Paper No. 143

Drinking water supply coverage to rural areas in Pakistan

By

Engr. S.M. Ashraf

Superintending Engineer, Punjab Public Health Engineering Department

Paper No. 143

DRINKING WATER SUPPLY COVERAGE TO RURAL AREAS IN PAKISTAN

Engr. S.M..Ashraf *

1. INTRODUCTION

It is not a particular time of death which one can escape but it is the incidence of avoidable invalidity and premature death which a man can seek to ensure. Man was without shelter, defenceless against disease and uncertain about food in pro-historic days. As the time passed by man achieved supremacy over wild life, managed to overcome undesirable climate, avoided famine and was to reasonable extent attain success over the spread of disease. With multiplication of population, new problems emerged and even now about 30,000 people die daily due to non provision of potable water and sanitary facility in the Third World countries. According to United Nations estimates about 30% population of all reported diseases are water borne or water caused and that 40% of all deaths are attributable to diseases caused by unhygenic water and unsanitary conditions. The causes and process of communicable diseases are generally not understood even by educated people who are ignorant about microbiology and epidemiology. The pathogenic organisms which are generally simple form of plant or animal live on or in the human body, resulting in rapid multiplication and attack their host who further communicates the disease to other fellows who inhale in that environment.

The most common water related diseases are Tuberculosis, Small Pox, Measles, Dysentery Diarrhoeas, Typhoid, Cholera, Hookworm, V.D., etc. These diseases take heavy toll of life, especially of infants. About 18% of the infants die before reaching the age of five which can otherwise be cut down by 50% by potable water supply. This adds to the human sufferings of the adults of the Rural Community, especially during the rainy season which is the prime time for both agricultural inputs and water related diseases. All those unable to work loose income resulting in mal-

* Superintending Engineer, Punjab Public Health Engineering Department.

nutrition and thus increase in susceptibility to disease and death. The number of water taps per thousand persons is a better indication of health than the number of hospital beds. About one fourth to one sixth of female member's time in Developing and Under-developed World goes waste in lifting unhygenic water from distant sources. This time can, otherwise be usefully utilized towards other projected works such as farming and Cottage Industry leading to extra income and prosperity. Potable water is insurance against disease and infant mortality in Developing Countries.

2. WATER DECADE

This serious problem of supply of clean water and proper sanitation especially to the Rural area was high lighted in the United Nation Conference held at its Headquarter in November, 1980. The Secretary General was of the view that the provision of safe water and sanitation do not merely mean happier and healthier Citizen but also means increased economic productivity. Investment in the human potential is not only moral imperative but it is also sound economics. It was also decided in the said historic meeting that hundred percent population will be served with clean drinking water by 1990 all over the globe. This is possible even if four percent of money spent in purchase of Cigarettes and tranquillizers is diverted to water supply and sanitation sector.

3. NATIONAL CONFERENCE ON DRINKING WATER AND SANITATION

As follow up action of water decade the Government of the Pakistan held a National Conference on drinking water and sanitation in November, 1981 and took close reconnaissance of the situation in the country. Top experts of the country, representatives of International Agencies such as World Bank, Asian Development Bank, W.H.O., U.N.D.P., UNICEF and Public Representatives attended. The National Conference was addressed by the President of Pakistan and Finance Minister, Government of the Pakistan. It was decided that the supply of drinking water

to Rural population will be increased from 20% to 66% by the 1990. (Population Projections shown in appendix-1)

This was decided keeping in view the projected achievement upto the end of 5th Plan. Full stock of Fifth Five years plan was taken and it was anticipated that 38.57 million additional Rural population will get benefit of clean drinking water at an estimated cost of Rupees 4115 millions. The Province/Area-wise split is as Appendix-II.

4. INPUTS SINCE 1955

The financial out-lay right from the first five-year plan upto the present sixth five-years plan with the achievement and actual on Rural Water Supply/Sanitation is as under :--

A -- FINANCIAL OUTLAY

(Figures in Million)

First Plan	Second Plan	Third Plan	Non Plan	Fifth Plan	Sixth Plan
1955-60	1960-65	1965-70	1970-78	1978-83	1983-88
9	20	118	706	1201	3190

B – ADDITIONAL POPULATION SERVED/TARGET

N.A	0.40	1.65	5.60	6.50	18.00

The rural share in benefit of development with respect to rural water supply since July, 1977 to close of Sixth Five year Plan is as under :–

	YEARS		
	1977-78	1982-83	1987-88
No. of persons served with potable water (Million)	7.66	13.65	31.2 (proposed)
% age of total population	14	22	45 (proposed)

5. SIXTH FIVE YEAR PLAN

According to the Sixth Plan 1983-88 the percentage of population served is proposed to be increased from twenty two percent to forty five percent with financial out lay of Rupees three thousand, one hundred and ninety millions. The supply system in Rural Areas is proposed to consist of mainly of storage tanks and hand pumps. The progress in the field is negligible uptill now.

Keeping in view the achievement attained with respect to financial investment, it appears that the estimates framed for the sixth five year plan or water decade do not hold good. Rural pipe water supply schemes constructed in Barani Areas of Attock, Jhelum and Rawalpindi Districts as per Appendix-III for which detailed statistics were collected shows that 8.58 lac additional population was served from 1978-79 to 1984-85 at a cost of Rupees two hundred and forty three million resulting as average cost of Rupees 283 per capita. The position in Mianwali, Khushib, D.G. Khan and other Barrani and desert Districts is not different due to long pipe lines from the source to the village. Though this example cannot be applied to the entire Pakistan but one can conclude that the present estimates of sixth five year plan are on low side and as such the targets fixed are difficult to attain. The unit cost of pipe water supply per capita as Rupees two hundred is to be doubled on the average due to inflation and devaluation of Rupee in open market for practical purposes or in other words 23% additional population to be served target during

sixth plan may reduce to 8–10% only with the same financial outlay.

A radical change is required at the National Planning level giving required emphasis and increased capital inputs in order to achieve desired results of sixth plan, a real break through is only possible if programme is given the place which it deserve.

In the opinion of author finances required to cover additional Rural population of Pakistan are as per table below :–

Sr. No.	Population in Millions		Percentage covered Proposed to cover	Population proposed to be covered in Million	Rate per capita in Rupees for pipe water supply	Total cost in Million Rupees
1.	1981	60.05	20	–	–	–
2.	1985	66.20	25	16.55		
					400	1848
3.	1988	70.55	30	21.17		
					425	1840
						4140
4.	1990	77.28	33	25.50		
			40	30.91		
					450	31995
						29560
5.	2000	96.60	100	71.10		
				65.69		

Note: Only 22% population coverage was attained in fifth five year plan against 36% target. 45% coverage fixed in Sixth plan is also not possible with meagre financial allocation and non acceptance of Hand pump technology by Public.

6. HAND PUMPS

In villages where ground water is not brackish, open wells are normally the source of water supply. Majority of users lift well-water with leather container or bucket and rope which are the usual tools. The villagers do not observe precautionry measures required from health point of view. The rope and the bucket get contaminated with microorganisum present in dust and thus transferred to well-water and ultimately to users.

Hand pump which is by far the cheapest means of providing good water supply takes care of such contaminations and is an improved source from health point of view for abstracting of potable ground water from shallow depth as compared to open well. However, Community open wells may be covered and hand pump installed therein to obtain hygenic water. Community Hand pumps were installed for supply of potable water to the villages in many parts of the country. After floods of 1973 this experiment has not proved successful and practical. All hand pumps have died their natural death due to non existance of institutional arrangement—operation and maintenance Management and community non participation. Only those hand pumps are working which were installed in private premises. The proposal contained in sixth plan of providing one and a half lac hand pumps in Punjab, one lac in Sind and ten thousand in Baluchistan is expected to meet the same fate as the one described above.

7. MODEST SCHEMES

Planning and Development Board Govt. of the Punjab has introduced Modest Water Supply Schemes for Rural areas a couple of years ago. In Modest Water Supply system distribution system is not provided and water is delivered in a storage tank in the village to be lifted by the users to their houses. The main principle is to minimize the expenditure and to provide this facility of water supply to more population within the same financial out-lay. No Revenue is paid by Consumers

to the water maintenance angency. Even site for storage tank is not handed over by public to construction agency. This experiment do not have the backing of public.

8. MINI FILTERS

Mini filters system has been adopted in the Southern part of Punjab to filter Canal or pond water for supply to the community. In this case as well the water is to be lifted which is not liked by the consumers in this modern age. No revenue is paid by the villagers. The expenditure is to be met from the Government exchequer and the scheme remains a constant source of complaint. Slow sand and filter system should be adopted with necessary component of distribution system for supply to the consumer through house connection.

9. SOCIAL PROBLEMS

The cost of Rural piped water supply can be reduced by direct pumping instead of providing an overhead Reservoir. However, laying of the distribution system in the village is important as the community is not ready to pay when the water is carried on their heads from central location in village under the modest water supply system. House to house connection is the demand of the day as social habits of the people have changed. In the village the old system of man turning their back when women pass by has ceased to exist. The Society has changed itself from "simple" to "complex" and elders do not want their daughter to travel to fetch water due to turning of low cast people richer through Middle East income but without mental improvement otherwise. The modest water supply system is only working where it has been dove-tailed with distribution system and house to house connection. The community is not ready to pay tarrif when water is to be lifted to their houses.

10. COMMUNITY PARTICIPATION

At present water supply is provided to the community as a donation by the

Government. The resident provide land free of cost for the construction of water works and its components. The Chairman, Zila Council decides the priorities for provision of water supply in the District and usually he attaches importance to his own area from where he is to fight Election to Provincial or National Assembly. In order to expedite the provision of potable water to different villages, it is suggested that the community should be asked to pay 10% contribution towards the Capital cost and only then priority list should be prepared. This will not only help in improving the quality of work and feeling of ownership among the community but also assist in fixing the quantum of work or type of scheme to be carried out. 10% additional population of the country will also come under the water supply umbrella without extra expenses. Decision making when assigned to the community will result in proper collection of water charges leading to the efficient operation of the water supply system. Community may be asked to participate in providing manual labour for laying water supply lines in the village when the same are supplied by some donor agency. The idea behind the proposal is to involve the community in the construction programme as well as operation and maintenance and at the same time reduce the financial outlay keeping in view the resource constraint.

It has been observed that the villagers do not have storage tanks in their houses and as such supply of water one hour in the morning and one hour in the late after noon is sufficient. There will not be any complaint if the Community itself appoints a local skilled worker to operate a tubewell at cut throat wages and thus reduce operation and maintenance cost to a reasonable extent as compared to maintenance at public expense where village elders demand more than two to three persons relating to particular group to be employed at Government sanctioned rates.

Public Health Engg. Department should as an interim measure continue to operate and maintain the scheme after its construction till mental improvement is observed in the Society and the power politics which exist in practically every village diminishes with imparting of education. Rural water supply Ordinance 1985 issued by Government of N.W.F.P. should be extended to other Provinces of Pakistan.

11. ELECTRIC CHARGES

WAPDA on supply of electricity to a Rural Water Supply system is charging on "Industrial Tariff" which is higher as compared to "Agriculture Tariff". Rural water supply comes under Social Sector where no profit is expected to accrue. It is recommended that Government should take up this issue with Chairman WAPDA and electricity consumed against a drinking water supply system should be charged on "Agriculture Tariff" if not less an not on "Industrial Tariff".

If above decision is arrived at then the cost of maintenance will reduce and water supply system can be maintained at reduced cost which will be in the capacity of consumers to pay.

The problem of excess expenditure than water charges collected will minimize and thus scheme can be maintained efficiently after construction to the entire satisfaction of public.

12. TRAINING AND RESEARCH

Public Health Engineers and economist may be sent on training abroad to those countries where Rural Water Supply Systems are working efficiently. Though Rural Water Supply is not considered to be a profitable proposition in the World, still there are countries in South East Area like Korea, Japan where the situation is quite promising. A group may be detailed to study the working of those countries and then strategies in planning suitably modified keeping in view our socio-economic position. This is a formidable and uphill task which requires reconsideration.

Research wing is required to be strengthened to devise cheeper technology instead of imported which is very costly. village well can be improved to supply clean and Hygenic water without changing the habits of the users and at the same time safe guard against disease. PCSIR, PHED and other allied agencies are

required to be encouraged.

It is suggested that :—

a) In view of the actual achievement with respect to target set in Fifth Five year Plan, Planning Commission should reconsider the target fixed with respect to financial out-lay as provided in the Sixth Five Year Plan for Rural Water Supply Sector. Additional funds if required should be invested to honour the commitment made on International level with regard to Drinking Water Supply Decade.

b) Rural water supply should be extended to only those villages, the residents of which contribute 10% of the capital cost of the scheme instead of free gift by Government on recommendation of the Chairman, Zila Council. This can help in additional service to 10% population.

c) No overhead reservoir should be provided to the villagers with population less than 5000. Direct pumping should be done through distribution system to collect revenue to meet the operational and maintenance expenditure.

d) PHED should continue he maintenance of Rural Water Supply Schemes till improvement in "thinking" with regard to such socially oriented projects is observed in the village community. The Ordinance issued by the Government of N.W.F.P. 1985 for Rural Water Supply Systems should be extended to other provinces as well.

e) WAPDA may be persuaded to collect electrical charges on "Agricultural tariff" instead of on "Industrial Tariff".

f) Modest, Mini Filter and Hand Pump schemes should be discouraged.

APPENDIX - I

POPULATION DISTRIBUTION

(All figures in 1000)

	1972 Census (Rural	1981 Census (Rural	1990 (Projections)
Punjab	28,153	34,278	42,263
Sind	8,010	10,740	14,673
NWFP	7,281	9,227	11,871
Baluchistan	2,071	3,633	6,606
FATA	2,507	2,175	1,870
Total	48,022	60,053	77,283

Sources: Total distribution over provinces 1972 according to Census Bulletin No. 1 dated January 1973 and census Bulletin No. 1 of 1980-81.

Projections are based on growth rates between 1972 and 1981 censuses, i.e. period of 8.46 years between the two censuses.

GOVERNMENT DECADE TARGETS RURAL WATER SUPPLY

Appendix II

(All figures in millions)

	Province/Area	Population 1981	Population 1990	Population coverage 1981 %	Proposed population coverage in 1990 %	Additional population to be covered by 1990	Finances required to cover the additional population (Rs.)
1.	Punjab (incl. Federal Capital Area)	34.28	42.26	18	60	19.14	1,500
2.	Sind	10.74	14.67	13	81	8.70	500
3.	NWFP	9.23	11.87	22	66	5.00	1,250
4.	Baluchistan	3.63	6.61	13	47	1.09	166
5.	Federally Administered Tribal Areas (FATA)	2.18	1.87	9	75	*	370
	Total	60.05	77.28	20	66	38.57**	4.115**

* FATA 1990 population projection adopted according to 1980 Census Table.

** Includes allowances for Azad Kashmir and Northern Areas.

Unit rates adopted for working out the financial requirements :—

1.	Punjab	150000 hand-pumps at Rs. 2,000 per hand pum. Population to be served at 75 persons per hand pump. Total population to be served 11.25 million. Piped system Rs. 200 per capita to serve a population of 5.75 million. Shallow tubewells. Rs. 70 per capita to serve a population of 2.14 million @ Rs. 15- Million.
2.	Sind	100000 hand pumps at Rs. 2000 per handpump. Population to be served at 75 persons per hand-pump: Rs. 7.5 million.
3.	Baluchistan	10,000 hand-pumps at Rs. 3000 per hand-pump to serve 0.75 million population. Piped system at Rs. 400 per capita to serve population of 0.34 million.
4.	NWFP	Unit rate Rs. 250 per capita.

PUBLIC HEALTH ENGG. DEPARTMENT RAWALPINDI CIRCLE

Appendix III

Name of District	1978			1983			1985		
	Projected population in thousands	Population served in thousands	% age coverage	Projected population in thousands	Population served in thousands	% age coverage	Projected population in thousands	Population served in thousands	% age coverage
1	2	3	4	5	6	7	8	9	10
RURAL SCHEMES									
Attock	1015	118	12	1167	133	11	1226	272	22.2
Jhelum	1040	185	18	1196	210	18	1257	384	30.5
Rawalpindi	1159	125	11	1333	152	11	1400	202	14.4
Total	3214	428	13	3696	495	13	3883	858	22.1

SYMBULS

T.W.	Tubewell
I.G/S	Infilteration Gallory/spring.
N.	Nullah.
S.	Spring.

p.W	Percolation well.
F.B	Filter Bed.
E.	Electricity
D.	Diesel
H.C.	House connection
P.S.P.	Public stand post

UPTODATE PROGRESS ACHIEVED IN RAWALPINDI CIVIL DIVISION

No. of Schemes		Total cost (In lac)	Population served 1983	Cost/Capita Rs.
1. ATTOCK DISTT	53	703.37	2,72,149	258
2. JHELUM DISTT	68	1090.02	3,84,322	284
3. RAWALPINDI DISTT	57	640.48	2,02,416	316
Grand Total	178	2433.87	8,58,887	283

COMPLETED RURAL WATER SUPPLY SCHEMES

Sr. No.	Name of scheme	Tehsil	Year of completion	Population			Source	Pumping	Total Expenditure
				1972	1978	1983			(in lac)
ATTOCK DISTRICT									
1.	W/S Scheme Injra Ph-I	Pindi Gheb	1975-76	12,300	14,148	15,916	T.W.	D	30.30
2.	W/S Scheme Domel	Pindi Gheb	1975-76	6,698	7,702	8,664	P.W	E	7.39
3.	W/S Bahtar	Fateh Jang	1979-80	4,461	5,130	5,771	T.W	E	14.70
4.	W/S Kot Fateh Khan	Fateh Jang	1979-80	3,378	3,884	4,370	P.W+I/G	E	5.50
5.	W/S Ghinji	Talagang	1980-81	4,036	4,641	5,221	T.W	D	14.86
6.	W/S Ahmadal	Pindi Gheb	1980-81	3,740	4,301	4,839	P.W	E	17.08
7.	W/S Gharibwal	Pindi Gheb	1980-81	1,532	1,762	1,982	T.W	E	28.58
8.	W/S Mullan Mansoor	Attock	1981-82	2,331	2,658	2,990	P.W	E	6.56
9.	W/S Pathar Garh	Attock	1981-82	1,989	2,287	2,572	S	E	5.54
10.	W/S Lawa	Talagang	1981-82	13,228	15,212	17,144	P.W	E	14.00
11.	W/S Khunda	Fateh Jang	1982-83	6,056	6,964	7,835	I.G	E	39.45
12.	W/S Haji Shah	Attock	1982-83	5,605	6,446	7,252	P.W	E	11.78
13.	W/S Qutab Bandi	Attock	1982-83	2,000	2,360	2,714	P.W	E	3.23
14.	W/S Peera Fateial	Talagang	1982-83	3,810	4,382	4,930	I.G	E	15.06

Sr. No.	Name of scheme	Tehsil	Year of completion	Population			Source	Pumping	Total Expenditure
				1972	1978	1983			(in lac)
15.	W/S Aurangabad	Pindi Gheb	1982-83	2,259	2,666	2,999	P.W	D	10.23
16.	W/S Thatta	Pindi Gheb	1982-83	6,954	8,206	9,437	P.W	E	16.98
17.	W/S Bosal	Pindi Gheb	1982-83	6,857	8,091	9,304	P.W	E	11.36
18.	W/S Jaffar	Pindi Gheb	1982-83	2,241	2,577	2,899	P.W	E	10.00
19.	W/S Surg.	Pindi Gheb	1982-83	2,199	2,529	2,845	P.W	E	11.93
20.	W/S Pachnand	Talagang	1982-83	7,722	8,880	9,990	P.W	E	15.29
21.	W/S Buhdial	Talagang	1982-83	2,535	2,915	3,279	P.W	D	10.75
		Total		102,911	117,741	132,930			300.57

COMPLETED RURAL WATER SUPPLY SCHEMES

Sr. No.	Name of scheme	Tehsil	Year of completion	Population			Source	Pumping	Total Expenditure
				1972	1978	1983			(in lac)
1.	W/S Scheme Haranpur	P.D. Khan	1970-71	6,945	7,086	8,984	T.W	E	9.57
2.	W/S Lillah	P.D. Khan	1970-71	11,592	13,330	14,946	S	E	23.56
3.	W/S Billowal	P.D. Khan	1970-71	1,815	2,087	2,348	S	E	11.83
4.	W/S Thall. Illaqa	P.D. Khan	1970-71	27,908	32,094	36,106	S	E	33.52
5.	W/S Domeli	Jhelum	1978-79	7,653	8,800	9,900	P.W	E	11.87
6.	W/S Wahoola	P.D. Khan	1979-80	3,859	4,437	4,991	S	E	21.70
7.	W/S Basal	Chakwal	1980-81	3,220	3,703	4,165	P.W	D	9.38
8.	W/S Murid (Exten)	Chakwal	1980-81	15,306	17,601	22,226	S	E	7.78
9.	W/S Baral	Jhelum	1980-81	2,449	2,890	3,323	T.W	E	13.92
10.	W/S Chak Khushi	P.D. Khan	1980-81	7,083	8,145	9,163	I.G	E	34.97
11.	W/S Dhok Badahah	P.D. Khan	1981-82	5,958	6,852	7,708	P.W	E	14.82
12.	W/S Padhri	Jhelum	1981-82	2,810	3,231	3,635	P.W	E	4.08
13.	W/S Munday Mangowal	Chakwal	1981-82	4,051	4,658	5,240	P.W	D	5.37
14.	W/S Jalalpur Sharif	P.D. Khan	1981-82	4,863	4,985	5,608	P.W	E	10.99
15.	W/S Saghri	Jhelum	1981-82	1,837	2,112	2,376	P.W	E	5.0

Sr. No.	Name of scheme	Tehsil	Year of completion	Population			Source	Pumping	Total Expenditure
				1972	1978	1983			(in lac)
16.	W/S Adrana	Jhelum	1981-82	3,788	4,356	4,900	P.W	D	11.16
17.	W/S Pindi, Sawika	Jhelum	1981-82	2,530	2,910	3,274	P.W	D	7.94
18.	W/S Langah	Chakwal	1981-82	2,748	3,160	3,555	P.W	D	14.41
19.	W/S Chawali	Chakwal	1981-82	2,537	2,917	3,281	P.W	D	14.72
20.	W/S Dullah	Chakwal	1981-82	2,398	2,757	3,101	P.W	D	13.10
21.	W/S Chak Hamid	P.D. Khan	1981-82	2,671	3,071	3,454	T.W	D	7.74
22.	W/S Daryala Khahoon	P.D. Khan	1981-82	2,034	2,339	2,631	P.W	E	8.33
23.	W/S Bhara Gawa	Jhelum	1981-82	3,223	3,706	4,169	P.W	D	10.99
24.	W/S Dandot	P.D. Khan	1981-82	5,300	6,254	7,192	S	E	8.77
25.	W/S Kundal Kundwal	P.D. Khan	1982-83	9,200	10,787	12,135	S	D	32.52
26.	W/S Watli	P.D. Khan	1982-83	1,102	1,267	1,423	S	E	8.51
27.	W/S Amral	Jhelum	1982-83	977	1,124	1,265	T.W	D	8.90
28.	W/S Sultanpur	Jhelum	1982-83	2.061	2,370	2,666	T.W	E	11.37
29.	W/S Dhalwal Badshahpur	P.D. Khan	1982-83	6,825	7,848	8,829	S	E	40.63
30.	W/S Maira Bugga & Sial	P.D. Khan	1982-83	3,526	4,054	4,760	T.W	D	12.33

Sr. No.	Name of scheme	Tehsil	Year of completion	Population 1972	Population 1978	Population 1983	Source	Pumping	Total Expenditure (in lac)
31.	W/S Ahmadabad	P.D. Khan	1982-83	2,940	3,381	3,803	T.W	E	13.54
		Total		161,109	185,208	209,957			443.32

COMPLETED RURAL WATER SUPPLY SCHEMES

Sr. No.	Name of scheme	Tehsil	Year of completion	Population			Source	Pumping	Total Expenditure
				1972	1978	1983			(in lac)
1.	W/S Scheme Garja	R/Pindi	1974-75	1,976	2,262	2,544	P.W	E	13.97
2.	W/S Chakri	R/Pindi	1976-77	2,356	2,709	3,048	T.W	D	5.95
3.	W/S Adhwal	R/Pindi	1978-79	2,586	2,972	3,444	P.W	D	3.56
4.	W/S Usman Khattar	R/Pindi	1978-79	2,774	3,273	3,763	T.W	E	6.39
5.	W/S Syed Station	D.G. Khan	1978-79	3,179	3,655	4,112	P.W	D	9.82
6.	W/S Joochha	Kahutta	1979-80	1,149	5,031	5,786	P.W	E	5.67
7.	W/S Chak Bali Khan	R/Pindi	1979-80	5,119	5,887	6,618	T.W	E	12.94
8.	W/S Syed Kasran	D.G. Khan	1979-80	4,375	5,163	5,937	P.W	D	19.38
9.	W/S Matore	Kahuta	1979-80	2,678	3,080	3,465	S	E	12.26
10.	W/S Lower Aliot	Muree	1979-80	3,233	3,718	4,183	S	E	4.54
11.	W/S Kallar Syedan	Kahutta	1979-80	4,500	5,175	5,822	T.W	E	16.37
12.	W/S Rawat	Murree	1979-80	2,140	2,461	2,768	S	E	2.67
13.	W/S Reman	G. Khan	1979-80	1,716	1,973	2,219	P.W	E	16.08
14.	W/S Kantrilla	G. Khan	1979-80	5,350	6,313	7,260	T.W	E	11.09
15.	W/S Gujri Misrial	R/Pindi	1979-80	2,102	2,417	2,719	P.W	D	21.18

Sr. No.	Name of scheme	Tehsil	Year of completion	Population			Source	Pumping	Total Expenditure
				1972	1978	1983			(in lac)
16.	W/S Basali	R/Pindi	1981-82	3,080	3,542	3,985	S	E	16.96
17.	W/S Hayal Sharif	R/Pindi	1981-82	1,031	1,185	1,333	P.W	E	16.05
18.	W/S Chauntra	R/Pindi	1981-82	2,079	2,391	2,690	T.W	E	10.82
19.	W/S Choa Khalsa	Kahutta	1981-82	4,505	5,180	5,829	P.W	E	16.49
20.	W/S Boken	Gujar Khan	1981-82	698	802	903	P.W	E	5.82
21.	W/S Mandra	Gujar Khan	1981-82	2,170	2,495	2,806	P.W	E	15.69
22.	W/S Daultala	Gujar Khan	1981-82	6,522	7,500	8,437	P.W	E	4.24
23.	W/S Qazian	Gujar Khan	1981-82	1,466	1,686	1,897	P.W	D	6.72
24.	W/S Susral	Gujar Khan	1981-82	1,160	1,335	1,502	P.W	E	3.02
25.	W/S Samli	Muree	1981-82	2,000	2,300	2,588	S	E	10.62
26.	W/S Lebtrar	Kahutta	1981-82	1,455	1,673	1,882	S	–	7.80
27.	W/S Daduchha	R/Pindi	1981-82	874	1,005	1,131	S+I/G	E	3.44
28.	W/S Wah Village	R/Pindi	1981-82	4,381	5,038	5,667	S	E	2.90
29.	W/S Khala Bat & Ban	Murree	1981-82	612	703	791	S	–	1.74
30.	W/S Devel & Ausia	Murree	1982-83	8,085	9,298	10,460	S	E	16.36
31.	W/S Sair Bagla	Murree	1982-83	2,210	2,542	2,860	S	–	17.30

Sr. No.	Name of scheme	Tehsil	Year of completion	Population			Source	Pumping	Total Expenditure
				1972	1978	1983			(in lac)
32.	W/S More Gah	R/Pindi	1982-83	5,185	5,963	6,708	P.W	E	18.08
33.	W/S Dhamial	R/Pindi	1982-83	1,196	1,447	1,700	P.W	E	15.09
34.	W/S Scheme Jhungle	G/Khan	1982-83	1,226	1,409	1,585	P.W	D	14.35
35.	W/S Sansrulah	Murree	1982-83	1,500	1,725	1,940	S	D	14.97
36.	W/S Sukhoo	G. Khan	1982-83	3,376	3,882	4,367	P.W	E	17.06
37.	W/S Chaklala	R/Pindi	1982-83	4,842	5,568	6,264	T.W	E	12.88
38.	W/S Latori, Syedan	Kahutta	1982-83	2,000	2,300	2,588	S	E	3,58
39.	W/S Aliot Dhok Abbassian	Murree	1982-83	4,000	4,600	5,175	S	–	1.00
40.	W/S Mial	R/Pindi	1982-83	2,595	2,984	3,357	T.W	D	12.30
		Total		113,471	124,662	152,273			427.15

RURAL WATER SUPPLY SCHEME COMPLETED OR NEAR COMPLETION

DISTRICT ATTOCK

Sr. No.	Name of Scheme	Tehsil	Population			Source	Pumping	Total Expd. (In lac)
			1972	1978	1983			
1	2	3	4	5	6	7	8	9
1.	W/S Scheme Panda Shah Bilawal	Talagang	3,466	4,090	4,703	P.W+I/G	E	19.77
2.	W/S Mokhad	Pindi Gheb	3,134	3,698	4,252	F.B	E	16.52
3.	W/S Dhurnal	Talagang	3,055	3,604	7,628	P.W	E	16.80
4.	W/S Babraki	Attock	1,179	1,391	1,600	S	E	5.31
5.	W/S Boota	Attock	3,542	4,180	4,500	T.W	D	8.52
6.	W/S Jhatla	Talagang	5,685	6,708	7,714	P.W	E	15.45
7.	W/S Kot Chhaji	Pindi Ghab	3,378	3,986	4,584	P.W+S+I/G	E	11.76
8.	W/S Ghakhar	Attock	1,871	2,207	3,250	P.W	D	6.44
9.	W/S Maky Dhoke Based on Kanjoor Dam	Fateh Jang	2,117	2,498	2,872	Dam	E	13.51
10.	W/S Dalyal	Fateh Jang	1,381	1,629	1,873	Dam	E	17.62
11.	W/S Nauragi	Talagang	1,599	1,887	2,170	S+I/G	E	10.31

Sr. No.	Name of Scheme	Tehsil	Population			Source	Pumping	Total Expd. (In lac)
			1972	1978	1983			
1	2	3	4	5	6	7	8	9
12.	W/S Maryala	Pindi Gheb	1,545	1,823	2,096	P.W	E	15.90
13.	W/S Lakarmar	Pindi Gheb	1,971	2,318	2,650	P.W	D	9.55
14.	W/S Gali Jageer	Fateh Jang	1,330	1,570	1,904	P.W	E	13.75
15.	W/S Waisa	Attock	4,816	5,682	6,534	P.W	E	15.67
16.	W/S Akwal	Talagang	3,762	4,439	7,250	P.W	E	17.00
17.	W/S Kamarial	Pindi Ghab	4,368	5,154	5,927	P.W	E	18.93
18.	W/S Chhab	Pindi Ghab	3,488	4,011	7,500	P.W	D	7.86
19.	W/S Malal	Pindi Ghab	2,493	2,866	3,180	P.W	D	17.25
20.	W/S Larencepur	Attock	3,078	3,622	4,140	T.W	E	13.00
21.	W/S Ratwal	Pindi Gheb	1,995	2,354	2,760	P.W	D	11.37
22.	W/S Maghian	Pindi Gheb	1,913	2,257	2,596	T.W	E	24.46
23.	W/S Khaur	Pindi Gheb	4,740	5,593	6,432	P.W	E	24.21
24.	W/S Dhilomar	Talagang	3,919	4,624	5,318	P.W	D	11.99
25.	W/S Bai	Attock	1,333	1,572	1,807	S	E	5.98
26.	W/S Attock (Khurd)	Attock	803	945	1,081	P.W	E	6.95

Sr. No.	Name of Scheme	Tehsil	Population			Source	Pumping	Total Expd. (In lac)
			1972	1978	1983			
1	2	3	4	5	6	7	8	9
27.	W/S Scheme Majhia	Fateh Jang	1,114	1,315	1,512	I/G	E	8.01
28.	W/S Mianwala	Fateh Jang	1,303	1,537	1,768	P.W	E	12.00
29.	W/S Peera Jangla	Talagang	1,608	1,897	2,182	P.W	D	7.00
30.	W/S Kot Sarang	Talagang	4,261	5,028	5,782	S	E	14.91
31.	W/S Mam Doot	Talagang	1,110	1,310	1,506	I/G	E	5.00
		Total	95,070	112,684	136,219			402.80

Sr. No.	Name of Scheme	Tehsil	Population			Source	Pumping	Total Expd. (In lac)
			1972	1978	1983			
1	2	3	4	5	6	7	8	9
DISTRICT JHELUM								
1.	W/S Scheme Basharat	P.D. Khan	14,893	17,126	19,266	S	E	90.57
2.	W/S Bhown	Chakwal	7,166	8,240	9,270	P.W+I/G	E	24.55
3.	W/S Lehri	Jhelum	4,471	5,141	5,784	P.W	D	24.81
4.	W/S Bochal Kalan	P.D. Khan	11,267	12,957	14,576	S	E	24.87
5.	W/S Dhudi Phapra & Adjoining villages	P.D. Khan	15,038	17,745	20.406	T.W	E+D	32.00
6.	W/S Langar Pur	P.D. Khan	1,754	2,017	2,270	P.W	E	15.13
7.	W/S Dhok Munawar	Jhelum	880	1,012	1,138	P.W	E	13.18
8.	W/S Balkasar	Chakwal	4,207	4,964	6,175	T.W	E	17.00
9.	W/S Murid & Kalagu	Chakwal	5,540	6,371	7,167	P.W	E	13.67
10.	W/S Pither, Halter, schotra Kalwal and adjoining villages	Chakwal	3,124	3,570	4,200	T.W	D	13.60
11.	W/S Malot, Kanoli Chhoi & adjoining villages	Chakwal	1,417	1,619	1,904	P.W	D	11.0
12.	W/S Saigal Abad	Chakwal	2,477	2,848	3,275	P.W	D	11.98

Sr. No.	Name of Scheme	Tehsil	Population			Source	Pumping	Total Expd. (In lac)
			1972	1978	1983			
1	2	3	4	5	6	7	8	9
13.	W/S Phadial	Jhelum	771	909	1,076	N	D	13.18
14.	W/S Mohra Dharkana	P.D. Khan	2,380	2,737	3,080	P.W	E	17.13
15.	W/S Chhoi Gujran	Jhelum	587	690	788	S	D	11.05
16.	W/S Jhamra	P.D. Khan	4,178	4,804	5,405	T.W	E	13.00
17.	W/S Bishandaur	Jhelum	1,976	2,272	2,556	P.W	E	14.37
18.	W/S Bangial	Jhelum	1,165	1,340	1,507	P.W	D	12.00
19.	W/S Sohawa Exten	Jhelum	5,354	6,317	7,264	F.B	E	17.18
20.	W/S Kudlathi	Chakwal	4,587	5,275	5,934	P.W	D	17.188
21.	W/S Biagal	Chakwal	3,015	3,467	3,900	P.W	D	13.50
22.	W/S Neela	Chakwal	2,776	3,266	3,732	P.W	E	17.74
23.	W/S Pari Darwaza	Jhelum	1,584	1,821	2,048	P.W	D	8.92
24.	W/S Dhudhial	Chakwal	5,546	6,524	7,455	P.W	E	15.00
25.	W/S Dhok Bidder	Jhelum	2,120	2,409	2,850	P.W	E	23.06
26.	W/S Dheri Syedan	P.D. Khan	1,995	2,354	2,707	P.W	E	11.85
27.	W/S Arar	P.D. Khan	1,282	1,583	2,863	P.W	E	14.79
28.	W/S Jand Awan	Chakwal	1,251	1,476	1,697	P.W	E	14.85

Sr. No.	Name of Scheme	Tehsil	Population			Source	Pumping	Total Expd. (In lac)
			1972	1978	1983			
1	2	3	4	5	6	7	8	9
29.	W/S Scheme Dhoda	Chakwal	2,303	2,648	2,978	P.W	–	14.85
30.	W/S Jur	Chakwal	1,281	1,510	1,736	P.W	–	14.98
31.	W/S Khokher Zer Dam	Chakwal	2,699	3,184	3,661	P.W	D+E	14,87
32.	W/S Thoabahadar	Chakwal	2,699	3,149	3,625	P.W	E	14.70
33.	W/S Kallar Kahar	Chakwal	2,185	2,578	2,965	S	E	14.91
34.	W/S Sarkalan & Mutton	P.D. Khan	2,856	3,570	3,875	–	–	11.28
35.	W/S Malot	Jhelum	1,905	2,248	2,585	P.W	E	13.45
36.	W/S Kharasohair	Jhelum	1,533	1,869	2,200	P.W	D	11.00
37.	W/S Chakshadi	P.D. Khan	1,094	1,258	1,337	T.W	E	7.50
		Total	131,326	152,753	174,365			646.70

RURAL WATER SUPPLY SCHEME COMPLETED OR NEAR COMPLETION

Sr. No.	Name of Scheme	Tehsil	Population			Source	Pumping	Total Expd. (In lac)
			1972	1978	1983			
1	2	3	4	5	6	7	8	9
DISTRICT RAWALPINDI								
1.	W/S Scheme Waryama Relamohra Amin Shah	R/Pindi	693	817	1,545	I/G	E	12.84
2.	W/S Moira	Kahutta	1,956	2,308	2,596	I/G	E	0.63
3.	W/S Mohragarh Baghsangri	R/Pindi	1,590	1,828	2,056	P.W	D	17.35
4.	W/S Bilowal	R/Pindi	1,113	1,314	1,510	P.W	D	10.31
5.	W/S Koliangoru, Lass Mali	R/Pindi	892	1,025	1,153	P.W	D	12.40
6.	W/S Chhaparunpur	R/Pindi	937	1,105	1,270	P.W	D	16.94
7.	W/S Dhalyal & Mohra	R/Pindi	2,424	2,952	3,260	T.W	D	12.55
8.	W/S Sarwar Shaheed Sangori	G. Khan	791	910	1,023	P.W	E	15.04
9.	W/S Gujar & Piracha	R/Pindi	2,932	3,371	3,792	S	E	15.85
10.	W/S Kotha Kalan	R/Pindi	8,258	9,496	10,683	P.W	E	14.04
11.	W/S Kianger	G. Khan	2,500	2,875	3,234	—	—	14.98

Sr. No.	Name of Scheme	Tehsil	Population			Source	Pumping	Total Expd. (In lac)
			1972	1978	1983			
1	2	3	4	5	6	7	8	9
12.	W/S Dhok Lakhan	R/Pindi	1,171	1,382	1,588	P.W	E	14.50
13.	W/S Guliana	G. Khan	5,943	6,834	7,688	P.W	E	14.50
14.	W/S Karor	Murree	2,851	3,278	3,687	S	E	14.50
15.	W/S Ranial	R/Pindi	1,391	1,599	1,428	P.W	E	15.00
16.	W/S Ucha Murree	Murree	1,485	2,170	2,480	S	—	6.25
17.	W/S Sarmandal	Murree	890	1,023	1,150	S	—	5.65
		Total	37,677	45,987	50,143			213.33