

# Design of Haraulipur group of villages water supply scheme at Hamirpur District of Uttar Pradesh

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**ABSTRACT:** Water supply and distribution infrastructures are vital for current life. They have a significant role in public health, providing safe water for drinking and human consumption. These diverse objectives create challenges for everyone who must address in some way the actual performance of the system. Drinking Water has become a challenge for the country, specifically in rural areas. With ever growing population demand is bound to grow and in recent times climate change has aggravated the problem more. People face acute shortage of drinking water. To address the situation Govt of India launched Jal Jeevan Mission (JJM) which is envisioned to provide safe and adequate drinking water through individual household tap connections by 2024 to all households in rural India. The programme will also implement source sustainability measures as mandatory elements, such as recharge and reuse through grey water management, water conservation, rain water harvesting. The Jal Jeevan Mission will be based on a community approach to water and will include extensive Information, Education and communication as a key component of the mission. JJM looks to create a Jan Andolan for water, thereby making it everyone's priority. The vision of the project is "Every rural household has drinking water supply in adequate quantity of prescribed quality on regular and long-term basis at affordable service delivery charges leading to improvement in living standards of rural communities."

This research has been done to design a complete Conventional Surface Source Multi Village Water Supply Scheme for 39 Villages of Kurara Block of Hamirpur District of Uttar Pradesh which shall include Planning, designs, drawings and estimation of multi village rural water supply scheme

**KEYWORDS:** Grey Water Management, Water Conservation, Water Supply, Kurara, Hamirpur, Intake Well, WTP, MCWR, CWR

## I. INTRODUCTION

Drinking Water has become a challenge for the country, specifically in rural areas. Growing population demand and recent climate change has aggravated the problem more. People face acute shortage of drinking water especially in dry seasons. To address the situation Govt of India launched Jal Jeevan Mission (JJM) which is envisioned to provide safe and adequate drinking water through individual household tap connections by 2024 to all households in rural India.

Main objective is to design a complete Conventional Surface Source Multi Village Water Supply Scheme for 39 Villages of Kurara Block of Hamirpur District of Uttar Pradesh which shall include Planning, designs, and drawings for a Multi village rural water supply scheme.

As per Strategic plan (2011-2022) of Government of India, the 90% of the Rural population in the country has to be benefited with the piped water supply. However, only 19% rural population of Uttar Pradesh is covered with piped water supply schemes. In order to achieve the objective of project, it has been decided to provide the piped water supply schemes particularly in water scarce area of Bundelkhand and Vindhya region and Arsenic, Fluoride and AES/JE affected areas in the State.

To achieve the objective of project State water and Sanitation Mission (SWSM), Uttar Pradesh has decided to provide water supply schemes in rural areas of Uttar Pradesh under Jal Jeevan Mission Project. One of those proposed schemes has been selected to plan and design under this dissertation named "Construction of Haraulipur

Group of Villages Water Supply Scheme (Surface Water) in Kurara Block of District- Hamirpur with relevant works. In this dissertation multi-village water supply scheme has been proposed for 39 villages of Kurara Block of Hamirpur District of Uttar Pradesh

Detailed design of Conventional Surface Source Multi Village Water Supply Scheme for 39 Villages (listed below) has been done. It consist of all the technical details, Designs, Drawings, Population Projections, Planning and Design of River Water Intake, Water Treatment Plant, Clear Water Reservoirs, Over Head Tanks, Raw Water & Clear Water Rising Main, Distribution Main, proposing best technically feasible locations of INTAKE WELL, WTP, MCWR, CWR cum Pumping Station, OHT and costing of the scheme.

The scheme have been designed in order to arrive at economical sizes of rising mains, distribution pipelines, head and discharge of pumps, capacities of INTAKE WELL, WTP,

MCWR, CWRs, OHTs and sizes of various electrical components, quantities and sizes of various valves, etc. The DPR, submitted is based on CPHEEO guidelines.

## II. METHODOLOGY

The design criteria for the design of water supply systems for multivillage water supply scheme will be framed as per the guidelines set by CPHEEO and relevant IS codes.

### Design Guidelines

#### Design Period

Clause 2.2.6 of Manual stipulate design period, For some components it may be modified depending on its useful life, facility for carrying out extensions when required and interest rate so that expenditure far ahead of utility is avoided. Project components may be designed to meet the requirements of the following design period..

Sl.No.	Data Source	Design period in years
1	Storage by dams	50
2	Infiltration Works	30
3	Pumping	
	i. Pump house (civil works)	30
	ii. Electric motors and pumps	15
4	Water treatment units	15
5	Pipe connection to several treatment units and other small appurtenances	30
6	Raw water and clear water conveyance mains	30
7	Clear water reservoirs at the head works, balancing tanks and service reservoirs (overhead or ground level)	15
8	Distribution system	30

## III. EXPERIMENTATION

### Administrative measures :

Develop State specific guidelines, formats for carrying out survey. Carrying out survey by GPS and Total Station, data management and preparation of DPR on sustainability structures. District/Block level consultation with stakeholders · Block level workshop / consultation with stakeholders

### Technical Surveys, Data Collection, integration, interpretation, and analysis:

General information about water availability and present status.

Getting the River discharge

Meeting with Panchayat Pradhan and officials and briefing about the proposed Water

Supply Scheme and collection of following information:

Demographic profile of the villages.

Physical features of the villages.

Details of existing water sources and their water quality testing.

Water Demand assessment for individual village through by means of House Hold survey.

Technical Details, Location with latitude and longitude of all water sources, existing sustainability structures, and particularly all drinking water sources preferably with GPS or other advanced tracking system.

## IV. CONCLUSION

Following is the summary of Technical proposals analyzed in all 12 Water Supply zones proposed under above said Water Supply Scheme

S. No.	Components	Quantity	Unit
1	Raw Water Intake Well	9.00	MLD
2	Raw Water Pumping main (DI K9 Pipe)	0.51	Kms
3	Water Treatment Plant	8.00	MLD
4	Clear Water Pumping Main (DI K9 Pipe)	83.43	Kms
5	<b>Under Ground Clear Water Reservoirs (RCC Structure)</b>		
i	MCWR	600.00	KL
ii	CWR-1	450.00	KL
iii	CWR-2	350.00	KL
iv	CWR-3	250.00	KL
v	CWR-4	100.00	KL
6	Chlorinator (Electro- Mechanical Type Doser)	6.00	Nos.
7	<b>Over Head Tanks (RCC Structure)</b>		
i	Zone-1	125 KL 18 m staging	
ii	Zone-2	125 KL 14 m staging	
iii	Zone-3	150 KL 14 m staging	
iv	Zone-4	75 KL 14 m staging	
v	Zone-5	200 KL 18 m staging	
vi	Zone-6	75 KL 18 m staging	
vii	Zone-7	175 KL 16 m staging	
viii	Zone-8	75 KL 20 m staging	
ix	Zone-9	175 KL 18 m staging	
x	Zone-10	125 KL 14 m staging	
xi	Zone-11	75 KL 16 m staging	
xii	Zone-12	100 KL 16 m staging	

8	<b>Distribution Network</b>		
i	HDPE PN-7 (PE-100) 200 mm Outer Dia	25795	Metres
ii	HDPE PN-7 (PE-100) 160 mm Outer Dia	10705	Metres

iii	HDPE PN-7 (PE-100) 140 mm Outer Dia	13137	Metres
iv	HDPE PN-7 (PE-100) 110 mm Outer Dia	9663	Metres
v	HDPE PN-7 (PE-100) 90 mm Outer Dia	13028	Metres
vi	HDPE PN-7 (PE-100) 75 mm Outer Dia	24379	Metres
vii	HDPE PN-7 (PE-100) 63 mm Outer Dia	84424	Metres
<b>9</b>	<b>Valves</b>		
i	Sluice Valves	196	Nos.
ii	Scour Valves	179	Nos.
iii	Air Valve	204	Nos.
iv	Fire Hydrants (Sluice Valves Type)	12	Nos.
<b>10</b>	<b>Stand Post (Single Tap Pillar Type)</b>	<b>78</b>	<b>Nos.</b>
<b>11</b>	<b>House Service Connections</b>	<b>9636</b>	<b>Nos.</b>
<b>12</b>	<b>Staff Quarters</b>	<b>10</b>	<b>Nos.</b>
<b>13</b>	<b>Pump Houses</b>	<b>12</b>	<b>Nos.</b>

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