (PHED)

Although PHED began working in urban areas in 1961, in 1985 its efforts expanded extensively into the rural areas. The organization chart shown in Figure 2.4.1 indicates that the PHED activities are directed by two Chief Engineers, one for Punjab North and one for Punjab South. Both answer to the Secretary of Housing, Physical and Environment Planning. A hierarchy of one Superintending Engineer in each Division, one Executive Engineer in each District, supported by sub-divisional engineers and sub engineers provide the engineering design and construction implementation staffing required.

PHED funding is primarily derived from the Annual Development Programme (ADP). Funding for rural schemes has been increased from Rs. 265 million in 1985/86 to Rs. 1125 million in 1988/89. Funding is distributed into Districts using a weighted population based formula. Barani and saline area populations are weighted by a factor of two. This provides more funding per capita for water and drainage facilities to these areas where the need is greater.

At present, potential water schemes are nominated by District Council and other elected officials and then forwarded to P&D for approval. These schemes are then sent to PHED for feasibility engineering. This involves location of available water sources, and preparation of a Feasibility Report for the water supply scheme. Cost estimates are prepared and then, depending on the scheme size, they are forwarded to either the Superintending Engineer, Chief Engineer or Secretary for approval. When approved, detailed design begins. Upon completion of the detailed design, final technical approval is given by the Superintending Engineer or Chief Engineer, depending on the contract amount. Following this approval, construction can proceed.

PUBLIC HEALTH ENGINEERING DEPARTMENT - ORGANIZATION CHART

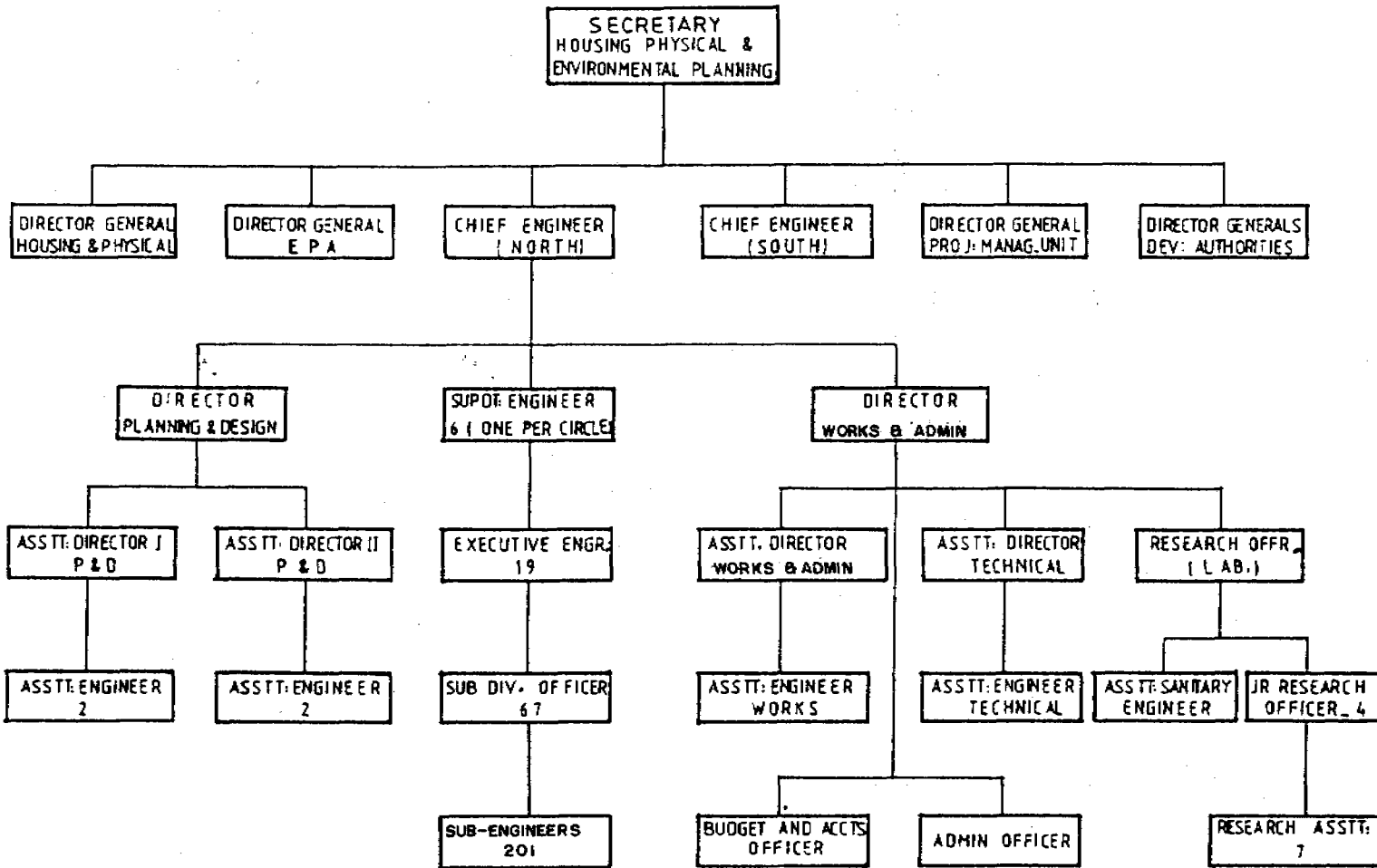


FIGURE 2.4.1

Technically the procedure is sound, but in reality the time required to perform a thorough feasibility report, which can identify the most viable and sustainable system design, is too short.

Another key issue in this procedure is the lack of full involvement of the community in the stages of planning, design and construction. This is making it difficult for the community to take ownership of the scheme and subsegment responsibility for operation and maintenance costs.

PHED could also make more effective use of a ground water resources if their level of expertise was increased.

By June 1988, PHED had completed 1039 rural water schemes. The current practice is for PHED to operate new schemes for the first two years after which an attempt is made to hand the scheme over to Local Government. The number of schemes older than two years is 756 and of these, 336 (45%) have been handed over to the community. Analysis of the status of these schemes has provided the following information:

- 83% of schemes older than two years are still functioning; and
- schemes with house connections are most likely to remain functional.

#### 2.4.2 Local Government and Rural Development Department

LGRDD strives to improve the quality of life of the rural population through the eradication of poverty and the provision of basic necessities in villages. LGRDD supports rural development through Local Government institutions to generate local leadership at the community level and to provide a framework for active participation of community resources in development activities.

LGRDD employs more than 8000 persons in its five wings (Planning, Administration, Adult Education, Finance and Accounts, Engineering). Within the Province, it operates at all levels of Local Government, including Division, District, Markaz and Union Council. An organizational chart is shown in Figure 2.4.2.



# LOCAL GOVERNMENT AND RURAL DEVELOPMENT DEPARTMENT ORGANIZATION CHART ( 1989 )

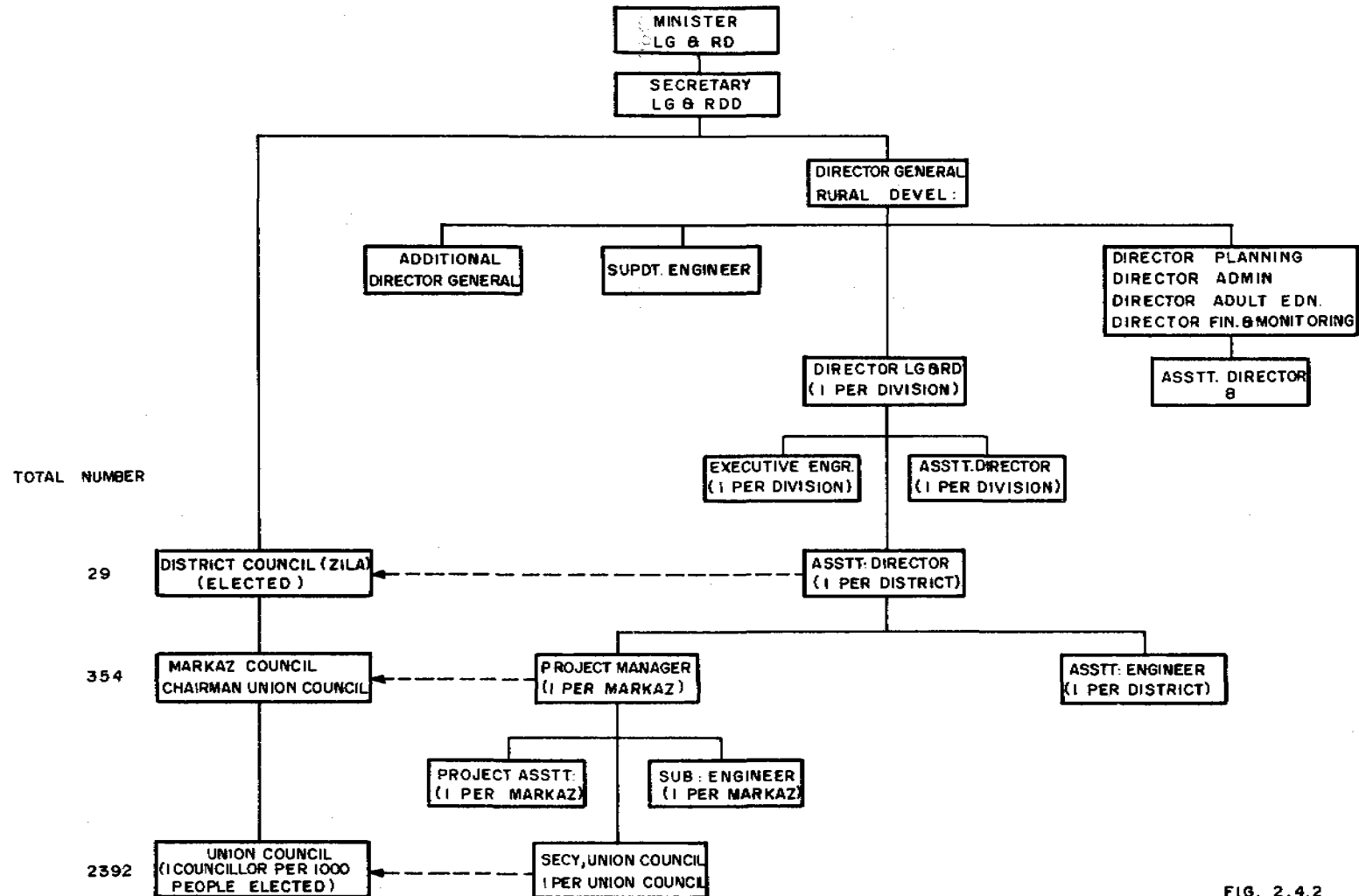


FIG. 2.4.2

LGRDD is currently the Government department with the best community participation focus and the best infrastructure to conduct village level development work. LGRDD could enhance the effectiveness of its community participation activities by the adoption of new methodologies of community interaction, by increasing transportation resources within the organization and by ensuring adequate numbers of well-trained staff.

Although LGRDD has demonstrated its ability to perform in the sector, much of its work has been on smaller scale initiatives. However LGRDD does not have the engineering capability to design piped water schemes.

Currently LGRDD is establishing a Water and Sanitation Unit with assistance from UNICEF. The Unit promotes latrines and small scale water schemes. This initiative utilizes a procedure which could provide a model on which to expand.

#### 2.4.3 Education Department

The Education Department provides primary education to the rural population through 50,000 schools and 157,000 teachers. These serve a student population of 3.1 million. Approximately half of rural school-age children attend school, but male students out-number female students by a ratio of two to one. The Education Department estimates that as many as 47% of male students and 67% of female students who enter primary school do not complete grade five.

The curriculum used in primary schools suffers from being urban-oriented but it does include hygiene education both in health chapters and in Islamic Studies. Improvements to the curriculum would be beneficial.

For the purposes of the sector, the school system represents a mechanism for imparting proper water-handling and good hygiene behaviours to those children who attend school. School teachers are a resource that could be utilized to assist in community development and/or adult education activities.

#### 2.4.4 Health Department

The Health Department provides basic health services and control of communicable diseases through a multi-tiered system which extends specified preventive and curative services to the village level and offers a referral network offering services of increasing specialization at progressively higher levels. The lowest tier of the system is at the village where more than 1900 rural mobile teams offer immunization, communicable disease control and health education. At the Union Council level there are approximately 1800 Basic Health Units, each staffed by seven persons including one doctor. 262 Rural Health Centres operate at the Markaz level, each staffed by 29 persons including two doctors. These services are supported by District Head-quarter Hospitals.

The Health Department operates a Health Education Unit at the Provincial and Divisional levels. The Health Education Unit produces education materials for both the mass media and for face-to-face communications. Face-to-face teaching may occur at Basic Health Units or in the village and are conducted by rural mobile teams.

The structures created by the Health Department represent a tremendous effort to meet the health needs of the rural population. Refinement and strengthening of the system are occurring to overcome existing weaknesses. Increased involvement of women, especially in village level health activities, is desirable. Ensuring supplies, support and motivation for mobile teams and Basic Health Units is a challenge.

The current Health Education Unit has limited resources (particularly mobility) and its approaches for communicating with its target audience could benefit from revision.

#### 2.4.5 District and Union Councils

The mandates of District and Union Councils overlap. Both are responsible for the provision and maintenance of water schemes, sanitation and other measures for cleanliness and the promotion of community development. Operations are divided between the two such that District Councils provide guidance and funding while Union Councils carry out tasks. District Council maintain their own offices, and staff are paid from the revenues derived from rates, fees, taxes, investments and Government aid. Union Councils receive funds from District Councils and from LGRDD. LGRDD also provides a full-time secretary to each Union Council.

Representatives are elected to Councils for a period of four years. District Councillors represent 50,000 persons and one Union Councillor is elected for each 1000 persons. The Council system includes an intermediary group, the Markaz Council, to provide coordination between the two but operational deficiencies reduce the effectiveness of the Markaz Council. LGRDD maintains a training institute at Lalamusa which provides orientation and upgrading of skills for elected Councillors.

Both Union and District Councils represent important organizations for reaching the village level. Many Councils are currently involved in sector initiatives and Councils in contact with UNICEF or other NGO activities may already be sensitive to the need for enhanced community involvement in the sector.

Difficulties in the organization and operation of the Councils may stem from the lack of direct responsibility of Union Councils to District Councils. Although provision has been made for the participation of women in the Councils, in practice female Union Councillors have limited direct input to the decision-making process. Insufficient funding exists at the Union Council level to permit major improvements in the sector to occur.

#### 2.4.6 Non-Government Organizations (NGOs)

In Punjab, NGOs have been identified as having achieved positive interaction with communities on water and sanitation projects. Although sector initiatives may be secondary portions of their mandates, when dealing with the expressed needs of the community successful working relations have been developed.

The Family Planning Association of Pakistan has gained much experience in community participation, some of it in water supply. The Memorial Christian Hospital at Sialkot is involved in drainage projects. The Adult Basic Education Society prepares high quality teaching material for health and hygiene education, and UNICEF is deeply involved with Local Government in promoting hand pump water supplies and sanitation schemes.

The approaches developed by these organizations for engaging a community in development projects needs to be shared with Government institutions. The methods developed for preparing, testing and presenting support materials for community forums and hygiene education can successfully be used for future sector developments.

#### 2.4.7 Planning and Development (P&D)

The Provincial Planning and Development department is the counterpart of National Planning and Development department of the Planning Commission. It oversees decision-making and implementation of sector initiatives. The Physical Planning and Housing section of P&D is concerned with water supply, sanitation and health, whereas the Foreign Aid Unit acts as the liaison between Donors and implementing Government departments.

The functions of P&D include preparation of the Annual Development Programme and monitoring the execution and performance of all developmental activities.

#### 2.5 Social and Cultural Considerations

##### 2.5.1 Social Groupings in Punjab

The ability of communities to mobilize resources for development purposes depends on the form of social groupings, the impact of migration and economic factors including land tenure. Various arrangements in the Province lead to regional differences in social organization and differing mechanisms for its achievement. Punjab can be divided into a number of social regions; each is described below.

In four Districts in the Potwar Plateau and in Gujrat District, limited economic opportunities have encouraged much out-migration and military employment. The 'biraderi' system (major castes and re-grouping of castes) is not strong but returned migrants and ex-military personnel have provided the basis upon which both Union Councils and village groups have formed. External employment has fostered an appreciation of development and cash resources to contribute to new initiatives.

Eight Districts in central Punjab have a well developed and strong biraderi system which forms the basis of much community decision-making. The biraderi system was carried to south Punjab by settlers who took up irrigated land in Bahawalnagar, Bahawalpur and Rahim Yar Khan. This contrasts to the desert and rain-fed areas of the Districts where broad-based tribal clans provide decision-making units for nomadic peoples. Settled people reside in the deserts of Dera Ghazi Khan and Rajanpur where tribal leaders represent their communities.

Most of the Southern part of Punjab experiences a strong landlord presence characterized by an inertia within the community stemming from a traditional dependence on existing authority.

### 2.5.2 The Role of Women

Women are responsible for both the collection and storage of water and for family health and hygiene. Women strongly expressed the need for sector improvements and they will be important and immediate beneficiaries. Women are also the persons who will initiate improvements in hygiene and sanitation practices and the maintenance of household water supplies. To date, ensuring the sustainability of water schemes has been inhibited due to women's limited access to information, education, decision-making and inclusion in planning and implementation stages.

Resolution of these deficiencies needs to become a priority, however progress will be hindered by the reluctance of traditional segments of society to accord women the higher status required for effective involvement. Certain institutional changes have occurred (e.g. the inclusion of one woman on each Union Council) but lack of commitment and societal barriers have limited the effectiveness of these initiatives. The creative challenge of increasing women's involvement in sector projects requires the identification of meaningful options within the bounds of the existing social order.

### 2.5.3 Community Participation

The need to involve a broad segment of a community is perceived to be of critical importance to ensure the long-term sustainability of sector initiatives. Communities are organized to look after at least some village problems through either formal or informal organizations. In many areas of Punjab, biraderi leadership and panchayats (council of elders) resolve a variety of issues including water disputes. Other nuclei for community organization at the village level have been provided by retired Government employees, ex-military personnel, groups of returned migrant workers and school teachers belonging to the village. More recently, Union Councils have assumed some of the earlier functions of the panchayats and biraderis, particularly with respect to development activities. Scattered across Punjab, particularly in the northern barani areas and the desert areas of the south,

villages have established formal social organizations. Where these exist they have virtually replaced older forms of organization.

Transitions from traditional to newer forms of organization have been facilitated by the absorption of informal village leaders into both the Union Councils and village organizations. In turn, informal leadership has mobilized community involvement and enhanced acceptance of development schemes. Neither traditional nor more recent village level organizations adequately incorporate women in their activities.

Surveys demonstrated that formally registered village organizations are most capable of properly mobilizing the community to meet sector needs. Union Councils rank second. Landlords may be capable of fostering effective community participation but this varies between individuals.

The creation of formal village organizations is favoured where some non-agricultural employment exists, where there is exposure to urban culture and possibilities of travel, where the existing biraderi is free from conflict, or where there are examples of model villages. Village organizations were not found where land ownership is concentrated nor in tribal desert areas.

#### 2.5.4 Practices and Beliefs Related to Hygiene

The rural population of Punjab lives in circumstances which mitigate against the maintenance of hygienic conditions. Areas within the home and compound are usually well-kept, but communal areas within villages are often littered with solid and liquid wastes.

Interviews were held in rural areas with mothers of children under the age of five years. More than half of mothers with children under five years of age know the causes of childhood diarrhoea and the potential for contaminated water to cause disease. Few mothers associate dehydration in children with diarrhoea; rather spiritual elements are identified as the cause. As a result, ineffective treatments are often sought for childhood dehydration rather than oral rehydration therapy, even though oral rehydration therapy sachets are commonly available.

Basic Health Units are widely distributed in Punjab. The range and effectiveness of services vary depending on the availability of supplies, staff and support infrastructure. Common

alternative sources of health care, which provide competition to Department of Health services are private dispensers, untrained para-medics, traditional and spiritual healers.

When current knowledge and practices related to health are examined, it is relatively easy to identify gaps in knowledge, but this is not the only problem. Situations can be identified where knowledge of disease causation is present and is accompanied by a desire to act upon the knowledge but still improper behaviours exist. The greater challenge is to identify the existing social, economic and physical barriers that prevent optimal behaviours from being practised, and then develop strategies that effectively reduce the constraints created by the barriers.

## 2.6 Human Resource Development and Training

### 2.6.1 Public Health Engineering Department (PHED)

PHED has no permanent training facility and there is no structured training programme for PHED employees. Some senior members have been trained overseas or at Government sponsored programmes, but few training opportunities are locally available for the needs of the various sub-professional groups. PHED has a reference library, but the contents cover only a limited range of subjects and could be upgraded.

The human resource development and training needs of PHED include:

- statistics on current human resources and skill capabilities;
- training programmes for the professional and sub-professional staff; and
- in-house training coordination.

### 2.6.2 Local Government and Rural Development Department (LGRDD)

LGRDD operates a Training Academy at Lalamusa. The Academy is located on 30 acres of land and offers hostel accommodation for up to 60 trainees, a kitchen and dining room, and recreational facilities. There are two fully equipped classrooms and a library with recent volumes. The major disadvantage with the location is its distance from Lahore, Multan, Faisalabad and Rawalpindi.



Presently there are ten full time instructors and one principal on staff. Orientation courses are being offered for newly elected officials from Local Government. In-service courses are conducted on a regular basis covering such topics as public and financial administration, rural economics, project management and rural sociology. Currently there are no courses of a technical nature for LGRDD staff, but community development courses are being run to train community promotion personnel.

External organizations such as UNICEF, and the Agricultural Development Bank organize courses at the Academy to suit specific needs within their projects. The Academy offers flexibility for this type of arrangement.

The human resource development and training needs of LGRDD have been identified as:

- statistics on current human resource and skill capabilities;
- technical training courses;
- upgraded instructors; and
- technical resource materials.

### 2.6.3 Primary Education

There are approximately 48,000 Primary Schools (including Mosque and Mohallah Schools) in the Province of Punjab, employing some 101,000 teachers (21,000 of whom are not trained). The majority of these schools are without water and sanitation facilities.

The current curriculum suffers from having an urban focus. It contains a number of health and hygiene segments pertaining to social and Islamic studies. Although hygiene subject matter has been integrated into the curriculum, topics are narrow and could be improved.

The teacher training process has a number of weaknesses. Teachers are not encouraged to portray hygiene activities through demonstration, imitation and/or drama. The training process is too short and the availability of teacher learning materials, including visual aids, is limited.

The primary education system could make a greater contribution to hygiene education through the provision of curricula improvements, teacher training enhancements and improved learning and teaching materials.

#### 2.6.4 Technical Education

The Province currently operates three colleges of technology, 10 Polytechnic Institutions (three of which are for women), one Institute of Technology and one Technical Training College.

Institutions typically offer three year diploma programmes in the basic technologies (electrical, mechanical, civil) or other specialised areas, structured on standard Nationally controlled curriculum. Approximately two-thirds of class time is spent in practical work with the remainder being devoted to theory. The civil faculty offers courses in water supply, sanitation and hydraulics but material focuses on the urban environment. The mechanical department has the capability to cover topics such as pumps, motors and engines but lacks the appropriate equipment. Special areas such as diesel technology have adequate facilities and equipment. Teaching staff are adequately trained in their current disciplines.

The needs that have been identified for technical education in Punjab include an expanded curriculum and improved training equipment.

#### 2.6.5 The University of Engineering and Technology, Lahore

The University operates a Centre of Excellence in Water Resources and the Institute of Public Health Engineering and Research. Courses are offered in Public Health Engineering and Water Resources at the Master and Doctorate level, with some courses available on a part time basis. Both are involved in various research projects within Pakistan and provide short courses to a number of Provincial and National Government departments and other autonomous bodies. There are no topics within the current courses that deal with low cost water supply and sanitation schemes, nor do the programmes deal with sociological aspects of community involvement in rural water supply. The Centre and Institute have produced a number of publications and have within their libraries theses produced over the past ten years, some of which relate to rural water.

The Centre provides a valuable training resource that could provide more for the rural water sector by having an expanded curriculum and more resource materials with a rural focus.

#### 2.6.6 District Councils

There are 29 District Councils in Punjab. Each Council has between 70 and 80 members who elect one Chairman. Each District Council office has one Assistant Director and one Assistant Engineer. There are no training facilities at the District Council level although meeting rooms can be utilized if necessary. All training requirements are normally met by the LGRDD Academy at Lalamusa.

After an election, courses are offered at the LGRDD Academy to train new Councillors in Local Government administration and law, rural economics and financial management. The programme could be enhanced through the addition of improved technical and community awareness programmes and management courses. At the District Council level there are occasional courses offered to communities dealing with health matters, hand pump maintenance and agricultural activities, to which Councillors are invited.

The role and function of District Councils could be improved by permitting Councillors to spend more time in training at Lalamusa. Improvements to the course could include greater emphasis on management procedures, community awareness, project planning and technical matters related to water and sanitation.

#### 2.6.7 Union Councils

There are 2392 Union Councils in Punjab, with seven or eight members in each Council. The members elect a Chairman who in turn selects a Vice-Chairman. All members are elected for a term of four years. Technical support is provided by LGRDD.

There are no training facilities at the Union Council level. All training requirements are normally met by the LGRDD Academy at Lalamusa and these are similar in nature to those provided for District Councillors. Occasionally courses are delivered to Union Councillors via a mobile training unit.

Training Requirements for Union Councillors are similar to those for District Councillors. Extra emphasis may be required in project planning, implementation and the management of operation and maintenance due to the increased likelihood of direct involvement of a Union Councillor in the implementation and management of a water scheme.

#### 2.6.8 Health

The health care system benefits from high standards of training which provide a threshold for entry into the profession. Training does suffer from excessive emphasis on curative aspects, less focus on preventive strategies and little attention to the proper methods for communicating health messages. In the current system, mobile teams are responsible for face-to-face health education at the village level. Room exists to upgrade their interactive teaching methods.

This training need provides an excellent opportunity to impart some of the lessons learned by NGOs into the Government health care system. A group with good experience at developing village-level communication tools, like the Adult Basic Education Society, could be used to provide models of methodology and materials for some hygiene education work by the Health Education Department.

#### 2.6.9 Communities

Within the community there is a need to have one or more persons trained in a trade such as plumbing, masonry or electrical work to provide technical support for a water scheme. Many Technical and Vocational Training Centres exist in Punjab to provide such training. Other training opportunities to meet these needs are provided by apprentice programmes offered by the Labour Department and various village level development organizations such as the Agency for Barani Areas Development, the Women's Division, and NGOs.

The training needs of village organization committees relate to gaining understanding of Government structures, procedures and the current support schemes available to communities. Also required is information on how to mobilize the community through interactive processes and how to manage resources, including accounting procedures.

Hygiene education conducted at the village level is beneficial, particularly in conjunction with the provision of water sector facilities. Department of Health staff operating at the

village level have the mandate to conduct education, however enhanced methods, improved educational materials and additional motivation would do much to strengthen the process.

The community in its entirety requires an increased awareness of its own abilities as an agent of development and of the powers to be gained through organization. It should be oriented to ensuring inclusion of all segments of the community. The community will need to be briefed on how to ensure commitment to a scheme and the methods of community management, including financial management. Successful implementation of a water scheme is an empowering process and the community could benefit from knowledge of other Government assistance available for future development. One mechanism for achieving training of a large base of the community is through interactive community forums.

## 2.7 Hygiene Education

Health authorities identify poor hygiene practices as major causes of childhood illness and death. The provision of an improved water supply, supplemented with effective health education is an important means of improving the health status of a community. The magnitude of health benefit derived from sector improvements will depend on other societal factors, including socio-economic status of the community, maternal and childhood nutrition status and the provision of effective health services.

Hygiene education promotes individual and community behaviours related to:

- improved personal hygiene designed to interrupt faecal-oral transmission of pathogens;
- the proper construction and correct usage of latrines;
- the preservation of water quality in the collection, storage and use of water;
- the need for proper drainage of waste water; and
- the treatment of diarrhoeal dehydration with oral rehydration therapy.

The mandates of numerous institutions include health and/or hygiene education. The Department of Health conducts health education on a broad scale at the village level

through its mobile teams and Basic Health Units. Health education materials for the mass media and face-to-face delivery are produced by the Health Education Unit in the Department of Health. Health and hygiene messages are included in the Education Department's curriculum for primary schools but coverage is limited due to limited enrolment and high drop-out rates.

UNICEF is an important contributor to health education through the production of materials, the promotion and training of field staff and the conduct of demonstration projects. Amongst NGOs, the Family Planning Association of Pakistan, the Adult Basic Education Service and the Memorial Christian Hospital at Sialkot have made significant contributions even though sector initiatives may be secondary portions of their mandates.

Hygiene education initiatives are most effective when they are related to the provision of services (e.g. when given by mobile teams who are attending to other health needs of the population). The time of water scheme provision provides an excellent opportunity for a concentrated hygiene education input.

When the products of existing hygiene education providers are contrasted, a trade-off between coverage and quality of communication is observed. NGOs working with a limited population have developed excellent methods and materials for their work. Remaining is the task of integrating the high quality approach into organizations that offer potential for mass coverage.

Developments in the sector have demonstrated the benefits of involving much of the beneficiary community using a community involvement approach that includes hygiene education. Existing trained community resources, whose job descriptions have a health or hygiene education mandate, include Department of Health mobile teams, the staff of Basic Health Units, school teachers and other extension workers. The task of uniting these human resources and mobilizing them to participate in hygiene education related to water scheme provision remains a creative challenge.

Although women are recognized as the most important target for hygiene education, they are a difficult audience to reach. Mass media techniques are not perceived to be effective as women often have limited access to either radios or television, even when they are available to a household. Face-to-face communication methods are preferred but the low

number of trained women participating in hygiene education at the village level remains a constraint.

## 2.8 Private Sector

### 2.8.1 Hand pumps

Hand pumps are almost exclusively financed, supplied and installed by the private sector. More than half of existing coverage is achieved by hand pumps and these are concentrated in the sweet water zone. Efforts are being made by LGRDD and UNICEF to introduce better quality hand pumps to small communities in selected barani Districts.

Capital and operating costs for hand pumps can vary significantly. Table 2.8.1 provides a summary of survey findings. The increased depth of wells in the barani areas, including the Potwar Plateau, results in significantly increased costs for this technology.

TABLE 2.8.1 HAND PUMP CAPITAL AND OPERATING COSTS

	<u>Sweet Water Plains</u>	<u>Saline Plains</u>	<u>Potwar Plateau</u>
Capital Costs (Includes Labour Materials)	Rs. 1,150	Rs. 1,150	Rs. 10,750
O&M Costs (Per Year)	Rs. 110	Rs. 230	Rs. 575

Hand pumps are locally manufactured and readily available from local distributors. The use of brass in moving parts is diminishing to keep the purchase price low but this leads to higher costs for maintenance. The prospect of altering this situation is low as purchasers probably prefer a low initial expenditure, even though long-term costs may be higher than if a good quality hand pump was purchased.

The greatest weakness of the current hand pump system is the high likelihood for contamination of the water source. This may occur due to poor installation procedures or poor protection of the site immediately surrounding the borehole. Because the hand pump manufacturing and installation system operates on a decentralized basis without government involvement, contamination problems will be difficult to overcome.

## 2.8.2 Latrines

Latrine pans are readily available within 30 kilometres of most villages. They are frequently sold in hand pump shops. The home-owner generally will purchase the pan and then hire a local mason to install the latrine. Pour flush latrines complete with a septic tank cost from Rs. 2,000 to Rs. 4,000 installed. Pour flush latrines with septic tanks are popular as they do not require manual cleaning. Masons who are trained by the apprenticeship method are locally available.

## 2.8.3 PHED Water and Drainage Scheme Contractors

Private contractors are tied into a set of registration fees and contractor classification schemes which restrict their ability to compete effectively. Contractors working for PHED are divided into four classifications as shown in Table 2.8.2.

TABLE 2.8.2 CONTRACTOR CLASSIFICATION SCHEME

<u>Class</u>	<u>Limit of Contract Prices</u>	<u>Annual PHED Registration Fee</u>	<u>Approx. Number.</u>
A	No limit	5,000	10
B	Rs. 5,000,000	1,500	50
C	Rs. 2,000,000	750	200
D	Rs. 400,000	500	5000

As C class contractors are limited to working in one District, some have applied for B classification to permit them access to projects across Punjab. They would not need to upgrade their technical abilities due to limits of contract value and because most rural scheme contracts are tendered at less than the Rs. 2,000,000 limit for C contractors. B class contractors must have an engineer on staff. Although this increases their costs by an estimated Rs. 5,000 per month plus a Rs. 5,000 annual fee to the Pakistan Engineering Council, one would expect the quality of their work and organizational ability to improve accordingly. Directing more work to B class contractors should be considered to improve the quality of workmanship and efficiency with which rural schemes are executed.



#### 2.8.4 Consultants

There are a number of engineering consultants with excellent experience in rural water and drainage projects. The number remains low because there are only few water projects available to them. Should more work in this field become available, more consultant staff will require orientation in rural water and drainage scheme design. This orientation will assist in preventing the transfer of urban design strategies to rural schemes without a thorough review of the different requirements of rural schemes.

#### 2.8.5 Credit Arrangements for Rural Water Supply Schemes

The possibility of instituting a credit scheme to assist communities or individual households to develop their own water supply, drainage or sanitation facilities was reviewed. It is unlikely that the existing institutional framework can be used to provide credit and the prospect of establishing a new institution is not feasible. These conclusions are based on the following observations:

- Government and commercial banks are reluctant to process small loans unless these loans finance income generating activities that provide the cash flow required for debt servicing;
- the collateral that private borrowers can offer against a loan is often inadequate;
- the overhead to the institution of handling small loans is high;
- the problems of organizing communities for the handling of group loans are formidable; and
- there is an absence in the rural sector of suitable NGOs to operate a credit scheme for these purposes.

### 3. POPULATION AND DEMAND

#### 3.1 Population

Since the last census was taken in 1981, the District boundaries in Punjab were revised. Figure 3.1.1 presents the new boundaries of all 29 Districts, including eight new Districts. New District area and population figures have also been calculated. Note the Federal District of Islamabad is not included in the Punjab Investment Plan.

Although the total population growth averages 3.1%, the rural growth rate for the 1988 to 1993 period is projected to be 1.9%. This lower rate is primarily due to urbanization. The population growth rate history and projections by District from 1972 to 1998 have also been assembled. They indicate a wide variation in growth rates between Districts ranging from almost zero in Toba Tek Singh, to 3.5% in Rajanpur and Lahore Districts.

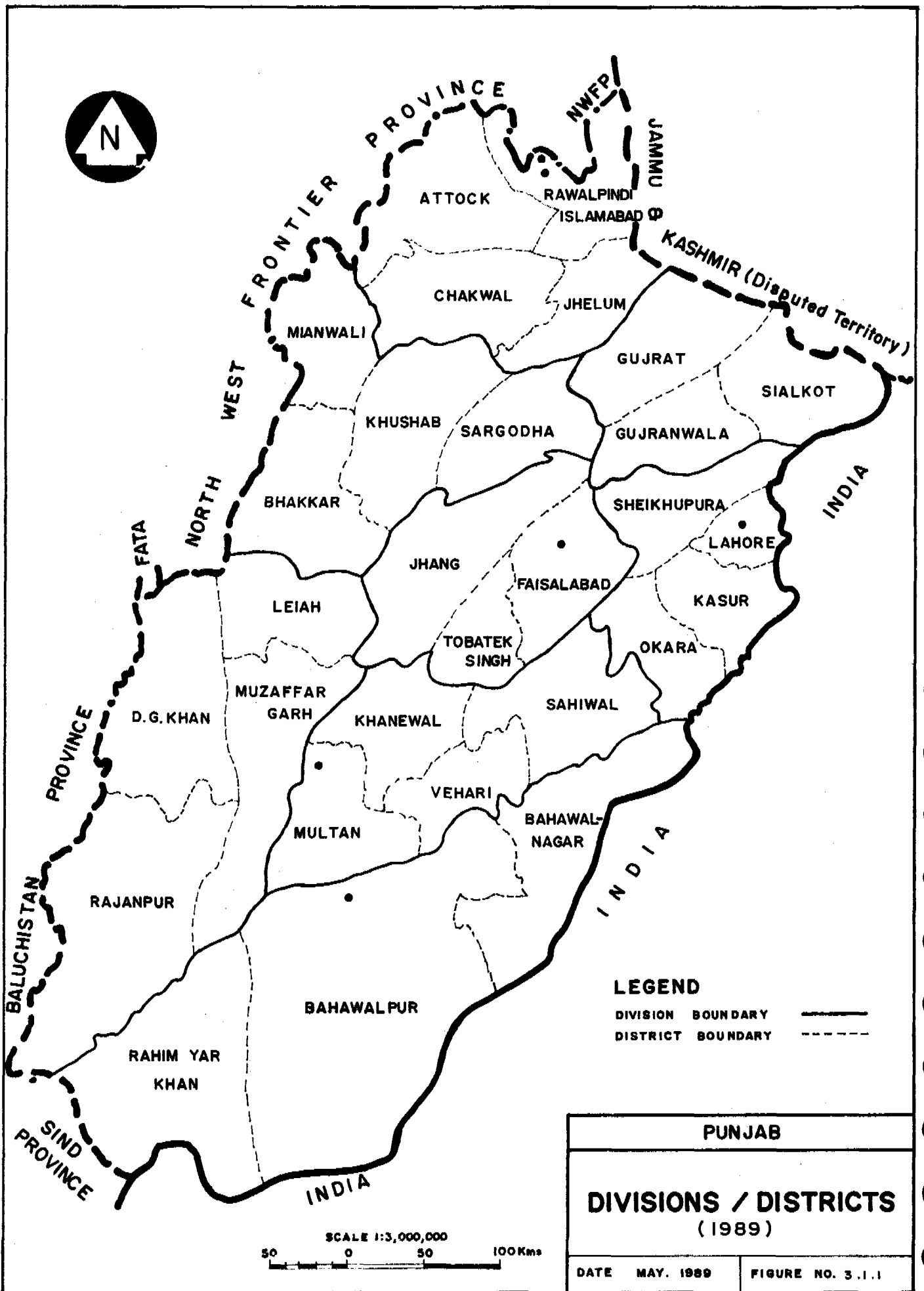
Villages have been classified according to population size where villages containing less than 1000 persons are considered small, villages with between 1000 and 2000 persons are medium, and villages with more than 2000 persons are large. Figure 3.1.2 shows that although over 50% of the villages are in the small category, only 17.3% of the population lives there. The majority live in medium and large villages.

#### 3.2 Effective Demand for Services

##### 3.2.1 Water Supply

Although the level of demand for water is specific to each village, certain generalizations are useful for planning purposes.

The Potwar Plateau has a high need for water. The primary reason is that the area is rain-fed and does not have a uniform, easily accessible sweet water aquifer as is the case in large areas of the irrigated plains. On the Potwar Plateau ground water resources are deeper and of lower capacity. Often long distances separate the villages from developed water sources. The high cost of developing available water sources prevent more extensive involvement of the private sector. Also the lack of reliable information on ground water resource is slowing development.



# DISTRIBUTION OF POPULATION AND VILLAGES

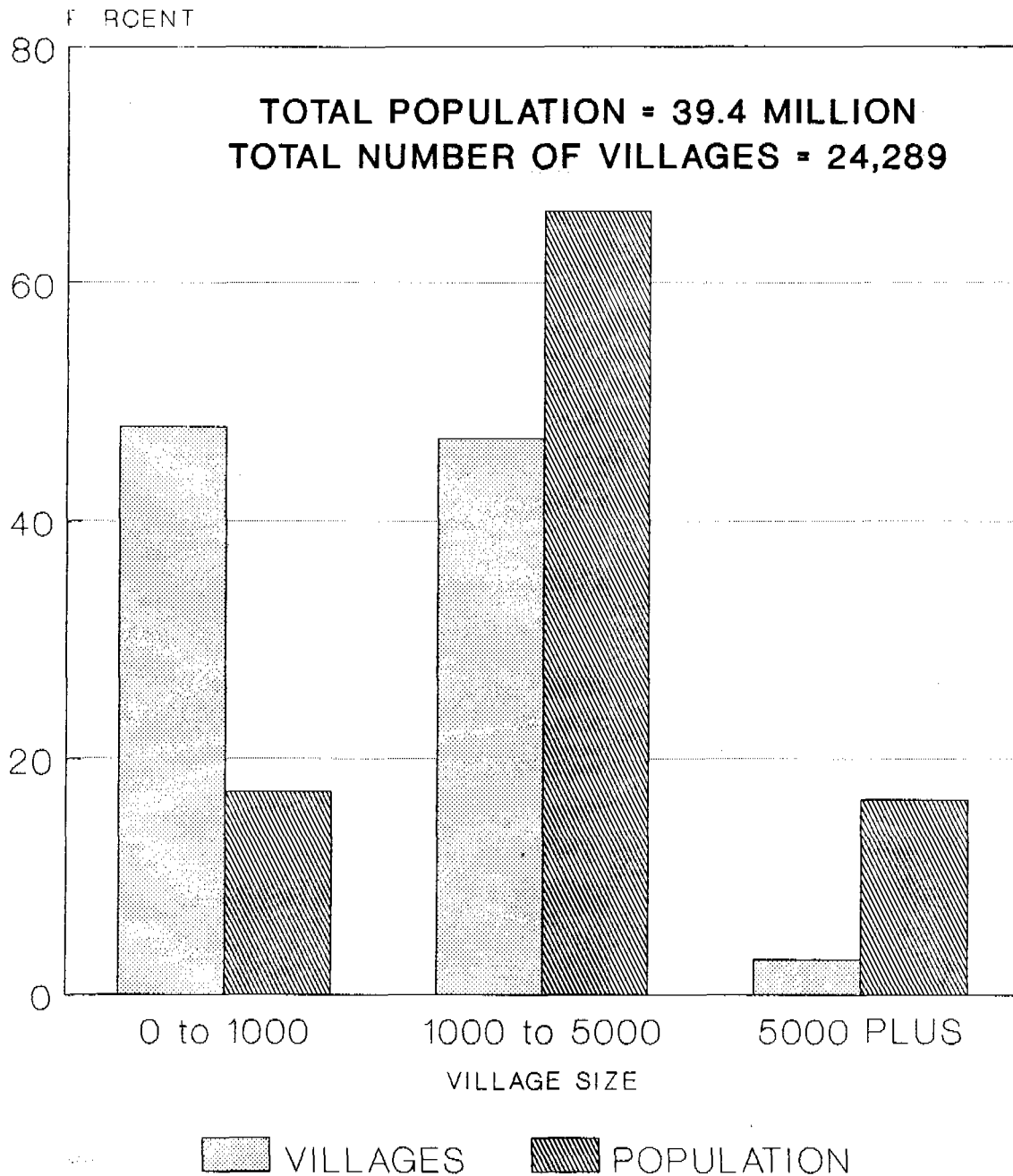


FIGURE 3.1.2

On large sections of the irrigated plains, shallow sweet water is readily available. Therefore central piped water schemes provided by PHED are not required.

In the saline areas where in-home hand pumps are frequently used, the interest in central water schemes can be limited, depending on the severity of the salinity problem. In these areas the level of demand is centred on the level of service or convenience provided. Also, people may prefer their alternate saline water or even canal water settled in small containers, to stand-post or community tank supplies, if a usage tariff is applied. Improving the level of service from stand-posts to house connections will significantly enhance the demand and willingness to pay for treated water.

### 3.2.2 Drainage

The need and also the demand for drainage is less in the Potwar Plateau where the terrain often permits natural drainage, although in many villages some drainage of sullage and rainwater is required. The need for drainage is also less here because there are fewer villages with water supplies in the home.

In the sweet water irrigated plains, a high demand for drainage exists. This is a direct result of many homes having in home hand pump water supplies which provide large quantities of water when required. This water is drained into the street contributing to the drainage problem.

Many villagers feel this is a high priority need, yet they are unable to deal with the funding, engineering, and coordination required to implement a drainage scheme. Similarly, in saline areas where hand pumps provide household water, drainage is a problem. In both barani and saline villages where PHED has provided piped water schemes with house connections, drainage is a need which is increased by the scheme due to the increased volume of water brought into the home.

### 3.2.3 Latrines

The demand for latrines is lower than for water supply and drainage. However where water is supplied into the home, and where drainage facilities are available, the interest and also the number of latrines installed is higher. It is estimated that, on average, approximately one

quarter of households in villages with house connections and drainage facilities have latrines. Where this level of service is not present, very few households have latrines. This supports the argument that an effective way to encourage the installation of latrines is to provide the support systems required to operate a low maintenance pour flush latrine system.

### 3.3 Population to be Served

PHED rural water schemes provide water to 4.8 million people (12% of the total rural population). A further 20.2 million people (52% of the total) receive water from systems provided by the private sector (usually hand pumps) but half of these are deemed to be contaminated. The population not covered by water schemes is 14.3 million (36% of the total). Figure 3.3.1 illustrates this relationship.

### 3.4 Proposed Service Levels

#### 3.4.1 Water Supply

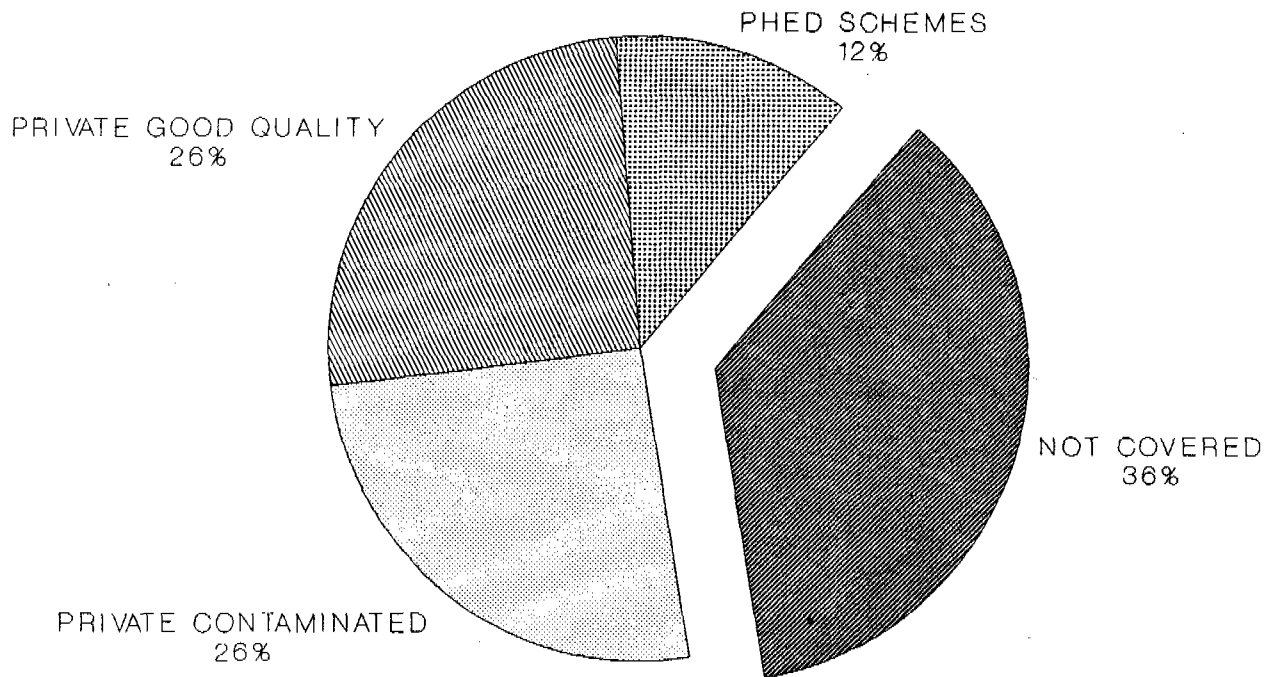
The minimum service levels proposed for Punjab are based on present PHED design practices, the level of service requested by the community, and its willingness and ability to pay for this level of service.

Basic service levels proposed are 45 litres per capita per day at a distance of no more than 150 meters from the home. Water should be of acceptable quality and have a hardness level below 1500 PPM. Where the supply source is outside the community, and where the community cannot afford house connections, stand-posts will be provided for water distribution. Where the demand for house connections is matched by a willingness and ability to pay for the house connection fee and operation and maintenance costs, distribution piping will be provided on all streets. Households will then have to arrange for, or pay for their own house connection from the distribution pipe.

#### 3.4.2 Drainage

For villages with a water supply in the home from either hand pump or house connections, concrete drainage channels for removal of sullage water are proposed. In areas where the village is relatively flat and natural drainage for rainwater is not effective, bricked streets are proposed to eliminate ponding and to direct water outside the village boundary. This

# ESTIMATED COVERAGE WATER SUPPLY 1988



TOTAL POPULATION = 39.4 MILLION

FIGURE 3.3.1

will not only remove rainwater ponding but will also limit the overflow of sullage water onto the streets. This occurs frequently in villages without paving. Brick paving also significantly enhances the overall cleanliness of the community with minimal long term maintenance.

The drainage system effluent will collect in the village pond. Treatment in these ponds should be maximized by designing and shaping the ponds to permit maximum oxidation to take place. Following this treatment stage the effluent can be used for irrigation.

#### 3.4.3 Disposal of Human Waste

Disposal systems should effectively eliminate contact between humans and un-decomposed human waste. It should be stored in such a way as to minimize access by flies. Meeting these criteria generally involves the use of latrines, either dry pit type or pour flush latrines.



## 4. INVESTMENT STRATEGY

### 4.1 Objectives

The objective of the strategy is to improve the health and overall quality of life of the rural population, through increased coverage achieved by the implementation of more cost effective and sustainable water, sanitation, and hygiene education initiatives. This basic objective will be implemented by expanding the existing infrastructure of water supply, drainage and human waste disposal facilities.

A second major objective of the strategy is to achieve economies for the Government by reducing the amount of public funds used to operate and maintain water schemes. This objective will be achieved by increasing the rate at which operation and maintenance responsibilities are transferred to the communities. Steps will be taken to prepare communities for acceptance of these responsibilities.

The Seventh Five Year Plan indicates that the mechanism used to build rural infrastructure should involve community participation:

To achieve this objective, the institutions of Local Government and rural community organizations will be strengthened and extended up to the village level to ensure the maximum participation of beneficiaries in decision-making and implementation. During the Seventh Plan emphasis will be placed on associating the local institutions such as District Councils, Union Councils and Rural Community Organizations in planning and implementation of development programmes and achieving a productive partnership between the rural organization and the Government. Decentralization will be a key objective and an essential pre-requisite for promoting community participation.

The objectives of the strategy proposed here are to involve people in the development of their water sector infrastructure.

## 4.2 Strategy

### 4.2.1 Introduction

The proposed strategies strive to increase coverage, rehabilitate inoperative schemes and reduce the growing burden of operation and maintenance costs. Some of the strategies represent enhancements to existing structures and systems. Their introduction will be piloted using an externally funded project and then be carefully assessed. Strategies of demonstrated effectiveness will be incorporated into Government programmes on a staged basis as existing capacity permits.

The proposed strategies incorporate:

- the delivery of new water schemes and the rehabilitation of old ones in areas of greatest need;
- an integrated approach of water supply, drainage, human waste disposal and hygiene education to achieve maximum benefits;
- an equitable balance between affordability, sustainability and level of service designed into schemes;
- broad based community involvement to achieve commitment from the community to accept operation and maintenance responsibilities; and
- increased opportunities for women to participate in the sector.

### 4.2.2 Priority Areas

The investment strategies will place emphasis on areas or Districts where existing water sources are more than 150 metres from the village and where the water is of unacceptable quality, as in brackish areas. In Punjab this is primarily in the Potwar Plateau and other barani areas, saline areas of the irrigated plains, and desert areas.

#### 4.2.3 Integrated Schemes

To maximize the health impact and investment effectiveness, water supply, drainage schemes latrines and hygiene education will be provided as part of an integrated package.

This is particularly important if the proposed water scheme includes house connections. Without proper drainage the benefits of an in-home water supply can be reduced.

The provision of water supply and drainage facilities will support and stimulate community demand for latrine construction by the private sector. Latrine construction will also be promoted through hygiene education.

#### 4.2.4 Water Scheme Viability

To achieve technical viability, well planned designs will be used and operating staff will be trained. Schemes will be designed to be affordable so that the community can meet long-term operation and maintenance costs. Achieving this economic viability requires increased input of the community at the planning stage to ensure the scheme meets the level of service requested and to ensure the scheme operating and maintenance costs are affordable to the community. Without this coordination, willingness to pay for service will decrease and endanger a scheme's sustainability.

#### 4.2.5 Increased Coverage through Rehabilitation

Although major emphasis will remain on providing new water supplies to unserved communities, some attention and funding will be directed to rehabilitating abandoned schemes. Any facilities that can be revived at low cost will provide a large return on the investment.

Overcoming contamination problems at hand pumps, open wells and existing schemes will be a task for the private sector. Encouragement for making improvements will be provided through hygiene education.

#### 4.2.6 Water Scheme Extensions

In villages where stand-posts are used, extension of distribution piping into parts of the village not yet served will be made. Providing this piping permits house connections to be added by the households. This will significantly enhance the willingness of beneficiaries to pay and thus the scheme's viability.

#### 4.2.7 Coordination Between Agencies and the Community

PHED will continue to design and supervise the construction of new schemes. Because the design phase will include greater liaison with the recipient community, PHED will coordinate activities with LGRDD, a department with demonstrated community involvement abilities.

#### 4.2.8 Priority Villages

A community will be selected for the input of a scheme only after it has expressed its desire for such a project and demonstrated its ability and willingness to accept operation and maintenance responsibilities. Community involvement and hygiene education processes should involve a large segment of the community. Where the number of communities meeting selection criteria exceed the resources available to provide schemes, villages with the lowest per capita cost for the scheme should be selected first.

#### 4.2.9 Training

Orientation and upgrade information for elected representatives and PHED on the issues relating to rural water, human waste disposal and hygiene education will be provided. In addition water scheme operator training will be provided. The effectiveness of these operating personnel in maintaining acceptable, dependable service to the community is a key element in scheme sustainability.

#### 4.2.10 Hygiene Education

Hygiene education will be provided to the community whenever a new water scheme is provided. The approach will be multi-faceted and included in Government staff orientation programmes, (PHED, LGRDD, District Councils, etc.), water scheme operator training

programmes, and village education programmes. Whenever possible, messages will be integrated into existing programmes using existing staff. The hygiene education message will include promotion of latrines.

#### 4.2.11 Utilization and Management of External Funds

External funds, either in the form of a loan or grant, will be utilized to permit increased coverage rates to be achieved. These funds will be used to build schemes according to the proposed strategies. LGRDD will be the implementing agency for this project.

### 4.3 Investment Criteria

#### 4.3.1 District Selection Criteria

To establish an effective method of selecting Districts for Donor funding, each District was ranked according to two equally weighted criteria:

- the number of people requiring coverage; and
- the percent of population without coverage.

By considering the uncovered population in both absolute and proportional terms, these criteria provide the highest overall rating to Districts that have large numbers of people needing coverage, and a corresponding low percentage of coverage.

Of the eight Districts ranked highest, seven have been recommended for Donor financed schemes. These are:

- the three northern Districts of Rawalpindi, Attock and Chakwal; and
- four Districts in south Punjab, namely Bahawalpur, Bahawalnagar, Rahim Yar Khan and Rajanpur.

Faisalabad also ranked high but was not included because of the long distance to the other two groups of selected Districts.

Although Dera Ghazi Khan is often noted as an area in which the need for water is high, this District ranked lower than many others as PHED has already provided a lot of coverage here. The total population needing a water supply in Dera Ghazi Khan is three times less than in Rahim Yar Khan for example.

The weighting system presently used by PHED provides a weighting factor of two to the population living in saline and barani areas and has a similar impact on distribution of funds. The procedure used here is a refinement of the PHED procedure.

#### 4.3.2 Village Selection Criteria

The criteria used to select a village for a scheme should require the community to clearly demonstrate a desire to obtain a water scheme. Thereafter participation in an organized community involvement process will lead to a demonstration of the community's willingness and also ability to take responsibility of all operation and maintenance costs which may arise in the long term. Preferably this will be expressed by an organization or committee that has wide community support.

Should the number of villages meeting this criteria exceed the funds available for new schemes, then the scheme capital cost per capita should be used to rank villages within a District. Generally this will involve providing service to the larger villages first. The Investment Plan has been prepared on this basis.

#### 4.4 Methodology

To implement the project strategy, the following methodology is proposed.

##### 4.4.1 Strengthening the Process of Community Involvement and Hygiene Education

The process of implementing a new scheme within the sector has been broken into six phases. Each phase is described below.

##### Phase 1. Community Preparation

Villages that meet initial selection criteria must be identified. Village awareness of issues related to the sector will be raised and the village will be assisted in forming a water

committee. A request to proceed into the planning stage will be made. Hygiene education emphasis in this phase will be placed on increasing community demand for sector improvements.

### Phase 2. Planning and Design

A decision will be made by a Government approval body to verify that the community has met initial criteria including acceptance of responsibility for operation and maintenance costs, before approval of a scheme can be issued. On scheme approval PHED engineers will present to the community viable options for meeting the community's desired level of service and affordability. The technology may range from community hand pumps to central treatment facilities with distribution piping suitable for house connections. The most suitable option will be recommended by PHED. The community would then confirm acceptance of PHED's recommendation for the proposed scheme before detailed design proceeds.

### Phase 3. Construction

A contractor will build the scheme. PHED engineers will administer the construction work and make regular inspections to ensure quality work is maintained. On verifying that the scheme has been properly installed and start-up has been completed, the Union Council or community water committee would accept the scheme.

### Phase 4. Community Training

The water committee will recruit one or more scheme operators who will receive technical training. Communities will be encouraged to permit the involvement of women in the process of scheme operation. The broader community will receive orientation and training on organizational and financial management methods.

### Phase 5. Scheme Start-up

The contractor will provide the community with a warranty period after which the community will accept full responsibility for maintaining and operating the scheme. Hygiene education emphasis in this phase will stress methods for maximizing health benefits from the scheme and will encourage the construction of latrines.

## Phase 6. Follow-up

After the scheme has been operating for some months, the design engineers, the construction contractor and the community involvement promoters will meet with the community to identify and resolve any outstanding problems. Latrine promotion activities can be initiated. A debriefing process will take place with the community to permit them to assess their involvement in the scheme development and to consider future self-development steps.

### 4.4.2 Organizations Involved in the Process

Different groups of people will be involved in the various phases of project implementation. A description of each main group is given followed by an indication of where the group's input will be required.

#### The Total Community

As many members of the community as possible will be encouraged to attend forums and education sessions. Special strategies will be used to maximize the involvement of women.

#### The Community Water Committee

A committee will be selected at a community forum to represent community interests in scheme developments. This committee should include at least two women.

#### Water and Sanitation Promoters

The existing Water and Sanitation Unit within LGRDD will be strengthened to take responsibility for promoting community involvement and conducting hygiene education in larger water schemes.

#### PHED Engineers

Existing PHED staff will be used to design schemes, administer construction, coordinate start-up and provide follow-up technical assistance as required.



### Government Approval Bodies

P&D will provide necessary approvals at the Provincial level while at the District level, the District Coordination Committee will grant approvals.

### Construction Contractors

Private contractors will be used to build schemes. This may include contributions from the community.

### Training Organizations

Existing external organizations will be used to provide specialized technical and managerial training related to operation and maintenance issues.

Involvement of each organization in the six phases of project implementation is summarized in Table 4.4.1. The community is involved in all phases of implementation although in some phases, such as planning and design or construction, community involvement will primarily be conducted through the water committee.

The portions of this design which represent the greatest enhancement to procedures currently in place are strengthening of the Water and Sanitation Unit within LGRDD, and additions to existing training organizations. Both of these receive greater description in Chapter 7.

#### 4.4.3 Hygiene Education

Experience gained in Punjab and elsewhere has demonstrated the benefits of attaching health and/or hygiene education to the delivery of a service, rather than conducting the education in isolation. Including hygiene education in the provision of a water scheme helps to secure the attention of the audience and achieve 'the teachable moment'.

Hygiene education is best delivered at the village level using small group discussions supported by stimulating audio-visual material. Small groups are lead by a trained group

facilitator. The process may be perceived as labour intensive and time consuming, but this is the price of achieving effective communication.

TABLE 4.4.1 ORGANIZATIONAL INVOLVEMENT

<u>Phase</u>	<u>Total Community</u>	<u>Water Committee</u>	<u>Promoters</u>	<u>PHED Engineers</u>	<u>Govern- ment Approval Bodies</u>	<u>Construc- tion Contra- ctors</u>	<u>Trainin Organi- zations</u>
Community Preparation	*	*	*				
Planning and Design		*	*	*	*		
Construction		*		*	*	*	
Community Training	*	*	*				*
Scheme Start-up		*	*	*			
Follow-up	*	*	*	*			

Hygiene education does not appear as an isolated project component in this plan. To achieve greatest impact, hygiene education is included in a number of other project components, providing common messages and approaches that are delivered through a number of channels. The various approaches are summarized below.

At the National level, efforts will be made to develop improved hygiene education materials and methods. This development process will supplement but not replace the efforts undertaken at the Provincial level. Plans for National investment in hygiene education have been included in the National Investment Plan.

The Provincial hygiene education approach will be developed and initiated by the community involvement advisory group attached to LGRDD. This group will contain at least one person with demonstrated experience in rural hygiene education. Hygiene education will become an integral portion of the community involvement process, with village forums

containing messages related to the preservation of water quality, personal hygiene practices, latrine construction or water borne diseases (particularly diarrhoea and treatment of dehydration).

As stated, good hygiene education requires not only sound messages but also an effective delivery mechanism. The advisory group will be responsible for designing improvements to the methods of interaction normally used by Government workers at the village level. These improvements will be introduced and Government employees will receive both training and on-the-job experience in using the methods. The advisory group will secure appropriate audio-visual materials to use in the process. Resources currently exist in Punjab for the production of high quality flip-charts supported by cassette programmes.

Political support for the involvement of Department of Health staff from a variety of levels will be secured. Health Education Unit staff, both at the Provincial and Divisional level, will be included in the process of preparing hygiene education methods and materials. The Provincial advisory group would use Health Department Staff to implement hygiene education in the District.

An important step in the community involvement and hygiene education process is the training of volunteers at the Markaz level. This is designed to permit the active inclusion of village level Department of Health staff in the community involvement process. Health workers will receive training on interactive teaching methods and gain an opportunity to develop their skills in a supervised setting. Once health workers discover the ease and effectiveness of using small group discussions supported with audio-visual aids, they will be motivated to conduct this type of session in their routine activities. The project includes provision of audio-visual materials to Basic Health Units to facilitate on-going hygiene education at the village level.

Resource limitations prohibit the Province-wide distribution of audio-visual materials, however the strategy proposed permits introduction and testing of the method. Health Education Unit staff will be involved in the entire process and the decision will be theirs to incorporate the methods on a Province-wide basis.

Two other channels have been proposed for including hygiene education in projects. Both have been described in sections on training. The first involves enhancements to the primary school curriculum to include health messages integrated with other subjects.

The second channel involves including hygiene education sessions at the Lalamusa Academy. The Provincial advisory group attached to LGRDD will oversee the preparation and use of appropriate materials.

## 5. INVESTMENT PLAN

### 5.1 Present Situation

The estimated total investment in rural water supply, drainage and human waste disposal systems for fiscal 1989/90 is Rs. 1220 million (M). These funds will be provided by:

• Annual Development Programme	Rs. 940 M
• People's Program;	Rs. 240 M
• Local Government; and	Rs. 20 M
• UNICEF.	<u>Rs. 20 M</u>
Total	Rs. 1220 M

The investment is divided into the following components:

• water supply;	Rs. 610 M
• drainage; and	Rs. 600 M
• human waste disposal.	<u>Rs. 10 M</u>
Total	Rs. 1220 M

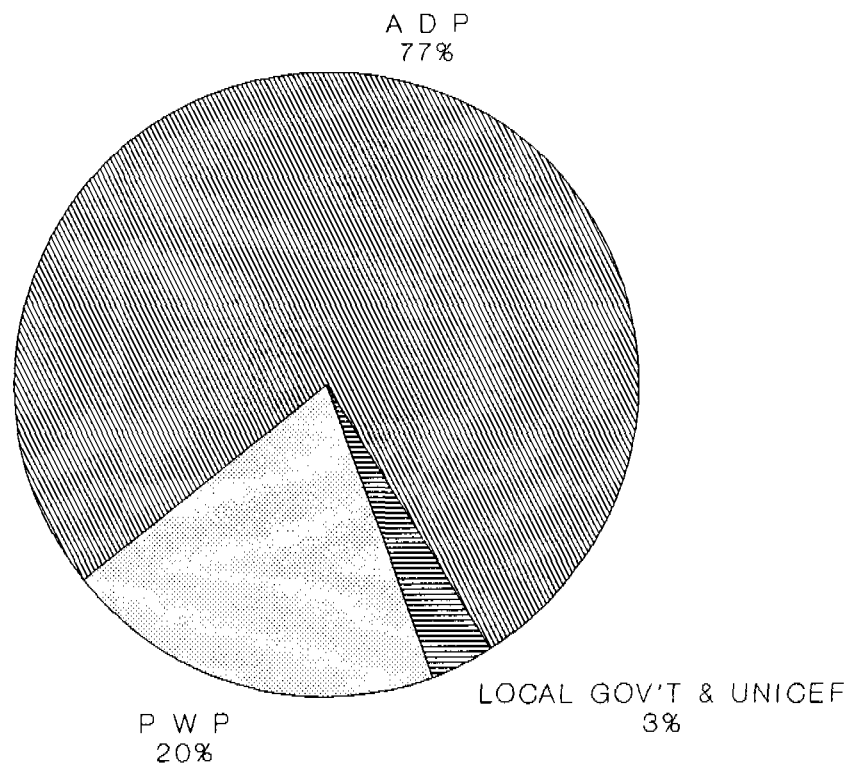
This distribution is based on half the People's Programme sector funds going to water and half to drainage schemes. There is no direct allocation made for training, community development, hygiene education or support to the private sector (Figure 5.1.1). All references to currency in this chapter are in constant July 1989 Rupees unless specifically noted otherwise.

### 5.2 Investment Plan 1990/91 to 1992/93

The investments presented exclude the People's Programme, Local Government, UNICEF and private sector contributions. Investments referenced will include only ADP and new Donor funding.

On this basis, the recommended annual investment for the balance of the Seventh Five Year Plan is Rs. 1040 million. Of this, Rs. 940 million would be provided by the ADP and Rs. 100 million, or 10% by Donor funding. Funding would be allocated to the various sector

# EXISTING INVESTMENT PLAN 1989/90



TOTAL PROJECTED SECTOR EXPENDITURE - RS 1220 MILLION

FIGURE 5.1.1

activities as listed in Table 5.2.1 and shown in Figure 5.2.1. Estimates indicate that the operation and maintenance expenditures for PHED run water schemes will continue to rise throughout the Seventh Plan period.

**TABLE 5.2.1 RECOMMENDED AVERAGE INVESTMENT ALLOCATION  
1990 to 1993 (Rs. in Millions)**

<u>Sector Component</u>	<u>Govt ADP</u>	<u>Donors</u>	<u>Total</u>
New Water Schemes	430	27	457
O&M for PHED run water schemes	80	-	80
Drainage	430	27	457
Water Scheme Rehabilitation and extension	-	10	10
Water Scheme Sustainability and Hygiene Education	-	22	22
Training		14	14
<b>Total</b>	<b>940</b>	<b>100</b>	<b>1040</b>

### 5.2.1 Annual Development Programme Allocation

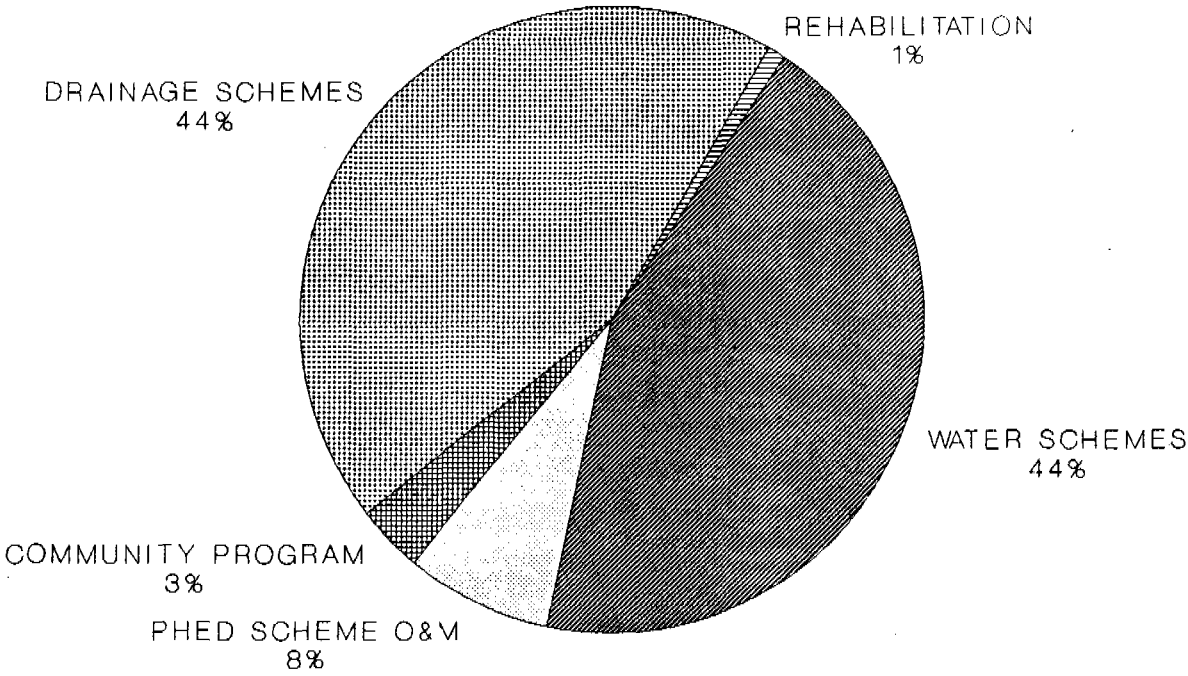
No real growth in the ADP from its present level of Rs. 940 million is anticipated over the next three years. It should be disbursed according to present procedures until 1992/93. If by this time the process proposed for the Donor project has worked well, ADP funds should be integrated into this process on a staged basis.

The ADP investment from 1990 to 1993 will extend water supply and drainage coverage to an estimated 2.8 million people.

### 5.2.2 Donor Allocation

The strategies presented in Chapter 4 provide enhancements to existing procedures. To test their effectiveness it is proposed that Donor funds be utilized to implement the project outlined in this section.

# ANNUAL INVESTMENT PLAN 1990 TO 1993



ADP & NEW DONOR RESOURCES - RS 1040 MILLION

FIGURE 5.2.1



The project scope and its components for the Seventh and Eighth Plan period are shown in Figure 5.2.2. The project's budget is Rs. 800 million over the eight years of the Seventh and Eighth Plan (1990 to 1998). During the first three years the expenditure would be Rs. 300 million. The project scope includes the provision of new integrated water and drainage schemes in target Districts in north and south Punjab. Also included in the south is a significant rehabilitation component which involves restarting abandoned water schemes. Additional components of the project include support for the sustainability of these schemes by:

- strengthening community involvement;
- providing water scheme operator training;
- providing hygiene education; and
- strengthening technical abilities of PHED.

#### Potwar Plateau - New Water and Drainage Schemes

An annual allocation of Rs. 40 million is proposed for the Districts of Rawalpindi, Attock, and Chakwal combined. The technology applied will be site specific. Water schemes will be supplemented with drainage systems, including bricked streets where a need for drainage is established.

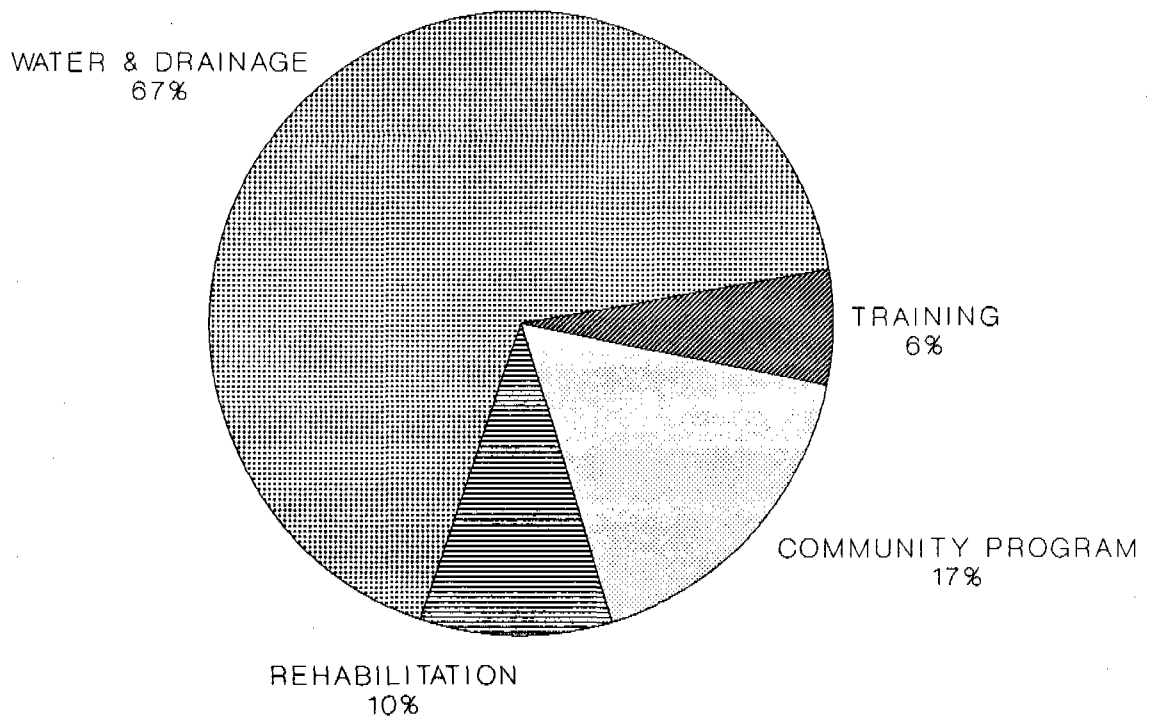
Completion of this work over three years will provide water and drainage coverage to 135,000 people.

#### Punjab South - Water and Drainage Schemes

This component of the project has two parts. Both are implemented in the four southern Districts of Bahawalpur, Bahawalnagar Rahim Yar Khan and Rajanpur.

For the first part of this component, an allocation of Rs. 14 million annually should be used to fund new water and drainage schemes. Again, the need for drainage must be verified before being provided. An integrated water and drainage scheme with concrete drains and bricked streets has however been budgeted for each village.

# AVERAGE ANNUAL DONOR INVESTMENT 1990/91 TO 1997/98



ANNUAL ALLOCATION - RS 100 MILLION PER YEAR

FIGURE 5.2.2

Over three years this investment will provide integrated water and drainage facilities to 45,000 people.

For the second part of this component, Rs. 10 million annually should be allocated to rehabilitate abandoned schemes, extend distribution piping, and add drainage with bricked streets. As for new schemes, these facilities should not be provided unless the committee has met specific criteria. These criteria must include accepting responsibility for subsequent operation and maintenance costs.

This investment will reinstate water service and provide drainage facilities to 55,000 people over three years. In total, the Punjab south component will provide water and drainage coverage to 100,000 people in the first three years.

#### Community Involvement and Hygiene Education

The community involvement component includes Pakistani and expatriate advisor assistance for a fixed duration to support the Water and Sanitation Unit in LGRDD. The entire operating budget required for the advisory group will be provided from Donor funds. In supporting LGRDD, the advisory group will liaise with other government departments and NGOs that have rural water or health mandates. Improved methods for involving communities in the water sector will be developed and tested.

The advisory group will work in seven Districts over the first three years and expand their activities to other Districts thereafter. Effective units will be established at the District level to promote water and sanitation developments and hygiene education in villages. Funds have been allocated to provide support to Districts in the form of vehicles, training and audio visual materials.

The total cost of this component is Rs. 62 million for the period of 1990 to 1993.

#### Training

Human resources development through training is directed towards PHED, LGRDD, elected officials, and the population at large. The training is designed to prepare involved

institutions and recipient communities to maximize the benefits of the investment being made.

Within PHED the focus will be directed towards:

- providing a training coordination capacity;
- providing short term technical training for senior and sub-professional engineering staff;
- establishing a human resource information system; and
- providing additional resources to the library.

This will be accomplished with the assistance of one counterpart consultant who will report to the Chief Engineers.

The total cost of the PHED component will be Rs. 16.8 million with Rs. 16.5 million allocated between 1990 and 1993.

Overall direction of the human resources development focus within LGRDD will be to strengthen the Academy at Lalamusa. This will be accomplished by:

- designing, developing and implementing new courses for operation and maintenance personnel;
- selecting, and installing new equipment to support operation and maintenance courses;
- upgrading teaching staff;
- upgrading existing courses for elected local government officials and village promoters; and
- establishing a human resource information system.

To assist the Academy, two counterpart consultants will work with the principal and chief instructor.

The Donor cost of this investment in LGRDD in the first three years will be Rs. 27.3 million, with Rs. 26.8 million allocated between 1990 and 1993.

Primary level education will be targeted at introducing a revised integrated curriculum and upgrading the teacher training process. To facilitate these changes it is proposed that the existing World Bank Primary Education Project be the implementation vehicle. Utilization of this mechanism will not require additional investment.

The polytechnics and colleges of technology produce a major segment of the sub-professional staff employed at PHED and LGRDD. The investment in these educational institutions will be for long and short term gains. The process will involve the expansion of the Civil Technology curriculum to include rural water supply and drainage topics. Equipment and library materials will be provided and the faculty will be trained.

In turn the polytechnics will provide training to the sub-professional engineering staff of PHED, and the regular student body. This process will be adopted in each province, thereby gaining a national focus. The investment is a Federal contribution and therefore does not require any investment at the provincial level. Selected senior engineers will be provided with training in hydrology to strengthen PHED in this important area.

The Directorate of Manpower and Training will provide masonry and pipefitting training to rural artisans through existing programmes at technical training centres.

The total cost of this programme will be Rs. 3.4 million, with Rs. 2.2 million allocated between 1990 and 1993.

### 5.3 Investment Plan 1993/94 to 1997/98

The expected average annual investment for the Eight Five Year Plan is Rs. 1040 million. Of this, Rs. 940 million would be allocated from the Annual Development Programme and Rs. 100 million annually from Donor investment. Funds would be allocated to different components of the project according to the distribution presented in Table 5.3.1.

**TABLE 5.3.1 RECOMMENDED INVESTMENT ALLOCATION**

1993 to 1998 (Rs. in Millions)

<u>Component</u>	<u>ADP</u>	<u>Donor</u>	<u>Total</u>
New Water Schemes	1950	187	2137
Drainage	1950	187	2137
O&M of PHED run water schemes	800	-	800
Rehabilitation and Extension	-	50	50
Community Development and Hygiene Education	-	74	74
Training	-	2	2
<b>Total</b>	<b>4700</b>	<b>500</b>	<b>5200</b>

5.3.1 Annual Development Programme Allocation

The Eighth Plan is envisioned as a continuation of the programme started in the Seventh Plan with an annual allocation of Rs. 940 million, yielding a total allocation of Rs. 4700 million for the Eighth period. The procedures implemented in the Donor project will be evaluated, refined as necessary and integrated into the ADP financed investment on a staged basis. Given that the cost to operate PHED schemes will average Rs. 160 million in this period, the Annual Development Programme's contribution would cover an additional 4.2 million people for water and drainage facilities.

5.3.2 Donor Allocations

Potwar Plateau - New Water and Drainage Schemes

Funding on this component would continue at the same level of Rs. 50 million per year or Rs. 250 million for the Eighth Plan Period. Work should continue to serve communities meeting the village selection criteria and having the lowest cost per capita for providing water supply.

This investment will result in coverage being extended to an additional 270,000 people.

#### Punjab South - Water and Drainage Schemes

Depending on a review of progress in these Districts relative to others, an allocation of Rs. 174 million per year should continue for this investment through the end of the Eighth Plan period. The project should be reassessed at this time, particularly the rehabilitation component. With funding remaining at Seventh Plan levels, an additional 195,000 people will be covered by water and drainage services.

#### Training

The training project will finish in 1994/95 with an expenditure of Rs. 2 million in the 1993 to 1995 period.

#### Community Involvement and Hygiene Education

An investment of Rs. 74 million will be allocated over the five year period with one of the three original overseas staff remaining until the end of the Eighth Plan.

### 5.4 Disbursement Schedule Summary

As reflected in Table 5.4.1, allocations from the ADP would continue to decline gradually in real terms throughout the Plan period, if operation and maintenance costs paid by PHED continue to increase. Donor funds for training would begin high and decrease with time as shown.

**TABLE 5.4.1 INVESTMENT PLAN DISBURSEMENT SCHEDULE**

(Rs. in Millions)

	<u>1991</u>	<u>Year</u> <u>1992</u>	<u>1993</u>	<u>1990 to</u> <u>1993</u> <u>Sub</u> <u>Total</u>	<u>1993 to</u> <u>1998</u> <u>Sub</u> <u>Total</u>	<u>Grand</u> <u>Total</u>
<b>ADP funds</b>						
- Water	440	430	420	1290	1950	3240
- Drainage	440	430	420	1290	1950	3240
- O&M	60	80	100	240	800	1040
<b>Donor Project</b>						
- Potwar Plateau Schemes	40	40	40	120	250	370
- South Punjab Schemes	20	22	30	72	174	246
- Training	27	17	2	46	2	48
- Community Involvement and Hygiene Education	18	21	23	62	74	136
	1045	1040	1035	3120	5200	8320

5.5

**Summary of Donor Costs**

The costs presented in the investment Plan have been in Rupees. Part of the cost is in foreign currency. Table 5.5.1 summarizes the distribution of total costs between Rupees and foreign costs.



**TABLE 5.5.1 DONOR COSTS - LOCAL/FOREIGN**

(US Dollars in Millions)

	<u>Local</u>	<u>Foreign</u>	<u>Total</u>
Potwar Plateau - New Schemes	18.1	-	18.1
South Punjab - New Schemes	12.0	-	12.0
Community Involvement & Hygiene Education	3.2	3.5	6.7
Training	1.1	1.3	2.4
Total	\$34.4	\$4.8	\$39.2

**5.6 Government Recurring Costs for Donor Project**

The Potwar Plateau and South Punjab new water and drainage scheme components of the project will not add to the recurring budgets of LGRDD or PHED.

The annual recurring costs of implementing the Community Involvement and Hygiene Education component will be Rs. 400,000 for LGRDD and Rs. 60,000 for each of seven District Councils involved in the project.

Recurrent costs for the training coordinator and support staff within PHED will involve annual costs of Rs. 12,000 for one BPS-18 position. LGRDD recurrent costs will involve the cost of seconding two assistant engineers from PHED for an estimated Rs. 7000.

## 6. FINANCIAL RESOURCE AVAILABILITY

### 6.1 Macro Resource Availability

During the last few years, the resource position of the public sector has deteriorated significantly. Domestic resource mobilization has been constrained by a relatively inelastic and narrow tax base. Recurring expenditures on defence, debt servicing, general administration and subsidies have risen rapidly. Recurring deficits of the Provinces have widened considerably requiring large and growing subventions and grants-in-aid from the National Government. The consequence has been that development expenditure (ADP) in the public sector has become more dependent upon the flow of external resources.

Table 6.1.1 presents the ADP expenditures at constant prices of 1987/88 during the Fifth and Sixth Plan periods and the first year of the on-going Seventh Plan. Based on the recent National budget, a projection has been made of the level of real ADP for the next financial year. The table indicates that real ADPs of the National Government were constant during the Fifth Plan period, but showed growth during the Sixth Plan period. Provincial ADPs have demonstrated growth throughout the decade culminating with exceptionally large increases between 1985/86 and 1987/88. This enhanced rural development by increasing allocations for social and physical infrastructure (including rural water supply and sanitation), primarily through Provincial line departments.

The change of Government in 1988 along with a tightened resource situation and emergence of inflationary pressures in the economy has led to a cutback in development allocations. At the National level, it is expected that current real ADP expenditure will decline by about 2% from the previous year. Provincial development expenditure is likely to fall more dramatically, by almost 23%. The only component of the ADP which is likely to increase significantly is the Special Development Programme, which does not impact Punjab as it is directed at the more undeveloped areas of the country.

**TABLE 6.1.1 REAL ADP EXPENDITURES**

(Rs in Billion at constant prices of 1987/88)

	<u>National</u>	<u>Provincial</u>	<u>Special</u>	<u>Programme</u>	<u>Total</u>
<u>Fifth Plan Period</u>					
1978/79	29.4	7.2	-	-	36.6
1979/80	26.9	5.3	-	-	32.2
1980/81	29.8	6.4	-	-	36.2
1981/82	30.1	8.0	-	-	38.1
1982/83	29.7	8.3	0.2	-	38.2
<u>Sixth Plan Period</u>					
1983/84	27.4	8.9	0.5	-	36.8
1984/85	31.7	8.4	0.6	-	40.7
1985/86	31.5	10.7	0.9	-	43.1
1986/87	34.7	13.1	0.7	-	48.5
1987/88	34.0	14.5	1.3	-	49.8
<u>Seventh Plan Period</u>					
1988/89	33.4	11.2	3.4	-	48.0
1989/90#	32.4	10.8	3.1	2.5	48.8

\* ADP expenditures at current prices have been converted into constant prices by applying the implicit GDP deflator for gross domestic capital formation

# Budget

Sources: Pakistan Economic Survey, 1988/89, Economic Advisers' Wing, Ministry of Finance, GOP  
Budget-in-Brief, 1989/90, Ministry of Finance, GOP

There has been a noticeable change in priorities with the arrival of the new Government. The Five Point programme has been abandoned and this explains the precipitous decline in Provincial ADPs from the peak level. Instead, the Government has launched a Peoples Programme, which will also involve allocations for rural development including roads, education and water supply. Execution responsibility will primarily rest with District committees working directly under the control of the National Government.

Indications from the National budget of 1989/90 are that the recently established pattern in real ADP expenditures will continue. The National ADP could decline further in real terms by about 3% and the Provincial ADP by an equivalent percentage. The Peoples Programme will involve a development allocation of Rs 2.5 billion (at 1987/88 prices).

The prospects for the remaining years of the Seventh Plan period (up to 1992/93) are for continued pressure on public finances with anticipated rapid increases in debt servicing liabilities, which have emerged as the largest item in the recurring budget of the National Government. Unless a dramatic breakthrough is achieved in making the tax base more broad-based and buoyant, it is unlikely that even with significantly higher levels of foreign loans and grants, the overall development programme in the public sector will increase in real terms. Already the total public sector development programme is operating at a rate of between 70 to 75% of the target level in the Seventh Plan.

Not only will it be difficult to sustain real ADP at its present level but pressures on development funds will increase as limits to growth are attained due to bottlenecks in physical infrastructure. As shown by Table 6.1.2, the need for physical infrastructure has caused larger allocations to be made to the power and transport and communications sectors. Simultaneously, cutback is visible in sectors like physical planning and housing and rural development from which investments in rural water supply and sanitation have traditionally been financed. Greater external Donor assistance will be required if the country is to come close to achieving the Seventh Plan targets for drinking water and sanitation.

**TABLE 6.1.2 REAL SECTORAL ADP EXPENDITURES**

Constant prices of 1987/88

(National and Provincial Governments combined)

	<u>Energy</u>	<u>Transport and Communications</u>	<u>Physical Planning and Housing</u>	<u>Rural Development</u>	<u>Others</u>	<u>Total</u>
<u>Fifth Plan Period</u>						
1978/79	5.2	7.2	2.7	0.4	21.1	36.6
1979/80	4.8	5.7	2.1	0.3	19.3	32.2
1980/81	5.3	6.9	2.7	0.6	20.7	36.2
1981/82	6.3	7.5	2.6	1.0	19.9	37.3
1982/83	7.2	7.5	2.8	1.3	19.4	38.2
<u>Sixth Plan Period</u>						
1983/84	6.5	6.3	3.3	1.2	19.5	36.8
1984/85	9.6	6.6	3.3	1.2	20.0	40.7
1985/86	9.5	7.3	3.3	1.0	22.1	43.2
1986/87	11.5	6.4	4.8	2.2	23.7	48.6
1987/88	13.1	5.1	5.6	2.7	23.3	49.8
<u>Seventh Plan Period</u>						
1988/89	12.8	7.1	3.7	1.9	22.5	48.0
1989/90	13.8	N.A	N.A	N.A	N.A	48.8

Sources: Pakistan Economic Survey, 1988/89, Economic Advisers' Wing,  
Ministry of Finance, GOP  
Budget-in-Brief, 1989/90, Ministry of Finance, GOP

The emerging scenario for the next few years is characterized by the following salient features:

- no growth or only modest growth in the overall public sector ADP;
- a larger share being executed by the National Government;
- higher priority being given to investments in physical infrastructure; and
- lower real allocations for the social sectors, including rural water supply and sanitation.

Resource constraints confronted by the Government are not only operative on the development side but also on recurring expenditures. The last two National budgets have included an economy drive in current expenditures by Government departments. Table 6.1.3 indicates the trend in real recurring expenditures on general administration, social, economic and community services (including PHED) by the National and Provincial Governments. These expenditures grew rapidly up to 1986/87 but were followed by an attempt to contain the increase. In 1988/89 real recurring expenditures by both levels of Government on administration and on the operating and maintenance of publicly provided services are likely to be below the level attained in 1986/87, with the prospect that they would be reduced even further in 1989/90. The pressure on Provincial Governments to cut back on recurring expenditures is likely to be exceptionally strong in view of the decision by the National Government to freeze the total flow of funds (revenues from divisible pool of taxes plus non-obligatory grants) to the Province at the nominal level of 1988/89.

The economy drive on recurring expenditures implies that the ability of Provincial line departments (including PHED and LGRDD) to expand employment to undertake new initiatives will be limited in the next few years. In addition, there will be strong pressures to limit operation and maintenance expenditures on the existing network of services. The Provincial Government may try to develop its own revenue sources in the face of limits on National Government support. This opens up the prospect for more serious cost recovery with escalation in the level of user charges and improvements in revenue collection mechanisms.

TABLE 6.1.3 RECURRING EXPENDITURE

## NOMINAL AND REAL [1] GENERAL ADMINISTRATION AND SERVICES [2]

(Rs in Billion)

	<u>National</u>		<u>Provincial</u>	
	<u>At Current Prices</u>	<u>At Constant Prices</u>	<u>At Current Prices</u>	<u>At Constant Prices</u>
<u>Sixth Plan Period</u>				
1983/84	11.2	15.1	15.2	20.5
1984/85	13.2	17.8	16.8	22.7
1985/86	14.1	17.4	19.6	24.1
1986/87	21.1	22.8	24.0	25.9
1987/88	18.0	18.0	27.5	27.5
<u>Seventh Plan Period</u>				
1988/89	21.6	19.8	27.8 [3]	25.5 [3]
1989/90	23.1 [4]	19.3	N.A	N.A

1 At constant prices of 1987/88. The nominal expenditures have been converted into real expenditure by using the implicit GDP deflator for the public administration and defence sector in the National income accounts.

2 On economic, social and community services (including PHED)

3 Budget estimate

4 Including cost of 5% salary increase for employees up to BPS-16.

Sources: Pakistan Economic Survey, 1988/89, Economic Advisers' Wing, Ministry of Finance, GOP  
Budget-in-Brief, 1989/90, Ministry of Finance, GOP  
Budget Speech, National Minister of State for Finance, June 3, 1989

## 6.2 Sector Resource Availability

Table 6.2.1 presents a summary of the past sectoral ADP allocations and actual expenditures for the Fifth, Sixth and the first year of the Seventh Plan Period. Total Provincial allocations

have grown substantially between 1985 and 1988 after which the total dropped from Rs. 8920 million in 1987/88 to Rs. 7450 in 1988/89, and remained essentially the same for 1989/90. Due to a shift in priorities, the allocation to rural water and sanitation peaked in 1988/89 at Rs. 1125.9 million and has declined to Rs. 940 million for 1989/90, a drop of 23% in real terms.

The allocation to rural development through LGRDD has also begun to drop. This does not directly affect the rural water and drainage sector as these funds are not directed at rural water and drainage projects. Expenditures by District Councils and Development Authorities on rural water and drainage schemes are small, and there are no Special Development Programme expenditures planned for Punjab.

Recurring expenditures for PHED and LGRDD are shown in Table 6.2.2. They have risen significantly between 1985/86 and 1988/89 and are contributing to the Provincial Governments financial deficit. Budgets covering recurring expenditures will come under increasing pressure as the National Government reduces support to the Provinces.

A more detailed review of PHED actual capital and operating expenditures is presented in Table 6.2.3. The allocation for operating and maintaining schemes not transferred is increasing rapidly and has more than doubled in three years. If left unchecked, this item will continue to divert increasing amounts of funds from capital projects, thus reducing the coverage which can be achieved. PHED operational expenditures against capital expenditures has dropped from 19.8% of total expenditure in 1985/86 to 7.5% in 1987/88, signalling a significant increase in utilization of the department's resources. With an impending drop in capital expenditures planned for 1989/90, PHED's capacity to process projected expenditures should be adequate.



TABLE 6.2.1 PAST ADP ALLOCATIONS AND EXPENDITURES

Year	(Current Rs. in Million)						
	Rural Water Supply and Sanitation		Urban Water Supply and Sanitation		Rural Development (LGRDD)		Total (ADP)
	Alloc	Expend	Alloc	Expend	Alloc	Expend	Alloc
Fifth Plan							
1978/79	72.2	46.9	53.6	43.6	140.0	112.9	2324.0
1979/80	104.8	80.2	47.6	45.4	125.0	163.3	2500.0
1980/81	104.4	107.6	52.8	60.5	140.0	169.4	2800.0
1981/82	100.9	115.2	55.5	61.4	294.9	254.6	3350.0
1982/83	160.0	170.6	80.4	91.9	310.5	223.2	4050.0
Sixth Plan							
1983/84	190.8	217.9	80.6	102.0	220.0	202.7	4220.0
1984/85	190.8	203.4	83.0	92.0	262.6	206.6	4300.0
1985/86	265.8	255.5	130.0	130.0	511.0*	190.1	5678.0
1986/87	386.0	315.0	157.5	132.7	265.5	243.8	6870.0
1987/88	1000.9	904.9	113.7	94.1	264.5	242.1	8920.2
Seventh Plan							
1988/89	125.9	-	53.30	-	35.9	-	7450.0
1989/90	940.0	-	40.00	-	205.0	-	8100.0

\* Includes block allocation of Rs. 261.0 M.

TABLE 6.2.2 RECURRING BUDGETS AND ACTUAL EXPENDITURES\*

<u>Year</u>	(Current Rs. in Million)					
	<u>PHED</u>	<u>LGRDD</u>	<u>Total for Provincial Government</u>			
	<u>Budget</u>	<u>Actual Expenditure</u>	<u>Budget</u>	<u>Actual Expenditure</u>	<u>Budget</u>	<u>Actual Expenditure</u>
Fifth Plan						
1978/79	16.90	14.85	26.48	28.96	13071.61	11529.28
1979/80	16.77	15.02	44.37	47.24	13895.06	12189.24
1980/81	18.17	17.07	50.14	91.81	14766.61	17767.62
1981/82	19.42	21.58	57.61	85.51	17378.37	17663.82
1982/83	23.75	28.52	62.03	84.71	21228.68	22003.38
Sixth Plan						
1983/84	31.76	34.70	78.03	98.11	24012.88	20671.04
1984/85	38.62	40.44	91.53	95.39	21847.96	15923.79
1985/86	40.91	48.73	103.65	108.24	25679.07	25406.03
1986/87	55.71	58.98	230.77	116.91	31601.05	24374.50
1987/88	72.99	66.67	155.49	217.05	38806.61	23596.86
Seventh Plan						
1988/89	91.71	49.72#	173.07	151.65	41103.64	N.A.
1989/90	83.77	-	181.55			

\* Figures extracted from provincial publication "Estimates of charged expenditure and demand for grant (non-development)".

# Figures provided by the department. 1988/89 figures are for the period up to February 1989.

**TABLE 6.2.3 PHED OPERATIONAL EXPENDITURE**

(Current Rs. in Million)

<u>Year</u>	<u>Total Capital Expen- diture</u> [1]	<u>Maint- enance Expen- diture</u>	<u>Capital Expen- diture</u>	<u>Recurring Expen- diture</u> [2]	<u>Perc- entage</u> [5]
1983/84	217.95	6.00	211.95	34.70	16.4%
1984/85	203.49	7.50	195.99	40.44	20.6%
1985/86	255.55	9.50	246.05	48.73	19.8%
1986/87	315.04	13.20	301.84	58.98	49.7%
1987/88	904.97[3]	20.20	844.77	66.67*	7.5%
1988/89		26.00[4]			
1989/90		44.65[4]			

1 Provided by PHED.

2 Source provincial publication.

3 This includes expenditure out of block allocation of Rs. 532.4 M.

4 Budget figures.

5 Recurring expenditure as a percentage of total expenditure.

### 6.3 Existing Donor Agency Involvement

During fiscal years 1984 to 1988, Pakistan received development assistance commitments from foreign Donors of US\$ 2.4 billion annually. The rate of disbursements averaged US\$ 1.3 billion annually between 1983 and 1987, and increased to US\$ 1.8 billion in 1988.

Of the total commitments made during the past five years, 82% have been targeted to four sectors (agriculture, industry, water and power, transport and communications) and 6% for the social sectors (population and welfare, education and rural development).

In Punjab, several Donors are working in the rural water and sanitation sector. UNICEF is initiating a project with LGRDD to promote latrines and hand pumps in seven barani Districts. A German agency is continuing ground water investigations in the Cholistan Desert. In addition the British are proposing to initiate a ground water study in the Potwar

Plateau to locate water for use by rural villages. This project should be under-way by January 1, 1990.

#### 6.4 Recurrent Budget Implications

##### 6.4.1 Operations and Maintenance

In many cases it remains difficult to persuade Union Councils to accept responsibility for completed water schemes. This difficulty is contributing to a growing operation and maintenance liability for PHED. In 1987 Rs. 20 million was allocated for operating and maintaining schemes. In 1988 this allocation was increased to Rs. 26 million. Projections indicate this liability could grow to Rs. 100 million in 1993 and Rs. 220 million in 1998 if the present trend continues.

Communities are often reluctant to accept responsibility for schemes because the tariffs collected are not sufficient to meet expenses. This is why it is important to have the community accept the level of service they will be receiving, and the responsibility to pay for operation and maintenance costs, before the scheme is built.

Of the more than 300 schemes already transferred to Local Government, not all are self-financing. Some Districts such as Dera Ghazi Khan are subsidizing communities who are not collecting sufficient tariff. This is reasonable if the District Council has established that *certain communities cannot pay for water and therefore has made a specific policy decision to subsidize these schemes.* Where the ability to pay exists, an increased effort should be made to provide a level of service which will increase willingness to pay. In other Districts such as Bahawalpur, schemes turned over to the community are being abandoned primarily due to insufficient income to operate the scheme. The financial strength of water schemes must be enhanced to improve sustainability and to reduce the liability on PHED or Local Government for operation and maintenance costs.

##### 6.4.2 Affordability and Willingness to Pay

There are many communities that have been paying for the operating and maintenance costs of their own schemes for years. These schemes are almost exclusively funded by tariffs collected from households by the water scheme operator. Some villages which operate in

a spirit of cooperation or which exercise some method for tariff enforcement are experiencing a positive cash flow on their operation.

Schemes with positive cash flows usually have house connections for a large portion of homes. Schemes which are financially marginal often have only a small portion of the community tied into the distribution system with house connections. Extending distribution mains into all streets will permit more house connections and thus a greater willingness to pay for water service.

Willingness to pay for stand-post water schemes has been observed to be much lower than that for house connections. 55% of surveyed villagers were prepared to pay an average monthly tariff of Rs. 10 per month. The remaining villagers indicated no willingness to pay for delivered to stand-posts. When offered house connections, 96% were prepared to contribute an average of Rs. 17 per month, and only 4% indicated no willingness to pay. When asked about preferences for the frequency of tariff payments, the vast majority preferred regular monthly payments.

#### 6.4.3 Community Financing Mechanisms

In Punjab almost the only mechanism used to recover operation and maintenance costs from households is a direct monthly charge. Rates generally range from Rs. 10 to 20 per month, although some communities charge much more.

Two methods of collecting tariffs are commonly used. If a bank is available within a reasonable distance, tariff announcements are made using bank statements distributed to households. Payments are then deposited by each resident into the bank. For village run schemes, the Union Council secretary or revenue collector will often distribute notices.

If a bank is not available, PHED will use their District staff to collect payments. For community run schemes, the Union Council secretary or other responsible person in the village will collect the tariffs. A register will be kept to record payments. This approach of paying directly for the service is well established in over 300 Local Government or community run schemes.

There are existing schemes where the full cost of operation and maintenance is not affordable to the community even when full recovery of a reasonable tariff is achieved. This

may occur in hilly areas where high pumping costs will make full cost recovery difficult in the short term. For any new schemes proposed where the community will not be able to pay full operation and maintenance costs, the decision to proceed should be made only with careful consideration, as a long term liability for the Government to subsidize the scheme will result.

A policy to arrange a uniform Provincial water tariff to permit financially viable schemes to support unviable schemes was considered. This centralized approach is not recommended because it runs contrary to the decentralizing concept of this project and the Seventh Five Year Plan. It also detracts from the central issue of this project which is to have the community accept responsibility for their own scheme. If some of the tariffs collected are taken from the village to support other less viable schemes, the community's sense of ownership and control of their scheme will drop, placing the viability of financially healthy schemes in question. The centralized tariff collection and operation and maintenance approach is more appropriate for central utilities such as power and gas which are not community maintained and for which the same level of community ownership of the facility is not as critical to its viability.

The tariff rate structure should be two tiered where those with house connections pay the full tariff. Those within the community who decline to receive a house connection should still pay a reduced tariff because they are receiving benefit from having the water scheme in their village. It must be made clear to the community before a scheme is built that all must contribute to the scheme. For those few who cannot afford any amount, the community can make suitable exceptions or alternate arrangements.

## 7. PROJECT MANAGEMENT AND IMPLEMENTATION

### 7.1 Community Involvement and Hygiene Education

#### 7.1.1 Objectives

Cooperation between LGRDD and UNICEF has established an important foundation for the promotion of water and sanitation at the village level. This capacity requires expansion to permit larger water and drainage schemes to be included in the process. This plan proposes additional staff and resources be directed to the Water and Sanitation Unit within LGRDD to meet the following objectives:

- strengthening of the communication channels between Government institutions and communities;
- enhancement of the steps for processing village level development in the sector; and
- refinement of mechanisms to:
  - prepare communities for their increased responsibilities in the sector;
  - select communities ready for input of new schemes;
  - gain greater utilization of Union Councillors and other community representatives in community involvement and hygiene education processes for the sector; and
  - permit the occurrence of more media-supported face-to-face hygiene education at the village level.

Procedures being developed by LGRDD and UNICEF include operations at the Provincial and District levels. Additional staff will be placed in the Provincial Unit for a fixed duration. Their primary task will be to assist the process of establishing functional Water and Sanitation Units at the District level. Members of the District unit will provide orientation and specialized training to Union Councillors and other community representatives. When

village forums and education sessions are held, members of the District unit will call upon the trained representatives to supplement their efforts.

Support to Health Department staff operating at the village level will be provided by both the Provincial and District Water and Sanitation Units. Inputs will include audio-visual materials for hygiene education and training on their use.

#### 7.1.2 Additions to LGRDD's Provincial Water and Sanitation Unit

Consultants will be hired to work in LGRDD at the Provincial level for a fixed duration. The consultants will provide LGRDD with additional expertise in community development, rural water supply, health, adult education, materials production and evaluation. It is recommended that at least half of the consultants be female and that half the consultants have appropriate work experience gained in rural areas inside Pakistan.

The consultants will work with LGRDD to further refine existing community involvement and hygiene education processes. Specifically, the consultants will assist in:

- providing liaison with other organizations involved in the sector and in health promotion;
- establishing permanent Water and Sanitation Units at the District level, including the identification of available human resources for secondment into District Water and Sanitation Units;
- upgrading the skills of District level staff and supporting them in their work;
- designing, testing and recommending a procedure for selecting communities and processing their scheme from approval to start-up;
- monitoring the disbursement of funds and the implementation process; and
- developing strategies to effectively include women in community involvement and hygiene education processes.



The consultants will initially devote most attention to ensuring successful implementation of processes in the recommended project Districts. Once enhancements to current structures are shown to be effective, then Water and Sanitation Units can be developed in other Districts.

As shown in previous sections, budget requirements of the Provincial level inputs will be met using external funds.

### 7.1.3 District Water and Sanitation Units

LGRDD is in the process of establishing Water and Sanitation Units in a number of Districts. This process will be fostered and strengthened. It is proposed that a full-time group take on responsibility for District level promotion of community involvement and hygiene education in the sector.

The group will be comprised of one or more LGRDD District level staff members, a technical person seconded from PHED and one or more community development workers seconded from the Social Welfare Department, Health or another related organization. Working with this professional group will be a number of Water and Sanitation Promoters employed by the District Council (as is the current arrangement with LGRDD and UNICEF). Through proper composition, the group will have expertise in community participation, rural water supply, rural extension work and adult education. Efforts will be made to have women fill at least half the positions in the group.

The primary purpose of the District Water and Sanitation Units is to promote and facilitate the implementation of new water schemes that are sustained by recipient communities. The District units will receive direction, guidance and support from the Provincial unit. Major activities will include:

- introducing into the community involvement and hygiene education process new audio-visual materials and training community representatives on their use;
- conducting community forums and education sessions using trained community representatives;

- encouraging the participation of women in the community involvement and hygiene education process;
- supporting and facilitating liaison between Government and communities through the development of new water schemes; and
- introducing into the Health Department's community based programmes new audio-visual materials for hygiene education and training staff on their use.

#### 7.1.4 Community Representatives Promoting Water and Sanitation

Prior to working at the village level, it is planned that District units will recruit and train a selected group of community representatives to participate in the community involvement and hygiene education processes. This represents an attempt to harness the existing abilities of talented and skilled persons resident in the community.

To implement this procedure, members of the District unit will enter a Markaz and begin a process of identifying and recruiting potential promoters. Selection criteria include a person's willingness to promote development of the community and residence in the community. The involvement of women at this step facilitates subsequent involvement of women at village forums and education sessions. Volunteers who are selected will be respected members of the community, including such individuals as Union Councillors, retired persons, religious leaders, school teachers, women's division field staff, lady health visitors, members of the Basic Health Unit or mobile health teams and other Government extension workers.

Once identified and recruited by District unit staff, these volunteer promoters will:

- attend a training workshop to learn their role and function in facilitating community involvement and hygiene education in sector developments;
- assist District units in village level activities, including providing support at community forums and education sessions; and
- encourage and facilitate community involvement and hygiene education processes between visits from Government representatives.

By actively incorporating this group of people into the process, and upgrading their community involvement and hygiene education skills, valuable human resources are developed for participation in future community endeavours.

## 7.2 Human Resource Development and Training

### 7.2.1 PHED

It is proposed that one expatriate advisor be posted to PHED. The person will report to the Chief Engineer and will assist in the implementation of human resource development by:

- establishing a training coordination capacity;
- producing a human resource information system;
- selecting and arranging training for up to 30 senior engineers and up to 400 sub-professional engineering staff; and
- strengthening the library by adding reference materials (print, film and video).

To facilitate the implementation process, PHED will designate a new training coordinator position (at level BS18) who will report to the Chief Engineer North and the Chief Engineer South. The advisor will act as a counterpart to the coordinator and will impart skills and knowledge pertaining to training needs, job analysis, training plans, management of training programmes, and monitoring and evaluation processes applicable to training. A short term advisor will be required to establish the data base on which a human resource information system will be implemented.

Training for the senior and sub-professional engineering staff will be arranged by the coordination office. Courses will be held at Lahore or Multan Polytechnics. Senior engineers will attend a two or three day course to receive refresher training on new ideas in the design and implementation of rural water supply, drainage and sanitation schemes. Sub-professional engineering personnel will attend a 10 day course which will cover design, construction, and operation and maintenance of rural water schemes. Course costs will be met with project training funds to be administered by the training coordinator. Reference

books will be obtained from both National and international organizations by the coordination office.

The advisor will also assist and advise the PHED training coordinator on matters relating to:

- the preparation of operational work plans;
- setting up the training coordination office and selecting appropriate equipment and furnishing;
- selecting appropriate hardware and software for the human resource information system data base;
- designing the data base criteria and data collection instruments; and
- training data entry personnel.

On completion of the project the following items would be left as a long term asset for PHED:

- an operational training office;
- a functioning human resource information system;
- engineering staff with enhanced skills; and
- an expanded library.

#### 7.2.2 Primary Education

The World Bank is implementing a Primary Education project in Punjab, focusing on developing institutional capacity, policy reform and curriculum improvement. It is proposed that hygiene education be incorporated into new curriculums, following a prototype curriculum being developed and tested by the World Health Organization and UNICEF.

Twelve units provided in six teacher resource manuals permit the integration of water and health lessons into the overall curriculum. For example, hygiene education messages are included in science, home economics and health lessons while general awareness of the sector is included in mathematics (by conducting surveys of water utilization practices) and in art (drawing plants and animals in different situations showing their dependence on water for survival).

The teacher training process currently used in Punjab should be supplemented with this type of curriculum. Learning materials can be developed for actual use by teachers, using methods explained in resource manuals.

### 7.2.3 LGRDD

To implement the human resource development aspects associated with LGRDD's project, it is proposed that two expatriate training advisors be posted to the Academy at Lalamusa. The advisors will report to the principal and will assist the Academy to organize, implement, and evaluate the following:

- the creation of a human resources information system;
- the design, development and delivery of new courses for operations and maintenance personnel on technical issues and hygiene education;
- the selection and installation of new equipment to support operation and maintenance courses; and
- the upgrading of existing courses for elected Local Government officials and village promoters to include water scheme information and hygiene education.

To facilitate the implementation process, one advisor will be charged with assisting in all training activities related to operation and maintenance aspects. The second advisor will assist in course upgrading and the design of the human resource information system. A short term advisor will be required to establish the programme for the data base on which the human resource information system will be implemented.

When required, the Academy will be responsible for coordinating the training of artisans (e.g. masons, plumbers, pipe fitters) at an appropriate technical training centre. Course design will be suited to rural conditions and the cost will be met with project training funds to be administered by the Academy.

New equipment installed at Lalamusa will be representative of the technologies used in existing and planned water systems. Courses will be offered with limited enrolment to permit practical training with hands-on experience. The Academy will second two assistant engineers from PHED to take up positions of trainers for these courses. Advisors will train the assistant engineers in their role.

Courses currently conducted at Lalamusa for elected officials will present overall plans for sector development and certain technical aspects. Procedures for requesting Government assistance and the prerequisites for application approval will be outlined. Hygiene education messages that will accompany the provision of water systems will be introduced.

Sanitation promoters employed by District Councils receive training at Lalamusa. The course curriculum will be updated to include more information on methods of community involvement, technical and management issues and hygiene education.

Upon completion of the project, the following products will remain:

- a functional human resource information system;
- trained scheme operation and maintenance staff;
- trained elected officials, artisans and Academy staff; and
- a water scheme demonstration facility.