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Evaluation of Centrally Sponsored Accelerated Urban Water Supply Programme (AUWSP)

Final Report

National Institute of Urban Affairs
New Delhi

September 2005

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PREFACE

Water supply is a major problem in most Indian cities today. It is one of the most basic requirements that need to be addressed for all size classes of urban centres. While the larger urban centres have greater access to funds, it is the smaller towns that really need financial assistance to provide adequate water to its population. Many of the smaller towns are not able to meet even the norm of 70 litres per capita per day. These smaller towns rely largely on non-formal sources of water such as hand pumps, wells, ponds etc. The smaller towns are also often rural in character and hence have demands related to animal husbandry and agriculture. These create additional demand for water in these towns. Vagaries of weather add to the problems of these towns where the source may dry up and the limited financial resources prevent the authorities from taking up new schemes immediately. It was to address situations like this that the Centrally sponsored Accelerated Urban Water Supply Programme (AUWSP) was taken up in 1993-94. Ten years later the Centre decided to undertake an evaluation of the programme to understand the implementation and operational status of the schemes and the impact of the schemes on the lives of the people in these small towns. The Ministry of Urban Development entrusted NIUA with the evaluation of eleven such schemes in five northern Indian states. The schemes have indicated that these towns have benefited from the AUWSP schemes and have provided a better quality of life to the residents of these towns. However, despite the conditions laid down in the scheme for ascertaining source sustainability, some schemes have suffered on account of unprecedented, and prolonged, drought conditions, as in the state of Rajasthan. These have affected the sustainability of the schemes. Despite these problems, the AUWSP has provided the much needed assistance to water supply schemes in these small towns.

NIUA would like to thank the Central Public Health and Environmental Engineering Organisation (CPHEEO), Ministry of Urban Development, for entrusting the study to the Institute and providing guidance and assistance throughout the conduct of the study. The Institute is also grateful to the state government officials of the five states who provided their full support for carrying out this study. Finally, the Institute would like to thank all the officials of the eleven selected towns for providing information and logistical support for this study. Their assistance in arranging the field visits is also highly appreciated.

The evaluation study of the eleven AUWSP schemes was completed by NIUA within the stipulated period of nine months. At the Institute, the study was coordinated by Prof. Usha P.Raghupathi and she was ably assisted on technical aspects by Mr. Tarun Acharya, public health expert. The Institute places on record its appreciation for their hard work.

Usha P. Raghupathi

Usha P. Raghupathi
Professor and Officer in-Charge

September 2005

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Executive Summary

In order to address the water needs of the small towns of the country the Central Government made a provision in the Eighth Plan for the Accelerated Urban Water Supply Programme (AUWSP). The objective of AUWSP is to provide safe and adequate drinking water, improve the environment, quality of life and socio-economic conditions of the entire town having population of less than 20,000 (as per 1991 Census). According to the 1991 Census, the total number of towns having a population of less than 20,000 was 2151. AUWSP's efforts have been made to provide safe drinking water supply @ 70 lpcd and adopt appropriate and cost effective technologies to supply drinking water to the small towns.

The Ministry of Urban Development and Poverty Alleviation (now Ministry of Urban Development), Government of India, has approved a number of water supply schemes under the AUWSP in various states. The National Institute of Urban Affairs (NIUA) was entrusted, by the Ministry, to conduct an evaluation study of AUWSP schemes in eleven towns located in five states viz., Haryana, Himachal Pradesh, Jammu and Kashmir, Punjab and Rajasthan.

To carry out the evaluation study, a proforma was prepared by NIUA based on the study parameters. This was followed by interaction with the State implementing agencies, visiting scheme components and meeting officials connected with the implementation and O&M of the schemes including ULBs, and interviews with the residents in order to assess the impact of the scheme. The information collected through field visits was analysed and the final evaluation report prepared.

The evaluation results indicate that:

- There is a delay in completion of most schemes. In 8 of the 11 schemes evaluated, the completion has been delayed. The delay ranges from one to four years or more. The reasons for delay ranged from non-availability of funds on time, transfer of concerned officials, getting electricity connection, to getting permission for laying pipeline across the railway line.

- In four of the five the states, in which evaluation has been done, it is the State agency (PHED/PHD) that has implemented the scheme. These agencies also do the O&M of the scheme. The provision of water supply in these states is not yet in the charge of local governments. Only in Punjab, the local governments are responsible for O&M of water supply system.

- There was no clear pattern that emerged with respect to the actual expenditure on the scheme as compared to the approved cost. There were

schemes which had cost overrun, schemes which were completed at a lower cost than approved and also those where the approved and actual cost were the same. In 4 of the 11 towns, there has been either no cost variation or the variation has been within 5% (+ and -) of the estimated cost. In 5 towns, the expenditure on the scheme has been more than the estimated cost (> 5% variation). In 2 towns the expenditure was less than the estimated cost (> 5% variation).

- Schemes having surface/spring raw water source are more reliable and dependable than the tubewell source as far as the sustainability of schemes (till the design period) is concerned except in Punjab where tubewell water source is found adequate to sustain till the design period. Prolonged drought, particularly in Rajasthan, has had an adverse impact on the source as the water levels have fallen. Such extraneous and unpredictable factors have affected the reliability of the source.

- The quantity of water produced varies between 0.56 mld to 2.72 mld in the study towns while the quantity of water supplied varies between 0.52 mld to 2.09 mld. The variation between water produced and supplied ranges from 6% to 44%. This is because of system losses and UFW (leakage, illegal tapping etc.).

- Most of the schemes have not been able to cover the entire population with household connections (HSCs). Only 2 out of 11 schemes have reported 100% coverage of population by HSCs. In the remaining towns, except for Narnaud, the coverage by HSCs varies between 64% and 95%. In Narnaud the coverage by HSCs is only 24% while another 61% is covered by public standposts. However, the number of household connections has increased in all the towns after implementation of the schemes under AUWSP.

- The per capita supply in most of the towns was below the norm of 70 lpcd before the implementation of AUWSP scheme. However, discussions with the respective implementing agencies and the residents of the towns suggest that

the per capita supply in most towns has increased after the implementation of the scheme.

- The domestic tariff has increased in most of the towns except in the state of Rajasthan, where it has not changed since the implementation of the scheme. The monthly charges for domestic water supply ranged between Rs. 10 to Rs. 20 per month before the implementation of the scheme and at present it ranges between Rs. 25 to Rs. 50 per month.

- None of the towns under study have been able to recover full cost of providing water supply except Sarwar where 100% cost recovery for O&M of the scheme has been reported. The shortfall in revenue for the other 10 towns is met either by the State Government (in the towns where the state agency manages the water supply service) or by the local body from the general revenues (in the towns where the service is managed by the local body). The cost recovery ranges from about 11% to about 84% in these towns. The actual revenue-expenditure gap ranges from Rs. 0.49 lakhs to Rs. 27.31 lakhs.

- While the staff strength of most of the O&M agencies has increased after the implementation of the scheme, in two towns the staff strength has remained the same and in another two towns the staff strength has reduced.

- The wastewater from all the towns, except Uchana, is drained into storm water drains and discharged into low-lying lands/ ponds/ open channels without treatment. Uchana is partially covered by sewerage network and has oxidation pond for disposal of wastewater.

- The water quality was reported to be potable in all the towns. The residual chlorine available was sufficient. No outbreak of water-borne diseases was reported in any of the towns.
- Overall, the agencies implementing the schemes and those managing the water supply systems in the study towns were satisfied with the scheme.

- The views of the community also indicated that they were satisfied with the scheme, though there were some local level problems (low pressure) in some parts of some towns.

Based on the evaluation, a set of recommendations has been put forth for improving the implementation and effectiveness of the schemes. These recommendations are:

1. Annual revision of the Schedule of Rates by the state agencies for realistic estimation of the costs at the design stage;
2. Provision of adequate technical manpower to the urban local bodies before handing over the scheme to them;
3. Periodic revision of tariff and improvement in revenue collection to ensure 100% cost recovery for O&M of the scheme;
4. Providing flexibility to the implementing agency to revise the design year of the scheme due to changes in local conditions, after discussions with the Central and State governments;
5. Additional water demand (for fairs, festivals, livestock etc.) should be considered separately, as most of these small towns are rural in character, and should not be a part of the regular drinking water supply scheme under AUWSP;
6. Administrative approval for various components of schemes should be expedited by the State Governments to complete the schemes in time;
7. Release of funds from the state governments should be expedited to ensure timely completion of the scheme; and
8. Monitoring of schemes during implementation should look at all the bottlenecks and help in clearing them expeditiously.

CHAPTER 1

Introduction

CHAPTER I

Introduction

1. Background

1.1 The urban population of India is increasing due to rapid urbanization and industrialization. While in percentage terms the urban population grew from 19.91 per cent in 1971 to 27.78 per cent of the total population in 2001, in absolute terms the urban population grew from about 109 million in 1971 to about 285 million in 2001, adding about 176 million people to the urban areas in three decades. This increase has created an additional demand for basic amenities such as safe and adequate water supply and sanitation to improve the quality of life and the socio-economic conditions of the urban dwellers.

1.2 Urban areas play an important role in the economy of the country. It is estimated that about 55-60% of the country's Gross Domestic Product (GDP) is contributed by urban areas. Therefore, there is a need to provide adequate basic services to urban areas. However, even within urban areas, it is the smaller urban centres that suffer the most, facing sever shortages of drinking water and basic sanitation.

1.3 Water and sustainable development are inextricably linked. Water today defines human, social, and economic development. Without adequate supplies of water and its proper management, socio-economic development cannot take place. Pollution of ground and surface waters from agrochemicals (fertilizers and pesticides) and from industry poses a major environmental health hazard, and affects the quantity of water available for use. Water and human health are linked directly. Infectious, water-related diseases are a major cause of morbidity and mortality, particularly in the developing world. Drinking unsafe water causes many diseases, such as typhoid and cholera. Chemical contaminants namely fluoride and arsenic pose a very serious health hazard in the country. It is estimated that about 70 million people in 20 states are at risk due to excess fluoride and around 10 million people are at risk

due to excess arsenic in ground water. Apart from this, increase in the concentration of chloride, TDS, nitrate, and iron in ground water is of great concern for a sustainable drinking water programme. All these need to be tackled holistically. With over-extraction of groundwater the concentration of chemicals is increasing. The World Bank has estimated that the total cost of environmental damage in India amounts to US$ 9.7 billion annually, or 4.5 per cent of the gross domestic product. Of this, 59 per cent results from the health impacts of water pollution.

1.4 While capital investments have been made in most large urban centres for meeting the water needs of the growing population, the small towns have been neglected. Lack of adequate funds with State Governments as well as urban local bodies/boards has also been a reason for such neglect. To address the water needs of the small towns of the country the Central Government made a provision in the Eighth Plan for the Accelerated Urban Water Supply Programme (AUWSP).

1.5 The Centrally sponsored Accelerated Urban Water Supply Programme was included in the Eighth Plan with the objective of solving the drinking water problem in towns having a population of less than 20,000 as per 1991 Census. According to the 1991 Census, the total number of towns having a population of less than 20,000 was 2151. The Central and State Governments fund the scheme in the ratio of 50:50. The Cabinet Committee on Economic Affairs (CCEA) approved this programme to be launched during the year 1993-94 with an allocation of Rs. 50 crores for the Eighth Five Year Plan.

1.6 Through AUWSP efforts have been made by both Central and State Governments to provide safe drinking water supply @ 70 lpcd and adopt appropriate and cost effective technologies in the small towns.

Details of AUWSP scheme are given in Annexure.

2. Objective of the study

2.1 To evaluate the performance of water supply schemes being implemented under the Centrally sponsored Accelerated Urban Water Supply Programme (AUWSP) in coordination with the State implementing agencies as well as Urban Local

Bodies (ULBs), who are in-charge of the day-to-day operation and maintenance of the schemes. The specific objectives of the programme are:

- To provide safe and adequate water supply facilities to the entire population of the towns;
- To improve the environment and quality of life; and
- To upgrade socio-economic conditions of the towns, particularly, the vulnerable sections of the population such as women, children and other deprived sections that do not have access to safe water.

3. Need for evaluation

3.1 The AUWSP schemes in the study towns had been sanctioned by the Government of India at different times. Some of the schemes have been completed while others are in implementation stage. The main purpose of evaluation of the schemes was to ascertain the present status (both technical and financial) and performance of each scheme with respect to the objectives of the AUWSP.

4. Scope of Work

4.1 To evaluate:

1. The completed and commissioned schemes, which are reported to have been handed over to the ULBs;
2. Schemes approved upto 1998-99, but which have not yet been completed due to various reasons; and
3. Schemes approved after 1999-2000.

4.2 In order to evaluate the performance of the water supply schemes in various towns under the AUWSP, the Ministry of Urban Development, Government of India, has entrusted the National Institute of Urban Affairs (NIUA) to conduct the evaluation study for the water supply schemes in the following eleven towns located in five states namely Haryana, Himachal Pradesh, Jammu and Kashmir, Punjab and Rajasthan.

Table I: List of Towns given for the Evaluation Study

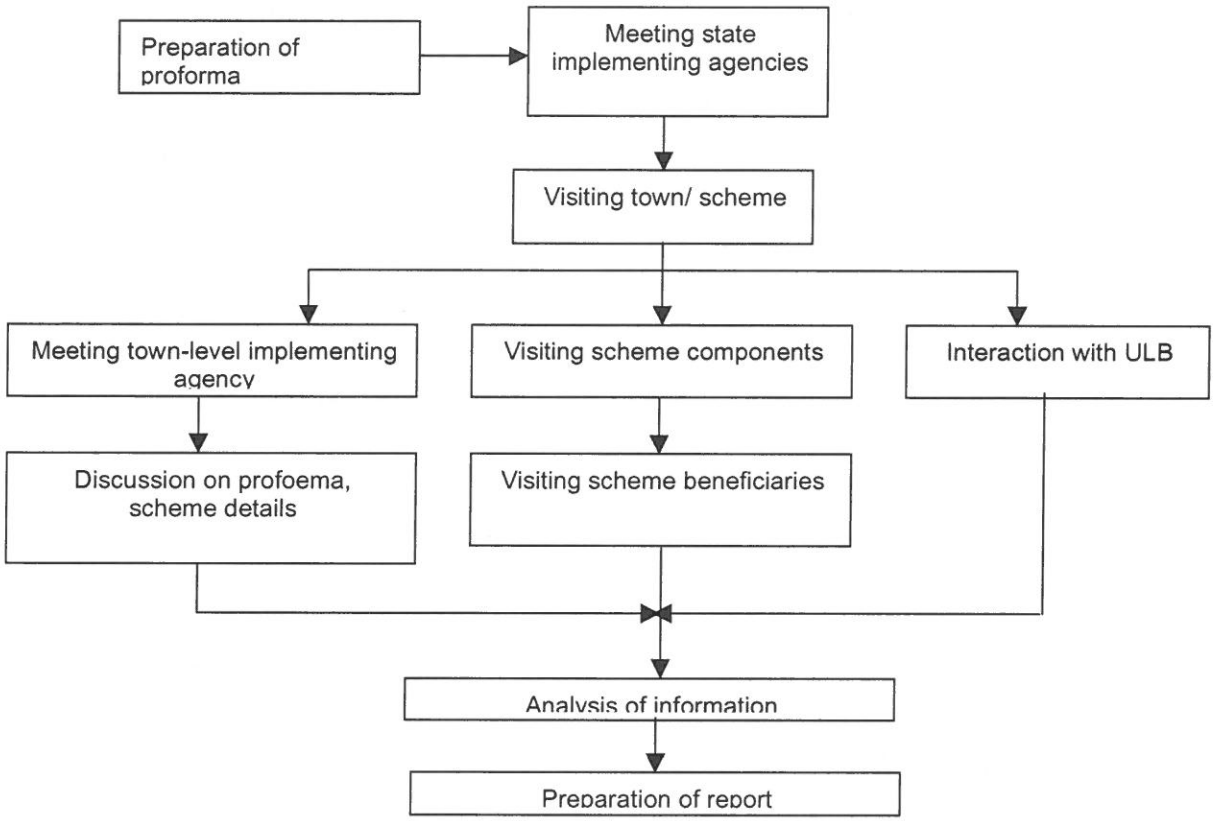
State	Name of Town	District	Implementation Status
Haryana	1. Narnaud 2. Bawani Khera 3. Uchana	Hissar Bhiwani Jind	Completed in June 1999 Completed On-going
Himachal Pradesh	1. Chowari	Chamba	Completed in March 1996
Jammu & Kashmir	1. Qazigund	Anantnag	Completed in March 1996
Punjab	1. Sanaur 2. Fategarh Churian	Patiala Gurdaspur	Completed in Dec. 2001 Completed in Dec. 2001
Rajasthan	1. Sarvar 2. Mahuwa 3. Pokharan 4. Nava City	Ajmer Sawai Madhopur Jaisalmer Nagaur	Commissioned Commissioned Commissioned Commissioned

5. Methodology

5.1 The methodology followed to carry out the evaluation study was as follows:

1. Preparation of questionnaire for evaluation based on the parameters given for the study (Annexure II).
2. Interaction with the State implementing agencies to apprise them of the study objectives, establish contact with the selected towns, and get basic information relating to the selected schemes.
3. Visiting the towns/ schemes – meeting the officials connected with the implementation and O&M of the schemes including ULBs and holding discussions with them.
4. Visiting scheme components and meeting the residents in order to assess the impact of the scheme.
5. Having discussions with the implementing agency on the filled questionnaire.
6. Analysing the information collected through field visits.
7. Report writing

Methodology for Conducting the Evaluation Study



6. Organisation of the report

6.1 This evaluation report consists of three chapters. Chapter 1 contains the introduction to AUWSP, objectives of AUWSP and the necessity for evaluation of the AUWSP schemes, scope of the study and methodology adopted for conducting the evaluation study. Chapter 2 is gives the status of the schemes evaluated. This chapter is sub-divided in to five parts to cover the five states selected for the study. In this chapter, each scheme has been described to broadly cover the following aspects:

- Scheme approval and implementation
- Implementing agency
- Project cost and actual expenditure
- Details of funds released
- Raw water source

- Population and water demand
- Components of the scheme
- Situation analysis before and after implementation of the scheme
- Water quality monitoring
- Present status of wastewater disposal
- Views of the implementing/O&M agency and community about the scheme

6.2 Evaluation study findings vis-à-vis the impact of the scheme with respect to the objective of the study for individual towns has also been enumerated in this chapter.

6.3 Chapter 3 summarises the findings from the study and gives recommendations for improving the implementation and effectiveness of the AUWSP schemes.

7. Format for evaluation

7.1 Issues and parameters considered while evaluating the scheme (as given by MOUD):

- ***Name of town, district & state***

- ***Population (as per 199) census***
- Initial
- Intermediate
- Ultimate (design)

- ***Water demand (lpcd)***
- Initial (year)
- Intermediate (Year)
- Ultimate (year)

- ***Source of water supply:*** ***Ground*** ***Surface*** ***Total***
- Quality of produced (MLD)
- Distance of the source from the town (Km)
- Any deviation compared to approve scheme

- Treatment facilities (specify unit operation)
- Per capita service level (lpcd)
- Details of work involved: Component wise along with approved estimate cost
- Implementing agencies

- ***Funds provided by:*** ***GOI*** ***State Govt*** ***ULB***
  (Rs. in. Lakh)

- ***Agency responsible for O&M***

- ***Tariff Structure***
  Before Implementation After implementation

- ***Water charges /kl***
  Before Implementation After implementation

- ***Since when is the present tariff structure imposed***

- ***Any future plan of tariff revision***

- ***Revenue*** (Rs in. Lakh)
  Before Implementation After implementation
  - ULB (overall)
  - From water supply scheme

- ***O&M Expenditure*** (Rs in. Lakh)
  Before Implementation After implementation
  - ULB (overall)
  - From water supply scheme

- ***In case of deficit, how is the expenditure*** **met** (Details may be furnished)
  Before Implementation After implementation

- ***Manpower available with the agency in-charge of O/M in respect of water supply***

  Before Implementation After implementation

- ***No of PFs provided***

  Before Implementation After implementation

- ***How many PSPs are working & percentage of population provided with public stand posts***

  Before Implementation After implementation

- ***No of house service connections (HSCs) provided***

  Before Implementation After implementation

- ***Percentage of population with HSCs.***

- ***Quantum of UFW (% & in MLD)***

  Before Implementation After implementation

- ***Whether UFW exercise has commenced or not***

- ***Whether UWF cell is set up or not***

- ***Views of ULB regarding the schemes***

  Before Implementation After implementation

- ***Views of public regarding usefulness of the scheme***

  Before Implementation After implementation

- ***Quality of water supply***

  (Please furnish periodicity of water quality testing along with test report and source of samples)

- ***Whether residual chlorine available is sufficient or not***
- ***Other issues such as power shortage, depletion or water sources, lack of funds for O & M etc.***

- ***What is the mode of disposal of waste water in the town***

  Before Implementation After implementation

- ***Salient features or drawbacks, if any***

- ***Specific recommendation /suggestion for improvement/ optimisation of performance***

CHAPTER 2

State-wise Evaluation of AUWSP Schemes

Part A: Haryana

Scheme 1:

Bawani Khera

District: Bhiwani

Based on the meetings and discussions with the (PWD) Public Health Division officials and visit to the project town Bawani Khera, the following information was obtained:

1.1 Scheme Approval and Implementation:

- MoUD, GOI approved the augmentation of water supply scheme of Bawani Khera, vide their letter dated 27th March 1997.
- As per the letter of approval, the scheme was scheduled to start in 1997-98 and be completed in 1998-99.
- It was reported that the scheme actually started in September 1997 and was commissioned in March 2000.
- Though the scheme has been commissioned and water is being supplied, the scheme has not been completed. It was learnt that 80% of total distribution system under AUWSP has been completed and laying of remaining 20% water supply distribution pipeline is in progress.
- One of the major reasons for delay in completion of the scheme, as stated by the PHD officials, is frequent transfer of concerned officials.

1.2 Implementing Agency: PWD, Public Health Department, Government of Haryana has implemented the scheme and the PWD, Public Health Division No. 2, Bhiwani, is responsible for the operation and maintenance of the scheme.

1.3 Project Cost and Actual Expenditure: The estimated cost of the scheme, as approved by MoUD, GOI, was Rs.223.54 lakhs. The actual expenditure incurred till date is Rs.209.96 lakhs.

1.4 Details of Funds Released by the State and Central government are furnished in Table 1.1:

Table 1.1: Release of Funds

Bhiwani			
Central Government		**State Government**	
Date of Release	**Amount** (Rs in Lakhs)	**Date of Release**	**Amount** (Rs in Lakhs)
27.3.1997	42.00	25.3.1997	4.00
27.3.1998	20.00	27.3.1997	6.00
13.3.1999	32.03	19.3.1998	32.00
18.5.1999	20.00	19.3.1998	20.00
		18.5.1999	20.00
		25.3.2001	27.51
Total	**114.03**		**109.51**

Source: PWD, PHD, Bhiwani

1.5 Raw Water Source: The source of raw water for the town is surface source (Bawani Khera Minor Irrigation Canal) located at a distance of about 3 km from Bawani Khera town. Raw water is drawn from the source through an inlet canal and stored in a storage reservoir. The canal water is normally available for 7-8 days a month. The storage reservoir is designed to store water for the entire month's water requirement.

1.6 Population and Water Demand: The population of the town in 1991 was 14,159 (Census), which increased to 17,424 in 2001 (Census). The present (2004) population of the town is 18,626. The population in the initial, intermediate and ultimate years and the corresponding water demand is given in Table 1.2.

Table 1.2: Population and Water Demand

Bhiwani				
Sl. No.	**Year**	**Initial**	**Intermediate**	**Ultimate**
		1996	**2011**	**2026**
1	Population covered under the scheme	17203	25803	30965
2	Water Demand (mld)			
	Domestic	1.20	2.00	2.50
	Non-domestic	0.42	0.42	0.42
	Total	1.62	2.42	2.92

Source: PWD, PHD, Bhiwani

The present quantity of water produced in the town is 2.50 mld and the quantity supplied is 2.09 mld. Of this 1.85 mld is being supplied for domestic use.

1.7 Project Component: The approved scheme components, estimated cost, actual expenditure and reasons for variation in expenditure are given in Table 1.3.

Table 1.3: Project Components, Approved Cost and Actual Expenditure

(Rupees in Lakh)

Bhiwani				
Sl. No.	**Project Components**	**Approved Estimated Cost (By MoUD, GoI)**	**Actual Expenditure**	**Variation from approved cost**
1	Source Development River/Stream Inlet Channel	8.27	8.27	-
2	Pump House & Pumping Machinery	7.1	7.1	-
3	Treatment Plant including Disinfection unit, S/S tank, HL Tank, Slow Sand Filter & Boundary Wall	62.11	62.11	-
4	Rising Main/ Leading Main	31.90	31.90	-
5	Clear Water Reservoir	9.13	9.13	-
6	Distribution System*	72.26	70.18	-2.08
7	Electric Power including Transformer	2.50	2.50	-
8	Office Buildings/ Quarters/ Laboratories	1.60	1.60	-
9	Land Acquisition	10.70	0	10.70**
10	Miscellaneous	1.41	1.41	Nil
	Sub- total	**206.98**	**194.2**	**12.78**
11	Contingencies	10.35	9.67	
12	WC Establishments	6.21	6.09	
	Total	**223.54**	**209.96**	

Source: PWD, PHD, Bhiwani
** Ongoing*
*** Land acquired. Payment yet to be made.*

- All the approved components of the scheme have been found to be physically existing and in operation.
- However, the laboratory room constructed under this scheme has not been equipped and is being used as a storage room for bleaching powder.
- It is also learnt from the discussions with the PHD officials that no expenditure was incurred on the approved components before sanctioning of the scheme.

1.8 Situation Analysis Before and After Implementation:

The water supply situation in Bawani Khera before and after implementation is described below and is given in a tabular form in Table 1.4.

a. The per capita supply in the town has increased marginally from 60 lpcd to 70 lpcd after implementation of the scheme.

b. The population covered by household service connections increased considerably after the implementation of the AUWSP scheme – from 55% to 85%. The remaining population is served by PSPs.

c. The number of domestic connections has increased significantly after the implementation of the scheme. All new connections given under the scheme are metered.

d. Water is supplied for one hour each in the morning and evening.

e. The UFW has been not been estimated for the town by the PHD officials.

f. No UFW Cell has been set up in the town nor has any exercise commenced to set up such a cell.

g. The revenue from water supply has increased marginally after implementation of the scheme. The cost recovery from water supply was only about 30% in 2002-03. In actual terms, the revenue-expenditure gap was Rs.14.28 lakhs in 2002-03. The State Government makes up the shortfall in revenue as PHD manages the service in the town and not the local government.

h. The total staff strength in the town has increased by 2 after the implementation of the scheme and stands at 13 currently.

Table 1.4: Status Before and After Implementation of AUWSP Scheme

Bhiwani

Sl. No.	Parameter	Before Implementation	After Implementation
1	**Population covered** by HSC	55%	85%
2	**Per capita supply** through HSC	60 lpcd	70 lpcd
3	**No. of HSC** Domestic (Metered) Non-domestic Total	 1311 - 1311	 2076 - 2076
4	**UFW** In percentage Actuals	 Not estimated -	 Not estimated -
5	**Water Tariff** Domestic (Unmetered) Non-domestic (Unmetered)	1997 Rs. 20/ month Rs. 25/ month	2004 Rs. 50/ month Rs. 75/ month
6	**Revenue** (Rs. in lakhs)	Rs 5.07 (1996-97)	Rs 6.25 (2002-03)
7	**Expenditure** (Rs. in lakhs)	Rs 12.86(1996-97)	Rs. 20.53 (2002-03)
8	**Manpower** Agency responsible for O&M No. of technical staff No. of managerial staff No. of staff for O&M Total strength of department	 PH Division, Bhiwani 2 2 7 11	 PH Division, Bhiwani 2 3 8 13
9	Mode of **disposal of wastewater**	Open drain without treatment	Open drain without treatment

Source: PWD, PHD, Bhiwani

1.9 Water Quality Monitoring:

- Raw water for the town is treated in a slow sand filter bed.
- The treated water is stored in a ground level clear water reservoir (CWR) and provided with bleaching powder (added manually with pre-fix dosing as disinfectant).
- It was reported that the quality of water is monitored by the PWD, PHD on a weekly basis.
- Laboratory tests are conducted only for bacteriological parameters. No physical and chemical tests are reported to be carried out.
- The water quality test reports (bacteriological parameters) suggest that the quality of water is fit for drinking.
- Residual chlorine available was stated to be sufficient.

1.10 Wastewater Disposal:

- It was reported that sewer lines have been laid to cover about 25-30% of the town. However, the sewerage system is yet to operate.
- The wastewater of the town is mostly disposed into the nearby low lands without any treatment and subsequently used by farmers for irrigation purpose.

1.11 Views of PHD regarding the scheme:

- The PHD officials stated that there were some area in the town where the water pressure was low. However, action has been taken to improve the situation.
- Recently a booster has been installed by the PHD at the tail-end of the system to improve water pressure and so water is now available to all parts of the town and the pressure now reaches up to 12 meters.
- The PHD officials expressed their overall satisfaction with the scheme.

1.12 Views of Community:

Interviews were conducted with consumers at different locations of the town (near the water works and at tail-end of the distribution system) to get the views of the community on the water supply situation.

- The interviews revealed that the consumers are getting adequate water to meet their daily demand.
- Some consumers did mention that at times water pressure is low and to solve this problem they have installed booster pumps.
- The quantity of water available to consumers has increased after implementation of the AUWSP scheme.
- According to the residents the quality of water and water pressure have also improved after implementation of the scheme.
- The people expressed their overall satisfaction with the scheme.

1.13 Summary of Evaluation Study and Findings for Bawani Khera Scheme:

1. The source of water supply for the town is surface water (Bawani Khera Minor Irrigation Canal) drawn through an inlet canal. The source, as

mentioned by the PHD officials, seems reliable and can be depended upon.

2. The scheme started almost on schedule but completion was delayed by a year due to frequent transfer of officials. The laying of pipe for the distribution system has also not been completed yet, 20% work is still left.

3. The estimated cost of the scheme approved by the Ministry was Rs. 223.54 lakhs while the actual expenditure till date was Rs. 209.96 lakhs. An additional expenditure of Rs. 10.70 lakhs will be incurred on the scheme as soon as the payment for land acquisition is made.

4. All components as per the letter of approval of the Ministry have been executed. All the components of the scheme have been completed except a small part of the distribution system.

5. A laboratory room that was constructed under the scheme is currently being used as a storage room for bleaching powder.

6. The per capita supply in the town has gone up marginally after the implementation of the scheme. It is now at the stipulated level of 70 lpcd.

7. Population covered by HSCs has gone up to 85% after the implementation of the scheme. The remaining population uses PSPs.

8. The number of HSCs in the town has gone up significantly after the implementation of AUWSP.

9. All the water supply connections in the town are metered.

10. The PHD officials in the town have not estimated the UFW. According to them, the quantity of UFW is insignificant.

11. No UFW cell has been created in the town, neither has any special exercise commenced to set up such a cell.

12. Domestic tariff in the town has gone up by two-and-a-half times after implementation of the scheme from Rs. 20 to Rs. 50 per month.

13. The revenue from water supply fell short of the expenditure on the service by 14.28 lakhs in 2002-03. Cost recovery from the service is only about 30% at present. The State Government meets the shortfall in expenditure, as PHD is a state government agency.

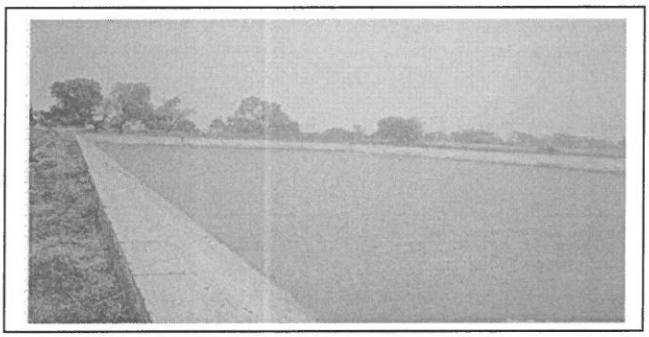
14. The scheme has not been handed over to the local body after completion. The PWD, PHD maintains the water supply system in the town.

15. The people in the town are satisfied with the scheme as they are getting sufficient water for their use.

16. The wastewater from the town is disposed into low-lying areas without any treatment. Subsequently farmers for irrigation purpose use it.

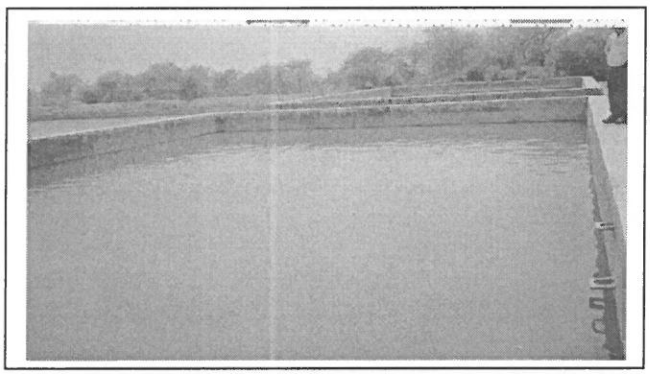
1.14 From the above discussions it can be seen that the scheme has had a positive impact on the water supply situation in the town. The overall objectives of the AUWSP have been achieved in the town. However, the scheme is not yet self-sustaining as the full operation and maintenance cost is not recovered.

Photographs of various components of AUWSP in Bawani-Khera:

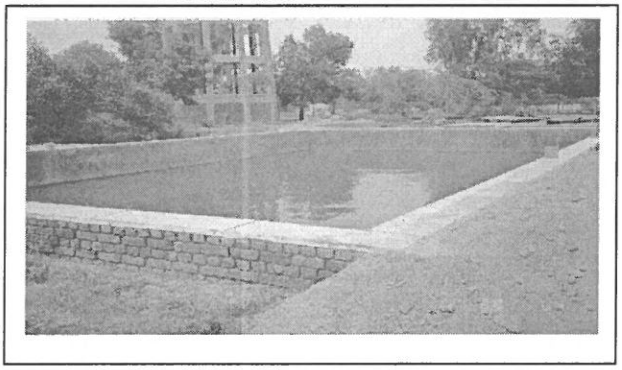


Photograph 1: Raw Water Storage Water Reservoir

Photograph 2: Pumping Machinery

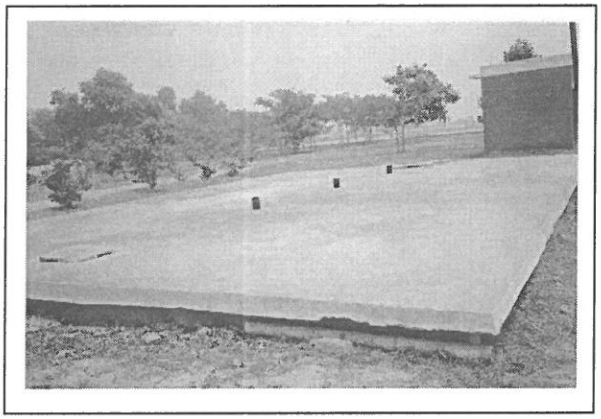


Photograph 3: Slow Sand Filter Water Treatment Plant

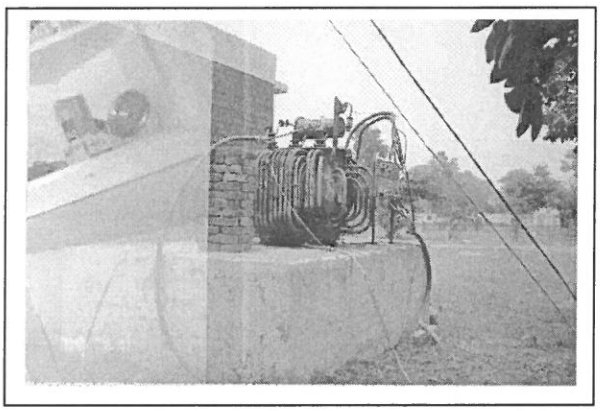


Photograph 4: Used filter bed materials from the Slow Sand Filter Plant

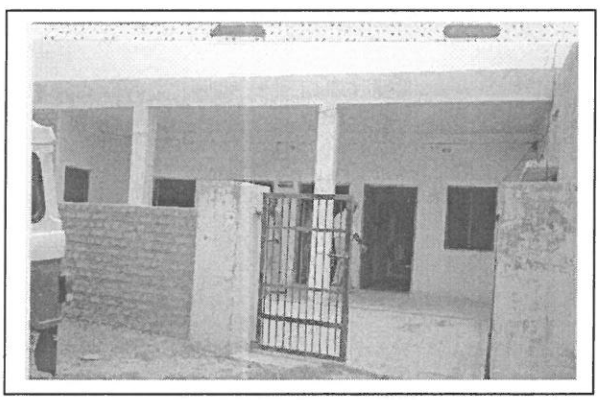
Photographs of various components of AUWSP scheme in Bawani-Khera



Photograph 5: Clear Water Storage Reservoir



Photograph 6: Electric Transformer



Photograph 7: Office Building

Part A: Haryana

Scheme 2:

Narnaud

District: Hissar

Based on the meetings and discussions with the PWD, Public Health Engineering Division officials and visit to the project town Narnaud, the following information was obtained:

2.1 Scheme Approval and Implementation:

- MoUD approved the augmentation of water supply scheme at Narnaud, GoI vide their letter dated 20th February 1994.
- As per the letter of approval, the scheme was scheduled to start in 1994-95 and be completed in 1995-96.
- It was reported that the scheme actually started in May 1995 and was completed in 1999-2000.
- One of the major reasons for delay in completion of the scheme, as stated by the officials, was frequent transfer of concerned officials.

2.2 Implementing Agency: The scheme was implemented by PWD, Public Health Division of Hansi. They are also responsible for the O&M of the water supply system in Narnaud.

2.3 Project Cost and Actual Expenditure:

- The estimated cost of the scheme as approved by the MoUD, GoI, was Rs.92.88 lakhs.
- The actual expenditure incurred till completion of the scheme was Rs. 97.62 lakhs.
- The additional cost of the scheme was met from the State Government funds.

2.4 Details of Funds Released by the State and Central government are furnished in Table 2.1:

Table 2.1: Release of Funds

Hansi			
Central Government		**State Government**	
Date of Release	**Amount (Rs in Lakhs)**	**Date of Release**	**Amount (Rs in Lakhs)**
19.03.1995	9.60	17.01.1995	2.10
25.03.1996	25.60	31.03.1995	7.50
25.03.1996	11.30	29.02.1996	4.50
		26.03.1996	6.75
		24.04.1996	25.60
Total	**46.50**	Total	**46.45**

Source: PWD, Public Health Division, Hansi

2.5 Raw Water Source: The source of raw water for the town is Hisar Major Distributary (Western Yamuna Canal system). Raw water is drawn from this source through an inlet canal and stored in a storage reservoir. The canal water is normally available for 7-8 days a month. The storage reservoir is designed to store water for the entire month's water requirement.

2.6 Population and Water Demand: The population of the town in 1991 was 12,197 (Census), which increased to 15,114 in 2001 (Census). The present (2004) population of the town is 16248. The population in the initial, intermediate and ultimate years and the corresponding water demand is given in Table 2.2.

Table 2.2: Population and Water Demand

Hansi				
Sl. No.		**Initial**	**Intermediate**	**Ultimate**
	Year	**1994**	**2009**	**2024**
1	Population covered under the scheme	12,197	20,656	24,786
2	Water Demand (mld)			
	Domestic	1.38	2.28	2.94
	Non-domestic	0.14	0.18	0.21
	Total	1.52	2.46	3.15

Source: PWD, Public Health Division, Hansi

- The present quantity of water produced in the town is 2.72 mld and the quantity supplied is 1.52 mld. Of this 1.38 mld is being supplied for domestic use.

2.7 Project Components: The approved scheme components, cost, actual expenditure and reasons for variation in expenditure are given in Table 2.3.

Table 2.3: Project Components, Approved Costs and Actual Expenditure

(Rupees in Lakhs)

Hansi					
Sl. No	**Project Components**	**Approved Estimated Cost (By MoUD, GoI)**	**Actual Expenditure**	**Variation from approved cost**	**Reasons for variation**
1	Source Development River/ Stream Inlet Channel & S/S Tank	28.2	38.58	+ 10.38	Due to increase in length of channel & capacity of S/S tank at site
2	Pump House & Pumping Machinery	3.1	8.07	+ 4.97	Cost estimated on lower side
3	Treatment Plant including Disinfection Unit & Rapid Sand Filtration plant	39.45	15.52	- 23.93	Cost estimated on higher side
4	Clear Water Reservoir	9.35	6.8	- 2.55	Cost estimated on higher side
5	Electric Power Including Transformer	0.5	1.78	+1.28	Actual exp. on higher side
6	Miscellaneous	5.5	9.79	+ 4.29	Actual exp. on higher side
7	Distribution (C.I.pipes & Spl)	-	3.35	+ 3.35	See note below
8	Leveling, dressing & making path	-	6.50	+ 6.50	See note below
	Sub-Total	**86.00**	**90.39**	**+ 4.39**	
9	Contingencies	4.3	4.52		
10	W. C. Establishment	2.58	2.71		
	Total	**92.88**	**97.62**		

Source: PWD, Public Health Division, Hansi

Note: There are certain deviations in the components with respect to that approved by the MoUD, GoI. Following components were considered necessary while implementing the scheme:

a. Water supply distribution system: The existing distribution system has been upgraded. This was not included in the approved scheme components but was added to the scheme. Rs. 3.35 lakhs has been spent for this component to cover some areas of the town.

b. Levelling, Dressing and Making Path: This is an additional component which was included for making access road, levelling and dressing of ground as per site requirement during scheme implementation. Rs. 6.50 lakhs has been spent on this component.

- All the approved components of the scheme have been found to physically exist and are in operation.

- It was also learnt from the discussions with the PHD officials that no expenditure was incurred on the approved components before sanctioning of the scheme.

2.8 Situation Analysis Before and After Implementation:

The water supply situation in Narnaud before and after implementation is described below and is given in a tabular form in Table 2.4.

a. The per capita supply in the town has increased from 40 lpcd (through PSPs) to 100 lpcd after implementation of the scheme.

b. The town did not have many household service connections until the AUWSP was implemented. Till then most of the population either depended upon public standpipes or their own private facilities. After the implementation of the scheme about 24% of the population was covered by HSCs, while 61% of the population is covered by public stand posts. This coverage is being increased now.

c. The number of domestic connections at present stands at 377 covering less than one-fourth of the households in the town. All new connections given under the scheme are un-metered.

d. At present water is supplied for four hours daily - two hours each in the morning and evening.

e. The UFW in the town was stated to be high but the officials could provide no estimate.

f. No UFW Cell has been set up in the town nor has any exercise commenced to set up such a cell.

g. The revenue from water supply has increased marginally after implementation of the scheme – from Rs. 0.48 lakhs to Rs. 0.74 lakhs. However, the revenue falls very short of the expenditure on the service. In 2002-03 the cost recovery in the town was below 2% and the income-expenditure gap was Rs. 44.02 lakhs. The State Government makes up the shortfall in revenues as PHD manages the service in the town and not the local government.

h. The total staff strength in the town has doubled after the implementation of the scheme – from 7 to 14.

Table 2.4: Status before and after implementation of AUWSP Scheme

Hansi			
Sl. No.	**Parameter**	**Before Implementation**	**After Implementation**
1	Population covered by HSC	Negligible	24% *
2	Per capita supply through HSC	40 lpcd	100 lpcd
	No. of HSC		
	Domestic	-	377
	Non-domestic	-	-
	Total	-	377
3	**PSPs** provided under the scheme	209	320
4	**UFW**		
	In percentage	No estimate	No estimate
	Actual	-	-
5	**Water Tariff**		2004
	Domestic (Metered)	-	Rs.1.25/ kl
	Domestic (Unmetered)	-	Rs. 50 per month
	Non-domestic (Metered)	-	Rs. 4.00/ kl
	Non-domestic (Unmetered)	-	Rs. 50 + 150% p.m.
6	Revenue (Rs. in lakhs)	Rs. 0.48 (1994-95)	Rs.0.74 (2002-03)
7	Expenditure (Rs. in lakhs)	Rs. 5.06 (1994-95)	Rs. 44.76 (2002-03)
8	**Manpower**		
	Agency responsible for O&M	PH Div Hansi	PH Div Hansi
	No. of technical staff	4	7
	No. of managerial staff	1	2
	No. of staff for O&M	2	5
	Total strength of department	7	14
9	Mode of disposal of wastewater	In pond and drain	In pond and drain

Source: PWD, Public Health Division, Hansi

** While only 24% population is covered by HSCs, overall 85% of population is covered by the water supply system; the others have been provided public stand posts.*

- A total of 209 PSPs existed in the town before the implementation of scheme and the PSPs increased to 320 after the implementation of the scheme. As per the PHD officials, 6 PSPs have been provided under AUWSP. Since the town started providing HSCs only after the AUWSP scheme, the PSPs will remain the main source for those not yet covered and for the EWS.

2.9 Water Quality Monitoring:

- Raw water for the town is treated in a rapid sand filtration plant.
- The treated water is stored in a ground level CWR and provided with bleaching powder (added manually with pre-fix dosing as disinfectant).
- Quality of water supplied to consumers is monitored on a quarterly basis.
- Reports provided by the department for the last three water tests indicate that the water is potable.
- Residual chlorine available was stated to be sufficient.

2.10 Wastewater Disposal: There is no proper wastewater disposal system in the town. The wastewater is disposed off in storm water drains and finally discharged into ponds and drains.

2.11 Views of PHD on the scheme: The PHD, which is responsible for the O&M of the scheme, is satisfied with the scheme. The infrastructure created for water supply in the town has greatly improved the town's water supply situation.

2.12 Views of Community:

- Interviews were conducted with some residents at different locations of the town (near the water works and at the tail-end of the distribution system).
- The interviews revealed that the consumers are getting adequate water to meet their daily demand. Normally, the water pressure at the consumer end is about 7m (i.e. up to first floor level).
- The quantity of water available to people has increased after implementation of the AUWSP scheme.
- Overall, people expressed their satisfaction with the existing water supply system in the town.

2.13 Summary of Evaluation Study and Findings for Narnaud town

1. The source of water supply for the town is surface water - Hisar Major Distributary (Western Yamuna Canal system) drawn through an inlet

canal. The source, as mentioned by the PHD officials, seems reliable and can be depended upon.

2. The scheme started on schedule but completion was delayed by a year due to frequent transfer of the concerned officials.

3. The estimated cost of the scheme, as approved by the Ministry, was Rs. 92.88 lakhs while the actual expenditure was Rs. 97.62 lakhs. The additional cost was on distribution system and leveling, dressing and making path (considered necessary at the time of implementation).

4. All components as per the letter of approval of the Ministry were executed. However, two additional components were also implemented whose cost was borne by the state government. All the components of the scheme have been completed.

5. The per capita supply in the town at present is 100 lpcd as against 40 lpcd that was provided earlier through PSPs.

6. The town did not have many HSCs before the implementation of AUWSP. The present population covered by HSCs stands at 24%, while the total population covered is 85%. The remaining population is dependent upon PSPs.

7. All the water supply connections in the town are un-metered.

8. The UFW for the town has not been estimated for the town.

9. No UFW cell has been created in the town, neither has any special exercise commenced to set up such a cell.

10. Domestic tariff was imposed in the town only after the implementation of AUWSP.

11. The scheme has not been handed over to the local body after completion. The PWD, PHD maintains the water supply system in the town.

12. The revenue from water supply falls woefully short of the expenditure on the service, forming less than 2% of the expenditure at present. This is because of the very small coverage of population by HSCs. The

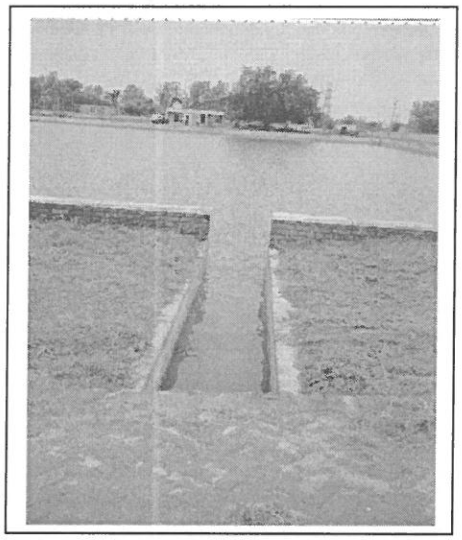
state government meets the shortfall in expenditure, as PHD is a state government agency.

13. The people in the town are satisfied with the scheme as they are getting sufficient water for their use. Now many households have HSCs.

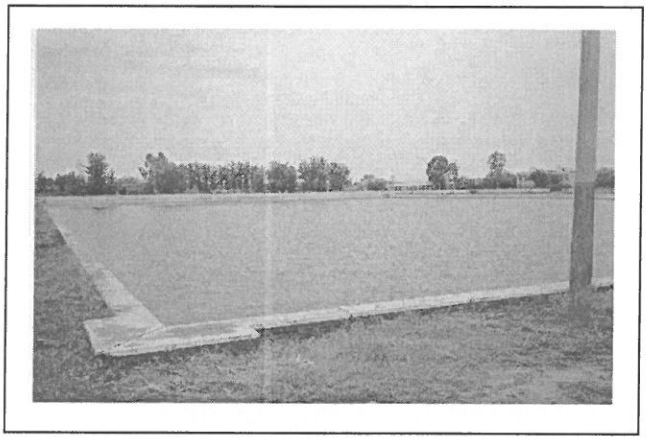
14. The wastewater from the town is disposed into ponds through storm water drains.

2.14 The water supply situation of the town has improved with the implementation of the AUWSP, both in terms of quality and quantity. This has resulted in a positive social impact on the population of the town. Almost the entire population of the town has been covered under the scheme. The overall objectives of the AUWSP have been achieved in the town. However, the revenue realisation is meager compared to the annual O & M cost of the water supply system. This will make the system non-sustainable in long run unless increasing HSCs and revising the present water tariff improve the revenue generation.

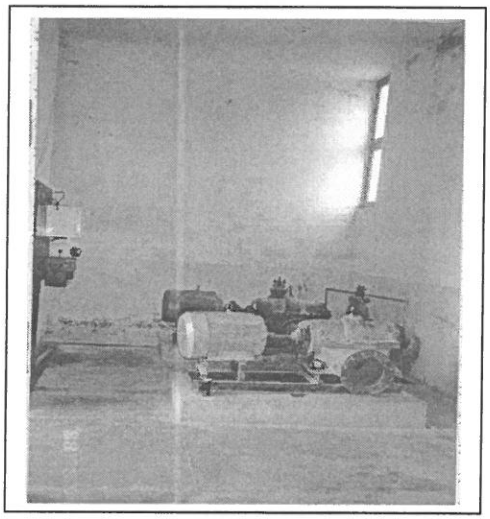
Photographs of various components of AUWSP scheme in Narnaud



Photograph 8: Inlet Channel carrying raw water from source

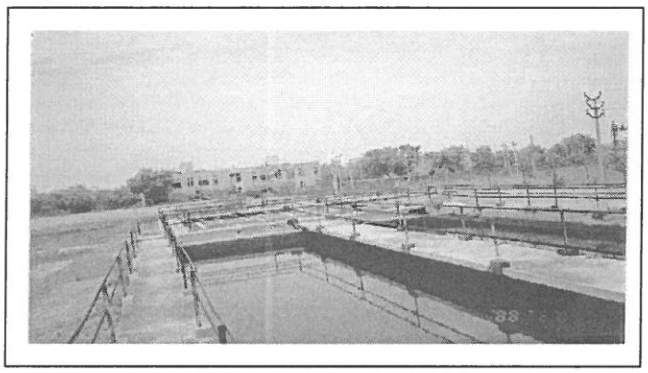


Photograph 9: Raw Water Storage Reservoir

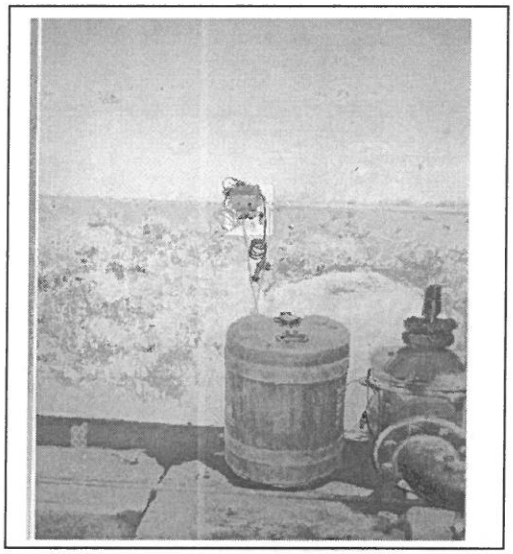


Photograph 10: Pump House and Pumping Machinery

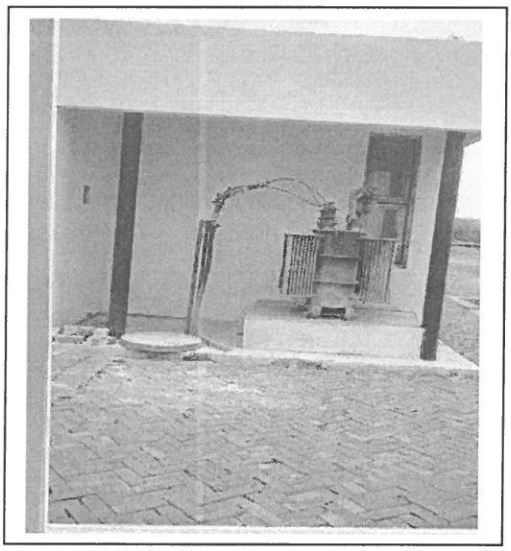
Photographs of various components of AUWSP scheme in Narnaud



Photograph 11: Rapid Sand Filter Water Treatment Plant



Photograph 12: Mechanically operated Chlorinator.



Photograph 13: Electric Transformer

Part A: Haryana

Scheme 3:

Uchana

District: Jind

Based on the meetings and discussions with the PWD, Public Health Division officials and visit to the project town Uchana, the following information was obtained

3.1 Scheme Approval and Implementation:

- MoUD approved the augmentation of water supply scheme of Uchana, GoI vide their letter dated 8th October 1998.
- As per the letter of approval, the scheme was scheduled to start in 1998-99 and be completed in 1999-2000.
- It was reported that the scheme actually started in May 2000. Though the scheme is in operation and water is being supplied, the scheme has not yet been completed.
- It was learnt from the PHD officials that 90% of total distribution system under AUWSP has been completed and laying/replacing remaining 10% water supply distribution pipelines is in progress.
- The Slow Sand Filter Bed is partly complete. Top layer of the filter media in two units are still to be laid.
- The major reasons for delay in completion of the scheme, as stated by the PHD officials, are delay in obtaining funds and frequent transfer of concerned officials.

3.2 Implementing Agency: PWD, Public Health Department has implemented the scheme and the PWD, Public Health Sub-Division, Uchana is responsible for the operation and maintenance of the scheme.

3.3 Project Cost and Actual Expenditure:

- The estimated cost of the scheme as approved by the MoUD, GoI was Rs.103.42 lakhs.
- The actual expenditure incurred till 31.03.2004 was Rs.91.18 lakhs.
- Discussions with the PHD officials indicated that there was no expenditure on acquisition of land since government land was available.
- The State Electricity Board at their own cost made the electric power connection and installation of transformer and hence no expenditure was incurred on this component.

3.4 Details of Funds Released by the State and Central government are furnished in Table 3.1:

Table 3.1: Release of Funds

Uchana			
Central Government		**State Government**	
Date of Release	**Amount (Rs in Lakhs)**	**Date of Release**	**Amount (Rs in Lakhs)**
18.12.2000	15.00	18.12.2000	15.00
25.03.2001	20.00	25.03.2001	20.00
28.03.2001	16.71	28.03.2001	15.00
		28.03.2001	1.71
Total	**51.71**	**Total**	**51.71**

Source: PWD, PH Sub-Division, Uchana

3.5 Raw Water Source: The source of raw water is surface source (New Barsola Canal Feeder) located at a distance of about 1.70 kms from Uchana. Raw water is drawn from the source through an inlet channel and stored in a storage reservoir. The canal water is normally available for 7-8 days a month. Storage reservoir is designed to store water for the entire month's water requirement.

3.6 Population and Water Demand: The population of the town, which was 10,216 in 1991 (Census) reached 12776 in 2001 (Census). The present (2004) population of the town is 13,536. The population in the initial, intermediate and ultimate years and the corresponding water demand is given in Table 3.2.

Table 3.2: Population and Water Demand

Uchana				
S. No		**Initial**	**Intermediate**	**Ultimate**
	Year	**1998**	**2013**	**2028**
1	Population covered under the scheme	10216	18146	21775
2	Water Demand (mld)			
	Domestic	1.34	n.p.	n.p.
	Non-domestic	0.30	n.p.	n.p.
	Total	1.64	n.p.	n.p.

Source: PWD, PH Sub-Division, Uchana n.p. = not provided

The present quantity of water produced is 1.65 mld and the quantity supplied is 1.64 mld. Of this, 1.34 is being supplied for domestic use.

3.7 Project Components: The approved scheme components, estimated cost, actual expenditure and reasons for variation are given in Table 3.3.

Table 3.3: Project Components, Approved Cost and Actual Expenditure

(Rupees in Lakhs)

Uchana					
Sl. No.	Project Components	**Approved Estimated Cost (By MoUD,GoI)**	**Actual Expenditure**	**Variation from approved Cost**	**Reasons for variation**
1	Source Development River/ Stream Inlet Channel	9.53	16.26	+6.73	Change of alignment due to construction of new canal with more raw water
2	Pump House & Pumping Machinery	2.95	4.49	+1.54	Lesser amt sanctioned against provisions made
3	Treatment Plant including Disinfection Unit, S/S Tank, HL Tank, Slow Sand Filter, Boundary Wall	13.58	25.02	+11.22	Due to higher premium on work of treatment plant and construction of boundary wall
4	Rising main/ leading main	1.90	1.40	-0.50	
5	Clear Water reservoir	8.16	5.67	-2.49	
6	Distribution System	45.65	36.27	-9.38	Not completed yet
7	Electric Power including transformer	6.00	Nil	-6.00	
8	Office buildings/quarters/ laboratories etc	2.86	2.07	-0.79	
9	Land acquisition	5.00	Nil	-5.00	
	Sub-Total	**95.63**	**91.18**	**-4.45**	
10	Contingencies @ 5%	4.78	-	-	
11	W.C. Establishments @ 3%	3.01	-	-	
	Total	**103.42**	**91.18**	**12.24**	

Source: PWD, PH Sub-Division, Uchana

- There are certain deviations in the cost of the individual scheme components with respect to that approved by the MoUD,GoI. The High Level Tank for storage of water, though was among the approved components, has been subsequently omitted from the scheme, as it was considered not required. Acquisition of land was also not required since government land was available. The reason for some variations in cost are as follows:
  a) Increase in the length of the inlet channel due to change in its alignment for drawing water from New Barsola Feeder instead of old canal source of Safakheri Minor for better availability of raw water.
  b) Escalation of price both for material and labour.
  c) Lesser amount approved than what was originally proposed.
- All the approved components of the scheme (except two units of the slow sand filter) physically exist and are in operation. Discussions with the PHD officials indicated that no expenditure was incurred on the approved components before sanctioning of the scheme.

3.8 Situation Analysis Before and After Implementation:

The water supply situation in Uchana before and after implementation is described below and is given in a tabular form in Table 3.4.

a. The per capita supply in the town has increased marginally from 45 lpcd to 70 lpcd after implementation of the scheme.

b. The population covered by household service connections has gone up to 100% after the implementation of the AUWSP scheme. Before the scheme, only a little over half the population was covered by HSCs.

c. The number of domestic connections has more than doubled after the implementation of the scheme. All new connections given under the scheme are un-metered.

d. At present water is supplied for seven hours daily – 3 ½ hours each in the morning and evening.

e. The UFW has been not been estimated for the town by the PHD officials.

f. No UFW Cell has been set up in the town nor has any exercise

commenced to set up such a cell.

g. Water tariff in the town has gone up two-and-half times since the implementation of the scheme from Rs 20 to Rs 50 per month.

h. The revenue from water supply in the town falls short of the expenditure on the service. The cost recovery from water supply was only bout 33% in 2003-2004. In actual terms the revenue-expenditure gap was Rs. 14.30 lakhs. The State Government makes up the shortfall in revenue as PHD manages the service in the town and not the local government.

i. The total staff strength in the town has increased by 4 after the implementation of the scheme and stands at 16 at present.

Table 3.4: Status before and after implementation of AUWSP Scheme

Uchana			
Sl. No.	**Parameter**	**Before Implementation**	**After Implementation**
1	**Population covered** by HSC	54%	100%
2	**Per capita supply** through HSC	45 lpcd	70 lpcd
3	**No. of HSC**		
	Domestic (Unmetered)	700	1850
	Non-domestic	-	-
	Total	700	1850
4	**UFW**		
	In percentage	Not estimated	Not estimated
	Actuals	-	-
5	**Water Tariff**	1997	2004
	Domestic (Unmetered)	Rs 20/month	Rs 50/month
	Non-domestic (Unmetered)	Rs 25/month	Rs 75/month
6	Revenue (Rs. in lakhs)	Rs 1.87 (1997-98)	Rs 6.95 (2003-04)
7	Expenditure (Rs. in lakhs)	Rs 17.91 (1997-98)	Rs 21.25 (2003-04)
8	**Manpower**		
	Agency responsible for O&M	P.H. Sub-Division, Uchana	P.H. Sub-Division, Uchana
	No. of technical staff	4	4
	No. of managerial staff	2	2
	No. of staff for O&M	6	10
	Total strength of department	12	16
9	**Mode of disposal of wastewater**	Partly in Oxidation pond, remaining discharged in low-lying areas without treatment.	Partly in Oxidation pond, remaining discharged in low-lying areas without treatment

Source: PWD, PH Sub-Division, Uchana

A total of 23 PSPs existed in the town before the implementation of the scheme

and the PSPs reduced to 15 after the implementation of the scheme. This is because the entire population of the town has been covered with HSCs. No PSP has been provided under the AUWSP scheme. The town provides PSPs mainly to the economically weaker sections.

3.9 Water Quality Monitoring:

- Raw water for the town is treated in a 2.5 mld capacity slow sand filter bed.
- The treated water is stored in a ground level CWR and provided with bleaching powder (added manually with pre-fix dosing as disinfectant).
- It was reported that the PHD officials on a weekly basis monitor the quality of water.
- Laboratory tests are conducted only for bacteriological parameters. No physical and chemical tests are reported to be carried out.
- Water quality test reports (bacteriological parameters) suggest that the quality of water is fit for drinking.
- Residual chlorine available was stated to be sufficient.

3.10 Wastewater Disposal:

- A small part of the town is presently covered under sewerage system.
- Wastewater from the sewerage system is treated in an oxidation pond.
- The remaining wastewater is let off untreated into open drains and finally discharged into low-lying areas.

3.11 Views of PHD regarding the scheme: The PHD officials expressed their satisfaction with the scheme.

3.12 Views of Community: A few residents from different locations of the town (near the water works and at tail-end of the distribution system) were interviewed to know their opinion about the water supply situation.

- The interviews revealed that the consumers are getting adequate water to meet their daily demand.
- The quantity of water available to residents has increased after implementation of the AUWSP scheme.
- The residents expressed their overall satisfaction with the existing water

supply system.

3.13 Summary of Findings of Evaluation Study for Uchana town

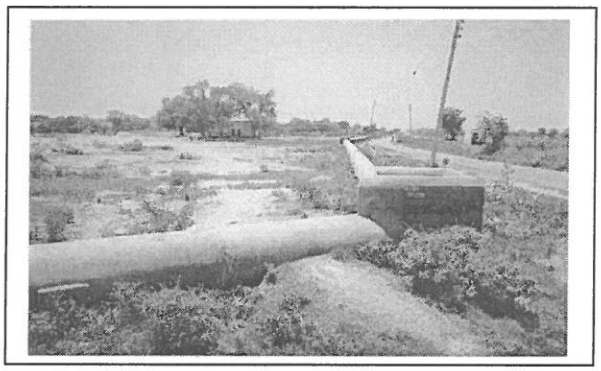
1. The source of water supply for the town is surface water (New Barsola Canal Feeder) drawn through an inlet channel. The source, as mentioned by the PHD officials, seems reliable and can be depended upon.
2. The start of the scheme was delayed by more than a year due non-availability of funds and also due to frequent transfer of officials. The laying/ replacement of pipes for the distribution system has also not been completed yet, 10% work is still left.
3. The estimated cost of the scheme approved by the Ministry was Rs. 103.42 lakhs while the actual expenditure till date was Rs. 91.18 lakhs. There was no expenditure on acquisition of land since Government land was available. The State Electricity Board at their own cost did the electric power connection and installation of transformer and hence no expenditure was incurred on this component.
4. All components as per the letter of approval of the Ministry have been executed and have been completed except for a small part of the distribution system and two SSF beds.
5. Population covered by HSCs has gone up to 100% after the implementation of the scheme.
6. The per capita supply in the town has gone up from 45 lpcd to 70 lpcd after the implementation of the scheme.
7. All the water supply connections in the town are un-metered.
8. The PHD officials in the town have not estimated the UFW. According to them, UFW is not easy to calculate.
9. No UFW cell has been created in the town, neither has any special exercise commenced to set up such a cell.
10. Domestic tariff in the town has gone up by two-and-a-half times after the implementation of the scheme.
11. The revenue from water supply falls short of the expenditure. The revenue forms only 33% of the expenditure at present. The state government meets the shortfall

in expenditure, as PHD is a state government agency.

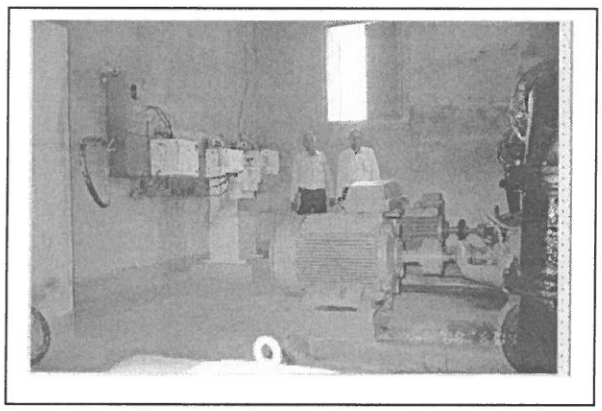
12. The scheme has not been handed over to the local body after completion. The PWD, PHD maintains the water supply system in the town.
13. The people in the town are satisfied with the scheme as they are getting sufficient water for their use.
14. The wastewater from the sewerage system in the town is treated in oxidation pond. The remaining wastewater is discharged into low-lying areas without any treatment.

3.14 Though the scheme has not been completed, it has had a positive social and environmental impact. The quality as well as quantity of water supply has improved in the town. The overall objectives of AUWSP have been achieved in terms of the total coverage of town's population, improvement in socio-economic conditions and quality of life of the inhabitants of the town. However, the O&M cost recovery is low and the water supply scheme's is still subsidy dependent even after achieving 100% HSCs.

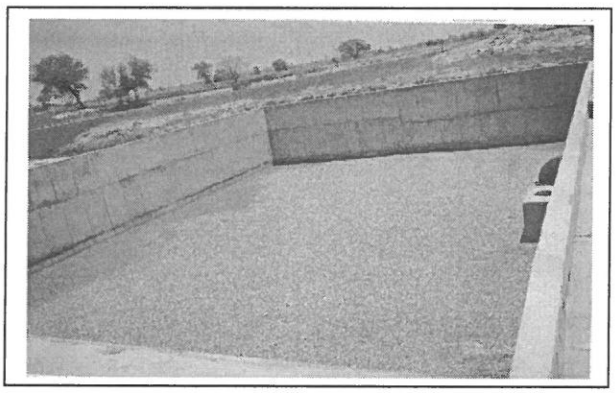
Photographs of various components of AUWSP scheme in Uchana



Photograph 14: Inlet Pipe for carrying raw water from source

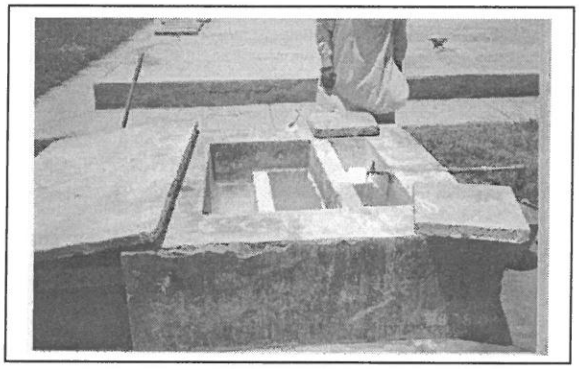


Photograph 15: Pumping Machinery

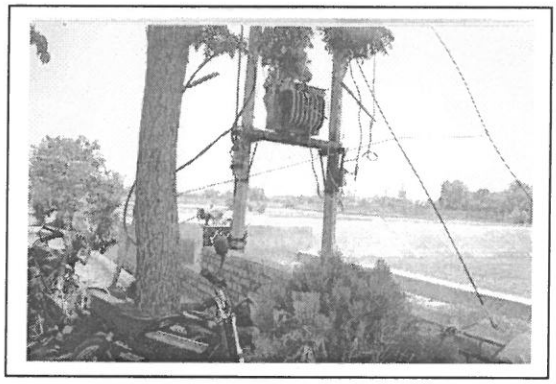


Photograph 16: Filter Bed of Slow Sand Filter Water Treatment Plant-under preparation

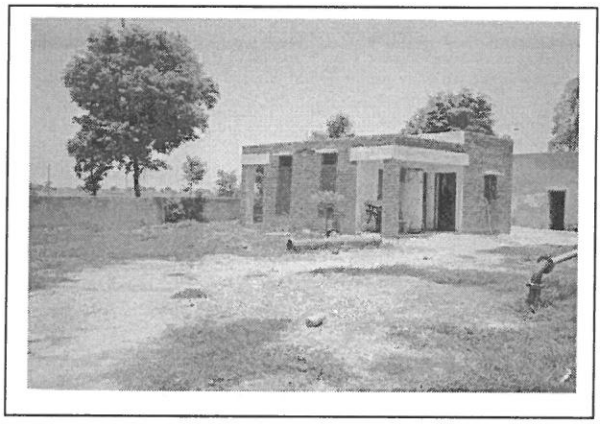
Photographs of various components of AUWSP scheme in Uchana



Photograph 17: Alum Dosing Tank



Photograph 18: Electric Transformer



Photograph 19: Staff Quarter

Part B: Himachal Pradesh

Scheme 4: Chowari

District: Chamba

Based on the meetings and discussions with the Irrigation & Public Health Department (I&PHD) officials and visit to the project town, Chowari the following information was obtained.

4.1 Scheme Approval and implementation:

- The AUWSP scheme for Chowari was sanctioned on March 7, 1995 by MoUD, GoI vide letter no.Q-12045/9(1)/94-CPHEEO.
- As per the letter of approval, the scheme was scheduled to start in 1994-95 and be completed in 1995-96.
- The scheme was implemented as per schedule.

4.2 Implementing Agency: The Irrigation & Public Health Department (IPHD), Govt. of Himachal Pradesh, has executed the project. The I&PHD, Dalhousie carries out the operation and maintenance of the water supply system. The scheme has not been handed over to the local government.

4.3 Project Cost:

- The estimated cost of the scheme, as approved by the MoUD, GoI was Rs.39.50 lakhs.
- The actual expenditure incurred on the scheme till its completion was Rs.46.03 lakhs.
- The amount over and above the approved estimated cost (i.e. Rs. 6.53 lakhs) was borne by the Government of Himachal Pradesh.

4.4 Details of funds released by the State and the Central Government could not be furnished by the I&PHD officials to the NIUA team.

4.5 Raw Water Source: The source of water for the scheme is spring water. The source is located about 5 kms from Chowari town. Raw water from the source is transmitted, after filtration and sedimentation, through gravity main and stored in a reservoir.

4.6 Population and Water Demand: According to the Census of India, the population of Chowari town was 3,194 in 1991 and 3,961 in 2001. The present (2004) population of the town is estimated at 4,246. The population in the initial, intermediate and ultimate years and the corresponding water demand is given in Table 4.1.

Table 4.1 - Population and Water Demand

Dalhousie				
Sl. N.	**Item**	**Initial**	**Intermediate**	**Ultimate**
	Year	**1991**	**2005**	**2024**
1.	Population covered under the scheme	3,194	4344	6044
2.	Water demand (mld)			
	Domestic	Not given	Not given	0.42
	Non-domestic	Not given	Not given	0.14
	Total			**0.56**

Source: Irrigation and Public Health Department, Dalhousie

- The present quantity of water produced in the town is 0.562 mld and as per the officials this entire quantity is supplied to the town. Of this, 0.422 mld is supplied for domestic use.

4.7 Project Components: The approved scheme components, estimated cost, and actual expenditure are given in Table 4.2.

Table 4.2 - Project Components, Approved Cost and Actual Expenditure

(Rupees in Lakh)

Dalhousie			
Sl. No.	**Project Components**	**Approved Estimated Cost (By MoUD, GoI)**	**Actual Expenditure**
1	Source Development River/ stream	0.53	Component – wise actual expenditure not available*
2	Treatment Plants including Disinfection Unit	3.17	
3	Gravity Main	7.35	
4	Service Reservoir	1.75	
5	Distribution System	22.90	
6	Land Acquisition	0.10	
7	Miscellaneous	0.82	
	Sub-total	**36.62**	
	Contingencies @ 5%	1.83	
	W.C. Establishment Charges @ 3%	1.10	
Total		**39.55**	**46.03**
Variation from approved cost			**+6.48**

Source: Irrigation and Public Health Department, Dalhousie

** The I&PHD officials could not furnish this information.*

- The actual expenditure on the scheme has exceeded the approved estimated cost by MoUD, GoI by Rs. 6.48 lakhs.
- As per the officials, this is because of price escalation of labour and material and increased pipe length, which was not included in the estimated cost of the scheme.
- During the visit of the NIUA evaluation team it was observed that all the scheme components are physically existing and under operation.
- It was also learnt from the I&PHD officials that no expenditure was incurred on the approved components before sanctioning of the scheme.

4.8 Situation Analysis Before and After Implementation:

The water supply situation in Chowari before and after implementation is described below and is given in a tabular form in Table 4.3.

a. The coverage of population by house service connections (HSCs) has reached 100% after implementation of the scheme. Before the scheme, only 45% population had HSCs.

b. The per capita supply in the town has increased from 40 lpcd to 120 lpcd after implementation of the scheme.

c. At present water is supplied for ten hours daily in the town – five hours each in the morning and evening. .

d. The number of domestic connections has gone up significantly after the implementation of AUWSP. All new connections given under the scheme are un-metered.

e. No estimate of UFW has been provided by the I&PHD officials.

f. No UFW Cell has been set up in the town nor has any exercise commenced to set up such a cell.

g. Domestic water tariff has increased by four times after implementation of the scheme. It has gone up from Rs. 10 per month to Rs. 40 per month.

h. The revenue from water supply was not furnished by the I&PHD. The annual expenditure on water supply has gone up from about Rs. 0.22 lakhs before implementation of the scheme to about Rs. 0.71 lakhs at present. The state government as I makes up the shortfall in revenue&PHD manages the service in the town and not the local government.

i. The total staff strength has increased from 4 to 11 after the implementation of the scheme.

Table 4.3 - Status Before and After Implementation of AUWSP Scheme

Dalhousie			
Sl. No.	**Parameter**	**Before Implementation**	**After Implementation**
1	**Population covered** by HSC	45%	100%
2	**Per capita supply** through HSC	40 lpcd	120 lpcd
3	**No. of HSC** Domestic (Unmetered) Non-domestic Total	 200 34 234	 383 34 417
4	**PSPs**	12	46
5	**UFW** In percentage Actuals	Not estimated –	Not estimated –
6	**Water Tariff** Domestic (Un-metered) Non-domestic	Rs.10 per month -	Rs.40 per month -

Dalhousie			
Sl. No.	**Parameter**	**Before Implementation**	**After Implementation**
7	Revenue	Not furnished	Not furnished
8	**Expenditure** (Rs. in lakhs)	Rs.0.22 (1992-93)	Rs.0.71 (2003-04)
9	**Manpower**		
	Agency responsible for O&M	I&PH Department	I&PH Department
	No. of technical staff	-	-
	No. of managerial staff	-	-
	No. of staff for O&M	4	11
	Total strength of department	4	11
10	Mode of **disposal of wastewater**	In natural drains	In natural drains

Source: Irrigation and Public Health Department, Dalhousie

- A total of 12 PSPs existed in the town before the implementation of the scheme and the PSPs increased to 46 after the implementation of the scheme. As per the officials, 34 additional PSPs have been provided for under the AUWSP scheme. The town provides PSPs for the poor.

4.9 Water Quality Monitoring:

- The treated water, after filtration and sedimentation, is chlorinated manually by using bleaching powder before distribution.
- The quality of water supplied to the consumer is monitored by the I&PH Department on quarterly basis by sampling and testing water from the consumer taps.
- No test reports could be obtained during the visit of the NIUA evaluation team.
- Residual chlorine available was stated to be sufficient.
- No major outbreak of water-borne diseases has been reported from the town after the implementation of the AUWSP scheme.

4.10 Waste Water Disposal: The town does not have a sewerage system. Wastewater is disposed through the natural drains mostly without any treatment.

4.11 Views of PHD regarding the Scheme: The I&PHD officials expressed their satisfaction with the AUWSP scheme.

4.12 Views of Public: During the visit to the town, the NIUA team interviewed a few water consumers to seek their opinion on the AUWSP scheme.

- The interviews revealed that the consumers are getting adequate water to meet their daily demand.
- The quantity of water has increased after implementation of the AUWSP scheme.
- According to people, the quality of water and water pressure has also improved after the implementation of the scheme.
- People expressed their overall satisfaction with the water supply situation.

4.13 Summary of Evaluation Study and Findings for Chowari Scheme

1. The source of water supply to the town is spring water. The source is reliable and can be depended upon as it stands today.

2. The scheme was completed as per schedule.

3. The approved estimated cost by MoUD, GoI, for the scheme was Rs. 39.50 lakhs while the actual expenditure on the scheme was Rs. 46.03 lakhs. The increase in cost was due to price escalation and increased pipe length.

4. All components of the scheme, as approved, have been executed.

5. The entire population of the town has been covered by household connections after the implementation of the scheme. The earlier coverage was only 45%.

6. The per capita supply in the town has increased from 40 lpcd to 120 lpcd at present.

7. All the water supply connections given under the AUWSP scheme are un-metered.

8. The UFW has not been estimated by the I&PHD officials.

9. No UFW cell has been created in the town and no exercise has commenced to set up such a cell.

10. Domestic tariff has increased by four times after the implementation of the scheme. However, its impact on the revenues of the I&PHD could not be assessed in the absence of information on revenue collection. It was mentioned by the officials that the State Government meets the revenue shortfall.

11. The scheme has not been handed over to the local body after completion. The I&PHD itself maintains the water supply system in the town.

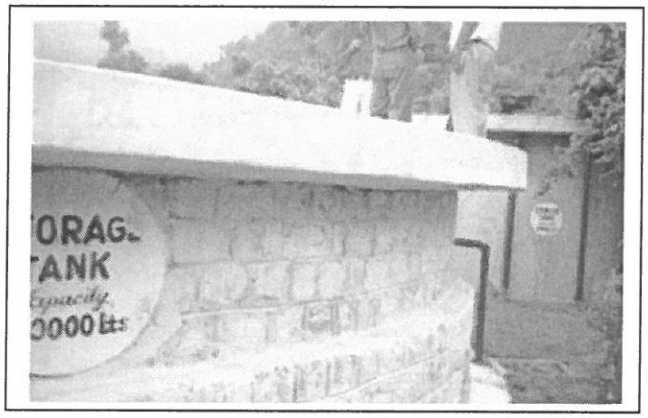
12. The staff numbers have almost tripled in the town after the implementation of the scheme- from 4 to 11.

13. Most of the people in the town are satisfied with the scheme as they are getting sufficient water for their use.

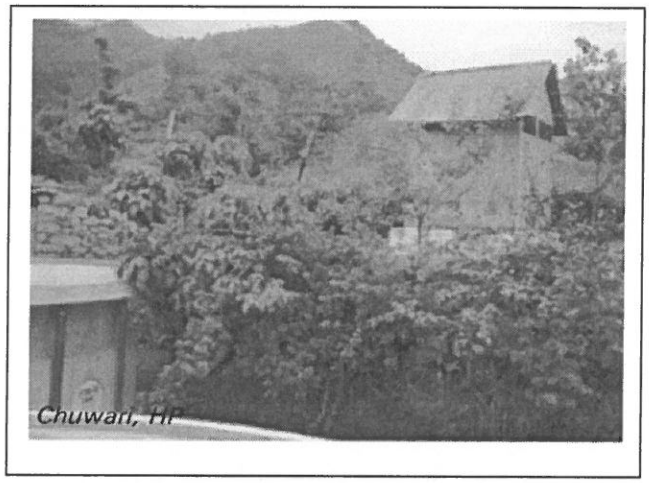
4.14 The wastewater from the town is disposed off untreated into natural drains.

4.15 The scheme has been implemented on schedule and has had a positive social and environmental impact. The quality as well as quantity of water supply has improved after implementation of the scheme under AUWSP. The overall objectives of AUWSP have been achieved in terms of the total coverage of the town's population, improvement in socio-economic conditions and quality of life of the residents of the town. However, the water supply scheme is still subsidy dependent even after achieving 100% HSCs.

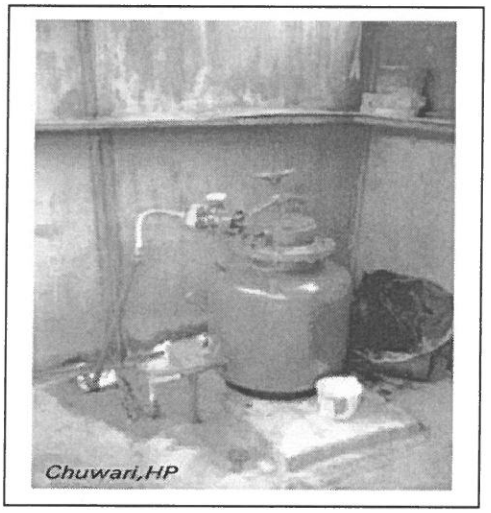
Photographs of various components of AUWSP scheme in Chowari



Photograph 20: View of clear water storage tank.

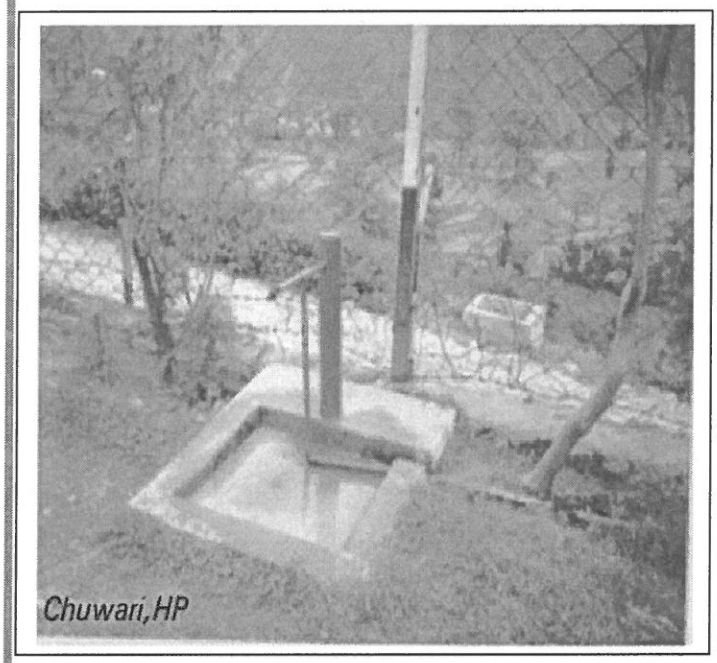


Photograph 21: storage tank and chlorination house.

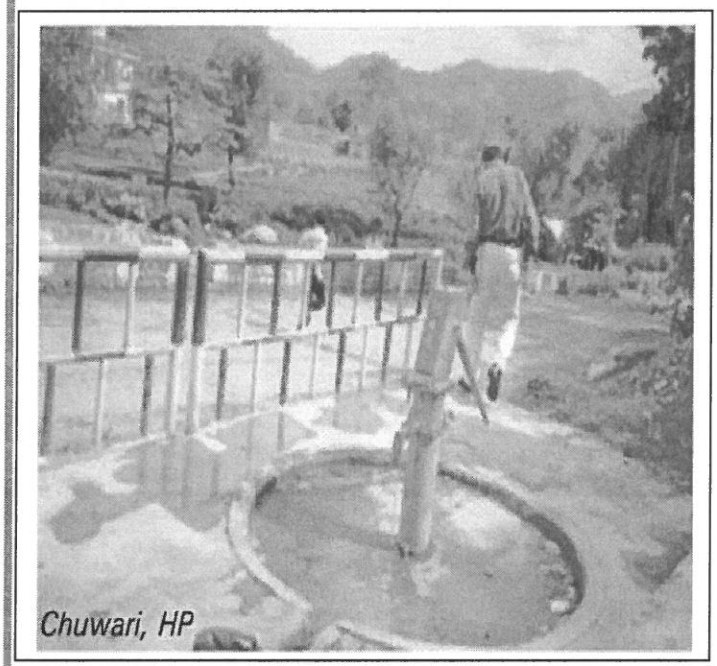


Photograph 22: Chlorinator connected with the existing W/S system

Photographs of various components of AUWSP scheme in Chowari



Photograph 23: Public stand posts



Photograph 24: Existing hand pump

Part C: Jammu & Kashmir

Scheme 5: Qazigund

District: Anantnag

Based on the meetings and discussions with the Public Health Engineering Division (PHED) officials and visit to Qazigund, the following information was obtained:

5.1 Scheme Approval and Implementation:

- MoUD, GoI, sanctioned the AUWSP scheme for Qazigund on 7 March 1995.
- As per the letter of approval, the scheme was scheduled to start in 1994-95 and be completed in 1996-97.
- The water supply scheme under AUWSP for Qazigund was started in the year 1994-95 and was completed in March 1996.
- The scheme was completed as per schedule.

5.2 Implementing Agency: The PHED, Jammu and Kashmir, has implemented the scheme and the PHED, Qazigund, is responsible for the operation and maintenance (O&M) of the scheme.

5.3 Project Cost and Actual Expenditure:

- The estimated cost of the scheme as approved by the MoUD, GoI is Rs.42.52 lakhs.
- As per the PHED officials, the actual expenditure on the scheme was also Rs.42.52 lakhs.

5.4 Details of funds released by the State and the Central Government are furnished in Table 5.1.

Table 5.1: Release of Funds

Qazigund			
Central Government		**State Government**	
Date of Release	**Amount (Rs in lakhs)**	**Date of Release**	**Amount (Rs in lakhs)**
Sept. 1994	5.32	Sept.1994	6.26
Sept. 1995	15.94	Sept.1995	15.00
Total	**21.26**		**21.26**

Source: PHED, Qazigund

5.5 Raw Water Source: The source of raw water for the town is spring water from Verinag, located at a distance of about 10 kms from Qazigund town. Raw water from the source is collected by means of two collection tanks. The collected water is transmitted to the SR through gravity main before supplying to the consumers through a distribution network system.

5.6 Population and Water Demand: The population of Qazigund town, which was 8211 in 1991 (Census) reached 10428 in 2001 (Census) and is estimated to be 11,262 at present (2004). The population in the initial, intermediate and ultimate years and the corresponding water demand is given in Table 5.2.

Table 5.2: Population and Water Demand

Qazigund				
Sl. No	**Year**	**Initial**	**Intermediate**	**Ultimate**
		1991	**1994**	**2009**
1	Population covered under the scheme	8,211	9,114	14,000
2	Water Demand (mld)			
	Domestic	0.57	0.63	0.86
	Non-domestic	-	-	0.12
	Total	0.57	0.63	0.98

Source: PHED, Qazigund

- The present quantity of water produced in the town is 0.60 mld and the quantity supplied is 0.52 mld. Of this 0.45 mld is supplied for domestic use.

5.7 Project Components: The approved scheme components, estimated cost, actual expenditure and reasons for variation in expenditure are given in Tables 5.3 and 5.4. Table 5.3 gives the component-wise approved cost as per the letter of approval of the Ministry while Table 5.4 gives the component-wise details as available with the PHED, Qazigund. It was not possible for NIUA to reconcile the two tables; hence they are given as two separate tables.

Table 5.3: Project Components and Approved Cost (As given in the Ministry's letter of approval)

(Rupees in Lakhs)

Qazigund		
Sl. No.	**Project Components**	**Approved estimated cost(by MoUD,GoI)**
1	Pump House	0.60
2	Service Reservoir	4.50
3	Distribution System	25.40
4	Office building/ quarters	4.40
5	Land Acquisition	0.30
6	Miscellaneous	2.25
	Sub-total	**37.45**
	Contingencies @ 5%	2.87
	W.C. Estt. @ 3%	1.02
	Total	**41.34**

Source: Approval letter of MoUD, GoI

Table 5.4: Project components, Approved Cost and Actual expenditure

(Rupees in Lakhs)

Qazigund				
Sl. No.	**Project Components**	**Approved estimated cost (by MoUD, GoI)**	**Actual Expenditure**	**Variation from approved cost**
1	Construction of 2 No collecting tanks instead of 0.20 lakh gallons capacity service reservoir	4.00	0.82	-3.18*
2	Revamping of existing impounding SR at Drad Kote	0.60	0.6	–
3	Construction of catch water drain around additional SR	0.50	0.58	+-0.08
4	Barbed wire fencing around SR	0.50	0.7	+0.20
5	Construction of Pipes and pipe specials	20.40	9.41	-10.99**
6	Laying and fitting of Pipes	6.12	8.37	+2.25
7	Construction of cement concrete blocks	0.65	–	0.65
8	Staff quarters/temporary CGI shed and brick walling	4.40	3.39	-1.01
9	Improvements to existing distribution system	2.00	2.12	+0.12
10	Land compensation	0.30	0.2	-0.10
11	Repairs to SR by way of checking of leakages	1.10	2.34	-1.24
12	Contingencies and W.C.	2.02	2.42	+0.40
	TOTAL	**42.59**	**30.95**	**-8.46**
	Actual expenditure till completion		**42.52*** **	

Source: PHED, Qazigund

As per the PHED officials -

** Total requirement for ½ day storage capacity works out to 1.06 lakh gallons, which stands already constructed and so construction of an SR of 0.20 lakhs gallons capacity was not needed.*

*** Reason not given – records gutted.*

**** It was reported that the actual expenditure till completion of the scheme was Rs.42.52 lakhs. However, the details of expenditure for Rs. 11.57 lakhs (42.52 – 30.95) incurred since March 1995 are not available since the documents are reported to have been gutted in 1995 due to militancy in the region.*

- As per the data provided by the PHED, Qazigund, there is a variation of Rs. 7000 in the total approved estimated cost by MoUD, GoI with respect to the component wise aggregated cost (as approved by the GoI) for the scheme. The variation could not be crosschecked, as the letter of approval of MoUD, GoI for Qazigund is not available.
- It is reported that the scheme is complete in all respects and is under operation. All the scheme components have been found to physically exist and in operation. The cement concrete blocks component was not executed, as it was not considered necessary at the time of implementation. It is also learnt from the discussions with the PHED officials that no expenditure was incurred on the approved components before sanctioning of the scheme.

5.8 Assessment of Situation Before and After Implementation:

The water supply situation in Qazigund before and after implementation is described below and is given in a tabular form in Table 5.4

a) The population covered by house service connections (HSC) has increased after implementation of the scheme and stands at 64% at present. The remaining households of the town have independent water facilities or depend upon PSPs.
b) The per capita supply in the town has increased significantly after the implementation of the scheme from about 25 lpcd earlier to over 90 lpcd at present. The reason for this high level of supply is that the town has sufficient water resources available.
c) At present water is supplied in the town for five hours daily - three hours in the morning and two hours in the evening.
d) The number of domestic connections has gone up to 143 after the implementation of AUWSP from 88 before implementation. However, all the domestic and non-domestic connections in town are un-metered.
e) The estimated UFW has also come down from about 5% before implementation to about 2 %. However, UFW is based on the perception and best guess of the water-supplying agency and therefore has to be taken as such.
f) No UFW Cell has been set up in the town, nor has any exercise commenced to set up such a cell.

g) The domestic tariff before implementation of AUWSP was Rs 120 per annum, which has gone up by Rs. 60 to Rs 180 per annum after the implementation of the scheme.

h) The PHED officials stated that the revenue from water supply was extremely low during the initial period of militancy in the state as the militants threatened people and asked them to not pay for water charges. While the revenue has gone up considerably since 1998-99, the cost recovery is still only about 33%. In actual terms the shortfall is Rs. 0.92 lakhs. The State Government meets the shortfall in expenditure.

i) The staff position has not changed after the implementation of AUWSP scheme.

Table 5.4: Status before and after implementation of AUWSP Scheme

Qazigund			
Sl. No	**Parameter**	**Before Implementation**	**After Implementation**
1	**Population covered** by HSC	36%	64%
2	**Per capita supply** through HSC	20-25 lpcd	90-100 lpcd
3	**No. of HSC** Domestic (Unmetered) Non-domestic (Unmetered) Total	 88 2 90	 143 23 166
4	**UFW** In percentage Actuals	 5% 0.03 mld	 2% 0.01 mld
5	**Water Tariff** Domestic Commercial Institutional	1994 Rs 120/ per year Rs 120/ per year Rs 120/ per year	Since 1998 Rs 180 /per year Rs 500 /per year Rs 180 /per year
6	*Revenue **(in Rs.)***	Rs 1,350 (1991-92)	Rs. 44,960 (2000-01)
7	**Expenditure** (Rs. in lakhs)	Rs.0.40 (1991-92)	Rs.1.37 (2000-01)
8	**Manpower** Agency responsible for O&M No of technical staff No of managerial staff No of staff for O&M Total strength of department	 Kashmir PHED, Srinagar 3 1 7 11	 Kashmir PHED, Srinagar 3 1 7 11
9	Mode of **disposal of wastewater**	Due to hilly terrain, natural disposal of wastewater into open channels/ drains, discharged finally into river	Due to hilly terrain, natural disposal of wastewater into open channels/ drains, discharged finally into river

Source: PHED, Qazigund

- A total of 35 PSPs existed before the implementation of the scheme and 26 were added to this after the implementation of the scheme. The poorer households of the town are provided PSPs for their water requirements.

5.9 Water Quality Monitoring:

- According to the PHED officials since the spring water is directly tapped, no further treatment except chlorination is required. Chlorination is done on a regular basis to keep the water free from pathogens. No testing of water is normally done. It was also mentioned that there was no outbreak of water borne disease after the implementation of the scheme.

5.10 Waste Water Disposal: Qazigund is a hilly area and so the wastewater drains naturally into channels/ open drains and is finally discharged into river.

5.11 Views of ULB regarding the Scheme:

- The PHED felt that the scheme has benefited the town considerably.
- The PHED has been able to create the required infrastructure with the assistance of the AUWSP scheme.

5.12 Views of Community: A few residents from different locations of the town (near the water works and at tail-end of the distribution system) were interviewed to find out their views about the water supply situation before and after the implementation of the scheme.

- The people said that they are getting adequate water to meet their daily demand.
- According to the residents the quality of water and water pressure has improved after the implementation of the scheme.
- The people expressed their overall satisfaction with the existing water supply system.

5.13 Summary of Evaluation study and Findings for Qazigund town

1. The source of water supply to the town is spring water. This is a perennial source and therefore reliable.
2. The scheme started and got completed as per schedule.
3. The approved estimated cost by MoUD, GoI, for the scheme was Rs. 42.52 lakhs and the actual expenditure, according to the PHED officials, was also Rs. 42.52. However, records for an expenditure of Rs. 11.57 lakhs could not be located as the documents were gutted during militancy in the State.
4. While implementing, there was one change in the component approved by the Ministry. Instead of constructing a 0.20 lakh gallon capacity SR, two collection

tanks were constructed instead. The PHED officials stated that the total requirement for ½ day storage capacity works out to 1.06 lakh gallons, which stands already constructed and so construction of an SR of 0.20 lakh gallon capacity was not needed. The construction of the cement concrete blocks was also not taken up, as at the time of implementation it was not considered necessary.

5. All implemented components of the scheme have been completed and physically exist.

6. The coverage of population by household connections has improved to 64% after the implementation of the AUWSP scheme. The remaining population has been provided with PSPs.

7. The per capita supply in the town has increased significantly from about 25 lpcd to over 90 lpcd after the implementation of the scheme.

8. All the water supply connections given under the AUWSP scheme in the town are un-metered.

9. The UFW, estimated by the officials, seems unrealistically low at 2% at present. In the absence of a special study to estimate UFW, all figures must be taken as estimates by the officials. These are based on rough calculations and guess work.

10. No UFW cell has been created in the town and no exercise has commenced to check UFW.

11. Domestic tariff has increased in the town after the implementation of the scheme. This has resulted in an improvement in the revenue from water supply.

12. Only about 33% of the revenue from water supply is recovered in the town. The town had a very dismal revenue collection scenario in the early to mid 1990s due to militancy in the region. The State Government makes up the shortfall in revenue.

13. The scheme has not been handed over to the local body after completion; the PHED itself maintains the water supply system.

14. There has been no change in the manpower situation before and after the implementation of the scheme.

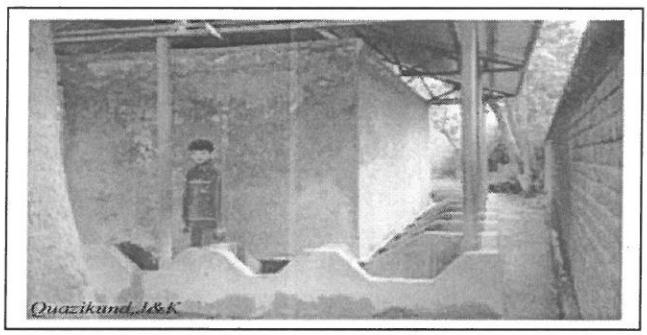
15. Most of the people in the town are satisfied with the scheme as they are getting sufficient water for their use.

16. The wastewater from the town is disposed off untreated into open channels and drains. This problem needs to be addressed and hygienic conditions need to be created in the town.

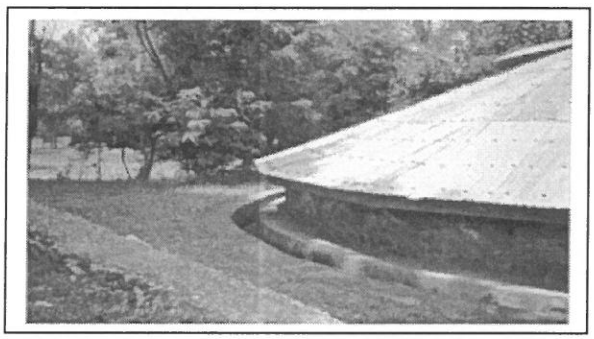
5.14 The scheme was completed on time and has had a positive impact on the residents. The Society has been benefited from the scheme in terms of access to better quality and quantity of drinking water after implementation of the scheme. The overall objective of the AUWSP has been achieved after implementation of the scheme. However, the revenue realisation is low compared to the O &M cost of the scheme even after three times hike in water tariff after implementation of the scheme. This hinders the scheme from becoming self-sustainable.

Photographs of various components of AUWSP scheme in Qazigund

Photograph 25: A storage tank rehabilitated under AUWSP

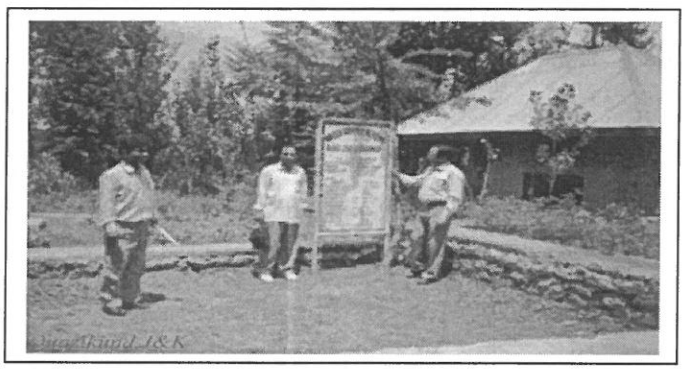


Photograph 26: Catch water drain under storage reservoir



Photograph 27: Barbed Wire Fencing around Storage Reservoir.

Photograph 28: Repair to storage reservoir and construction of boundary wall.



Part D: Punjab

Scheme 6:

Fatehgarh Churian

District: Gurdaspur

Based on the meetings and discussions held with the Punjab Water Supply and Sewerage Board (PWSSB) officials and visit to Fatehgarh Churian, the following information was obtained:

6.1 Scheme Approval and Implementation:

- MoUD, GoI, approved the extension and augmentation of water supply scheme under AUWSP at Fategarh Churian, vide its letter dated 10th March, 1998.
- As per the letter of approval, the scheme was scheduled to start in 1998-99 and be completed in 1999-2000.
- The scheme started in September 1998 and was completed in May 2003.
- The major reasons for delay in completion of the scheme, as stated by the PWSSB officials, was delay in receiving funds from the Punjab Government (see Table 1), and acquisition & finalisation of land for construction of OHSR.

6.2 Implementing Agency: The scheme is implemented by the PWSSB. Municipal Committee, Fatehgarh Churian is responsible for the operation and maintenance (O&M) of the scheme.

6.3 Project Cost and Actual Expenditure:

- The estimated cost of the scheme, as approved by MoUD, GoI was Rs. 47.00 lakhs.
- The actual expenditure incurred till completion of the scheme was Rs. 47.04 lakhs.
- The variation in the actual expenditure with respect to the approved estimated cost is within 5%.

6.4 Details of Funds Released by the state and central government are

furnished in Table 6.1:

Table 6.1: Release of Funds

Fatehgarh Churian			
Central Government		**State Government**	
Date of release	**Amount (Rs. In lakh)**	**Date of release**	**Amount (Rs in lakh)**
October 1998	12.94	-	-
March 2000	3.13	March 2000	10.00
July 2000	7.43	September 2000	13.50
	23.50	**Total**	**23.50**

Source: PWSSB, Fatehgarh Churian

6.5 Raw Water Source: The source of raw water for the scheme is tube well. Raw water is mostly pumped directly to the distribution system. Sometimes the overhead reservoir is used for supplying water.

6.6 Population and Water Demand: The population of the town in 1991 was 11,069 (Census), 15,879 in 2001 (Census) and is 16,920 at present (2004). The population in the initial, intermediate and ultimate years and the corresponding water demand is given in Table 6.2.

Table 6.2: Population and Water Demand

Fatehgarh Churian				
S. No		**Initial**	**Intermediate**	**Ultimate**
	Year	**1998**	**2013**	**2028**
1	Population covered under the scheme	12149	16441	21531
2	Water Demand (mld)			
	Domestic	1.88	2.55	3.22
	Non-domestic	0.10	0.12	0.12
	Total	1.98	2.67	3.34

Source: PWSSB, Fatehgarh Churian

- The present quantity of water produced in the town is 1.96 mld and the quantity supplied is 1.57 mld. Of this 1.52 mld is supplied for domestic use.

6.7 Project Components: The approved scheme components, estimated cost, actual expenditure and reasons for variation in expenditure are given in Table 6.3.

Table 6.3: Project Components, Approved cost and Actual expenditure

(Rupees in Lakh)

Fatehgarh Churian					
Sl. No.	**Project Components**	**Approved Estimated Cost (By MoUD,GoI)**	**Actual Expenditure**	**Variation from approved cost**	**Reasons for variation**
1	Rising/Leading Main	0.61	*	*	*
2	Overhead Service Reservoir (Capacity 4.54 lakh litre)	17.00	19.86	+2.86	Price escalation
3	Distribution System	25.94	27.18	+0.63**	Price escalation
	Sub-total	**43.55**	**47.04**	**+3.49**	
	Contingencies @5%	2.18			
	W.C. Estt. @ 3%	1.27			
	Total	**47.00**	**47.04**	**+0.04**	

Source: PWSSB, Fatehgarh Churian

** Included in the Distribution system component, as per the PWSSB officials.*
*** Rising Main expenditure of Rs. 0.61 lakhs subtracted.*

a. According to the PWSSB officials, at present only one tubewell is being utilised for water supply to the town. The other tubewell is not in operation*.
b. The Municipal Committee does not have sufficient number of operators to operate pumps. Only one operator is presently engaged in operating both water supply and sewage pumps.
c. Because of inadequacy of pump operators, the OHSR constructed under AUWSP is under-utilised.
d. Water is presently being supplied mainly by direct boosting without using the OHSR.
e. The OHSR is filled occasionally and used for supplying water (usually to overcome problems due to power shortage).

All the approved components of the scheme have been found to physically exist. It was also learnt from the discussions with the PWSSB officials that no expenditure was incurred on the approved components before sanctioning of the scheme.

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* *A subsequent telephonic conversation with the officials at Fatehgarh Churian revealed that the second tubewell was put into operation on 15th August 2004. The OHSR is now being used regularly. This has now improved the water supply situation in the town.*

6.8 Situation Analysis Before and After Implementation: The water supply situation in Fatehgarh Churian before and after implementation is described below and is given in a tabular form in Table 6.4.

a. The coverage of population by house service connections has gone up significantly in the town –from about 20% to almost 80%. The remaining 20% of the population living in the extended areas, which have been newly developed, have not been provided piped water supply yet. They use their own private facilities for obtaining water.
b. The per capita supply in the town has reduced from 140 lpcd to 85 lpcd after implementation of the scheme. This is because of increased coverage and increase in the number of HSCs.
c. At present water is supplied for four hours daily - two hours each in the morning and evening.
d. All new connections given under the AUWSP scheme in the town are un-metered.
e. The estimated UFW is reported to have come down from about 25% before implementation to about 11 % after implementation. UFW is generally based on the perception and rough calculations of the water-supplying agency and therefore must be taken as such.
f. No UFW Cell has been created in the town nor has any exercise commenced to set up such a cell.
g. Domestic water tariff has increased from Rs. 20 per month before implementation to Rs. 50 per month. This increase has been implemented since 2003.
h. The revenue from water supply has increased from about Rs. 1.22 lakhs before implementation to about 2.29 lakhs at present (2003-04). The increase is because of the increase in water tariff.

i. The expenditure has also gone up from about Rs. 3.4 lakhs to about Rs. 5 lakhs in the corresponding period. The town is able to recover about 45% of the expenditure on the service. In actual terms the revenue shortfall is Rs. 2.77 lakhs at present. The shortfall in revenue is met with the overall revenues of the local body.

j. The total staff strength has not changed since the implementation of the scheme and remains at 3.. The water supply situation in the town has been adversely affected by the shortage of manpower.

Table 6.4: Status Before and After Implementation of AUWSP Scheme

Fatehgarh Churian			
Sl. No.	**Parameter**	**Before Implementation**	**After Implementation**
1	Population covered by HSC	20%	75 – 80 %
2	Per capita supply through HSC	140lpcd	140 lpcd
3	**No. of HSC** Domestic (Unmetered) Non-domestic Total	 525 - 525	 706 - 706
4	**UFW** In percentage Actuals	 25% 0.51 mld	 11% 0.32 mld
5	**Water Tariff** Domestic (Unmetered) Industrial (Unmetered) Commercial (Unmetered)	1997 Rs 20 per month Rs 150 per month Rs 50 per month	2003 Rs 50 per month Rs 200 per month Rs 200 per month
6	**Revenue** (Rs. in lakhs) ULB (Overall) From water supply	1999-2000 Rs 64.28 Rs. 1.22	2003-04 Rs 76.26 Rs. 2.29
7	**Expenditure** (Rs. in lakhs) ULB (Overall) On water supply	1999-2000 Rs. 60.72 Rs. 3.45	2003-04 Rs 74.43 Rs. 5.06
8	**Manpower** Agency responsible for O&M No. of technical staff No. of managerial staff No. of staff for O&M Total strength of department	 MC, Fatehgarh Churian - 1 2 3	 MC, Fatehgarh Churian - 1 2 3
9	Mode of **disposal of wastewater**	Discharged into drains/ low lying areas without treatment	Discharged into drains/ low lying areas without treatment

Source: PWSSB, Fatehgarh Churian

- A total of 14 PSPs existed in the town before the implementation of the scheme. No new PSPs have been provided in the town as the policy of the State is to do away with PSPs and only provide HSCs to all.

6.9 Water Quality Monitoring:

- It was reported that only disinfection is done for the raw water drawn from the tubewells and water sample is collected from the consumer taps for testing.
- Water quality testing is done at quarterly intervals and tested by the State Health Department.
- No test report could be obtained by the NIUA team during the visit of the town.
- The residual chlorine available was reported to be sufficient.
- No outbreak of water-borne diseases was reported in the town.

6.10 Waste Water Disposal:

- A sewerage system exists in the town. About 40% population of the town is covered by the sewerage system.
- The remaining population has its own septic tanks.
- It was reported that presently 466 households have been provided with sewer connections.
- Untreated wastewater from the town is discharged into drains and low-lying areas and used for irrigation purposes by farmers.

6.11 Views of ULB regarding the Scheme:

- The local government officials stated that the shortage of manpower was creating a problem in water supply in the town. It did not allow them to operate both the tubewells*.
- The poor power situation this year added to the problems of the town.
- The officials in the town were satisfied with the water supply situation in the town.
- They mentioned that the newly developed areas of the town would slowly be brought into the water supply system.

6.12 Views of Public: Interviews of a few water consumers was conducted at different locations of the town (near the water works and at tail-end of the distribution system).

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* *The situation has changed subsequently, as mentioned earlier.*

- The result of the interviews suggests that the consumers are not always getting adequate water to meet their daily demand, mainly because of the power shortage in the town this year.
- Water pressure reaches up to the first floor level.
- According to the residents the quality of water and water pressure have improved after implementation of the scheme.

6.13 Summary of Evaluation Study and findings for Fatehgarh Churian Scheme

1. The source of water supply to the town is ground water. The source, as mentioned by the PWSSB officials, seems reliable and can be depended upon.
2. The scheme started on schedule but completion was delayed by a year due to delay in release of funds from State Government and delay in acquisition & finalisation of land for construction of OHSR.
3. The approved expenditure on the AUWSP scheme was Rs. 47.00 lakhs while the actual expenditure was Rs. 47.04 lakhs.
4. All components of the scheme have been executed and completed and physically exist.
5. Of the two tube wells in the town, only one is being utilised due to shortage of manpower. This has affected the water supply service in the town.
6. The coverage of population by household connections stands at about 80 % at present. The rest of the population has its own private water facilities.
7. The per capita supply in the town which was 140 before the implementation of the scheme has come down to 85 lpcd, though it is still above the AUWSP specified norm.
8. All the water supply connections in the town, both domestic and non-domestic are un-metered. Therefore, under the AUWSP scheme also, all new domestic connections given are un-metered.
9. The UFW, at present, has been estimated at 11 %, which is within acceptable limits. The percentage of UFW before the implementation of the scheme was 25%.

10. No UFW cell has been created in the Municipal Council, Sanaur, neither has any exercise commenced to check UFW.

11. The domestic tariff has increased after the implementation of the scheme, from Rs. 20 to Rs. 50 per month, and is having a positive impact on the revenue from water supply.

12. Despite the increase in tariff, the revenue from water supply does not cover the expenditure on it. The shortfall in expenditure is met from the general revenues of the local body.

13. The power situation has been a major concern this year (2004) as the shortfall in monsoon rains has affected the power supply in the entire state. This has adversely affected the water supply situation in the town.

14. The scheme was handed over to the local body after completion. However, whenever there are major technical problems, the PWSSB is approached for help.

15. The people in the town have mixed reaction to the water supply situation at present. As mentioned earlier, the shortage of electricity and manpower has created some problems for the people. The situation was likely to improve soon as the local body was working on making the second tubewell operational*.

16. The town has a sewerage system, which covers 40 % of the population. The remaining population has its own septic tanks.

17. The wastewater from the town is disposed into drains and low-lying areas. The farmers use the wastewater for irrigation purposes.

6.14 The scheme has had a mixed impact on the residents. The objectives of the AUWSP are partially fulfilled after implementation of the scheme. The scheme has improved the quality of water but it has failed to improve the overall quality of life and socio-economic conditions of the society. The total population of the town has not been covered under this scheme. The scheme has been handed over to the ULB after implementation but it is not been properly managed due to shortage of power, manpower and skill.

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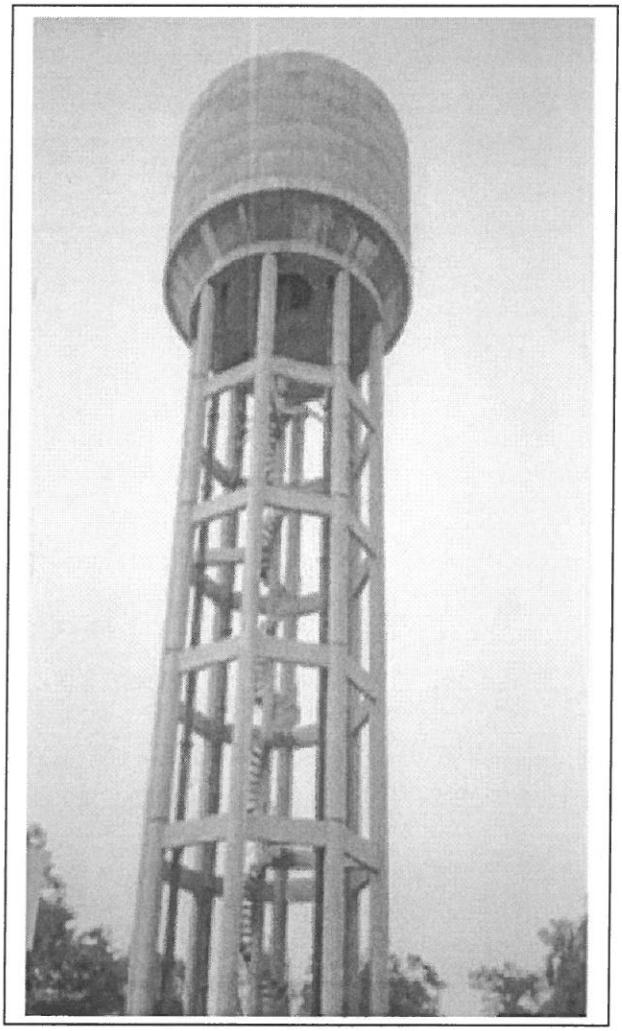
* Second tubewell has been activated, as mentioned earlier.

Photographs of various components of AUWSP scheme in Fatehgarh Churian

Photograph 29: OHSR



Part D: Punjab

Scheme 7:

Sanaur

District: Patiala

Based on the meetings and discussions with the Punjab Water Supply and Sewerage Board (PWSSB) officials and visit to Sanaur, the following information was obtained:

7.1 Scheme Approval and implementation:

- MoUD, GoI, approved the extension and augmentation of water supply scheme for Sanaur; vide their letter dated 9th March 1998.
- As per the letter of approval, the scheme was scheduled to start in 1998-99 and be completed in 1999-2000.
- The scheme started in November 1998 and was completed in December 2001.
- The major reasons for delay in completion of the scheme, as stated by the Punjab Water Supply and Sewerage Board (PWSSB) officials, were delay in receiving of funds from the Punjab Government and delay in obtaining electric connection.

7.2 Implementing Agency: The scheme was implemented by the PWSSB and after commissioning of the scheme it was handed over to the Municipal Council, Sanaur, in December 2001. The Municipal Council, Sanaur is responsible for the operation and maintenance (O&M) of the scheme.

7.3 Project Cost and Actual Expenditure:

- The estimated cost of the scheme as approved by the MoUD, GoI, was Rs.65.62 lakhs.
- The actual expenditure incurred till completion of the scheme was also Rs. 65.62 lakhs.

7.4 Details of Funds Released by the State and the Central Government are furnished in Table 7.1:

Table 7.1 - Release of Funds

Sanaur			
Central Government		**State Government**	
Date of Release	***Amount (Rs in lakh)***	***Date of Release***	***Amount (Rs in lakh)***
October 1998	18.07	-	-
March 2000	10.00	March 2000	20.00
October 2000	4.74	October 2000	12.81
Total	**32.81**	**Total**	**32.81**

Source: PWSSB, Sanaur

7.5 Raw Water Source: The source of raw water for the scheme is tube well, which is located within the periphery of the town. Raw water is pumped to the OHSR and distributed under gravity.

7.6 Population and Water Demand: The population of the town was 16,438 in 1991 (Census) reached 17, 938 in 2001 (Census). The present (2004) population of the town is estimated at 18,839. The population in the initial, intermediate and ultimate years and the corresponding water demand is given in Table 7.2.

Table 7.2 - Population and Water Demand

Sanaur				
Sl. No.	**Item**	**Initial**	**Intermediate**	**Ultimate**
	Year	***1991***	***2004***	***2025***
1	Population	16,438	18,839	32,464
2	Water demand (mld)			
	Year	***1998***	***2012***	***2025***
	Domestic	1.20	1.70	2.20
	Non-domestic	0.06	0.06	0.07
	Total	1.26	1.76	2.27

Source: PWSSB, Sanaur

The present quantity of water produced in the town is 1.89 mld and the quantity supplied is 1.72 mld. Of this 1.66 mld is supplied for domestic use.

7.7 Project Components: The approved scheme components, cost, actual expenditure and reasons for variation in expenditure are given in Table 7.3.

Table 7.3 - Project Components, Approved Cost and Actual Expenditure

(Rupees in Lakh)

Sanaur					
Sl. No.	**Project Components**	**Approved Estimated Cost (By MoUD, GoI)**	**Actual Expenditure**	**Variation from approved cost**	**Reasons for variation**
1	Tube well	4.63*	4.50	-0.13	
2	Pump House & Pumping Machinery	5.44	5.40	-0.04	
3	Rising Main	1.68	1.60	-0.08	
4	Service Reservoir	28.09	25.00	-3.09	**
5	Distribution System	18.15	23.03	+4.88	Price escalation
6	Electric Connection including transformer	2.00	0.50	-1.50	
7	Miscellaneous	0.69	0.65	-0.04	
8	**Total**	**60.68**	**60.68**	-	
9	Contingencies (5%)	3.03	3.03	-	
10	W.C. Estt. (3%)	1.91	1.91	-	
	Grand Total	**65.62***	**65.62**	-	

Source: PWSSB, Sanaur

** Given as Rs. 4.13 lakhs in the letter of approval of MoUD, GOI. Should be Rs. 4.63 lakhs if the total of Rs. 65.62 is to be correct. Otherwise there is a difference of Rs. 50,000 in the actual estimated cost of components and that given in the letter of approval. The state has taken the amount as Rs. 4.63 lakhs.*

*** The provision of Rs. 28.09 lakhs for the construction of service reservoir of 909200-litre capacity made in the project is on the lower side. Moreover, due to fall of underground water level, the discharge of the tube wells is decreasing day by day. Technically, it is not good to construct bigger reservoir i.e. more than 1.00 lakh gallon (454600 litres) capacity. So keeping in view these factors, 1.00 lakh gallon capacity reservoir has been constructed at site with a total cost of Rs. 25.00 lakhs.*

a. All the approved components of the scheme have been completed and are found to exist physically.

b. According to the PWSSB officials no expenditure was incurred on the approved components before sanctioning of the scheme

7.8 Situation Analysis Before and After Implementation: The water supply situation in Sanaur has improved after the implementation of the AUWSP scheme. The situation before and after implementation is described below and is given in a tabular form in Table 7.4

a. The coverage of population by house service connections (HSC) has improved after implementation of the scheme. At present it stands at 94%. The remaining

households of the town have independent water facilities and so have not yet taken water supply connection.

b. The per capita supply in the town was 180 lpcd before the implementation of AUWSP which came down to 135 lpcd after implementation of the scheme. The reason for the drop in per capita supply was because of greater coverage of population and more house service connections. The present supply is almost twice the norm specified for scheme. This high level of supply is possible in the town as it has sufficient water resources available.

c. At present water is supplied for two hours daily - one hour each in the morning and evening.

d. The number of domestic connections has gone up significantly after the implementation of AUWSP. However, all the domestic and non-domestic connections in town are un-metered.

e. According to the PWSSB officials, the UFW has come down from about 21% before implementation to about 9 %. UFW is estimated based on the perceptions and some rough calculations by the water supplying agency and no scientific method have been used to estimate this.

f. No UFW Cell has been set up in the town, nor has any exercise commenced to set up such a cell.

g. Domestic water tariff at present is two-and-a-half times higher than what it was before the implementation of AUWSP, though tariff increase is the decision of the State Government and not that of the local Municipal Council.

h. The cost recovery from water supply in the town is about 74%. The revenue-expenditure gap in actual terms is Rs. 3.89 lakhs at present. The deficit in water supply operations is met from the general revenues of the Municipal Council.

i. The staff position has also improved marginally after the implementation of the AUWSP scheme - from 6 to 8.

Table 7.4 - Status Before and After Implementation of AUWSP Scheme

Sanaur			
Sl. No.	**Parameter**	**Before Implementation**	**After Implementation**
1	**Population covered** by HSC	81%	94%
2	**Per capita supply** through HSC	180 lpcd	135 lpcd
	No. of HSC		
	Domestic	1445	2410
	Non-domestic	5	15
	Total	1450	2425
3	**UFW**		
	In percentage	21 %	9 %
	Actuals	0.71 mld	0.17 mld
4	**Water Tariff**	1998	2004*
	Domestic (Unmetered)	Rs 20/ month	Rs 50/ month
	Commercial (Metered)	Rs 25/ month	Rs 60/ month
5	**Revenue** (Rs. in lakhs)	1997-98	2003-04
	ULB (Overall)	Rs. 19.50	Rs. 48.01
	From water supply	Rs. 3.93	Rs 10.91
	Expenditure (Rs. in lakhs)	1997-98	2003-04
	ULB (Overall)	Rs. 19.50	Rs. 46.81
	On water supply	Rs. 4.45	Rs 14.80
6	**Manpower**		
	Agency responsible for O&M	Municipal Council, Sanaur	Municipal Council, Sanaur
	No. Of technical staff	1(JE)	1 (JE)
	No. Of managerial staff	3	4
	No. Of staff for O&M	2	3
	Total strength of department	6	8
7	Mode of **disposal of wastewater**	Individual septic tanks followed by discharge into storm water drains	Individual septic tanks followed by discharge into storm water drains

Source: PWSSB, Sanaur, and Municipal Council, Sanaur

** The present tariff has been in operation since 1.1.2000. It is not known when the water tariff will be revised in the future.*

- A total of 20 PSPs existed in the town before the implementation of the scheme. No new PSPs have been provided in the town, as the policy of the State is to do away with PSPs and only provide HSCs to all.

7.9 Water Quality Monitoring:

- It was reported that water samples are collected at monthly intervals and tested by the State Health Department.
- However, no test report was furnished during the visit of the town.
- It was reported that the State Health Department keeps the test reports and does not give them to the town.
- It was also reported that residual chlorine available was sufficient.
- Both PWSSB and local Municipal Council officials stated that no outbreak of water borne diseases has been reported in the town after the implementation of the AUWSP scheme.

7.10 Wastewater Disposal:

- About 70% of the households in the town have individual septic tanks.
- Semi-treated wastewater from the septic tanks overflows into the nearby storm water drains.
- Final disposal of wastewater is into a pond located about 2.5 km away from the town.
- Farmers use the wastewater from the pond for irrigation purpose.

7.11 Views of ULB regarding the Scheme: A discussion with the officials of the ULB regarding the AUWSP scheme revealed that they are satisfied with the scheme. Yet there are some parts of the town, which are at a higher level, where the water pressure is low. At present water rises up to first floor level. In order to improve the situation a new augmentation scheme is being proposed for the town.

7.12 Views of Community: A few residents from different locations of the town (near the water works, at the tail-end of the distribution system and at random locations) were interviewed to know their views about the scheme.

- Most people stated that after the implementation of the AUWSP scheme they are getting adequate water to meet their daily demand.
- Some households at the tail end of the system were not very satisfied with the pressure of water.

- They said that the quality of water and water pressure has both improved after implementation of the scheme.
- They expressed their overall satisfaction with the water supply system.

7.13 Summary of findings of Evaluation Study for Sanaur Scheme

1. The source of water supply to the town is ground water. The source, as mentioned by the PWSSB officials, seems reliable and can be depended upon.
2. The scheme started on schedule but completion was delayed by a year due to delay in release of funds from State Government and delay in obtaining electric connection.
3. The actual expenditure on the scheme did not exceed the estimated cost, which was Rs. 65.62 lakhs.
4. All components executed were as per the letter of approval of the Ministry.
5. The overall expenditure on the scheme was within 5% of the approved cost. The cost of distribution system went up by Rs. 4.88 lakhs due to an increase in the cost of materials and labour. The cost of the service reservoir came down by Rs. 3.09 lakhs due a reduction in the capacity of the reservoir from 2 lakh gallons to 1 lakh gallon.
6. All the components of the scheme have been completed.
7. The coverage of population by household connections stands at 94% at present. The rest of the population has its own private water facilities.
8. Though PWSSB claims that the per capita supply in the town is 135 lpcd as against the norm of 70 lpcd for AUWSP schemes, based on the information provided by them it seemed to be about 100 lpcd. This is because the town has sufficient water resources.
9. All the water supply connections in the town are un-metered.
10. The UFW, at present, has been estimated at 9 %. However, UFW is based on the rough calculations and perceptions of the officials.

11. No UFW cell has been created in the Municipal Council, Sanaur, neither has any exercise commenced to set up such a cell.

12. Domestic tariff has increased after the implementation of the scheme from Rs. 20 to Rs. 50 per month. However, the Municipal Council has no role to play in the increase in tariff. It is a decision of the State Government.

13. Despite the increase in tariff, the revenue from water supply does not cover the expenditure on it. The shortfall in expenditure, currently at Rs. 3.89 lakhs, is met from the general revenues of the local body.

14. The power situation has been a major concern this year (2004) as the shortfall in monsoon rains has affected the power supply in the entire state and therefore the water supply situation.

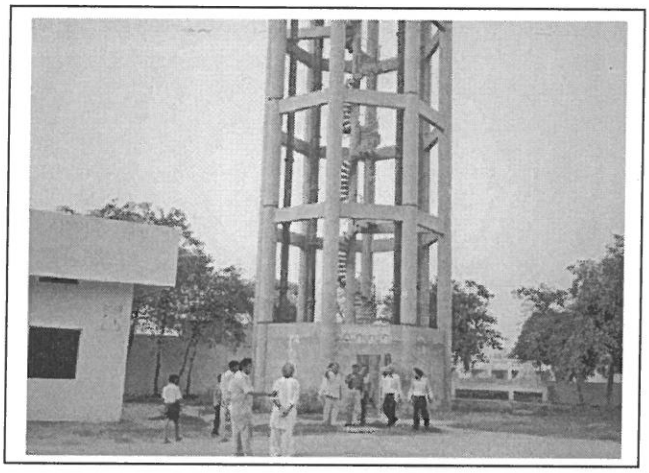
15. The scheme was handed over to the local body after completion. However, whenever there are major technical problems, the PWSSB is approached for help.

16. Most of the people in the town are satisfied with the scheme as they are getting sufficient water for their use. However, some of the households residing in the higher areas are facing problem of low pressure. The local body is considering ways of improving the situation.

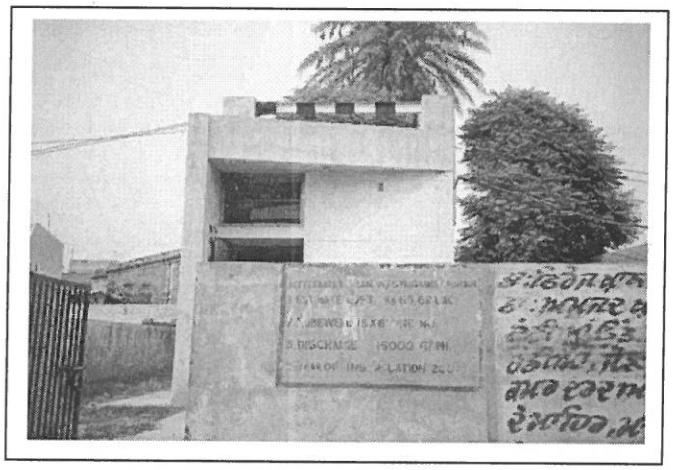
17. Most households in the town have septic tanks. The wastewater is disposed into ponds through storm water drains and from the pond the farmers use the water for irrigation purposes.

7.14 The scheme has had a positive impact on the town. The overall objectives of AUWSP have been achieved after implementation of the scheme. A substantial portion of the O&M cost is recovered from the revenues generated from the scheme. Further improvement in revenue collection efficiency may make the scheme financially self-sustainable.

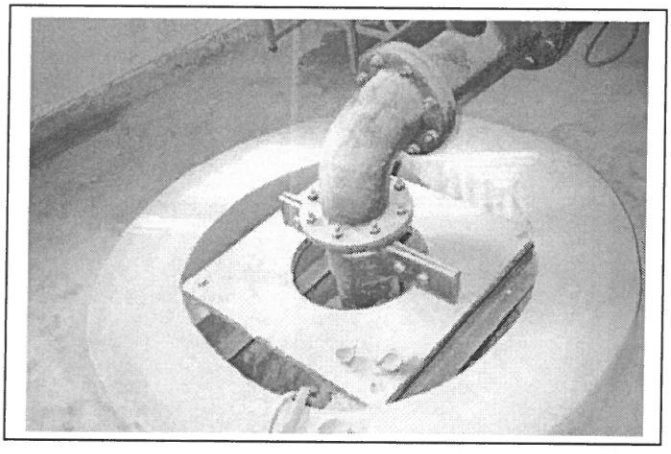
Photographs of various components of AUWSP in Sanaur



Photograph 30: View of the 4.546 lakh litre capacity OHSR



Photograph 31: Tube well with pump Chamber



Photograph 32: Tube well

Part E: Rajasthan

Scheme 8:

Mahuwa

District: Dausa

Based on the meetings and discussions with the Public Health Engineering Department (PHED) officials and visit to Mahuwa, the following information was obtained:

8.1 Scheme Approval and implementation:

- MoUD, GoI, approved the AUWSP scheme for Mahuwa; vide their letter dated 23rd February 1995.
- As per the letter of approval, the scheme was scheduled to start in 1994-95 and be completed in 1995-96.
- The scheme started in May 1995 and was completed and commissioned in May 1996, except for the electrical components that were commissioned in April 2000.
- As per the PHED officials, till that period power supply was intermittent (5-6 hours per day) and the power was obtained through an additional feeder from an existing power line on temporary basis.
- Though the design year for the water supply scheme, as mentioned in the letter of approval by MoUD, is the year 2021, the scheme has been designed and implemented for 2015. This, according to PHED officials, is because the design population of 32597 is expected to be achieved by the year 2015.

8.2 Implementing Agency: Public Health Engineering Department (PHED), Govt. of Rajasthan, has executed the scheme. The PHED also carries out the operation and maintenance (O&M) of the water supply system. In the state of Rajasthan, the PHED is responsible for water supply and this responsibility has not been handed over to the local governments.

8.3 Project Cost and Actual Expenditure:

- MoUD, GoI at an estimated cost of Rs. 40.80 lakhs, approved the AUWSP scheme at Mahuwa.
- The actual expenditure on the scheme was Rs. 48.92 lakhs.
- According to the PHED officials, the increase in project cost was due to an escalation in prices during the project implementation period and the additional cost for bringing power from the temporary feeder line.
- The additional cost of Rs. 8.09 lakhs was borne by the State Government.

8.4 Details of the release of funds: Details of release of funds were not made available to the evaluation team.

8.5 Raw Water Source: The source of raw water for the scheme is groundwater - tube wells located at a distance of 3 kms. from the town.

8.6 Population and Water Demand: According to the Census of India, the population of Mahuwa was 13,091 in 1991 and 19,558 in 2001. The present (2004) population of the town is estimated at 22,456. The population in the initial, intermediate and ultimate years and the corresponding water demand is given in Table 8.1.

Table 8.1 - Population and Water Demand

Mahuwa				
Sl. No.	**Item**	**Initial**	**Intermediate**	**Ultimate**
	Year	***1991***	***Not given***	***2011***
1.	Population covered under the scheme	13,091	19,558	27,150
2.	Water demand (mld)			
	Domestic	0.86	1.23	1.59
	Non-domestic	0.05	0.17	0.31
	Total	0.91	1.40	1.90

Source: PHED, Mahuwa

- The present quantity of water produced in the town is 1.51 mld and the quantity supplied is 1.24 mld. Of this 1.20 mld is supplied for domestic use.

8.7 Project Components: The approved scheme components and their cost are given in Table 8.2.

Table 8.2 - Project Components, Approved Cost and Actual Expenditure

(Rupees in Lakh)

Mahuwa			
Sl. No.	**Project Components**	**Approved Estimated Cost (By MoUD,GoI)**	**Actual Expenditure**
1	Tubewell	7.20	Break-up not furnished
2	Pumping Machinery	0.90	
3	Clear Water Rising Main	18.92	
4	Clear Water Reservoir	4.75	
5	Electric power including transformer etc.	4.02	
6	Land acquisition	1.60	
	Sub-total	**37.76***	
7	Contingencies @ 5%	1.94	
8	W.C. Establishment charges @ 3%	1.13	
	Total	**40.83**	**48.92**

Source: PHED, Mahuwa

Note: The actual expenditure on the different components could not be obtained from the town, despite our best efforts.

** The addition of all the component costs comes to Rs. 37.39 lakhs only whereas the figure given in MoUD's approval letter is Rs. 37.76 lakhs. The present report uses the figure given in MoUD's approval letter.*

8.8 Situation Analysis Before and After Implementation:

The water supply situation before and after implementation is described below and is given in a tabular form in Table 8.3

a. The coverage of population by house service connections (HSC) has increased from 46 % to 74 % after implementation of the scheme. The remaining households of the town have independent water facilities or use PSPs.
b. The per capita supply in the town has increased from 28 lpcd to 59 lpcd after implementation of the scheme. This is still below the norm set for the scheme. The officials have stated the falling water table as the reason for the low level of supply.
c. At present water is supplied for only one hour daily in the town.
d. The number of domestic connections has gone up significantly after the implementation of AUWSP. All new connections given under the scheme are un-metered.
e. The estimated UFW is reported to have gone up from 10 % to 15 % after

the implementation of the scheme. However, UFW is based on the perception and best guess of the water-supplying agency and therefore has to be taken as such.

f. No UFW Cell has been set up in the town nor has any exercise commenced to set up such a cell.

g. Domestic water tariff remains the same as was in existence before the implementation of the scheme. Increasing water tariff is the decision of the State Government and the towns follow the directive.

h. The revenue from water supply in the town formed only 15% of the expenditure on the service in 1999-2000. In actual terms, the revenue- expenditure gap was Rs. 29.19 lakhs in 1999-2000. The shortfall in revenue is made up by the state government as PHED manages the service in the town and not the local government.

i. The total staff strength of PHED in Mahuwa has gone up by 8 after implementation and stands at 30 at present.

Table 8.3 - Status Before and After Implementation of AUWSP Scheme

Mahuwa			
Sl. No.	**Parameter**	**Before Implementation**	**After Implementation**
1	**Population covered** by HSC	60%	90%
2	**Per capita supply** through HSC	28 lpcd	59 lpcd
3	**No. of HSC** Domestic (Un-metered) Non-domestic (Un-metered) Total	 1122 8 1130	 2145 28 2173
4	**UFW** In percentage Actuals	 10% 0.06 mld	 15% 0.24 mld
5	**Water Tariff*** Domestic (Metered) (Un-metered) Industrial (Metered) Commercial (Metered)	**June 1998** Rs. 1.56 /kl Rs. 25 / month Rs. 11 /kl Rs. 4.68 /kl	**April 2004** Rs. 1.56 /kl Rs. 20 +10 / month Rs. 11 /kl Rs. 4.68 /kl
6	**Revenue** (Rs. in lakhs)	2.58 (1995-96)	5.19 (1999-2000)
7	**Expenditure** (Rs. in lakhs)	16.60 (1995-96)	34.38 (1999-2000)
8	**Manpower** Agency responsible for O&M No. of managerial staff No. of staff for O&M Total strength of department	 PHED 2 20 22	 PHED 2 28 30
9	Mode of **disposal of wastewater**	Direct discharge into storm water drains	Direct discharge into storm water drains

Source: PHED, Mahuwa

** The present tariff has been in operation since June.1998. It is not known when the water tariff will be revised in the future.*

- A total of 16 PSPs existed in the town before the implementation of the scheme and the PSPs increased to 26 after the implementation of the scheme. The town provides PSPs for the poor.

8.9 Water Quality Monitoring:

- Quality of water supplied to the consumers is monitored weekly in the town.
- Samples are normally collected from the tube wells directly.
- No treatment other than Disinfection is done for the raw water drawn from the tubewells.
- The residual chlorine was reported to be sufficient.
- No outbreak of water-borne diseases was reported in the town.

8.10 Waste Water Disposal: According to the officials, the wastewater from the town is disposed off untreated into the open storm water drains, which later discharges into low lying lands.

8.11 Views of PHED regarding the Scheme:

- According to the PHED officials, the water depletion at source is a major concern.
- While they feel that the scheme has benefited the town, the present supply is below the norm specified and this is due to the depletion of water at source and the age of the pipelines, which are old and need replacement.
- The existing SR's capacity is not sufficient to cater to the needs of the growing population and this needs augmentation.
- Prolonged drought in the state has created problems for water supply.
- The officials stated that at present staff the strength in PHED, Mahuwa, is less than the actual requirement. This causes problem in proper operation and maintenance of the water supply system.
- The officials also felt that the tariff needs to be revised as the present tariff is very low and the revenue is insufficient to meet the expenditure.
- There is a problem of low pressure in the town. According to the PHED officials, the water pressure problem can be minimised if another reservoir is constructed and the existing distribution system is augmented.
- In order to improve the situation, a proposal has already been forwarded to the MoUD, GoI for its approval under AUWSP Phase –II.

8.12 Views of Community: Interview of a random sample of residents at various locations was done by the NIUA team.

- The general opinion suggests that the quantity of water available has not improved significantly after the implementation of the AUWSP.
- The water pressure has also reduced after the implementation of the scheme than it was before.
- However, the residents were happy that the quality of water supplied has improved after the implementation of the AUWSP, as they used to get water from open dug wells before the AUWSP scheme was implemented.

8.13 Summary of findings of Evaluation Study for Mahuwa Scheme

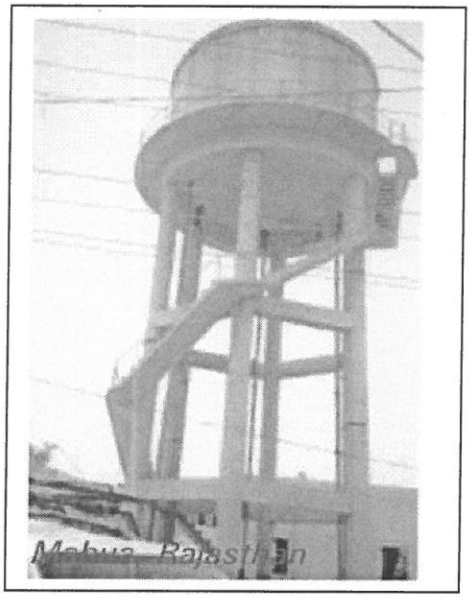
1. The source of water supply to the town is ground water. The source is depleting due to the prolonged drought conditions in the state. Therefore, the source cannot be relied upon.
2. The scheme started and got completed on schedule, except for the electrical component, which was commissioned after a delay of almost four years. Till that period, power supply was intermittent (5-6 hours per day) and the power was obtained through an additional feeder from an existing power line on temporary basis.
3. According to the PHED officials, the design year of the scheme was changed from 2021 to 2015 as the town was expected to reach the design population by 2015 instead of 2021.
4. The approved estimated cost, by MoUD, GoI, for the scheme was Rs. 40.80 lakhs while the actual expenditure on the scheme was Rs. 48.92 lakhs. The additional expenditure was due to price escalation and the additional cost for bringing power from the temporary feeder line. These costs were not included in the estimated cost of the scheme as sanctioned by MoUD.
5. All components of the scheme have been commissioned and exist physically.
6. The coverage of population by household connections is only 90 % at present. The remaining population depends upon its own facilities or uses PSPs. The distribution system needs to be expanded in the town to cover the entire population by piped water supply system.

7. The per capita supply in the town, though has increased from 28 lpcd to 59 lpcd at present, the supply is below the norm of 70 lpcd for the scheme. Low availability of water at source is one of the reasons for this situation.
8. The water pressure is low in most of the locations in the town except a few areas located close to the existing overhead service reservoirs. People have installed individual hand pumps to draw water from the water supply pipelines directly to meet their water requirements. This has further resulted in a reduction in pressure at the tail end. Water pressure just reaches the first floor level in the town.
9. The present distribution system in the town is old. The distribution pipes are under-sized with respect to the present demand. In addition, the existing SR (which was constructed before the implementation of AUWSP) is of lesser capacity and was not designed to cater to the extended area and increased population.
10. All the water supply connections given under the AUWSP scheme are un-metered.
11. The UFW, at present, has been estimated at 15 %. These are based on rough calculations and guess work as the officials do have any scientific method of calculating the UFW.
12. It was observed that at each tube well location a tap has been provided. The taps are subsequently removed and as result a considerable quantity of water is lost at each of the tube well location. Significant water losses have also been observed at the valves and pipe joints near the clear water reservoir.
13. No UFW cell has been created in the town and no exercise has commenced to set up such a cell.
14. Domestic tariff has not increased in the town after the implementation of the scheme as the decision to increase tariff rests with the State Government.
15. Revenue from water supply in the town falls very short of the expenditure on it. Cost recovery from the service in the town is only about 15%. The state government makes up the shortfall.
16. The scheme has not been handed over to the local body after completion as, in the state of Rajasthan. The PHED itself maintains the water supply system throughout the state.

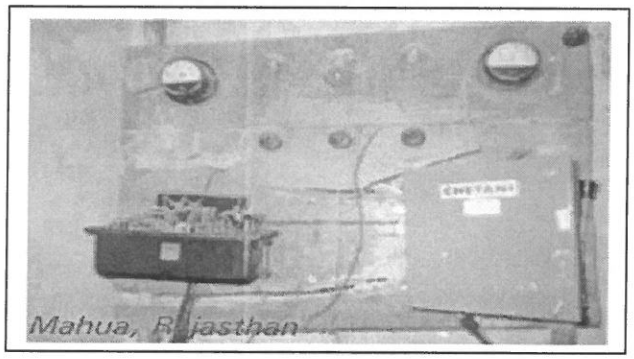
17. While the staff strength has increased after the implementation of the scheme, the PHED officials say that the staff strength is still below what it should be. This situation, they claim is affecting the O&M of the scheme.
18. The wastewater from the town is disposed off untreated into low-lying lands. This problem needs to be addressed to create a better environment in the town.

8.14 The scheme has had a mixed impact on the town. The overall objectives of the AUWSP have partially been achieved. The scheme has brought about an improvement in the quality of drinking water supply in the town and almost the entire population of the town has been covered by the scheme. However, the quantity and pressure of water supply has not improved substantially. The O&M cost recovery has been very low in the scheme and therefore, the scheme has achieved the objectives AUWSP only partially.

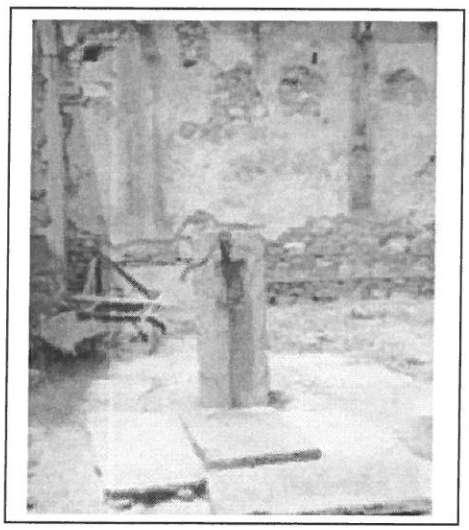
Photographs of various components of AUWSP scheme in Mahuwa



Photograph 33: An Existing OHSR

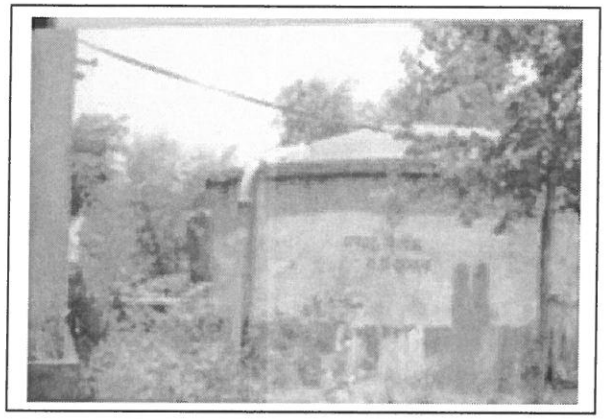


Photograph 34: View of the automatic switch room presently in use for opening submersible pump of TW

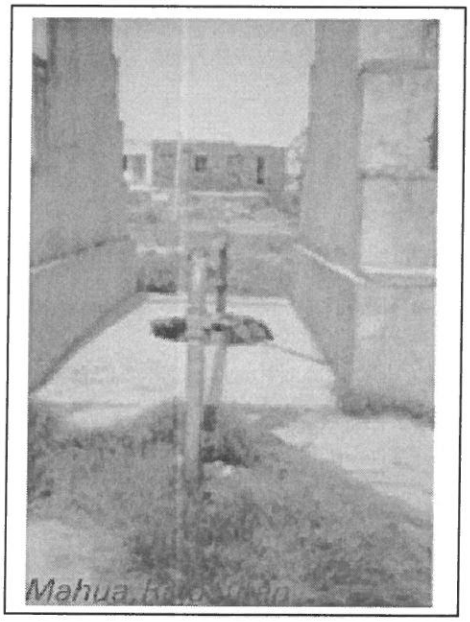


Photograph 34: Hand pump, being used to draw water directly from the water supply distribution main

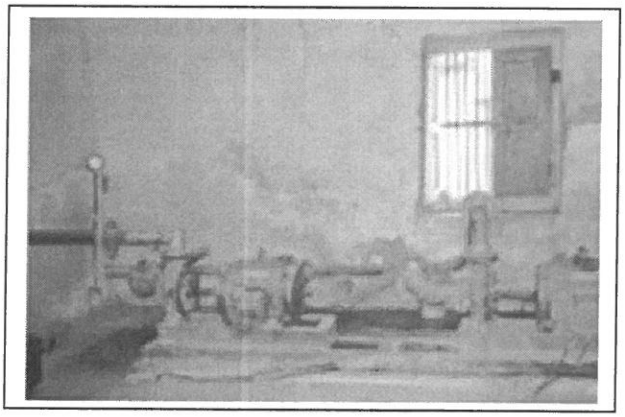
Photographs of various components of AUWSP scheme in Mahuwa



Photograph 36: View of CWR constructed prior to implementation of AUWSP



Photograph 37: Tube well



Photograph 38: View of pump house near CWR. The pump is used to pump clear water from CWR.

Part E: Rajasthan

Scheme 9: Nawa

District: Nagaur

Based on the meetings and discussions with the Public Health Engineering Department (PHED) officials and visit to Nawa City, the following information was obtained:

9.1 Scheme Approval and implementation:

- MoUD, GoI, approved the AUWSP scheme for Nawa City; vide their letter dated 22 March 1996.
- As per the letter of approval, the scheme was scheduled to start in 1996-97 and be completed in 1997-98.
- The scheme was completed as per schedule.

9.2 Implementing Agency: The Public Health Engineering Department (PHED), Govt. of Rajasthan, has executed the project. The PHED also carries out the operation and maintenance (O&M) of the water supply system in the town.

9.3 Project Cost and Actual Expenditure:

- MoUD, GoI, approved the AUWSP scheme in Nawa City at an estimated cost of Rs. 114.62 lakhs.
- The scheme got Administrative & Financial (A&F) sanction at a higher estimated capital cost of Rs. 120.45 lakhs from the State Government.
- The actual amount spent till completion of the project was Rs. 138.28 lakhs.

9.4 Details of the Release of Funds: Details of release of funds could not be obtained from the town.

9.5 Raw Water Source: The source of raw water for the scheme is groundwater - tube wells located at a distance of 9 kms from the town.

9.6 Population and Water Demand: According to the Census of India, the population of Nawa City was 13,969 in 1991 and 18,160 in 2001. The present (2004) population of the town is estimated at 18,440. The population in the initial, intermediate and ultimate years and the corresponding water demand is given in Table 9.1.

Table 9.1 - Population and Water Demand

Nawa City				
Sl. No.	**Item**	**Initial**	**Intermediate**	**Ultimate**
	Year	**1995**	**n.a**	**2013**
1.	Population covered under the scheme	16,106	n.a.	30,700
2.	Water demand (mld)			
	Domestic	1.13	n.a.	2.15
	Non-domestic	-	-	-
	Total	1.13	n.a.	2.15

Source: PHED, Nawa City

- The present quantity of water produced in the town is 1.36 mld and the quantity supplied is 1.28 mld, all for domestic use.

9.7 Project Components: The approved scheme components, estimated cost, actual expenditure and reasons for variation in expenditure are given in Table 9.2.

Table 9.2 - Project Components, Approved Cost and Actual Expenditure

(Rupees in Lakh)

Nawa City						
Sl. No.	**Project Components**	**Approved Estimated Cost (By MoUD,GoI)**	**Approved Estimated cost (by state Govt)**	**Actual Expenditure Till**	**Variation from approved cost (of MoUD, GoI)**	*Reasons for Variation*
1	Source Development Tube well (10 Nos.)	18.95	26.46	17.69	-1.26	Estimated depth not required.
2	Pump house & pumping machinery	7.78	6.83	9.47	1.70	Actual cost of pump differed from the actual cost of pumps.
3	Rising Main	30.85	45.22	30.72	-0.14	
4	Clear water Reservoir & Pump House with Pumping Machinery	5.17	14.80	6.54	+1.37	Price escalation

Nawa City						
Sl. No.	**Project Components**	**Approved Estimated Cost (By MoUD,GoI)**	**Approved Estimated cost (by state Govt)**	**Actual Expenditure Till**	**Variation from approved cost (of MoUD, GoI)**	*Reasons for Variation*
5	Service Reservoir	8.50	-	15.00	+6.50	Price escalation
6	Distribution System	16.17	-	26.13	+9.96	Length of pipeline increased for providing benefit to localities, which developed after the sanctioning of the scheme.
7	Electric Power including transformer	8.05	8.21	14.17	+6.12	The position of source has been changed as recommended by Hydro geologist, hence electrification cost is more.
8	Office buildings/ quarters/ laboratories	7.53	9.37	8.22	+0.69	
9	Land acquisition	2.00	-	-	-2.00	Land was available free of cost.
10	Miscelleneous (Boundary wall)	1.13	-	3.21	+2.08	Escalation in the price of material and labour
11	Railway crossing and T&P	-	0.50		-	Was not required.
	Sub total	**106.13**	**111.39**	**131.15**	**+25.02**	
12	Contingencies @ 5%	5.31	5.56	4.35		
13	WC, Establishments @ 3%	3.18	3.50	2.78		
	Total	**114.62**	**120.45**	**138.28**	**+23.66**	

Source: PHED, Nawa City

- All the approved components of the scheme have been completed and are found to exist physically.
- According to the PHED officials no expenditure was incurred on the approved components before sanctioning of the scheme.
- During the visit to the town it was reported that out of the 9 tube wells installed under AUWSP, only 6 are functioning and 3 are abandoned (due to fall in water table).
- The average yield of the existing tube wells is 9 Kl/hr.
- In order to compensate for the production of water from the abandoned tube wells, the existing tube wells are being operated for additional hours to maintain the present water supply demand of the town.

9.8 Situation Analysis Before and After Implementation:

The water supply situation in Nawa City has improved after the implementation of the AUWSP scheme. The situation before and after implementation is described below and is given in a tabular form in Table 9.3.

a. The coverage of population by house service connections (HSC) has increased from 70 % to 90 % after implementation of the scheme. The remaining population is in the newly developing areas of the town, which will be covered by expanding the distribution network in due course. At present the remaining population uses PSPs and their own facilities.

b. The per capita supply in the town has increased from 48 lpcd to 70 lpcd after the implementation of the scheme.

c. At present water is supplied in the town for only one hour daily.

d. All new connections given under the scheme are metered.

e. The PHED has given a very rough estimate of UFW at 4 % after implementation. The UFW is based on the perception and rough calculations of the PHED officials and therefore has to be taken as such.

f. No UFW Cell has been set up in the town nor has any exercise commenced to set up such a cell.

g. Domestic water tariff remains the same as was in existence before the implementation of the scheme. Increasing water tariff is the decision of the State Government in Rajasthan and the town just follows the directive.

h. The revenue from water supply has increased in the town after implementation of the scheme. The cost recovery from the service was about 25% in 2002-03. The revenue-expenditure gap in actual terms was Rs. 27.15 lakhs in 2002-03. The revenue gap is made up by the State Government as PHED manages the service in the town and not the local government.

i. The total staff strength has reduced by two after the implementation of the scheme, the O&M staff, which were 8 before implementation came down to 6 after implementation. This is because the vacant posts have not been filled. The officials stated that there is a ban on recruitment hence the posts cannot be filled.

j. Water billing activity has been fully privatised in Nawa City due to shortage of manpower. The activity has been contracted out since 1996. The expenditure on this activity before privatising was R. 0.48 Lakhs and after privatising the expenditure has come down to Rs. 0.11 Lakhs, resulting in a saving Rs. 0.37 Lakhs for the PHED.

Table 9.3 - Status Before and After Implementation of AUWSP Scheme

Nawa City			
Sl. No.	**Parameter**	**Before Implementation**	**After Implementation**
1	**Population covered** by HSC	70%	90%
2	**Per capita supply** through HSC	48 lpcd	70 lpcd
	No. of HSC	**1995-96**	**1998-99**
	Domestic (Metered)	1030	1293
	(Un-metered)	713	713
	Non-domestic (Metered)	66	111
	Total	1809	2117
3	**UFW**		
	In percentage	3 %	4 %
	Actuals	0.04 mld	0.05 mld
4	**Water Tariff***	Dec. 1997	Jun-98
	Domestic (Metered)	Rs. 1.56 /kl	1.56 /kl
	Un-metered	Rs. 25 / month	Rs. 20 +10 / month
	Industrial (Metered)	Rs. 11 /kl	Rs. 11 /kl
	Commercial (Metered)	Rs. 4.68 /kl	Rs. 4.68 /kl
	Connection Charge	Rs. 100	Rs. 125
5	**Revenue** (Rs. in lakhs)	Rs.4.43 (1996-97)	Rs. 8.68 (1998-99) Rs. 9.29 (2002-03)
6	**Expenditure** (Rs. in lakhs)	Rs.14.48 (1996-97)	Rs. 25.78 (1998–99) Rs. 36.44 (2002-03)
7	**Manpower**		
	Agency responsible for O&M	PHED	PHED
	No. of technical staff	10	10
	No. of managerial staff	5	5
	No. of staff for O&M	8	6
	Total strength of department	23	21
8	Mode of **disposal of wastewater**	Disposal in low lands - untreated	Disposal in low lands - untreated

Source: PHED, Nawa City

** The present tariff has been in operation since June.1998. It is not known when the water tariff will be revised in the future.*

- A total of 10 PSPs existed in the town before the implementation of the

scheme and the numbers have remained the same after the implementation of the scheme. The town provides PSPs for the poor.

9.9 Water Quality Monitoring:

- The quality of water supplied is monitored in the town on a half yearly basis. The officials stated that the ground water quality seldom changes frequently and therefore half yearly frequency was sufficient.
- Samples are collected from the raw water source i.e., tube wells.
- No treatment other than Disinfection is done for the raw water drawn from the tube wells.
- The residual chlorine was reported to be sufficient.
- No outbreak of water-borne diseases was reported in the town.
- Salinity is a major problem for drinking water source in the town. It is learnt that except in some aquifers in the upper strata, ground water is mostly saline and hence is not suitable for drinking purpose.

9.10 Wastewater Disposal:

- Nawa City does not have any sewerage system.
- Households have their individual septic tank from which excess water discharged into the storm water drain.
- The wastewater of the town is disposed into the low-lying areas/ ponds without any treatment.

9.11 Views of PHED regarding the Scheme:

- The PHED officials stated the drought conditions of the last few years have affected the water supply in the town.
- Three of the 9 tubewells under the scheme have been abandoned due to a drop in water table.
- The department also has a shortage of manpower.
- A new project for bringing water from Indira Gandhi Canal has been submitted for consideration to the State Government for augmenting water supply to the town.

9.12 Views of Community: A random selection of residents, representing the

beginning, middle and the tail end of the water supply system, were selected to ask their opinion about the scheme.

- The general opinion of the people was that the water supply situation has improved after the implementation of the scheme both in terms of quality and quantity.
- The people of the town are satisfied with the water supply situation at present.

9.13 Summary of Findings of Evaluation Study for Nawa City Scheme

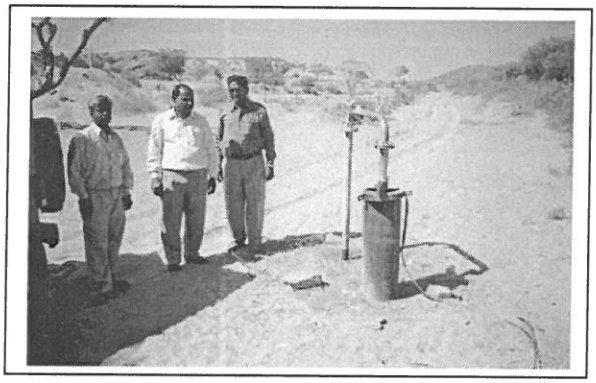
1. The source of water supply for the town is ground water. Three of the 9 tube wells developed under AUWSP in the town have already been abandoned due to a fall in the water table. In order to compensate for the loss in production from the abandoned tube wells, the existing tube wells are being operated for additional hours. Due to this excess withdrawal of water from the existing tube wells, the sustainability of these tube wells till the ultimate design period (i.e. year 2013) is doubtful.
2. In the past few years the state of Rajasthan has experienced prolonged periods of drought. This has created a problem for water supply in the town.
3. The scheme completed as per schedule.
4. The actual expenditure on the scheme exceeded the approved cost of MoUD, GoI, by Rs. 23.66 lakhs. The excess cost was due to an increase in the length of pipeline for the distribution system and a change in the position of the source, which was changed on the recommendation of the Hydro geologist. Escalation in the cost of materials and labour also increased the expenditure on the scheme.
5. All components, as per the letter of approval of the Ministry, were executed and physically exist.
6. The coverage of population by household connections is only 90% at present. The remaining population either uses PSPs or their own facilities.
7. The per capita supply in the town has increased from 48 lpcd to 70 lpcd at present.
8. All the water supply connections in the town given under the AUWSP scheme are metered.
9. The UFW, at present, has been estimated at 4. In the absence of a special study to estimate UFW, all figures must be taken as best estimates by the

officials. These are based on rough calculations and guess work.

10. No UFW cell has been created in the town and no exercise has commenced to set up such a cell.
11. Domestic tariff has not increased in the town after the implementation of the scheme as the decision to increase tariff rests with the State Government.
12. Revenue from water supply in the town falls short of the expenditure on it. In 2002-03 the cost recovery from the service was 25% and the actual revenue-expenditure gap was a little over Rs. 27 lakhs. The State Government meets this shortfall.
13. The scheme has not been handed over to the local body after completion as, in the state of Rajasthan, the PHED itself maintains the water supply system.
14. There is a shortage of manpower in the town's PHED, as per the officials. The total staff strength stands at 21 at present.
15. Most of the people in the town are satisfied with the scheme as they are getting sufficient water for their use.
16. The wastewater from the town is disposed off untreated in low-lying lands/ ponds. This problem needs to be addressed to create a better environment in the town.

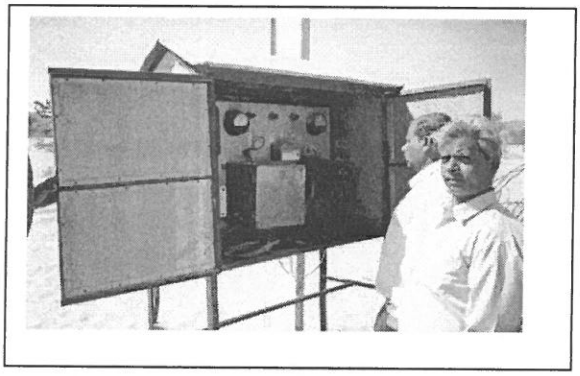
9.14 The scheme has a positive impact on the town. The overall objectives of AUWSP have been fulfilled in terms of improvement both in quality and quantity of water. Almost the entire population of the town has been covered by water supply. However, the existing water supply source seems to be inadequate to continue meeting the norm of 70 lpcd in future. Further augmentation of the source is required to make the scheme technically sustainable. The present cost recovery towards O&M of the scheme is also not encouraging. Though some improvement in cost recovery is made after privatization of the revenue collection system, a rational revision of existing tariff is necessary to meet the O&M expenses and make the scheme financially self-sustainable.

Photographs of various components of AUWSP scheme in Nawa City

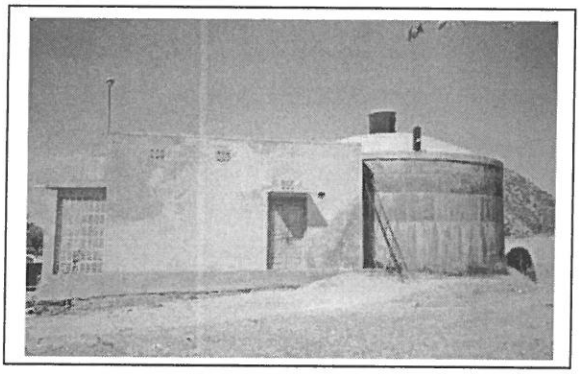


Photograph 39: A functioning tube well

Photograph 40: Pumping Machinery

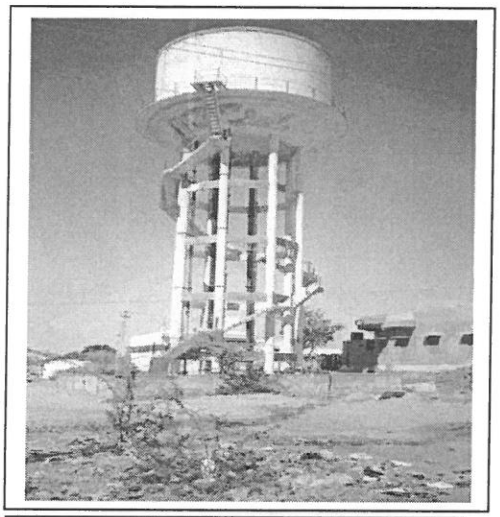


Photograph 41: Electrical connection for operating Pump

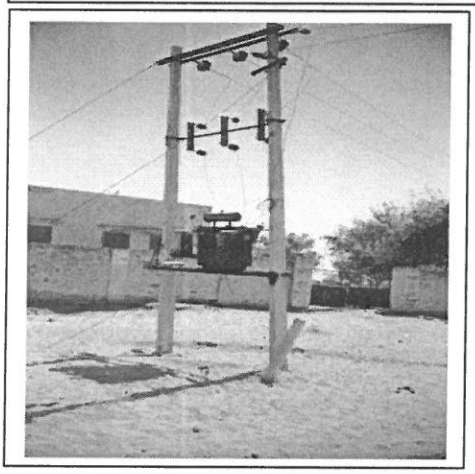


Photograph 42: Clear water Reservoir and Pump house

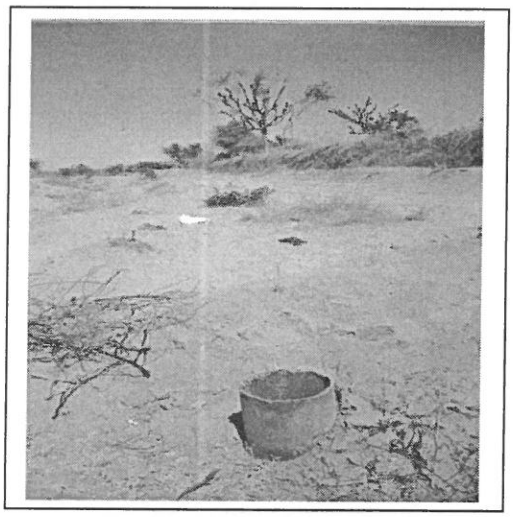
Photographs of various components of AUWSP scheme in Nawa City



Photograph 43: Power Connection-Transformer



Photograph 44: Power Connection-Transformer



Photograph 45: An abandoned Tube well

Part E: Rajasthan

Scheme 10:

Pokhran

District: Jaisalmer

Based on the meetings and discussions with the Public Health Engineering Department (PHED) officials and visit to Pokhran, the following information was obtained:

10.1 Scheme Approval and implementation:

- MoUD, GoI, approved the AUWSP scheme for Pokhran; vide their letter dated 21 December 1995.
- As per the letter of approval, the scheme was scheduled to start in 1995-96 and be completed in 1997-98.
- The scheme started in July 1997 and was completed in July1999.
- It was reported that while the A&F sanction for the scheme was given in July 1996, the technical sanction was given only in June1997. This delayed the start and completion of the scheme.
- The completion of the scheme also got delayed because of a delay in getting approval from the Ministry of Railways, GoI, for laying water supply pipeline across the railway track.

10.2 Implementing Agency: Public Health Engineering Department (PHED), Govt. of Rajasthan, has executed the project. The PHED also carries out the operation and maintenance (O&M) of the water supply system. In the state of Rajasthan, the PHED is responsible for water supply and this responsibility has not been handed over to the local governments.

10.3 Project Cost and Actual Expenditure:

- The AUWSP scheme at Pokhran was approved at an estimated cost of Rs. 106.90 lakhs.

- The scheme got Administrative & Financial (A&F) sanction at a reduced estimated capital cost of Rs. 95.39 lakhs.
- The actual amount spent till completion of the project was Rs. 104.95 lakhs.
- As there was a delay in completion of the scheme, the final cost of the scheme went up, though it still remained below the amount approved by MoUD, GoI.

10.4 Details of the release of funds: Details of release of funds were not made available to the evaluation team.

10.5 Raw Water Source: The source of raw water for the scheme is groundwater - tube wells located at a distance of 6 kms from the town.

10.6 Population and Water Demand: According to the Census of India, the population of Pokhran was 14,865 in 1991 and 19,077 in 2001. The present (2004) population of the town is estimated at 20,340. The population in the initial, intermediate and ultimate years and the corresponding water demand is given in Table 10.1.

Table 10.1 - Population and Water Demand

Pokhran				
Sl. No.	**Item**	**Initial**	**Intermediate**	**Ultimate**
	Year	***1995***	***2005***	***2015***
1	Population covered under the scheme	16,550	20,761	25,000
2	Water demand (mld)			
	Domestic	1.16	1.45	1.75
	Non-domestic	0.10	0.10	0.10
	Total	1.26	1.55	1.85

Source: PHED, Pokhran

- The present quantity of water produced in the town is 2.06 mld and the quantity supplied is 1.77 mld. Of this 1.672 mld is supplied for domestic use.

10.7 Project Components: The approved scheme components, estimated cost, actual expenditure and reasons for variation in expenditure are given in Table 10.2.

Table 10.2 - Project Components, Approved Cost and Actual Expenditure

(Rupees in Lakh)

Pokhran						
Sl. No.	**Project Components**	**Approved Estimated Cost (By MoUD, GoI)**	**Approved Estimated cost (by state Govt)**	**Actual Expenditure**	**Variation from approved cost (of MoUD, GoI)**	**Reasons for variation**
1	Source Development Tube well	9.04	3.02	3.36	-5.68	Initially, as per approval, 7 tube wells were sanctioned which were located at Kelawa. However, at the time of A&F sanction the Technical Member(TM) did not agree for Kelawa as the discharge there was low. The report of the Chief Hydro geologist proposed new source (2 tube wells at Gomat) where the discharge was high. This resulted in cost saving.
2	Pumping machinery	7.14	5.62	5.38	-1.76	Reduction in the number of tubewells reduced the cost for this component also.
3	B.P. Dozing plant	2.00	0.20	0.00	-2.00	Considered not required.
4	Clear water Rising main	48.28	17.82	27.40	-20.88	The previously proposed source was 13 kms. away from Pokhran, while the new source proposed was only about 6 kms. away. Due to reduction in distance there was cost saving.
5	Clear water Reservoir, Sump, Pump House with Pumping machinery	3.35	13.62	11.49	+8.14	Due to an increase in the design year capacity of CWR and SR.
6	Distribution System	12.38	16.27	28.10	+15.72	Due to increase in design year capacity, increase in demand & the length of pipe
7	Electric Power connection	7.00	8.00	7.23	+0.23	Due to separate power feeder taken at source
8	Office buildings/ quarters/ laboratory etc.	7.26	17.40	19.59	+12.33	Due to creation of New Division, Executive Engineer's Office, AEn Qtr. & JEn Qtr. were proposed
10	Miscellaneous	2.50	6.25	2.40	-0.10	
	Sub-total	**98.95**	**88.20**	**104.95**	**+6.00**	
11	WC, Establishment charges @ 3%	2.96	2.65			
12	Contingencies @ 5%	4.95	4.54			
	Total	**106.86**	**95.39**	**104.95**	**-1.91**	

Source: PHED, Pokhran

- All the approved components of the scheme have been completed and are found to exist physically.
- According to the PHED officials no expenditure was incurred on the approved components before sanctioning of the scheme.

10.8 Situation Analysis Before and After Implementation:

The situation before and after implementation of the AUWSP scheme is described below and is given in a tabular form in Table 10.3.

a. The coverage of population by house service connections (HSC) has increased from 46 % to 74 % after implementation of the scheme. The remaining households of the town either have independent water facilities or depend on PSPs.
b. The per capita supply in the town has increased from 40 lpcd to 83 lpcd after implementation of the scheme.
c. At present, water is supplied for only one-hour per day in the town.
d. The number of domestic connections has gone up significantly after the implementation of AUWSP. All new connections given under the scheme are metered.
e. The estimated UFW is reported to have come down significantly after the implementation of the scheme, from about 15% before implementation to about 3 % after implementation. However, UFW is based on the perception and best guess of the water-supplying agency and therefore has to be taken as such.
f. No UFW Cell has been set up in the town nor has any exercise commenced to set up such a cell.
g. Domestic water tariff remains the same as was in existence before the implementation of the scheme. Increasing water tariff is the decision of the State Government and the towns just follow the directive.
h. The revenue from water supply has increased from about Rs. 8 lakhs before implementation to about 19 lakhs at present (2004). The increase is because the quantity of water supplied has increased and also the coverage through household connections (HSC) has increased. The expenditure has also gone up from about Rs. 18 lakhs to about Rs. 23 lakhs in the corresponding period.

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Evaluation of Centrally Sponsored Accelerated Urban Water Supply Programme (AUWSP)

Final Report

National Institute of Urban Affairs
New Delhi

September 2005

i. The cost recovery from the service is about 83% in the town. The shortfall in revenue, of about Rs. 4 lakhs (2003-04) is made up by the State Government as PHED manages the service in the town and not the local government.

j. The total staff strength has reduced by two after implementation, the staff that was at 20 before implementation stands at 18 at present. This is because the vacant posts have not been filled.

Table 10.3 - Status Before and After Implementation of AUWSP Scheme

Pokhran			
Sl. No.	**Parameter**	**Before Implementation**	**After Implementation**
1	**Population covered** by HSC	46%	74%
2	**Per capita supply** through HSC	40 lpcd	83 lpcd
	No. of HSC		
	Domestic (Metered)	55	797
	(Un-metered)	1594	1594
	Non-domestic	2	2
	Total	1651	2393
3	**UFW**		
	In percentage	15%	3%
	Actuals	0.11 mld	0.05 mld
4	**Water Tariff***	**June 1998**	April 2004
	Domestic (Metered)	Rs. 1.56 /kl	Rs. 1.56 /kl
	(Un-metered)	Rs. 25 / month	Rs. 20 +10 / month
	Industiral (Metered)	Rs. 11 /kl	Rs. 11 /kl
	Commercial (Metered)	Rs. 4.68 /kl	Rs. 4.68 /kl
5	**Revenue** (Rs. in lakhs)	Rs. 7.93 (1996-97)	Rs. 18.98 (2003-04)
6	**Expenditure** (Rs. in lakhs)	Rs.18.24 (1996-97)	Rs. 22.97 (2003-04)
7	**Manpower**		
	Agency responsible for O&M	PHED	PHED
	No. of managerial staff	1	1
	No. of staff for O&M	20	18
	Total strength of department	21	19
8	Mode of **disposal of wastewater**	Disposal in low lands - untreated	Disposal in low lands - untreated

Source: PHED, Pokhran

* The present tariff has been in operation since June.1998. It is not known when the water tariff will be revised in the future.

- A total of 39 PSPs existed in the town before the implementation of the scheme and the PSPs increased to 45 after the implementation of the scheme. The town provides PSPs for the poor.

10.9 Water Quality Monitoring:

- Quality of water supplied to the consumers is monitored periodically in the town.
- Samples are normally collected from the tubewells directly.
- Laboratory test for analysis of physical and chemical parameters of the raw water samples drawn from the tubewells is done.
- The reports indicate that the Nitrates (as NO3) contents in the raw water is higher than the limits recommended in the "Manual on Water Supply and Treatment" by MoUD, GoI, for drinking water quality.
- As per the available water quality report, the other physical and chemical parameters are within the tolerance limits.
- No treatment other than disinfection is done for the raw water drawn from the tubewells.
- The residual chlorine was reported to be sufficient.
- No outbreak of water-borne diseases was reported in the town.

10.10 Waste Water Disposal: Most households in the town have individual soak pits. The wastewater from the town is disposed off untreated into the open storm water drains, which later discharges into low lying lands.

10.11 Views of PHED regarding the Scheme:

- While the PHED officials at Pokhran were satisfied with the AUWSP scheme, they said that the demand is much more than what was calculated @ 70 lpcd for the design year population.
- The officials said that while the large army presence in Pokhran has been taken care of in the scheme, the additional burden of the army when the border situation gets tense (when the army presence increases) has not been taken into account.
- Also, near Pokhran there is the Ramdeo Temple where a 'Mela' is held twice a year and about 300,000 pilgrims come to the Mela.
- During the period of the Mela half the pilgrims also visit Pokhran which overloads the water supply system.
- Even when the Mela is not on, the daily visitors to the temple are about 10,000. This floating population has not been accounted for in the scheme.

- Another factor that overloads the system is the cattle ownership in the area. On an average, the cattle population in the region is 5.5 times the human population. This too creates an additional overload on the system.
- Therefore, the PHED officials were of the view that the calculation of water demand based on just the resident population and the army does not solve the water supply problem for the town.
- The PHED officials at Pokhran stated that there is a need for augmentation of the scheme as it stands today.

10.12 Views of Community: A random sample of water consumers from different points in the town to represent the beginning, middle and the tail end of the water supply system were interviewed. They were asked their opinion on the water supply situation before and implementation of the scheme.

- The AUWSP scheme has increased the quantity of water available to them.
- Most of the people of the town are satisfied with the water supply situation at present.
- Some people at the tail end of the system do face low-pressure problem at times. The water supply usually reaches only the first floor level.
- The reason for low pressure is illegal tapping of water and installation of booster pumps by some individuals, which creates a problem for others.

10.13 Summary of Evaluation Study and Findings for Pokhran Scheme

1. The source of water supply to the town is ground water. The source developed under AUWSP is reliable and can be depended upon as it stands today. However, if the region experiences prolonged periods of drought, the present source may not remain reliable.
2. The scheme did not start on schedule because of a delay in getting Technical Sanction for the scheme. The completion of the scheme was also delayed due to a delay in obtaining permission to lay pipelines across the railway line.
3. The approved estimated cost by MoUD, GoI, for the scheme was Rs. 106.86 lakhs while the State Government approved a cost of only Rs. 95.39 lakhs. The main reduction in cost was in source development – a nearer

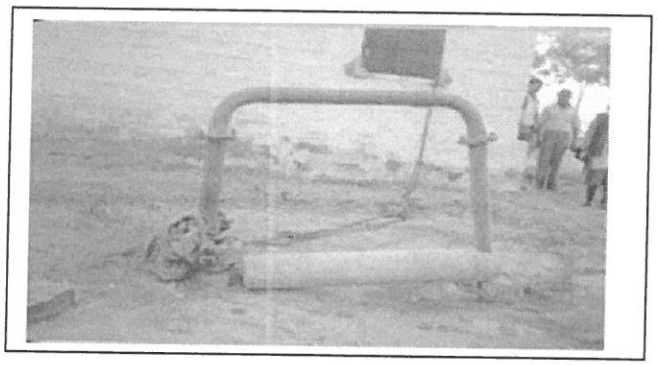
source was identified with greater discharge. This change necessitated the development of only two tube wells instead of seven tube wells planned earlier.

4. The actual expenditure on the scheme was Rs. 104.95 lakhs, which exceed the estimated cost approved by the State Government, but was within the estimated cost approved by MoUD, GoI.
5. All components, as per the letter of approval of the Ministry, except B.P. Dozing Plant, were executed. This component was not executed, as it was not considered necessary by the PHED.
6. All components of the scheme physically exist.
7. The coverage of population by household connections is only 74% at present. The rest of the population depends on its own private water facilities or on PSPs.
8. The per capita supply in the town has increased from 40 lpcd to 83 lpcd at present.
9. All the water supply connections given under the AUWSP scheme are metered.
10. The UFW, at present, has been estimated at 3 %, which may not reflect the true picture. In the absence of a special study to estimate UFW, all figures must be taken as best estimates by the officials. These are based on rough calculations and guess work.
11. No UFW cell has been created in the town and no exercise has commenced to set up such a cell.
12. Domestic tariff has not increased in the town after the implementation of the scheme as the decision to increase tariff rests with the State Government.
13. The recovery from water supply is about 83 % at present. The state government makes up the shortfall.
14. The scheme has not been handed over to the local body after completion as, in the state of Rajasthan, the PHED itself maintains the water supply system throughout the state.
15. There is a shortage of manpower in the town's PHED which is creating a problem in maintaining the water supply system.

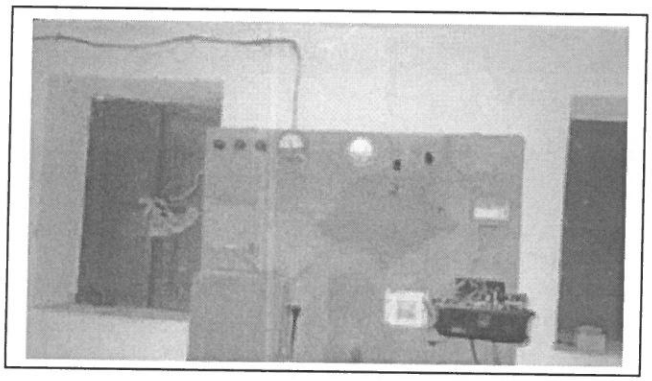
16. Most of the people in the town are satisfied with the scheme as they are getting sufficient water for their use. However, some of the households at the tail end of the system do face a problem of low pressure.
17. The wastewater from the town is disposed off untreated in low-lying lands. This problem needs to be addressed to create a better environment in the town.

10.14 The scheme has had an overall positive impact on the society. It has also achieved the primary objectives of AUWSP in terms of improvement in the quality and quantity of water, cost recovery towards O&M of the scheme and improvement of the socio-economic conditions of the community. It is likely that the augmentation of existing water supply sources and upward revision in water tariff will further improve the present water supply situation and make the scheme technically and financially sustainable.

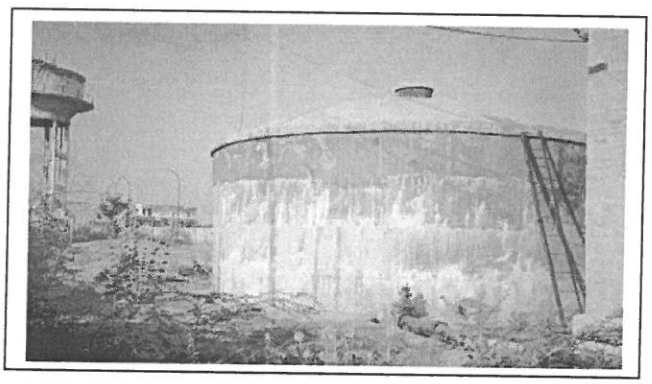
Photographs of various components of AUWSP scheme in Pokhran



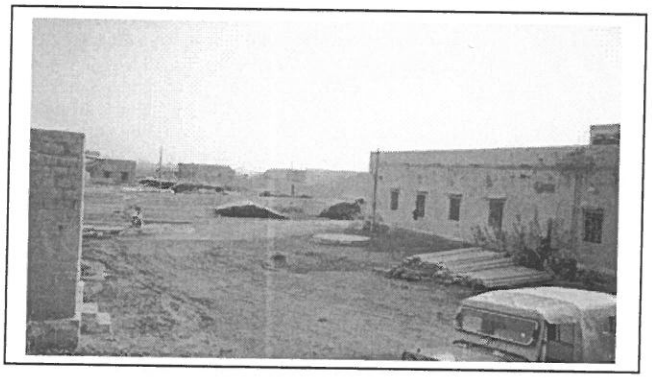
Photograph 46: View of Tubewell at Gomut



Photograph 47: View of Pump Room at Gomut, Pokhran. Submersible pump attached to the tube well is operated from this room.



Photograph 48: Clear Water Reservoir



Photograph 49: Civil Works, Pokhran

Part E: Rajasthan

Scheme 11:

Sarwar

District: Ajmer

Based on the meetings and discussions with the Public Health Engineering Department (PHED) officials and visit to Sarwar, the following information was obtained:

11.1 Scheme Approval and implementation:

- The water supply scheme in Sarwar under AUWSP was approved in the year 1995.
- The State Government's approval for the scheme was communicated to the town via the letter dated 5 June 1995.
- The scheme period was from 1995-96 to 1996-97.
- The scheme was commissioned in the year 1997-98.
- There was a 13-month delay in completing the scheme mainly because of delay in civil works and release of electrical connection for the scheme.

11.2 Implementing Agency: Public Health Engineering Department (PHED), Govt. of Rajasthan, has executed the project. The PHED also carries out the operation and maintenance (O&M) of the water supply system. In the state of Rajasthan, the PHED is responsible for water supply and this responsibility has not been handed over to the local governments.

11.3 Project Cost and Actual Expenditure:

- The AUWSP scheme at Sarwar was approved at an estimated cost of Rs. 10 lakhs.
- While the scheme got technical sanction initially for Rs. 10 lakhs, subsequently the sanction was revised by omitting the provision of CWR in November

1995.

- The proposal was revised again and resubmitted for issue of technical sanction because the soil bearing capacity of the proposed site for OHSR was not found up to the mark for construction of OHSR and an alternate site was discussed and finalised.
- The revised technical sanction was approved for Rs. 9.23 lakhs in April 1996.
- The actual expenditure on the scheme was Rs. 13.75 lakhs.
- The additional expenditure was due to price escalation and prorata charges during the project implementation period.

11.4 Details of the release of funds by year of release are given in Table 11.1.

Table 11.1 - Release of Funds

(Rs in lakh)

Sarwar			
Central Government		**State Government**	
Date of Release	**Amount**	**Date of Release**	**Amount**
1994-95	-	1994-95	0.56
1995-96	3.06	1995-96	2.00
1996-97	2.00	1996-97	3.00
1997-98	3.00	1997-98	-
Total	**8.06**	**Total**	**5.56**

Source: PWSSB, Sarwar

11.5 Source of water:

- The source of raw water for the scheme is surface water, obtained from a Bisalpur Dam located about 62 kms from the town.
- The dam water is treated at Kekri Filtration Plant.
- There is a pumping station at the Kekri plant from where water is pumped to station no. 3 at village Ajgara and further pumped to pumping station near village Goyala by means of 21" dia CI and 20" dia A.C. pressure pipe line.
- Water for Sarwar town is tapped from 21" dia pumping main near Sarwar.

11.6 Population and Water Demand: According to the Census of India, the Population of Sarwar was 12,000 in 1991 and 16,194 in 2001. The present (2004) population of the town is estimated at 18,815. The population in the initial,

intermediate and ultimate years and the corresponding water demand is given in Table 11.2.

Table 11.2 - Population and Water Demand

Sarwar				
Sl. No.	Item	Initial	**Intermediate**	**Ultimate**
	Year	Not given	**2001**	**2015**
1.	Population covered under the scheme		**16,194**	**21,000**
2.	Water demand (mld)			
	Domestic		**0.80**	**0.93**
	Non-domestic		**0.50**	**0.54**
	Total		**1.30**	**1.47**

Source: PHED, Sarwad

- The present quantity of water produced in the town is not given as water is drawn from the Bislapur Dam supply system. The total quantity of water supplied is 1.0 mld and of which 0.70 mld is supplied for domestic use.

11.7 Project Components: The approved scheme components, estimated cost, actual expenditure and reasons for variation in expenditure are given in Table 11.3.

Table 11.3 - Project Components, Approved Cost and Actual Expenditure

(Rupees in Lakh)

Sarwar			
Sl.No.	**Name of Component**	**Approved estimated cost (by MoUD, GoI)**	**Actual Expenditure**
1	Pumps & Machinery	0.30	Break-up not provided
2	Pump House	0.40	
3	Rising Main	2.49	
4	Distribution Network	0.10	
5	Electric Connections	0.50	
6	OHSR and pump house	5.60	
	Sub-total	**9.39**	
7	Contingency charges	0.47	
8	Establishment charges	0.14	
	Total	**10.00**	**13.75**

Source: PWSSB, Sarwad

- All the approved components of the scheme have been completed and are found to exist physically.
- According to the PHED officials no expenditure was incurred on the approved components before sanctioning of the scheme.
- However, from the discussions with the PHED officials it was revealed that the pumping machinery, which was among the approved components, is not in use at present, since the pressure in the rising main is sufficient to lift water up to the OHSR.

11.8 Assessment of Situation Before and After Implementation:

The water supply situation in Sarwar before and after implementation is described below and is given in a tabular form in Table 11.4.

a. The coverage of population by house service connections (HSC) has increased from 75 % to 95% after the implementation of AUWSP. The officials stated that the distribution system needs to be extended in order to cover the entire population of the town with piped water supply. The remaining population is being served by hand pumps.
b. The per capita supply in the town has not changed after implementation of the scheme. It remains at 70 lpcd.
c. At present, water is supplied for two hours a day in the town – on hour in the morning and one hour in the evening.
d. The number of domestic connections has gone up significantly after the implementation of AUWSP. All new connections given under the scheme are metered.
e. The estimated UFW is reported to have come down after the implementation of the scheme, from about 15% before implementation to about 11 % after implementation. However, UFW is based on the perception and best guess of the water-supplying agency and therefore has to be taken as such.
f. No UFW Cell has been set up in the town nor has any exercise commenced to set up such a cell.
g. Domestic water tariff remains the same as was in existence before the implementation of the scheme. Increasing water tariff is the decision of the State Government and the towns just follow the directives.

h. In 2002-03 the revenue from the service exceeded the expenditure by about Rs. 3.4 lakhs showing a cost recovery of about 147%. This exceptional situation, according to the officials, is mainly because: i) there is no expenditure on treating the surface water as treated water from Kekri Filtration Plant is tapped for the town; and ii) the pressure of water coming through the pipeline from the plant is sufficient to lift water to the OHSR. Therefore pumping is not required. This results in significant saving in electricity charges for the town.

i. The staff strength to manage the water supply system in the town has gone up after the implementation of the scheme from 2 to 5.

Table 11.4 - Status Before and After Implementation of AUWSP Scheme

Sarwar			
Sl. No.	**Parameter**	**Before Implementation**	**After Implementation**
1	**Population covered** by HSC	75%	95%
2	**Per capita supply** through HSC	70 pcd	70 lpcd
3	**No. of HSCs** Domestic (Metered) (Unmetered) Non-domestic (Metered) (Unmetered) Total	 50 830 47 4 931	 753 830 62 4 1649
4	**UFW** In percentage Actuals	 15 % 0.15 mld	 11 % 0.11mld
5	**Water Tariff***	**June 1998**	April 2004
	Domestic (Metered) (Unmetered)	Rs. 1.56 /kl Rs. 25 / month	Rs. 1.56 /kl Rs. 20 +10 / month
	Industiral (Metered) Commercial (Metered)	Rs. 11 /kl Rs. 4.68 /kl	Rs. 11 /kl Rs. 4.68 /kl
6	**Revenue** (Rs. in lakhs)	Rs.7.32 (1995-96)	Rs.10.73 (2002-03)
7	**Expenditure** (Rs. in lakhs)	n.a.	Rs.7.32 (2002-03)
8	**Manpower** Agency responsible for O&M No of technical staff No. of managerial staff No. of staff for O&M Total strength of department	 PHED 1 1 2 4	 PHED 1 1 5 7
9	Mode of **disposal of wastewater**	Individual septic tank followed by discharge in storm water drains	Individual septic tank followed by discharge in storm water drains

Source: PHED, Sarwar

** The present tariff has been in operation since June.1998. It is not known when the water tariff will be revised in the future.*

- A total of 44 PSPs existed in the town before the implementation of the scheme and the PSPs increased to 46 after the implementation of the scheme. The town provides PSPs for the poor.

11.9 Water Quality Monitoring:

- Quality of water supplied to the consumers in the town is monitored periodically.
- Samples are normally collected from various private and public taps.
- As the raw water is treated at the WTP at Kekri, no physical and chemical treatment is done in the town separately.
- Bacteriological tests are carried out in every 3-4 days. Laboratory test reports for analysis of bacteriological parameter (Coliforms) confirms that the water supplied to the consumer meets the drinking water quality standards.
- The residual chlorine was stated to be sufficient.
- No outbreak of water-borne diseases has been reported after the implementation of the scheme.

11.10 Waste Water Disposal:

- Most households in the town have individual soak pits.
- The wastewater from the town is disposed off untreated into the open storm water drains, which later discharge into low lying lands at a distance of about 5 kms from the town.

11.11 Views of PHED regarding the Scheme:

- The PHED officials felt that while the AUWSP scheme helped the town to get sufficient water, the distribution system needs augmentation to serve the entire town.
- Due to inadequate size of distribution system and service reservoir there is a pressure problem is some parts of the town especially in the higher and tail end zones.
- As the population of the town is increasing, the demand is also expected to increase. Therefore, a new proposal for Rs. 60 lakhs for supplying additional water to the town is being proposed.
- The new scheme proposes the construction of a clear water reservoir and an OHSR and a rising main and also an improvement in the distribution

system.

11.12 Views of Community: A random sample of water consumers from different points in the town to represent the beginning, middle and the tail end of the water supply system were interviewed. They were asked their opinion on the water supply situation before and implementation of the scheme.

- The general opinion of the people was that the water supply situation has improved after the implementation of the scheme.
- Those who did not have house service connections earlier were very satisfied as now they could get water in their houses and did not have to carry water from a distance.
- However, some households at the tail end of the system and those in higher elevation sometimes faced low-pressure problem. The water rises to the first floor level in the town.

11.13 Summary of findings of Evaluation Study for Sarwar Scheme

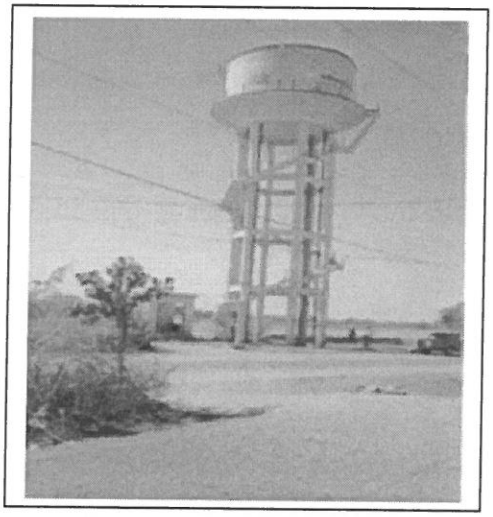
1. The source of water supply to the town is surface water. Since the source is a dam, it is a reliable and will be able to sustain the scheme till the design period of 2015.
2. The scheme started on schedule but there was a delay in the completion of the scheme because of a delay of 13 months in the completion of civil works and getting an electrical connection.
3. The approved estimated cost by MoUD, GoI, for the scheme was Rs. 10 lakhs while the technical sanction from the State Government was given for only Rs. 9.23 lakhs. The actual expenditure on the scheme though was Rs. 13.75 lakhs, mainly due to escalation in cost during implementation.
4. All components of the scheme have been completed and physically exist.
5. The coverage of population by household connections is 95% at present. The rest of the population is served by hand pumps.
6. The per capita supply in the town meets the norm i.e. 70 lpcd.
7. All the water supply connections given under the AUWSP scheme are

metered.

8. The UFW, at present, has been estimated at 11 %, which may not reflect the true picture. In the absence of a special study to estimate UFW, the officials must take all figures as best. These are based on rough calculations and guess work.
9. No UFW cell has been created in the town and no exercise has commenced to set up such a cell.
10. Domestic tariff has not increased in the town after the implementation of the scheme as the decision to increase tariff rests with the State Government.
11. The town's revenue from water supply exceeds the expenditure on it. This is mainly because the town gets treated water from Kekri Filtration plant and the pressure in the pipeline from where water is tapped is sufficient to fill the OHSR without pumping. This saves expenditure for the town on electricity. Getting treated water from the plant also reduces the expenditure on staff for the town.
12. The scheme has not been handed over to the local body after completion as, in the state of Rajasthan, the PHED itself maintains the water supply system throughout the state.
13. Most of the people in the town are satisfied with the scheme as they are getting sufficient water for their use in their homes. However, some of the households at the tail end of the system do face low-pressure problem.
14. The wastewater from the town is disposed off untreated into storm water drains which later discharge into low lying lands at a distance from the town. However, this problem needs to be addressed to create a better environment in the town.

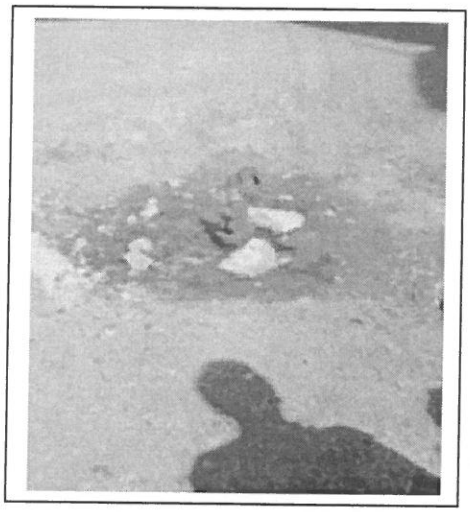
11.14 The scheme has had a positive impact on the society. AUWSP objectives of improvement in quantity and quality of water supply, coverage of town's population and full O&M cost recovery have been achieved. The socio-economic condition, environment and quality of life have improved after implementation of the scheme.

Photographs of various components of AUWSP scheme in Sarwar



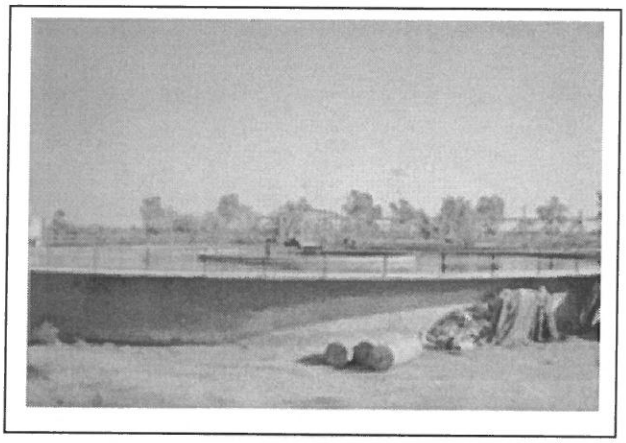
Photographs 50: Overhead Service Reservoir

Photograph 51: Leakage in the water supply main at the OHSR

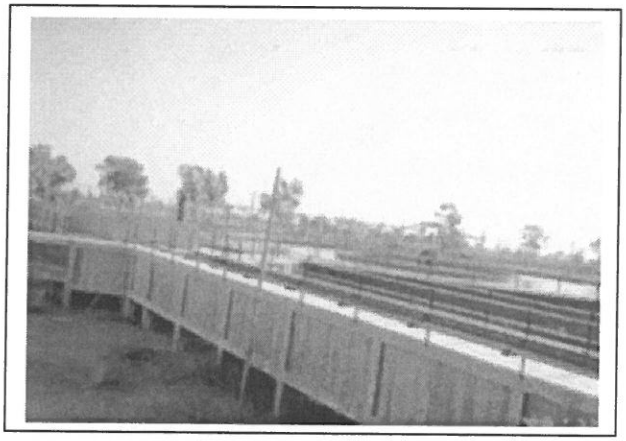


Photographs 52: Leakage of water taking place from the valve near OHSR

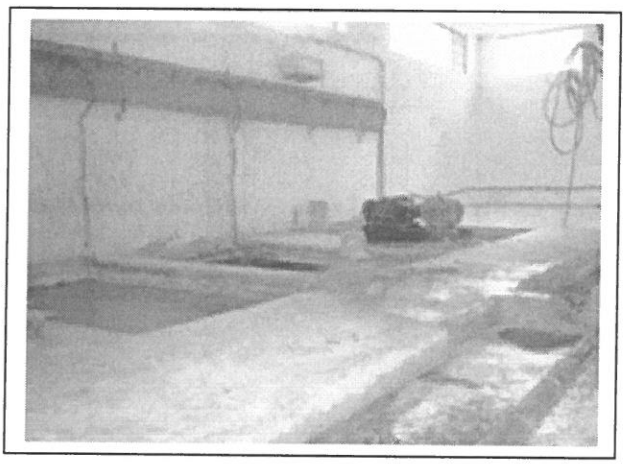
Photographs of various components of AUWSP scheme in Sarwar



Photographs 53: Water treatment plant at Kekri



Photographs 54: Water treatment plant at Kekri – Clarifier



Photographs 55: Water treatment plant at Kekri – Mechanical alum dosing

CHAPTER 3

Summary and Recommendations

CHAPTER 3

Summary and Recommendations

The present report gives the results of the evaluation of eleven AUWSP schemes. This chapter summarises the findings of the study and gives recommendations for improving the implementation and effectiveness of the AUWSP schemes.

A. Summary of Findings

1. Starting and Completion of Schemes

1.1 The evaluation results indicate that there is a delay in completion of most schemes. In 8 of the 11 schemes evaluated, the completion has been delayed (Table 12.1). The delay ranges from one to four years or more. The reasons for delay range from non-availability of funds on time, transfer of concerned officials, getting electricity connection, to getting permission for laying pipeline across the railway line.

1.2 In some cases the delay was because one of the components could not be implemented, while the other components were completed and commissioned. For instance, in Uchana while 10% of the distribution system is still not complete, the scheme was commissioned and made operational within the stipulated time. In Mahuwa, there was a delay in getting the electrical connection released. However, the scheme was made operational within the stipulated time with the help of an additional feeder from an existing power line on temporary basis. In other cases the entire scheme could not be completed and commissioned on schedule because of a delay in implementing one of the components. For instance, in Pokhran, the scheme could not be completed within the stipulated time because of a delay in getting permission for laying pipes across the railway track.

Table 12.1: Starting and Completion dates of AUWSP Schemes, Completion Status and Reasons for Delay

Sl. No.	Name of Town	Starting Date (As per approval)	Completion date (As per approval)	Delayed (Yes/No)	Completion status	Reasons for delay
1	Bawani Khera	1997-98	1998-99	Yes	On-going	20% distribution system remaining
2	Narnaud	1994-95	1995-96	Yes	Completed in 1999-2000	Transfer of concerned officials
3	Uchana	1998-99	1999-2000	Yes	On-going	10% distribution system remaining
4	Chowari	1994-95	1995-96	No	Completed	
5	Qazigund	1994-95	1996-97	No	Completed	
6	Fatehgarh Churian	1998-99	1999-2000	Yes	Completed in May 2003	Delay in receiving funds, land acquisition and Finalisation of land for OHSR
7	Sanaur	1998-99	1999-2000	Yes	Completed in Dec. 2001	Delay in receiving funds, release of electric connection
8	Mahuwa	1994-95	1995-96	Yes	Completed in April 2000	Delay in release of electric connection
9	Nawa City	1996-97	1997-98	No	Completed	
10	Pokhran	1995-96	1997-98	Yes	Completed in July 1999	Delay in approval from Ministry of Railways
11	Sarwad	1995-96	1996-97	Yes	Completed in 1998	Delay in civil works and release of electric connection.

2. Implementing Agency and Agency for O&M

2.1 In four of the five the states, in which evaluation has been done, it is the State agency (PHED/PHD) that has implemented the scheme. These agencies also do the O&M of the scheme. The provision of water supply in these states is not yet in the charge of local governments. Only in Punjab, O&M of water supply systems is the responsibility of urban local governments (Table 12.2).

Table 12.2: Implementing Agency and Agency for O&M

Sl. No.	State	Name of Town	Implementing Agency	Agency for O&M
1	Haryana	Bawani Khera	PWD, Public Health Department	PWD, Public Health Division No. 2, Bhiwani
2	Haryana	Narnaud	PWD, Public Health Department	PWD, Public Health Division, Hansi
3	Haryana	Uchana	PWD, Public Health Department	PWD, Public Health Division, Narwana
4	Himachal Pradesh	Chowari	Irrigation& Public Health Department	Irrigation& Public Health Division, Dalhousie
5	Jammu and Kashmir	Qazigund	PHED, J&K	PHED, Qazigund
6	Punjab	Fatehgarh Churian	PWSSB	Municipal Council, Fatehgarh Churian
7	Punjab	Sanaur	PWSSB	Municipal Council, Sanaur
8	Rajasthan	Mahuwa	PHED	PHED
9	Rajasthan	Nawa	PHED	PHED
10	Rajasthan	Pokhran	PHED	PHED
11	Rajasthan	Sarwad	PHED	PHED

3. Approved Cost and Actual Expenditure

3.1 There was no clear pattern that emerged with respect to the actual expenditure on the scheme as compared to the approved cost. There were schemes which had cost overrun, schemes which were completed at a lower cost than approved and also those where the approved and actual cost were the same.

3.2 In 4 of the 11 towns, there has been either no cost variation or the variation has been within 5% (+ and -) of the estimated cost. In 5 towns, the expenditure on the scheme has been more than the estimated cost (> 5% variation). In 2 towns the expenditure was less than the estimated cost (> 5% variation). See Table 12.3.

Table 12.3: Approved Cost, Actual Expenditure and Difference in Cost

(In Rs. Lakh)

Sl. No.	Name of Town	Approved Cost (Rs.)	Actual Expenditure (Rs.)	Variation (Rs.)	% Actual to approved
1	Bawani Khera	223.54	209.96	-13.58	94
2	Narnaud	92.88	97.62	4.74	105
3	Uchana	103.42	91.18	-12.24	88
4	Chowari	39.50	46.0.3	6.53	117
5	Qazigund	42.52	42.52	0.00	100
6	Fatehgarh Churian	47.00	47.04	0.04	101
7	Sanaur	65.62	65.62	0.00	100
8	Mahuwa	40.80	48.92	8.12	120
9	Nawa	114.62	138.28	23.66	121
10	Pokhran	106.90	104.95	-1.95	98
11	Sarwad	10.00	13.75	3.75	138

4. Raw Water Source

4.1 The raw water source in most surface water and spring water schemes are reliable and can be depended upon till the design year of the scheme. However, tube well water schemes in Rajasthan, unlike in Punjab, may not be able to sustain themselves till the design year. Prolonged drought has had an adverse impact on the source as the water levels have fallen. Tube wells have had to be abandoned in some cases. Such extraneous factors have affected the reliability of the source. See Table 12.4.

Table 12.4: Source of Raw Water

Sl. No.	Name of Town	Source of Raw Water
1	Bawani Khera	Bawani Khera Minor Irrigation Canal
2	Narnaud	Hisar Major Distributory (Canal)
3	Uchana	New Barsola Canal Feeder
4	Chowari	Spring Water
5	Qazigund	Spring Water-Verinag
6	Fatehgarh Churian	Tubewell
7	Sanaur	Tubewell
8	Mahuwa	Tubewell
9	Nawa	Tubewell
10	Pokhran	Tubewell
11	Sarwad	Bisalpur Dam

5. Present population and Quantity of Water Produced and Supplied

5.1 The present population of the towns varies from about 4 to 22 thousand. The quantity of water produced varies between 0.56 mld to 2.72 mld while the quantity of water supplied varies between 0.52 mld to 2.09 mld (Table 12.5).

Table 12.5: Population, Quantity of Water Produced and Supplied (2004)

Sl. No.	Name of Town	Present Population	Quantity of water produced (mld)	Quantity of water supplied (mld)	Quantity supplied for domestic use (mld)
1	Bawani Khera	18626	2.50	2.09	1.85
2	Narnaud	16248	2.72	1.52	1.38
3	Uchana	13536	1.65	1.64	1.34
4	Chowari	4246	0.56	0.56	0.42
5	Qazigund	11262	0.60	0.52	0.45
6	Fatehgarh Churian	16920	1.96	1.57	1.52
7	Sanaur	18839	1.89	1.72	1.66
8	Mahuwa	22456	1.51	1.24	1.20
9	Nawa	18440	1.36	1.28	1.28
10	Pokhran	20340	2.06	1.77	1.67
11	Sarwad	18815	*	1.00	0.70

Source: Data provided by the implementing agencies of the schemes for the respective towns

* The source of water for Sarwar is Bisalpur Dam and therefore water produced for the town does not apply.

Note: The variation in the quantity of water produced and the quantity of water supplied is because of system losses and UFW (leakage, illegal tapping etc.).

6. Population Covered by Household Connections (HSCs) and Number of HSCs

6.1 Most of the schemes have not been able to cover the entire population with HSCs. Only 2 out of 11 schemes have reported 100% coverage of population by HSCs In the remaining towns, except for Narnaud, the coverage varies between 64% and 95%. In Narnaud the coverage by HSCs is 24% while another 61% of the population is covered by public stand posts (see Table 12.6).

6.2 Discussions with the respective implementing agencies of the towns reveal the following reasons for non-coverage of 100% population under AUWSP of most of the towns:

- There is a gap in the population projected in the DPRs and the actual population increase.
- The density of population in the new areas of the towns is low and therefore, extending distribution network to such undeveloped areas in advance was found to be an uneconomical proposition.
- In some of the towns, expansion of the distribution system was not a part of the AUWSP scheme and therefore, the town could not expand the distribution network.

6.3 Overall, the number of household connections has increased in all the towns after the implementation of the scheme (Table 12.6).

Table 12.6: Coverage of Population by HSCs and No. of HSCs

Sl. No.	Name of Town	Coverage of population by HSCs (%)		No. of Household connections	
		Before	After	Before	After
1	Bawani Khera	55	85	1311	2076
2	Narnaud	Negligible	24	-	377
3	Uchana	54	100	700	1850
4	Chowari	45	100	200	383
5	Qazigund	36	64	88	143
6	Fatehgarh Churian	20	80	525	706
7	Sanaur	81	94	1445	2410
8	Mahuwa	60	90	1122	2145
9	Nawa	70	90	1030	1293
10	Pokhran	46	74	55	797
11	Sarwad	75	95	50	753

Note: Before = Before implementation and After = After implementation

7. Per Capita Supply

7.1 It was reported that the per capita supply in most of the towns was below the norm of 70 lpcd before the implementation of the AUWSP scheme. However, discussions with the respective implementing agencies and the residents of the towns suggest that the per capita supply in most towns has increased after the implementation of the scheme.

7.2 The study indicates that while four towns have a supply at the norm of 70 lpcd, six towns have a supply above the norm ranging from 83 lpcd to 140 lpcd. The per capita supply in only one town is below the specified norm for the scheme, mainly due to a fall in the water table in the region. (Table 12.7).

Table 12.7: Per Capita Supply and Hours of supply

Sl. No.	Name of Town	Per Capita Supply (lpcd)		Present Hours of supply
		Before	After	
1	Bawani Khera	60	70	1
2	Narnaud	40	100	4
3	Uchana	45	70	7
4	Chowari	40	120	10
5	Qazigund	20	90	5
6	Fatehgarh Churian	140	140	4
7	Sanaur	180	135	2
8	Mahuwa	28	59	1
9	Nawa	48	70	1
10	Pokhran	40	83	1
11	Sarwad	70	70	2

Source: Data provided by the implementing agencies of the respective towns

Note: Before = before implementation and after = after implementation

8. Hours of supply

8.1The present hours of water supply varies from 1 hour to 10 hours in the study towns (Table 12.7). Data for hours of supply of different study towns provided in Table 12.7 are average. Period of supply varies from season to season and from year to year. Most of the study towns where daily supply hours is less, i.e. 1-2 hours, are mainly those that depend on the ground water source, which is inadequate, and inconsistent over the year. This restricts the daily hour of supply. However, discussions with the respective implementing agency officials reveals that the per capita supply level is maintained by regulating supply to the water supply zones and augmenting pressure by additional booster arrangements.

9. Water Tariff

9.1 The domestic tariff has increased in most of the towns except in the state of Rajasthan, where it has not changed and is the same as before the implementation of the scheme.

9.2 The monthly charges for domestic water supply ranged between Rs. 10 to Rs. 20 per month before the implementation of the scheme and at present it ranges between Rs. 25 to Rs. 50 per month (Table 12.8).

Table 12.8: Water Tariff

Sl. No.	Name of Town	Domestic Tariff (Rs.)		Non-domestic Tariff (Rs.)	
		Before	After	Before	After
1	Bawani Khera	20 /p.m.	50 /p.m	25/ p.m	75 / p.m
2	Narnaud	-	1.25/ kl	-	4.00/ kl
		-	50/ p.m	-	150/ p.m
3	Uchana	20 / p.m	50 / p.m	25/ p.m	75 / p.m
4	Chowari	10 / p.m	40 / p.m	-	-
5	Qazigund	120/ annum	180/ annum	120/ annum	500/ annum
6	Fatehgarh Churian	20 / p.m	50 / p.m	150/ p.m	200 / p.m
7	Sanaur	20 / p.m	50 / p.m	25/ p.m	60/ p.m
8	Mahuwa	1.56/ kl	1.56/ kl	11/ kl (ind.)	11/ kl (ind.)
		25/ p.m	25/ p.m	4.68/ kl (comm.)	4.68/ kl (comm.)
9	Nawa	Same as for Mahuwa			
10	Pokhran				
11	Sarwad				

Note: p.m. = per month and kl = kilo litre or 1000 litres

10. Revenue and Expenditure

10.1 None of the towns in the study have been able to recover full cost of providing water supply. The shortfall in revenue is met by the State Government in the towns where the state agency manages the water supply service and in the towns where the service is managed by the local body the deficit is met from the general revenues of the local body.

10.2 The cost recovery ranges from about 11% to about 84% in these towns. The actual revenue-expenditure gap ranges from Rs. 0.49 lakhs to Rs. 27.31 lakhs (Table 12.9).

Table 12.9: Revenue and Expenditure

(Rs. in Lakhs)

Sl. No.	Name of Town	Revenue (Rs.)			Expenditure (Rs.)			Rev.- Exp. gap	% Cost recovery
		Year	Before	After	Year	Before	After	After	After
1	Bawani Khera	*1996-97*	5.07	12.86	*2002-03*	6.25	20.53	7.67	63
2	Narnaud	*1994-95*	0.48	5.06	*2002-03*	0.74	44.76	39.7	11
3	Uchana	*1997-98*	1.87	17.91	*2003-04*	6.95	21.25	3.34	84
4	Chowari	*1992-93*	_	0.22	*2003-04*	_	0.71	0.49	31
5	Qazigund	*1991-92*	0.14	0.4	*2000-01*	0.45	1.37	0.97	29
6	Fatehgarh Churian	*1999-2000*	64.28	60.72	*2003-04*	76.26	74.43	13.71	82
7	Sanaur	*1997-98*	19.5	19.5	*2003-04*	48.01	46.81	27.31	42
8	Mahuwa	*1995-96*	2.6	16.6	*1999-2000*	5.2	34.4	17.8	48
9	Nawa	*1996-97*	4.43	14.18	*2002-03*	9.29	36.44	22.26	39
10	Pokhran	*1996-97*	7.93	18.24	*2003-04*	18.98	22.97	4.73	79
11	Sarwad	*1995-96*	7.32	na	*2002-03*	10.73	7.32	n.a	n.a

Note: Before = before implementation and after = after implementation

11. Staff Strength

11.1 While the staff strength of most of the O&M agencies has increased after the implementation of the scheme, in two towns the staff strength has remained the same and in another two towns the staff strength has reduced due to non-filling up of vacant positions (Table 12.10).

Table 12.10: Staff Strength of the O&M Agency

Sl. No.	Name of Town	Staff Strength	
		Before	After
1	Bawani Khera	11	13
2	Narnaud	7	14
3	Uchana	12	16
4	Chowari	4	11
5	Qazigund	11	11
6	Fatehgarh Churian	3	3
7	Sanaur	6	8
8	Mahuwa	22	30
9	Nawa	23	21
10	Pokhran	21	19
11	Sarwar	4	7

Note: Before = Before implementation and After = After implementation

12. Wastewater Disposal

12.1 The wastewater from all the towns, accepts in one, is drained in storm water drains and discharged into low-lying lands/ ponds/ open channels without treatment.

Table 12.11: Mode of Wastewater Disposal

Sl. No.	Name of Town	Mode of wastewater disposal
1	Bawani Khera	Untreated into storm water drains
2	Narnaud	Untreated into storm water drains
3	Uchana	Partly treated in Oxidation Pond, remaining discharged into storm water drains
4	Chowari	Disposed in natural drains
5	Qazigund	Disposed in open drains, channels
6	Fatehgarh Churian	Untreated into storm water drains
7	Sanaur	Septic tanks followed by disposal in storm water drains
8	Mahuwa	Untreated into storm water drains
9	Nawa	Untreated into storm water drains
10	Pokhran	Untreated into storm water drains
11	Sarwar	Septic tanks followed by disposal in storm water drains

12.2 Only in Uchana, which has a partial sewerage network, wastewater is treated in an oxidation pond, the remaining water is discharged into storm water drains and later into low lying lands, untreated. In two towns many households had septic tanks for wastewater disposal. The overflow from these tanks and from other houses is discharged into the storm water drains and ponds without any treatment (Table 12.11).

13. Water Quality

13.1 It was reported that the water quality was fit for drinking in all the towns. The residual chlorine available was sufficient. No outbreak of water-borne diseases was reported in any of the towns.

14. Views of O&M Agencies

14.1 Overall, the agencies implementing the schemes and those managing the water supply systems in the study towns were satisfied with the scheme.

15. Views of the Community

15.1 The views of the community also indicated that they were satisfied with the scheme, though there were some local level problems (low pressure) in some parts of some towns.

B. Recommendations

After conducting the evaluation study of selected AUWSP schemes, the following recommendations are being put forth for improving the implementation and effectiveness of these schemes.

1. For estimating the cost of the scheme the Schedule of Rates are used by the agencies. Since there is a time lag between preparing the proposal, approval and final implementation, the cost of the components increase. This leads to an escalation in the expenditure on the scheme. A factor for inflation can be used in the schedule of rates and the cost estimated accordingly. It is learnt that the states do not revise the schedule of rates in every year. Annual revision of the schedule of rates would give a more realistic estimate of cost.

2. The schemes have not been handed over to the local bodies in most of the towns. This is because of the state policy of letting these state agencies maintain the schemes. If the local body has to manage the scheme, then adequate technical staff should be provided to them so that they can handle the water supply system.

3. Source reliability, though a mandatory requirement for the scheme, is not always possible to ensure due to local/ regional conditions. For example, the ground water source in certain towns is so unpredictable due to adverse climatic conditions that despite best efforts the sustainability of such

sources cannot be correctly estimated. Flexibility should be provided to the implementing agency to revise the design year of the scheme due to changes in local conditions, after discussions with the Central and State governments.

4. The additional water demand due to fairs, festival, livestock etc. should be considered separately, as most of these small towns are rural in character, and should not be a part of the regular drinking water supply scheme under AUWSP. Floating population should be considered in the calculations of water demand during design of the scheme.

5. The administrative approval for various components of schemes should be expedited by the State Governments to complete the schemes on time.

6. Funds from the state government should be released on time for ensuring that there is no delay in the completion of the scheme.

7. The increase in tariff, though implemented in many towns, has not been able to ensure full cost recovery. The tariff could be increased periodically and along side the efficiency of collection should also be increased. This would ensure sufficient revenues for the O&M agency to manage the scheme and ensure its sustainability. Tariff revision and additional revenue generation could be made a precondition for the release of the last installment of funds for the schemes.

8. Adequacy of staff should be ensured to manage the water supply system properly. Inadequate staff has affected the functioning and maintenance of some of the water supply systems.

9. Monitoring of schemes during implementation should also include looking at all the bottlenecks and helping in clearing them expeditiously.

Annexures

Annexure I

Annexure I

ACCELERATED URBAN WATER SUPPLY PROGRAMME

सत्यमेव जयते

GOVERNMENT OF INDIA
MINISTRY OF URBAN DEVELOPMENT
NEW DELHI

SEPTEMBER 1994

ACCELERATED URBAN WATER SUPPLY PROGRAMME (AUWSP)

I. SCHEME

Centrally Sponsored Accelerated Urban Water Supply Programme (AUWSP) for towns having population less than 20,000 (as per 1991 Census).

II. RATIONALE

Due to the low economic base and lower priority given by the State Governments to provide water supply to smaller towns, these are often neglected during normal times and are worst hit during the periods of drought as was observed in 1987. Therefore, there is a need to extend financial support to the State Governments/Local Bodies for providing water supply facilities in the towns having population less than 20,000 (1991 Census). With this in view a Centrally Sponsored Accelerated Urban Water Supply Scheme has been included in the VIII Five Year Plan and has been proposed to be initiated from the Annual Plan 1993-94.

III. OBJECTIVES

(i) To provide safe and adequate water supply facilities to the entire population of the towns having population less than 20,000 (as per 1991 Census) in the country within a fixed time frame.
(ii) To improve the environment and the quality of life.
(iii) For better socio-economic condition and more productivity to sustain the economy of the country.

IV. FEATURES OF THE PROGRAMME

(i) In general, the overall emphasis is being given on creating a better incentive environment in the sector. There is a need to emphasize on rationalization of tariffs, separation of budget of water supply and sanitation from the municipal budget; subsidies being extended for well identified target groups; water conservation, operation and maintenance (O&M) and distribution being given priority over new capital works; emphasis on leak detection and preventive maintenance rehabilitation of existing system.

(ii) The water supply sector has to be treated as public utility rather than a service and efforts have also to be made to bring about greater private sector participation and investment in this sector.

(iii) The principle aim of the programme will be to improve the quality of life of the poor, specially the most vulnerable sections of the population such as women, children and other deprived sections who do not have access to safe water.

(iv) The Urban Local Bodies will be suitably strengthened and closely associated in the implementation of Accelerated Urban Water Supply Programme (AUWSP) with a view to realizing the objective of providing water supply to the unserved population.

(v) Community participation will be made the cardinal principle underlying the whole programme. Community participation implies organizing local communities nurtured by field level staff of Urban Local Bodies and NGOs.

(vi) A Plan of Action will be formulated for each of the schemes comprising of town or towns depending upon the situation assessed by the concerned Department of State Government responding directly to the felt needs of the population in these towns.

(vii) Special emphasis will be placed on privatization of implementation, operation and maintenance and cost recovery so as to make the scheme self-sustaining.

(viii) The emphasis would be on whole town approach.

V. PROGRAMME IMPLEMENTATION APPROACH

The programme should be operationally integrated with the State Public Health Engineering Department/Water Supply and Sewerage Board and Urban Local Bodies for the provision of water supply facilities if found feasible. Involvement of Non-Government Organisation (NGOs) should also be considered.

In so far as the operation and maintenance of assets created under the programme are concerned efforts should be made to operate and maintain such scheme by the community itself once they are properly trained to take up such as task. Till then these should be maintained by the agency responsible for its implementation/urban local body. Preferably, however, the community while building up its own expertise and training during execution so that on completion of each project the local community could be ready and able to maintain it.

VI. CRITERIA FOR ALLOCATION AMONGST STATES

The following criteria would be applied to determine the share of each qualifying State of assistance under the scheme.

(a) 50% weightage being given to the population of such towns;
(b) 35% weightage being given to the incidence of poverty in a State/UTs;
(c) 5% weightage being given to the number of such towns in States/UTs
(d) 10% weightage being given in terms of population of such towns to the special requirements of State/UTs covered under DPAP, DDP, HADP and Special Category hilly states.

VII. COMMITTEE FOR SELECTION OF TOWNS/SCHEMES

For selection of towns/schemes under the programme, the State Governments/UT Administrations shall constitute a State level Selection Committee under the Chairmanship of Secretary to the State Government Incharge of Urban Water Supply with the following Members :

(a) Chief Engineer PHED/Managing Director, Urban Water Supply Board;
(b) A representative of the State Irrigation Department;
(c) A representative of the State Finance Department;
(d) A representative of the State Planning Department;
(e) A representative from CPHEEO, MOUD;
(f) Director, Municipal Administration/Urban Local Bodies Member Secretary.

VIII. GUIDELINES FOR SELECTION OF TOWNS/SCHEMES

The selection of towns/schemes shall be done only through the State-level Committee constituted for this purpose after considering the detailed project reports prepared in respect of the individual towns as per the guidelines of this scheme. Special attention should be given to ensure that the following stipulations are fulfilled in the detailed project report.

(i) The population of the town should not be more than 20,000 as per 1991 Census. For this purpose, the documents published by the Registrar General of India or the Director of Census Operations of the State concerned shall be the basis.
(ii) 95% dependability and reliability of the water source is established.
(iii) Provision for separate maintenance of accounts is made.
(iv) Provisions for sustainable O&M mechanism is evolved and incorporated in the DPR.
(v) A sustainable tariff system is evolved and approved by the State Government is incorporated in the DPR.
(vi) Provision is made for 5% contribution from the urban local bodies towards the project cost.
(vii) The commitment of the urban local body for all the stipulations including improvement in institutional and tariff mechanism, their preparedness for maintenance through suitable arrangements should be obtained and be included in the DPR.

If any of these stipulations are not fulfilled and incorporated in the DPR, the scheme will not be eligible for inclusion in the programme.

IX. PRIORITIES FOR TOWNS WITH SPECIAL PROBLEMS

Priority is to be given to towns with special problems like :

(a) Very low per capita supply;
(b) Very distant or deep water source;
(c) Drought-prone areas;
(d) Excess salinity, fluoride, iron content in the water source;
(e) High incidence of water borne diseases.

For this purpose, it is advised that the States may at the first instance prepare the list of towns having these special problems before preparation of the detailed project reports. Similarly, priority is to be given to rehabilitation and augmentation schemes rather than new schemes.

On selection by the state level committee, the DPRs of the selected towns along with the information in the prescribed format may be sent to the Ministry of UD (The format will be separately prescribed).

Per Capita Unit Cost

The per capita Unit Cost should normally be limited to Rs.1,000/-. However, this is not very rigid. In individual cases, the specific justification is required to be furnished in the DPR if the per capita cost is more.

X. PATTERN OF FINANCE

The Accelerated Urban Water Supply Programme bring a Centrally sponsored scheme, this will be funded on grant basis, by the Central Government 50% and the State Government 50% including 5% beneficiary/town contribution. In case of Union Territories, 100% financing is available from the Central Share.

XI. RELEASE OF FUNDS

The estimated cost of the selected scheme is to be borne on 50:50 basis between the Centre and the States. Accordingly 25% of the Central Share will be released to the State Government or the designated agency on selection of the scheme. The second instalment of the Central Share which will be 50% of the eligible Central Share for the scheme, will be released on :-

- release of the first instalment of the State share;
- completion of the ground work for execution of the scheme including award of contracts or placing of orders for supply of material etc. wherever required; and
- utilization of at least 50% of the amount released for the scheme (25% of the Central share plus 25% of the State share);
- submission of Detailed project report and its approval in case the first instalment is released before receipt of DPR.

The Third and final instalment amounting to 25% of the Central share will be released on:

(a) release of second instalment of State share (50%)
(b) utlisation of 80% of the total funds released for the scheme.

XII. DETAILED PROJECT REPORT

The detailed project reports should include the following with the proper justification/supporting data:

i) Reliability of Water Source(s)

- 95% dependability and reliability of selected raw-water source(s) must be established by the concerned State department so as to ensure long term sustainability of the scheme at the prescribed designed period of 20-25 years @ 70 lpcd. Supporting evidence in this regard should be included in the DPR.

ii) Use of appropriate technology

- Efforts be made to adopt appropriate and cost effective technologies viz. Horizontal Roughing Filters (HRF), Slow Sand Filters (SSF) etc.; so as to have minimum expenditure on capital as well as operation and maintenance. However, spot sources such as hand-pumps are not permitted due to inadequate and short-term sustainability as compared to piped water supply schemes.

- To the extent possible, minimum electrical and mechanical equipments be used in the scheme.

- Wherever necessary, land acquisition process be initiated in advance to avoid delay in the implementation of the scheme.

- Wherever electrical power supply is required for O&M, action be initiated with the concerned State agency to ensure the same when the project is ready for commissioning.

iii) Detailed Estimate should contain the following :

- Detailed engineering design of all the components.
- Abstract estimates of each component be prepared based on the latest schedule of rates.
- The estimate may include establishment charges maximum upto 3% and contingency charges upto 5%. No other charges viz. T&P, centage, etc. be included, since implementing agencies have adequate infrastructure for taking up such water supply schemes. If there is still a need for such expenditure, the same shall have to be met from the State funds only.

iv) Counter part funding

- As already stated, State Governments have to provide matching share as grant under the state plan and ensure timely release to implementing agencies for successful implementation of schemes.

v) Tariff structure

- Realistic tariff structure has to be evolved and incorporated in the DPR. In addition, the State Govt. should ensure adequate cost recovery so as to meet the annual O&M expenditure of the proposed schemes as per the tariff structure evolved and indicated in the DPR, along with the commitment of the State Govt. for the proposed mechanism.

The State Govt. should confirm imposition of suitable water tariff of various categories of beneficiaries based on present supply.

vi) Agencies responsible for implementation and O&M

- Agencies responsible for execution of the scheme and its subsequent O&M should have adequate infrastructure and institutional arrangements.

- To the extent possible, involvement of the community right from the planning stage up to O&M should be ensured.

- Involvement of non-governmental organisations (NGOs) and private agencies may be explored and given due weightage by the State Govt./local bodies.

vii) Action plan programme for Operation and Maintenance on sustainable basis

- The DPR may include a detailed action plan for proper O&M of the schemes, clearly indicating the Plan of Action for cost recovery, community involvement, quality control and human resources development.

XIII. SEPARATE ACCOUNTS TO BE MAINTAINED

The accounts for the funds released both by the Centre and the State under this scheme will be maintained separately by the Implementation agencies. Diversion of funds from this programme to any other programme is not permitted. Similarly diversion of funds released for a particular scheme/town to any other scheme/town without prior consent of the Central Government is also not permissible.

XIV. MONITORING OF THE SCHEMES

- The Ministry of Urban Development will monitor the physical and financial progress of implementation of each scheme on quarterly basis, for which suitable formats are being devised for circulation for the State/implementing agencies soon.

- To facilitate proper monitoring, separate scheme-wise accounts should be maintained.

- Physical and financial monitoring shall be done by the officers of the CPHEEO/Ministry by way of site visits and discussions with the Officials of the State Govt. and Urban Local Bodies.

Annexure II

EVALUATION OF CENTRALLY SPONSORED ACCELERATED URBAN WATER SUPPLY PROGRAMME
(Study sponsored by Ministry of Urban Development and Poverty Alleviation)

QUESTIONNAIRE

Name and Designation of the respondent

.....

.....

Name of the responding agency.. .....

.....

Address of the agency.....

.....

.....

Phone nos. .....

Fax. No.....

Email address: .....

Signature & Stamp

Date:.....

NATIONAL INSTITUTE OF URBAN AFFAIRS
Core 4 B, India Habitat Centre,
Lodhi Road, New Delhi –110003
Ph. (011) 2461 7515, 2461 7543

EVALUATION OF CENTRALLY SPONSORED ACCELERATED URBAN WATER SUPPLY PROGRAMME

Name of Town : ---------- District:---------- State: ----------

1) Population and Area

	As per 1991 Census	As per 2001 Census	Present (2004)
Population of the town			
Area of town (sq. km.)			
Total no. of wards			
Slum population			

2) Project Components and Present Status

Please provide the following details of the project components involved in the water supply scheme (Both approved and additional components, if any)

Sl No	**Name of the component**	**Implementation**			
		Completed		**If on-going, % work completed**	**Remarks**
		Date of starting/ date of purchase	**Date of completion/ date of installation**		
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

a) Is there any deviation (such as modification, addition, deletion etc.) in the water supply scheme components with respect to the approved one? Yes/No.

b) If "Yes", please provide the following details:

Project Components, Expenditure and Implementation Details

(Rupees in Lakh)

Sl No.	Name of the component	Approved Estimated Cost (By MoUD,GoI)	Approved Estimated Cost (By State Government)	Actual Expenditure Till Completion of the Project	Variation from Approved Cost	Reason for Variation	Remarks
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							

3) Project Cost and Funding

a) Total Capital Cost of the water supply scheme: Rs. ---------- (As in year ----------)
b) Total allocated/approved fund for the water supply scheme: Rs. ---------- (As in year --------)
c) Actual amount spent till completion of the scheme/ till date (if the scheme is ongoing):
Rs. ---------- (As in year----------)

Sl. No.		Fund Providers				Total
		Govt. of India	State Govt.	Urban Local Body	Others	
1	Total Allocated Fund for the scheme (Rs)					
2	Funds Received by the Scheme Implementing Agency till date (Rs.)					
3	Funds utilized till date (Rs.)					

Release of Funds

Funds Released by State Government		Funds Released by Central Government	
Date of Release	Amount (Rs.)	Date of Release	Amount (Rs.)

Date of Start of the Scheme:

Date of Completion of the Scheme:

Design Period of the Scheme (Years):

Has/was any expenditure been incurred on the components before sanctioning of the Scheme: Yes/No

If "Yes", please specify the reason:

4) Agencies Involved

Agency responsible for:

i) Planning, designing and execution of capital works: .....

ii) Operation and maintenance: .....

iii) Revenue Collection .....

5) Source of Water

	Type of Source (Surface/ Ground)	Quantity Produced (mld) (Year)			Distance of the source from the town (Km)	
		Surface	Ground	Total	Surface	Ground
Source(s) of Water Supply (Under AUWSP scheme)						

a) Ground water source:

i) Details of ground water source (such as Tubewell, Well, Hand Pump etc.):

Total number of

- Tubewell : ----------
- Well : ----------
- Hand-Pump : ----------
- Others (Please Specify): ----------

ii) Information for individual sources:

Sl. No	*TW/W/HP	Location	Depth (m)	Average Yield/Capacity (kl/hr)	Daily Hour of Pumping

*TW-Tubewell, W-Well, HP-Hand Pump

b) Surface water source:

Type of source (Please tick)	River	Canal	Spring	Lake	Dam	Reservoir	Others (Specify)
Name of the source							

6) *Water Demand*

For the AUWSP, please provide the estimated and projected water demand:

	Initial	Intermediate	Ultimate
Population covered under the scheme (i.e design population)			
Year			
Water demand for the following category of users			
• Domestic (mld)			
• Industrial (mld)			
• Institutional (mld)			
• Commercial (mld)			
Total (mld)			

7) *Quantity of Water*

a) Quantity of water actually being supplied (after considering the ***system losses**):

Domestic: ---------- (mld); Industrial: ----------(mld);
Institutional: ----------(mld) Commercial: ----------(mld); Total : ---------- (mld)

b) Quantity of water actually supplied to domestic consumers (after considering the system losses):
House Connection: ----------(mld); Public Stand Posts: ----------(mld)

[***system losses** include the losses considered during design of the system i.e. losses in treatment, transmission, distribution etc. but exclude unaccounted for water due to leakage, illegal tapping etc.]

8) *Quality of Water*

a) Is the quality of water supplied to the consumers monitored periodically? Yes/No

i) If Yes, water quality is monitored at an Interval of (Please Tick):

Weekly/Fortnightly/ Monthly/ Bi-monthly/Quarterly/Half-Yearly/Annual

ii) By collecting samples from the following locations (Please Tick):

Inlet of treatment/ Outlet of treatment/Outlet of Service Reservoir/At the Consumer Tap

(Please attach water quality test reports (last three test reports) conducted from various sample sources after implementation of the scheme)

9) *Water Losses*

Water losses in the system as % of total water produced	**Before Implementation of the Water Supply Scheme (Year)**	**As Per Provision of the Approved Design (Year)**	**After Implementation of the Water Supply Scheme (Year)**
- At Source (%) - At Treatment Plant (%) - During Transmission (%) - During Distribution (%) - Total (%)	_____ _____ _____ _____	_____ _____ _____ _____	_____ _____ _____ _____

10) House Service Connection (HSC)

	Metered	Unmetered	Total
Total number of HSC before implementation of AUWSP - Domestic - Non-Domestic (i.e. Industrial, commercial, Institutional etc.)	_____ _____	_____ _____	_____ _____
Total provision for HSC as per approved scheme - Domestic - Non-Domestic	_____ _____	_____ _____	_____ _____
Total number of HSC after implementation of AUWSP - Domestic - Non-Domestic	_____ _____	_____ _____	_____ _____

11) Percentage population covered and Per capita water supply by HSC:

	Before implementation of AUWSP	**After implementation of of AUWSP**
a) Population covered	.....%	.....%
b) Average per capita supply through HSC	..... lpcd	..... lpcd

12) Public Stand Post (PSP)

a) Number of PSP as per the approved scheme:

New Installation -------- (Nos.) Repair/Replacement -------(Nos.)

b) Number of PSP actually provided under the scheme:

New Installation -------- (Nos.) Repair/Replacement -------(Nos.)

c) Other details:

	Before Implementation of the Water Supply Scheme	**After Implementation of the Water Supply Scheme**
Percentage (%) of population provided with PSP		
Number of PSPs functioning		
Distance one has to walk to collect water from the nearest PSP - Minimum - Average - Maximum	_____(Km) _____(Km) _____(Km)	_____(Km) _____(Km) _____(Km)
Per capita water supply through PSP - As per the prevailing norms - Actually provided	_____lpcd _____lpcd	_____lpcd _____lpcd

13) Unaccounted For Water (UFW)

a) *Quantity of UFW	**Before Implementation of the Scheme**	**After Implementation of the Scheme**
- % of total water supplied	_____%	_____%
- In actuals	_____mld	_____mld

(**Quantity of UFW includes leakage, theft, illegal tapping etc. but excludes system losses)*

b) Has a UFW cell been set up? (Please Tick) Yes/No
If yes, please provide the following details

-Name of the cell: _____

-Composition of the cell: *(Use a separate sheet, if necessary)*

-When the cell was formed (year) : _____

-Major activities done so far by the cell *(Use a separate sheet, if necessary)*
(Please attach supporting documents in this regard)

c) Is the information provided in a) above is based on any study to assess UFW : Yes/No
If yes, please provide the following details
- Name of the agency which conducted the UFW assessment study_____

-Period of the study From ----- -------- ------ To ----- ------ ------
(DD) (MM) (YY) (DD) (MM) (YY)

-Recommendation of the study *(Please attach separate sheet, if required)*

14) Treatment Facilities

a) Is the raw water treated before supply to the consumer? Yes/No

b) If "No", please give reasons why treatment is not done

_____

c) If "Yes", then how the raw water is being treated (Please Tick):

1. By providing alum. 2. By providing chlorine. 3. By providing Water Treatment Plant (WTP)
4 Others (Please Specify) _____

d) If water is treated by providing disinfectant (Alum,Chlorine etc.), then please provide the following :
-Point(s)/Location(s) where the disinfectant dosing is being made (Please Tick)
1. At the point where raw water is drawn from the source. 2. At the outlet of Service Reservoir
3. Other Location (Please specify) _____

- How much alum/chlorine is dosed: _____
- Is the residual chlorine at the consumer end sufficient? (Please tick): Yes/No

e) If water is treated in Water Treatment Plant (WTP), please provide the following details of the WTP

Sl. No	Name/Location	Capacity (mld)	Quantity of Water Being Treated (mld)	Treatment Process Involved	Name of treatment units With No. of unit(s)	Date of Installation	Present Condition	Remarks

12. Water Tariff

a) Please provide information on the present water tariff rates (in Rs./kl) as below:

Item	Before Implementation of the Water Supply Scheme (year ____)				After Implementation of the Water Supply Scheme (year ____)			
	Domestic	Industrial	Commercial	Institutional	Domestic	Industrial	Commercial	Institu-tional
Metered								
Unmetered								
One time Water Connection Charge								

(Please attach schedule of water tariff)

b) From which year the present water tariff structure has been imposed: .....

c) Are Public Stand Posts (PSP) charged for? Yes/No

d) If yes, what is the charge (Rs./Per PSP) .....

e) How is the Tariff collected? .....

f) Is water tax levied? Yes/ No If yes, what is the rate of water tax : ----------

g) Do you have any future plan for revision of present water tariff rates: Yes/No

13. Expenditure Pattern

a) Of the Local Body (for five consecutive years before and after the implementation of AUWSP scheme):

Sl. No.	**Heads of Expenditure (In Rupees)**	***Before Implementation of the Water Supply Scheme**					**After Implementation of the Water Supply Scheme**				
	Financial Year	19--	19--								
1	General										
2	Administration										
3	Public Health										
3a	Water Supply										
3b	Others										
4	Public Works										
5	Public Safety										
6	Education										
7	Others										
8											
9											
	Total										

(Please provide copy of the Annual Budget for the last five years)

b) Of the Water Supply Department (for five consecutive years before and after the implementation of AUWSP scheme):

Sl. No.	**Heads of Expenditure (In Rupees)**	***Before Implementation of the Water Supply Scheme**					**After Implementation of the Water Supply Scheme**				
	Financial Year										
1	Salary & Wages										
2	Consumables										
3	Repair & Replacement										
4	Interest										
5	Debt										
6	Servicing										
7	Depreciation										
8											
9											
	Total										

14. Revenue Receipts

a) Of the Local Body (for five consecutive years before and after the implementation of AUWSP scheme):

Sl.	**Heads of Revenue (In Rs.)**	***Before Implementation of the Water Supply Scheme**					**After Implementation of the Water Supply Scheme**				
	Financial Year										
1	Taxes Receipts										
1a	Property Tax										
1b	Other Taxes										
2	Non-Tax Receipts										
2a	Water Charges										
2b	Other Charges										
3	Misc. Receipts										
4	Transfers										
4a	Share Taxes										
4b	Grants										
	Total :										

b) Of the Water Supply Department (for five consecutive years before and after the implementation of AUWSP scheme):

Sl. No.	**Heads of Revenue (In Rs.)**	***Before Implementation of the Water Supply Scheme**					**After Implementation of the Water Supply Scheme**				
	Financial Year										
1	Water Tax										
2	Water Cess										
3	Water Charges										
4	Connection Charges										
5	Public Stand Post										
6	Bulk Supply Charges										
7 8 9 10	Total										

Please furnish the details how the O & M expenditure on water supply system is met in case of deficit (i.e. difference in expenditure and revenue earning)

15. Manpower

Please provide the details of manpower available with the agency responsible for O & M of the water supply system :

	Before Implementation of AUWSP	**After Implementation of AUWSP**
a) Name of the agency responsible for O & M of the water supply system :	----------	----------
b) Name of the concerned department In-charge of O & M of the water supply system:	----------	----------
c) No. of Technical Staff :	----------	----------
d) No. of Managerial Staff :	----------	----------
e)No. of Staff Allocated for O & M of water supply system:	----------	----------
f) Total Staff Strength of the department:	----------	----------

(Please attach a copy of the organisation structure of the department)

What major problems/hindrances are you facing during O & M of the scheme (e.g. Lack of fund, Shortage of power, Shortage of manpower, Depletion of water at the source etc.)?

---

16 Disposal of wastewater:

	Before implementation of AUWSP	**After implementation of AUWSP**
a) How is the waste water in the town disposed ?		
• By sewerage network followed by treatment		
• By sewerage network with no Treatment		
• Individual septic tank followed by discharge in the storm water drains.		
• Direct discharge to the nearby storm water drains		
• By other mode (Please specify)		

Where is the waste water finally disposed?

- River
- Agriculture/Low land
- Others (Please Specify)

What are your suggestions for improvement in O&M of the water supply scheme?

---

*d) **Privatisation, Community Participation and Involvement of NGO***

Has any part of the water supply scheme been privatised? Yes/ No

If yes, please give the following details:

Sl. No.	*Activities Privatised	% of the activity privatised	Mode of Privatisation Used	Year in which Privatised	No. of Contractors Involved	Annual Costs (Rs.)	
						Before Privatisation	After Privatisation
1							
2							
3							
4							

(* such as maintenance of pipe lines, treatment plants, pumping stations, meter reading, billing, collection of water charges/tax etc.)

Please provide a copy of the contract documents.

Please mention the benefits you are getting after privatisation : ----------
---

Is any Community/NGO presently involved in O&M of the water supply scheme? Yes/No
If "Yes", Please mention in brief their activities
Community Activity : ----------

NGO Activity : ----------

Authorised Signatory (Name & Signature) Stamp of the Agency