SERVICE DELIVERY OF WATER SUPPLY IN ALWAR

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BACKGROUND

Alwar is a district located in the desert state of Rajasthan, with an area of 8380 square km, and an average rainfall of 631 mm as in the year 2013. Alwar city is the headquarter for Alwar district. The length and breadth of the city are 17.8 and 16.4 kilometers respectively.[1]The total area of the city is approximately 272 square kilometers. The distance between Alwar and Jaipur, the capital of the state of Rajasthan is 150 km and the distance between Alwar and New Delhi is 160 km.[2]The region is primarily flanked by flat topped hills, which are more prominent is in the south western part of Alwar.[3] Alwar primarily has alluvial and sandy soils.[4] The district is flocked by the Aravali hill range which runs through the city. The city does not have a perennial river. However, there are a few seasonal rivers, namely Sabi, Ruparail, Chuhar Sindh and Landoha. The depth of the ground water table depends upon a number of factors, including topography, geology, drainage etc. Moreover, the season also governs the level of the water table, leading to fluctuations. Alwar can be classified as a semi-arid region, with extreme heat during summers and extreme cold during winters, and rainfall primarily taking place during the South West Monsoon period.[5]

Considering the rapid growth of population, low levels of rainfall and depleting water table, with complete reliance on the underground water for fulfilment of the needs of the population of the city, there is an urgent to need to devise ways to ensure that the city does not run out of

[1]Chauhan, Divya, and Vijay Kumar Verma. "Rainfall Fluctuations and Depleting Water Levels In Alwar City." *SGVU J CLIM CHANGE WATER*, vol. 6.

[2]"पोर्टल, राजस्थानसरकार: Geographical Information." *District Informarion*, Government of Rajasthan, https://alwar.rajasthan.gov.in/jankalyan-category-and-entry-type/23/1/4. Accessed 26 July 2023.

[3]Yadav, R. N., and Ajit Singh. "Study of Water Management and Scarcity of Drinking Water in Alwar City (Rajasthan)." *Ecology, Environment and Conservation*, Feb. 2022, pp. 506–11. *DOI.org (Crossref)*, https://doi.org/10.53550/EEC.2022.v28i02s.076.

[4]*GROUND WATER INFORMATION ALWAR DISTRICT RAJASTHAN*. Central Ground Water Board , 2013, https://cgwb.gov.in/District_Profile/Rajasthan/Alwar.pdf.

[5]*GROUND WATER INFORMATION ALWAR DISTRICT RAJASTHAN*. Central Ground Water Board , 2013, https://cgwb.gov.in/District_Profile/Rajasthan/Alwar.pdf.

water for its own population. This requires not only an analysis of the current state of water and position of water supply in the city, but also calls for devising new techniques and reviving the existing ones to avert a fast-approaching situation of crisis. Alwar is in the dark zone, (Dark Zone refers to an area wherein the rate of depletion of ground water exceeds the rate at which the ground water is replenished/recharged) and is at a risk of running out of water very soon. This report analyses the current system of water supply in the city, with actual and projected statistics, in order to identify gaps and lacunae. The paper also suggests ways to overcome those gaps by suggesting practical and workable solutions, in order to ensure sustainability.

The graph appended below provides an overview of the declining trends in rainfall in the city between 2010 and 2017 –

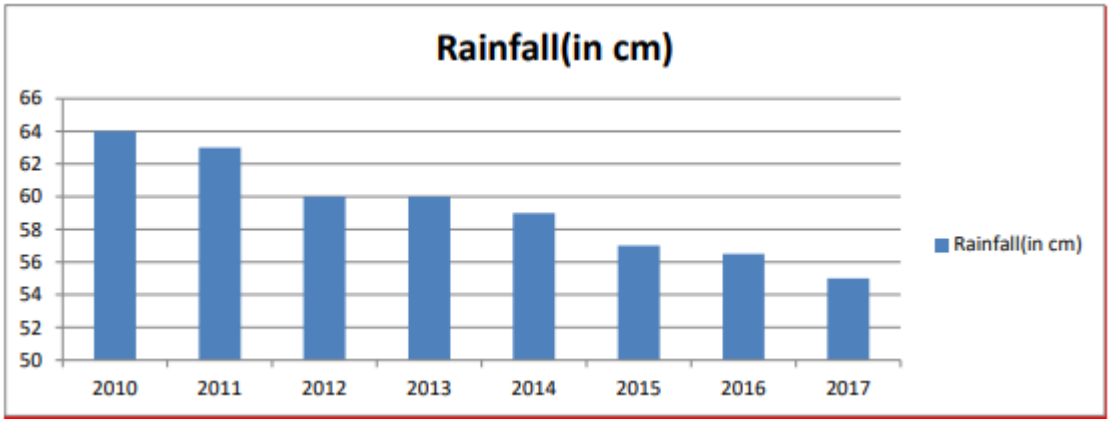

Figure 1: Rainfall Trends in Alwar City[6]

This graph represents the how the level of rainfall has been declining over the years. While the city received 64 cm rainfall in the year 2010, it came down to merely 57 cm in the year 2017, which reflects a concerning picture given the already low levels.

NEED FOR THE STUDY

Alwar belongs to the Dark Zone, wherein the water resources have been over exploited.[7] There also is no comprehensive literature available which analyses the status of water supply in the city. Thus, there is a need to evaluate the current system of service delivery of water

[6]Chauhan, Divya, and Vijay Kumar Verma. "Rainfall Fluctuations and Depleting Water Levels In Alwar City." *SGVU J CLIM CHANGE WATER*, vol. 6.

[7]"Dark Zones." *Press Information Bureau*, 2013, https://pib.gov.in/newsite/PrintRelease.aspx?relid=98849.

supply in the city, given the paucity of literature on the same and the need for a comprehensive study in order to devise workable solutions. Moreover, since Alwar belongs to the Dark Zone, there is an urgent need to improve the water management system which requires the identification of gaps and suggest readily achievable ways to improve and sustain the same. This study would also be beneficial for documentation for future reference.

RESEARCH METHODOLOGY

This study is based on primary as well as secondary data collection. The information provided by PHED Alwar, Alwar Municipality and the official documents has been used to analyze the status and situation of water supply in the city and reach to workable solutions. A major proportion of the data as well as factual information has been provided by the PHED. Survey method has also been used to collect information not available with the PHED, such as the extent to which rainwater harvesting systems have been done as well as the situation with regard to private tankers. A total of 60 households were surveyed, from different parts of the city and belonging to different income groups, in order to evaluate the parity between the official information and the actual situation of water supply in the city. A few sample responses have been attached in the appendix at the end of this report. The study also takes help of the existing literature and research papers, in order to make the same comprehensive.

CURRENT STATUS OF WATER SUPPLY IN ALWAR

The Public Health Engineering Department, also known as the PHED, has the primary responsibility of water supply and distribution in the city. However, the Municipality is responsible to supply water to the gap areas, where the PHED is unable to supply due to various limitations. The proportion of population covered by the Municipality is very low, amount to approximately merely 15% of the total. The paper focuses on the water supply and distribution undertaken by the PHED, given that a major chunk of the same is the responsibility of the Department.

SOURCES AND THE DISTRIBUTION SYSTEM

The primary source of water supply in the city is ground water from wells (refer Annexure). As per the information provided by the PHED officials, the average level of the water table (as of July 2023) is 70 meters below the ground. The absolute absence of any surface water source for water supply is a major challenge hindering adequate supply of water in the city, given that the level of water below the ground is considerably low and is dipping every year at a rate of approximately 15 meters annually. Water from the wells is first sent to the Clear Water Reservoirs, also known as CWRs, located at various places throughout the city. There is no full-fledged water treatment plant in the city. However, the water is disinfected through Chlorination using bleaching powder in the CWRs. The dosage for chlorination is 2ppm. From the CWRs, the chlorinated water goes to the OHRSs through the pump house.[8], from where it is supplied to the public through pipelines. The retention capacity of the OHSRs is between 10-24 hours.

AVAILABILITY OF WATER

The city is completely reliant upon ground water for all its water requirements. The following table depicts the prospective demand for water by the year 2025-

Table 1. Prospective demand of drinking water in Alwar by 2025 AD.

Year	Population	Daily demand (ML)	Daily Local supply (ML)	Short supply (ML)	No. of T/W at present time
2018	367459	49.6	36.0	13.6	230
2019	373872	50.4	36.8	13.6	234
2020	380285	51.3	36.5	14.8	266
2021	386707	52.2	36.5	15.7	290
2022	393120	53.0	-	16.5	-
2023	399533	53.9	-	17.4	-
2024	405946	54.8	-	18.3	-
2025	412359	55.6	-	19.1	-

Table 1: Prospective Demand of Drinking Water in Alwar by 2025[9]

[8]Yadav, R. N., and Ajit Singh. "Study of Water Management and Scarcity of Drinking Water in Alwar City (Rajasthan)." *Ecology, Environment and Conservation*, Feb. 2022, pp. 506–11. *DOI.org (Crossref)*, https://doi.org/10.53550/EEC.2022.v28i02s.076.

[9]Yadav, R. N., and Ajit Singh. "Study of Water Management and Scarcity of Drinking Water in Alwar City (Rajasthan)." *Ecology, Environment and Conservation*, Feb. 2022, pp. 506–11. *DOI.org (Crossref)*, https://doi.org/10.53550/EEC.2022.v28i02s.076.

The above table reflects the demand for drinking water by the year 2025. The fourth column represents the actual daily local supply. The fifth column reflects the quantum of short supply, which is the difference between the daily demand and the actual daily supply. The last column informs the number of tube-wells of the corresponding year. Though it is stated in the table above that the daily water supply is 36.5 MLD, as per information provided by the PHED, the current daily water supply (as of 2023) is only 32 LPCD, which amounts to only 23.6 MLD.

Presently the level of the water table in the city is approximately 70 meters below the ground. Due to extremely low levels of rainfall, and the absence of a robust recharge mechanism, the rate of recharge of ground water is negligible. It has been mentioned by PHED officials that the existing water resources can sustain only for a period 6 months in some areas to 6 years in others.

Receding Water Levels

With high levels of extraction due to the absence of other sources of water supply and meagre rate of recharge due to extremely low levels of rainfall and non-efficient utilization and no reuse and recycling mechanism in place, the ground water table is receding at an increasing rate, thereby leading to the drying up of tube-wells. The months during which the demand for water is the highest, i.e. March to July, the level of the tube-wells tends to decline the quickest, leading to disruption of water supply.

Quantum of Supply

While the level of ground water in the city is depleting, the demand for water is increasing due to the growing population. The rate of recharge is much lower than the rate of consumption, owing to population pressure and low levels of rainfall. Moreover, the unavailability of any surface water source adds to the already building pressure on the ground water.

As per urban water supply norms, the recommended quantum of water supply is 135 liters per capita per day.[10] However, as per data received from the PHED, 64 liters per capita of water is supplied every alternate day, which comes down to approximately 32 LPCD of water. It is also essential to note that these 64 liters per capita every alternate day is achieved after addition from temporary borewells/tube-wells, in the absence of which the department would only be able to achieve 46 liters per capita every alternate day. However, the city could not maintain uniformity in the quantity of water supplied in all areas because of a number of factors. As these factors are beyond the control of the PHED, the amount of water supplied in some areas is more than that of others.

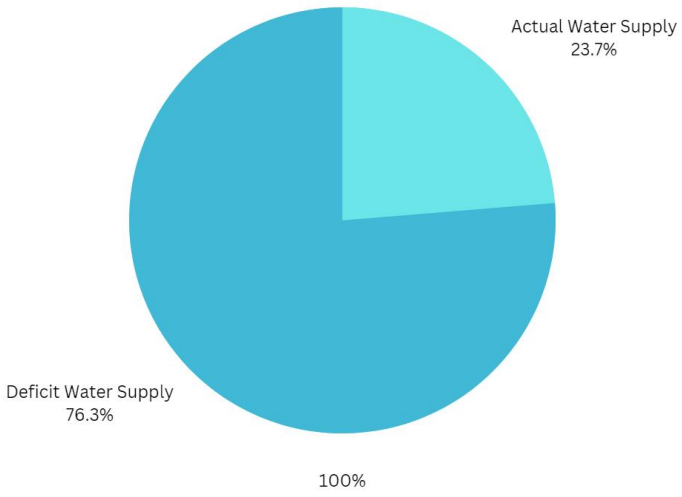

Figure 2: Water Supply (LPCD)

The above graph depicts that the actual water supply (approximately 32 LPCD) is merely 23.7% of the intended water supply (135 LPCD), which has been recommended by the Urban Water Supply Norms. This depicts a major deficit of 76.3%.

Frequency of water supply (as per survey)-

[10] *Report of the Committee Set up to Frame National Sustainable Habitat Standards for the Urban Water Supply and Sewerage Sector*. Ministry of Housing and Urban Affairs, https://mohua.gov.in/upload/uploadfiles/files/uwss.pdf.

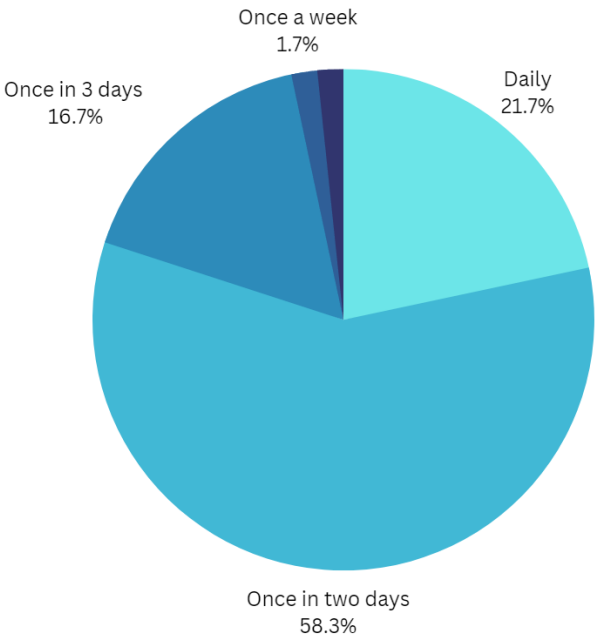

Figure 3: Frequency of Water Supply

Frequency	No of Households	Percentage of Households
Daily	13	21.7%
Once in two days	35	58.3%
One in three days	10	16.7%
One in a week	1	1.7%
No water since last 6 weeks	1	1.7%

A majority of the respondents (58.3%) informed that they receive water every alternate day. 21.7% receive water daily and 16.7% receive water once in three days.

What is concerning here is that one respondent informed that they receive water only once a week and another has not received water since the last 6 weeks. Despite having informed the PHED multiple times, they have received no respite and the issue remains unresolved.

Duration of water supply (as per survey) –

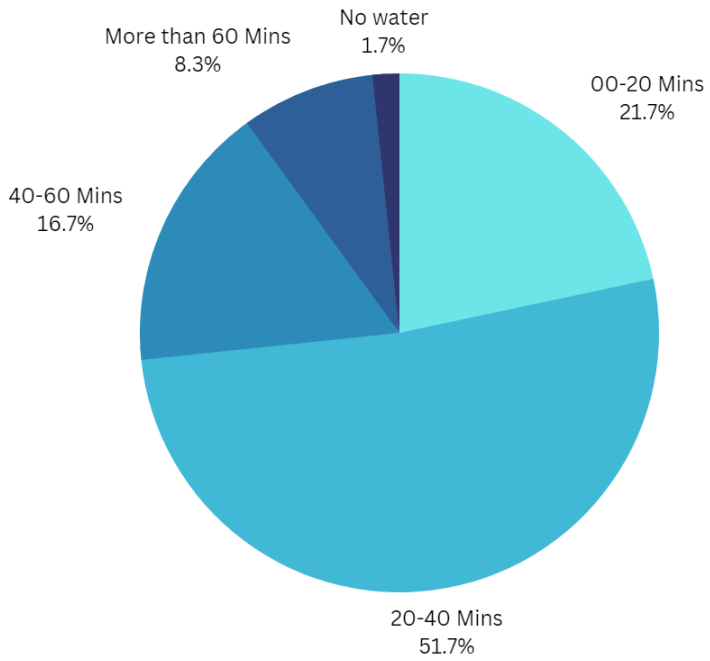

Figure 4: Duration of Water Supply

Duration of Water Supplied	Percentage of Households	Number of Households
0 – 20 Minutes	21.7%	13
20 – 40 Minutes	51.7%	31
40 – 60 Minutes	16.7%	10
More than 60 minutes	8.3%	5
No water	1.7%	1

A majority of the households (51.7%) receive water for 20-40 minutes. 21.7% receive water for less than 20 minutes and 16.7% receive water for 40-60 minutes. One respondent responded that they receive no water at all despite having a functional water connection.

PIPELINES AND WATER CONNECTIONS

The total length of the rising main in the city (from tube-wells to the Clear Water Reservoirs) is approximately 177 km. The distribution lines are approximately 722 km in length.

The current pipelines for water supply and distribution in the city were installed in three phases. The first set was installed between 2007-10, the second between 2016-18 under NCRPB and the third between 2017-19.

There are approximately 60,000 water connections in the city. The total percentage of households with water connection is approximately 75%, taking five as the average number of members per family, as per the data provided by PHED.

EXTENT OF METERING

Almost every household with a sanctioned water connection through the PHED has a meter installed. However, a huge number of meters are non-functional. Identification of such non-functional meters is a challenge. This is because the meter readers/persons incharge of recording the readings do no report about the non-functionality and its extent. The water bill is thus based on average consumption at a fixed rate. These meters are fully funded by the government.

Extent of metering (as per survey) -

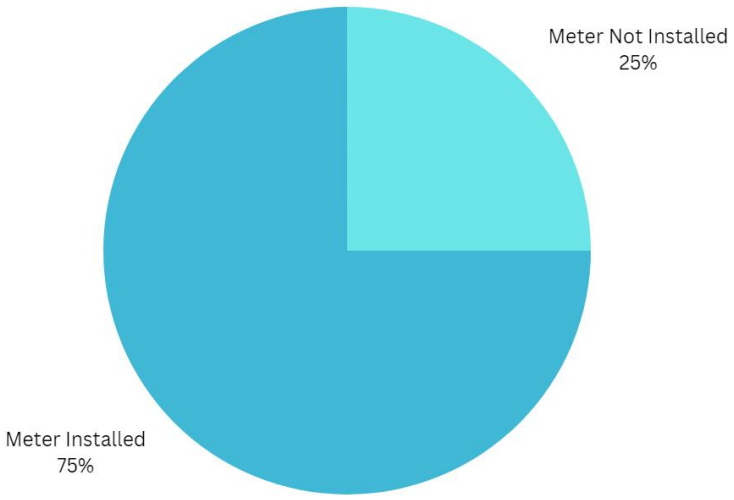

Figure 5: Extent of Metering

Whether Water Meter Installed	Percentage of Households	Number of Households
Not Installed	25%	15
Installed	75%	45

25% of the households surveyed do not have water meters installed. This is in contrary to what was informed by the PHED officials, citing 100% households having meters installed.

Extent of functional meters (as per survey) -

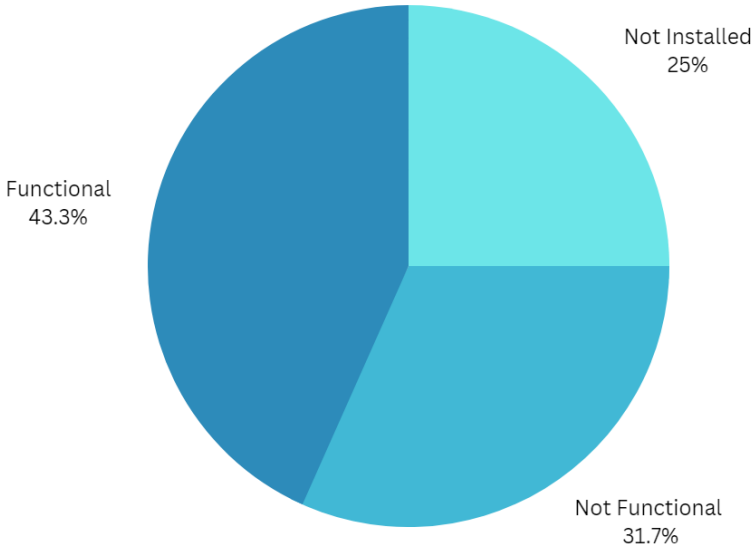

Figure 6: Extent of Functional Meters

Whether Water Meter Installed	Percentage of Households	Number of Households
Not Installed	25%	15
Not Functional	31.7%	19
Functional	43.3%	26

While 25% of the households do not have any meters installed, 31.7% households, despite having meters installed, have non-functional meters. This means that a mere 43.3% (of the total households surveyed) have functional water meters. The other households are charged on a uniform rate based on average levels of consumption.

USED WATER MANAGEMENT SYSTEM

As per the information from the PHED, there is no used water management system in place. The used water is discharged into drains with no reuse mechanism in place.

RAINWATER HARVESTING

The level of rainfall in the city is extremely low, which is why the rate of replenishment of ground water also remains low. In such a situation, it becomes even more important to catch the water wherever it falls. Rainwater harvesting is thus an essential requirement for the city.

In Alwar, all plots with a size of 20 square meters or more are required to have a rainwater harvesting system in place. However, no robust mechanism exists for the implementation of the same. While the initiative is a wonderful one, it would reap results only if and when the mandates are followed as well as enforced well.

As per surveys conducted and collating it with the information received from PHED, only about 15% of households belonging to the high income group category, about 10% of households belonging to the middle income group category and an insignificant percentage of households belonging to the low income group category have rain water harvesting systems in place.

Households with a functional rainwater harvesting system (as per survey) -

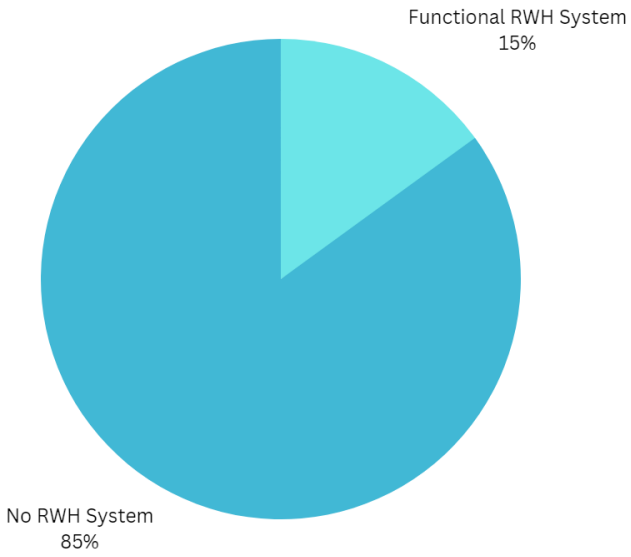

Figure 7: Extent of Rainwater Harvesting

Whether RWH System in Place	Percentage of Households	Number of Households
Functional RWH System	15%	9
No RWH System	85%	51

Only 15% of the households surveyed had a functional rainwater harvesting system in place, while a whopping 85% had no means to catch and collect rainwater.

STORMWATER MANAGEMENT

There is no stormwater management system in place in the city. As a result, the water just runs off with no mechanism to collect and channelize it into the ground for recharging the water table. Given the low levels of rainfall, it is essential to effectively and efficiently collect and utilize the rain water to the maximum possible extent.

WATER QUALITY TESTING MECHANISM

There is a well-established and fully functional lab in the city for the purpose of water quality testing. The samples for testing are collected primarily from four sources, namely, Tube-wells, CWRs, OHSRs and consumer taps. Tests are conducted from each category of source every 7 days, except consumer taps which are checked randomly.

Appended below are the water quality testing reports of samples collected from various sources in the city –

1. Lake Siliserh

MONITORING OF INDIAN NATIONAL AQUATIC RESOURCES

1. STATION CODE	2937	STATION	LAKE SILISED, ALWAR, RAJASTHAN
2. DATE AND TIME OF SAMPLE TAKEN (DD/MM/YYYY)	04/04/2023 11-30		
3. WEATHER	Clear		
4. APPROX.DEPTH OF MAIN STREAM	> 100 cm	TYPE	LAKE
5. COLOUR AND INTENSITY	Clear 1=Light	COMPLETED BY	Regional Laboratory Alwar
6. ODOUR	None	VERIFIED By	Chief Scientific Officer, Regional Laboratory Alwar
7. VISIBLE EFFLUENT DISCHARGE IN PROXIMITY	None	AGENCY	RAJASTHAN STATE POLLUTION CONTROL BOARD
8. HUMAN ACTIVITIES AROUND STATION	Others		
9. LOCATION DETAIL	U/s of Town or Industrial Area		

DETERMINAND	WHO CODE			AQC			VALUE
Cadmium as Cd mg/l							BDL
Copper as Cu mg/l							0.20
Iron as Fe mg/l							0.12
Total Chromium as Cr mg/l							BDL
Nickle as Ni mg/l							BDL
Zinc as Zn mg/l							0.11
Lead as Pb mg/l							BDL

DETERMINAND	ARBITRARY CODE			AQC			VALUE

Lab Incharge / Board Analyst

MONITORING OF INDIAN NATIONAL AQUATIC RESOURCES

1. STATION CODE	2937	STATION	LAKE SILISED, ALWAR, RAJASTHAN
2. DATE AND TIME OF SAMPLE TAKEN (DD/MM/YYYY)	04/04/2023 11-30		
3. WEATHER	Clear		
4. APPROX.DEPTH OF MAIN STREAM	> 100 cm	TYPE	LAKE
5. COLOUR AND INTENSITY	Clear 1=Light	COMPLETED BY	Regional Laboratory Alwar
6. ODOUR	None	VERIFIED By	Chief Scientific Officer, Regional Laboratory Alwar
7. VISIBLE EFFLUENT DISCHARGE IN PROXIMITY	None	AGENCY	RAJASTHAN STATE POLLUTION CONTROL BOARD
8. HUMAN ACTIVITIES AROUND STATION	Others		
9. LOCATION DETAIL	U/s of Town or Industrial Area		

DETERMINAND	WHO CODE			AQC			VALUE
Fecal Streptococci MPN/100 ml							14
Total Alkalinity mg/l	Y						256
B.O.D. mg/l	0	8	2	0	1	N	1.64
C.O.D. mg/l	0	8	3	0	1	N	18
Calcium as Ca mg/l	2	0	1	0	1	N	33.6
Chloride mg/l	Y						5.672
Conductivity µmho/cm	0	2	0	4	1	N	252.5
Dissolved Oxygen mg/l	0	8	1	0	1	N	5.8
Fecal Coliform MPN/100ml	3	6	0	1	1	N	20
Magnesium as Mg mg/l	1	2	1	0	3	N	1.94
pH	1	0	3	0	2	N	7.67
Phenolphthalein Alkalinity	Y						NT
Sodium mg/l	1	1	1	0	3	N	97.5
Sulphate mg/l	Y						16.4
Temperature 0C	0	2	0	0	1	N	23

DETERMINAND	ARBITRARY CODE			AQC			VALUE
Ammonia Nitrogen mg/l	Y						0.21
Boron Dissolved mg/l	0	5	1	0	5	N	0.19
Fluoride As F mg/l	Y						0.51
Total Hardness As CaCO3 mg/l	2	2	1	0	1	N	92
Nitrate as N mg/l	Y						1.44
Nitrite As N mg/l	Y						0.0051
Phosphate As PO4 mg/l	Y						0.16
Potassium As K mg/l	Y						8.7
Total Coliform MPN/100ml	3	7	0	0	1	N	34
Total Dissolved Solids mg/l	3	3	3	3	3	N	156
Turbidity JTU/NTU	0	2	1	0	1	N	0.17

Incharge / Board Analyst

2. Tubewell, MIA, Alwar

MONITORING OF INDIAN NATIONAL AQUATIC RESOURCES

1. STATION CODE	1706	STATION	TUBEWELL NEAR RIICO PUMP HOUSE NEAR MONTO MOTORS, MIA, ALWAR, RAJASTHAN
2. DATE AND TIME OF SAMPLE TAKEN (DD/MM/YYYY)	20/04/2023 11-30		
3. WEATHER	Clear		
4. APPROX.DEPTH OF MAIN STREAM	> 100 cm	TYPE	TUBE WELL
5. COLOUR AND INTENSITY	Clear 1=Light	COMPLETED BY	Regional Laboratory Alwar
6. ODOUR	None	VERIFIED By	Chief Scientific Officer, Regional Laboratory Alwar
7. VISIBLE EFFLUENT DISCHARGE IN PROXIMITY	None	AGENCY	RAJASTHAN STATE POLLUTION CONTROL BOARD
8. HUMAN ACTIVITIES AROUND STATION	Others		
9. LOCATION DETAIL	Abstraction for Water Supply		

DETERMINAND	WHO CODE		AQC				VALUE
Cadmium as Cd mg/l							BDL
Copper as Cu mg/l							BDL
Iron as Fe mg/l							0.16
Total Chromium as Cr mg/l							BDL
Nickle as Ni mg/l							BDL
Zinc as Zn mg/l							0.12
Lead as Pb mg/l							BDL

DETERMINAND	ARBITRARY CODE				AQC		VALUE

Lab Incharge / Board Analyst

MONITORING OF INDIAN NATIONAL AQUATIC RESOURCES

1. STATION CODE	1706	STATION	TUBEWELL NEAR RIICO PUMP HOUSE NEAR MONTO MOTORS, MIA, ALWAR, RAJASTHAN
2. DATE AND TIME OF SAMPLE TAKEN (DD/MM/YYYY)	20/04/2023 11-30		
3. WEATHER	Clear		
4. APPROX.DEPTH OF MAIN STREAM	> 100 cm	TYPE	TUBE WELL
5. COLOUR AND INTENSITY	Clear 1=Light	COMPLETED BY	Regional Laboratory Alwar
6. ODOUR	None	VERIFIED By	Chief Scientific Officer, Regional Laboratory Alwar
7. VISIBLE EFFLUENT DISCHARGE IN PROXIMITY	None	AGENCY	RAJASTHAN STATE POLLUTION CONTROL BOARD
8. HUMAN ACTIVITIES AROUND STATION	Others		
9. LOCATION DETAIL	Abstraction for Water Supply		

DETERMINAND	WHO CODE		AQC				VALUE
Fecal Streptococci MPN/100 ml							<3
Total Alkalinity mg/l	Y						216
C.O.D. mg/l	0	8	3	0	1	N	20
Calcium as Ca mg/l	2	0	1	0	1	N	36.8
Chloride mg/l	Y						87.91
Conductivity µmho/cm	0	2	0	4	1	N	954.3
Fecal Coliform MPN/100ml	3	6	0	1	1	N	2
Magnesium as Mg mg/l	1	2	1	0	3	N	40.82
pH	1	0	3	0	2	N	7.92
Phenolphthalein Alkalinity	Y						NT
Sodium mg/l	1	1	1	0	3	N	75.1
Sulphate mg/l	Y						123
Temperature 0C	0	2	0	0	1	N	27

DETERMINAND	ARBITRARY CODE				AQC		VALUE
Boron Dissolved mg/l	0	5	1	0	5	N	0.31
Fluoride As F mg/l	Y						1.06
Total Hardness As CaCO3 mg/l	2	2	1	0	1	N	260
Nitrate as N mg/l	Y						2.51
Nitrite As N mg/l	Y						0.0194
Phosphate As PO4 mg/l	Y						0.24
Potassium As K mg/l	Y						5.1
Total Coliform MPN/100ml	3	7	0	0	1	N	6
Total Dissolved Solids mg/l	3	3	3	3	3	N	585.5

Lab Incharge / Board Analyst

Standard Parameters for Determining Water Quality –

GENERAL STANDARDS FOR DRINKING WATER

(IS 10500: 2012) [18]

Sr. No.	PARAMETERS	DESIRABLE/ACCEPTABLE LIMIT	PERMISSIBLE LIMIT IN THE ABSENCE OF ALTERNATE SOURCE
1	Colour (Hazen Units)	5	15
2	Odour	Agreeable	Agreeable
3	Taste	Agreeable	Agreeable
4	Turbidity, NT Units	1	5
5	pH	6.5 – 8.5	No Relaxation
6	Total Hardness as $CaCO_3$, mg/l	200	600
7	Iron as Fe, mg/l	0.3	No Relaxation
8	Chloride as Cl, mg/l	250	1000
9	Free Residual Chloride	0.2	1
10	Total Dissolved Solids, mg/l	500	2000
11	Calcium as Ca	75	200
12	Copper as Cu	0.05	1.5
13	Manganese as Mn, mg/l	0.1	0.3
14	Sulphate as SO_4, mg/l	200	400
15	Nitrate as NO_3, mg/l	45	No Relaxation
16	Fluoride as F, mg/l	1.0	1.5
17	Phenols as C_6H_5OH	0.001	0.002
18	Mercury as Hg	0.001	No Relaxation
19	Cadmium as Cd	0.003	No Relaxation
20	Selenium as Se	0.01	No Relaxation
21	Arsenic as As	0.01	0.05
22	Cyanide as CN	0.05	No Relaxation
23	Lead as Pb	0.01	No Relaxation
24	Zinc as Zn, mg/l	5	15
25	Nickel as Ni, mg/l	0.02	No Relaxation
26	Anionic detergents as MBAS	0.02	1.0
27	Total Chromium as Cr	0.05	No Relaxation
28	Mineral Oil	0.01	0.03
29	Pesticides	Nil	0.001
30	Radioactive materials - Alpha emitters, Beq/l - Beta emitters, Pci/l	 - -	 0.1 1.0
31	Alkalinity as $CaCO_3$, mg/l	200	600
32	Aluminium as Al	0.03	0.2
33	Boron	1	5
34	Fecal Streptococci	Nil	-
35	Coli form M.P.N. (in 100 ml)	1	10
36	Cyclopes (or Guinea Worms)	Nil	Nil

* Charges on cations and anions are omitted

Some of the parameters of the tested samples are within desirable limits, most of the parameters are within the permissible limits, and only a few parameters are beyond the permissible limits.

Public satisfaction with water quality (as per survey)

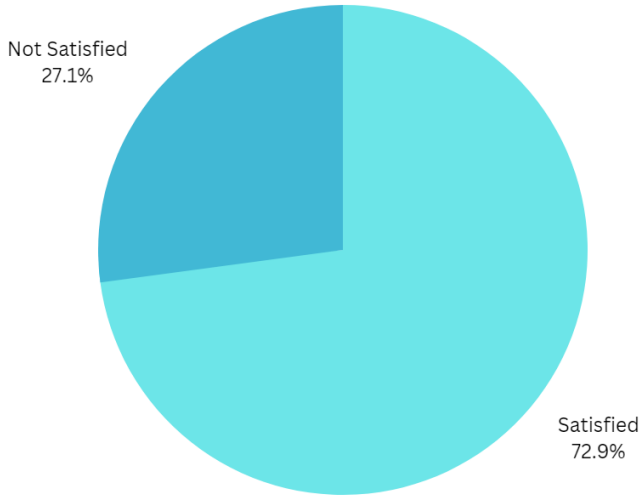

Figure 8: Extent of Public Satisfaction with Water Quality

Satisfaction with Water Quality	Percentage of Households	Number of Households
Satisfied	72.9%	43
Not Satisfied	27.1%	16

While a majority of the respondents (72.9%) were by and large satisfied with the water quality, 27.1% were dissatisfied by the same. The major reasons for dissatisfaction cited were muddy water, unpleasant taste/smell, unusual color etc.

OPERATIONS & MAINTENANCE

Operations and maintenance are carried out at regular intervals as a preventive measure. Moreover, there is an active response in case of a breakdown or failure. The process of the same is outsourced as well as departmental in nature.

The components which are outsourced include maintenance of tube-wells, submersible pumps, fixing leakages in the pipelines and maintenance of centrifugal pumps. The components looked after by the PHED include billing and operation of the pumps and pump houses.

The billing for last year was primarily under two heads, namely Pump & Machinery and Distribution. The former was approximately 80 lakhs, and for the latter was 1 crores 20 lakhs pertaining to last year.

Recovery of O&M Costs

The revenue collected by way of water bills, which is approximately just ₹200 per month per connection. As per the information provided by the PHED officials, approximately 70-75 per cent of the costs are recovered through user charges. Since a number of meters are non-functional, the bills are based on average consumption based on fixed rate. Water bills are generated once in every two months. The rate of charging for water remains throughout all income groups. Most payments of bills by the public are made through E-Mitra portals. The balance amount is funded by the State Government, and therefore the question of deficits does not arise.

Further, a deposit of ₹1210 per connection is being collected for every new connection.

Grievance Redressal

The grievance redressal is done through a toll-free number (0144-2337900) through which the aggrieved can register their complaints. The records of complaints are maintained for a period of one year. Any unresolved complaints during a particular year are carried forward to the next. As per the PHED officials, the rate of redressal is 100%. However, the veracity of the same has to be looked into. Moreover, hundred percent uniformity in the quantity and quantum of water supply cannot be maintained. This means that a number of complaints are registered alleging that a particular area receives less water than other areas. However, the same is impossible and unfeasible to be addressed because it depends on factors such as the location of tube wells, yield of tube well etc., which cannot be uniform at all places.

Public experience with the grievance redressal mechanism (as per survey) -

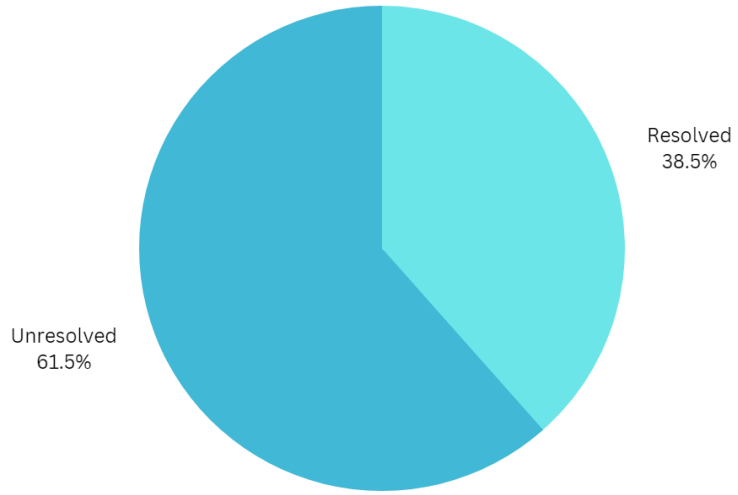

Figure 9: Public Experience with Grievance Redressal Mechanism

Resolution of Grievance	Percentage of Households	Number of Households
Resolved	38.5%	15
Unresolved	61.5%	24

Out of the households surveyed which had lodged grievances with the Department, a mere 38.5% grievances were resolved, while a whopping 61.5% remained unresolved. This is in stark contrast to the 100% grievance redressal which was cited by the PHED Officials.

TANKERS FOR DEFICIT FULFILMENT

Tankers are usually supplied as per the demand. Usually, the demand arises due to factors such as a locality not receiving enough water supply for a long period, or receiving no water at all through the piped water connection system. The demand is much higher during the summer months, primarily March to July, as compared to that in the other months. These tankers are completely free of cost for the public.

The demand for water fulfilled by tankers is less than 1% of the total demand of the city by volume. The department currently has a total of 24 tankers, which carry out 225 trips per day. The cost per tanker amounts to ₹450 per trip. The volume of water carried by each tanker is between 4000-5000 liters. In most cases as well as in the slum areas, the tanker is emptied

into a common water tank, to which taps are attached. The people come and collect water from such common tanks through the taps.

The entire demand for water in the city is not fulfilled by the PHED tankers due to a number of reasons. Moreover, the tankers supplied by the PHED are not accessible to all and are available to only the influential and privileged few, and the rest have to pay and call for private tankers. As a consequence, a number of persons have to call for private tankers, and pay huge sums of money for the same. The data on the same is not readily available as they are unorganized.

However, as per the information collected through interaction with the public it appears that these private tankers are getting water from private borewells. The cost per tanker is approximately ₹500, but it varies according to the areas to which the water is supplied as well as the service provider.

Source of tankers (as per survey) -

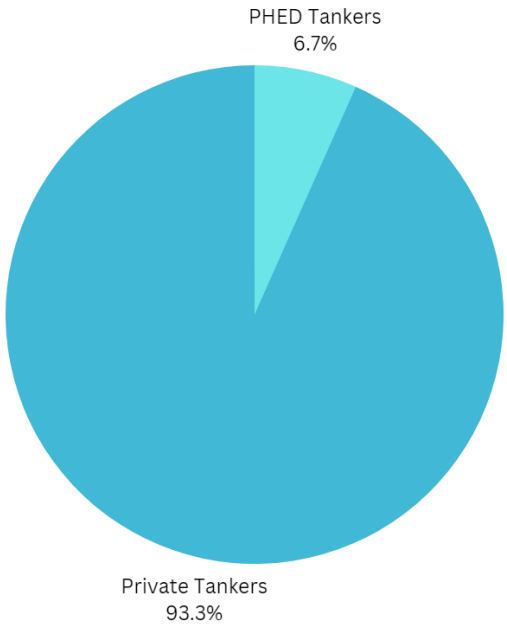

Figure 10: Source of Tankers

Source of Tankers	Percentage of Households	Number of Households
PHED Tankers	6.7%	3

Private Tankers	93.3%	42

Out of the respondents who call for tankers for fulfilling the deficit water requirements of their households, a whopping 93.3% had to call for private tankers and merely 6.7% received water from PHED tankers.

POWER SUPPLY

Small scale solar power plants have been installed in some places where there is absence of electricity supply, or where it is not feasible to install electric poles due to weather conditions. In the city, around ten such plants are in place and functional. There is, however, no solar power-based electricity backup for the city as a whole due to paucity of resources.

NON REVENUE WATER (NRW)

NRW refers to the water which is lost before it reaches the end user. As per the information provided by the PHED officials, the percentage of thefts is about 10% and leakages are negligible, amounting to merely 1-2% of the total water supplied. Thus, the total percentage of non-revenue water is approximately 12%, which is well within the targeted limits. The Service Level Benchmarks recommend a maximum threshold of 15% for NRW.[11]

A few projects have been proposed in order to fulfil the deficit between the demand for water and the supply of water. These have been discussed below –

FUTURE PLANS

A) EAST RAJASTHAN CANAL PROJECT

The ERCP was proposed by the previous BJP government to address the drinking and irrigation water issues in 13 districts of eastern Rajasthan.[12]

[11] *HANDBOOK OF SERVICE LEVEL BENCHMARKING*. MINISTRY OF URBAN DEVELOPMENT GOVERNMENT OF INDIA, https://cpheeo.gov.in/upload/uploadfiles/files/Handbook.pdf.

[12] Correspondent, Special. "Eastern Rajasthan Canal Project Takes Political Twist after Centre's Directive to Stop Work." *The Hindu*, 4 July 2022. *www.thehindu.com*, https://www.thehindu.com/news/national/other-

The Navnera-Belwa-Bisalpur-Israda Link Project, the Navnera Barrage and Israda Dam, the Ramgarh and Mahlpur Barrages, and Mej Anicut will all be constructed with the approval. By 2040, additional drinking water demands for various districts will be met owing to water management activities pursuant to the ERCP. The Yamuna River, which ordinarily drains into the sea through the state's tributaries, will no longer empty into the sea due to the construction of dams under the ERCP. However, no reservation for Alwar has been mad under the project yet.

In the state budget for 2023–2024, the government has allocated Rs 13,000 crore for a variety of tasks associated with this project.[13]

The Government of Rajasthan submitted the Detailed Project Report (DPR) of the Eastern Rajasthan Canal Project (ERCP) for techno-economic evaluation in November 2017 with a projected expenditure of Rs. 37,247.12 crore (at 2014 pricing level). The projects on interstate rivers must be designed for a 75% reliable yield in accordance with current standards. Due to the project's anticipated 50% dependable output, which is outside of accepted limits and is also unacceptable to the government of Madhya Pradesh (MP), a co-basin State, the project's appraisal could not be completed. The Rajasthan government has been asked by the Central Water Commission to update the project planning at a 75% dependability level. The updated DPR, which uses a 75% reliable yield, has not yet been submitted.[14]

The Eastern Rajasthan Canal Project (ERCP) and the Parbati-Kalisindh-Chambal River Link are two projects that the Union government has produced a massive proposal to combine. In January 2023, Prime Minister Narendra Modi made this announcement.

The Center has submitted a draft plan for the major endeavor with the state governments of Rajasthan and Madhya Pradesh. This project will integrate the canal project in Rajasthan with the Chambal river connection project.[15]

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states/eastern-rajasthan-canal-project-takes-political-twist-after-centres-directive-to-stop-work/article65600112.ece.

[13]PTI. "CM Gehlot Approves Financial Proposal For Construction Of East Rajasthan Canal Project." *Outlook*, 2023, https://www.outlookindia.com/national/cm-gehlot-approves-financial-proposal-for-construction-of-east-rajasthan-canal-project-news-269288.

[14] "EASTERN REGION CANAL PROJECT." *Press Information Bureau*, 2023, https://pib.gov.in/pib.gov.in/Pressreleaseshare.aspx?PRID=1898806.

[15] Saxena, Ankit. "Centre To Merge Eastern Rajasthan Canal Project And Chambal River Link To Ensure Supply In Water Scarce Districts Of Rajasthan." *Swarajyamag*, https://swarajyamag.com/infrastructure/centre-to-merge-

B) CHAMBAL

In the 2013-14 budget, the Rajasthan Government announced bringing water from Chambal and supplying it to various parts of the city and district. The estimated cost of the project was announced to be ₹950 crores. The state government has given its in-principle approval to the water projects and the NCRPB will fund the project, but it will be in the form of loans. These projects will cater to the major parts of Alwar, especially where there is acute water scarcity.[16]

C) SILISERH LAKE

It has been proposed that approximately 2800 lakh liters of water per year would be earmarked for the purposes of water supply and distribution in the city. A part of the same would also be designated for other purposes like fish culture and irrigation. The Water Works Department has been entrusted with the responsibility of implementation of the project, and the ancillary responsibilities such as laying of pipelines and establishment of a water treatment plant.[17]

MAJOR GAPS

Based on the above discussion, the following major gaps can be identified –

DEFICIT WATER SUPPLY

The population of the city, as of July 2023, is approximately 4.16 lakhs. As per the 2011 census, the population of Alwar was 3.22 lakhs. This shows an increasing trend in water

eastern-rajasthan-canal-project-and-chambal-river-link-to-ensure-supply-in-water-scarce-districts-of-rajasthan. Accessed 3 Aug. 2023.

[16]"Drinking Water Projects in Alwar District to Get Rs 1,132 Crore." *The Times of India*, 10 June 2012. *The Economic Times - The Times of India*, https://timesofindia.indiatimes.com/city/jaipur/drinking-water-projects-in-alwar-district-to-get-rs-1132-crore/articleshow/13981672.cms.

[17]"अलवर की प्यास बुझाएगी सिलीसेढ़ झील, सिंचाई विभाग ने सरकार के पास भेजा प्लान." *News18 हिंदी*, 7 Dec. 2022, https://hindi.news18.com/news/rajasthan/alwar-water-supply-from-silisedh-lake-in-alwar-irrigation-department-sent-plan-to-rajasthan-government-for-approval-5015531.html.

supply. As per the Urban Water Supply Norms, a minimum 135 LPCD of water ought to be supplied. According to this, the demand boils down to approximately 56.1 MLD.

However, the actual quantity of water supply is approximately 23.6 MLD at an average rate of 32 LPCD, which reflects a significant deficit.

Whether water supplied by PHED is enough (as per survey)

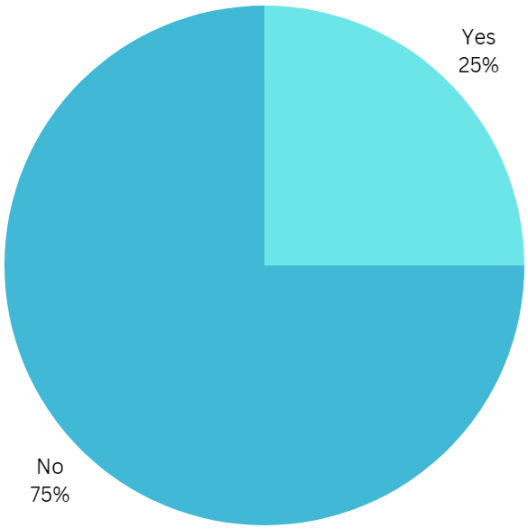


Figure 11: Sufficiency of PHED Water Supply

Whether Water is Enough	Percentage of Households	Number of Households
Yes	25%	15
No	75%	45

Only 25% of the respondents surveyed found the water supplied by the PHED enough to fulfil their daily consumption requirements. They rest 75% inevitably rely upon water tankers (whether supplied by PHED or by private contractors) to fulfil their daily consumption requirements.

Fulfilment of deficit consumption requirements (as per survey) -

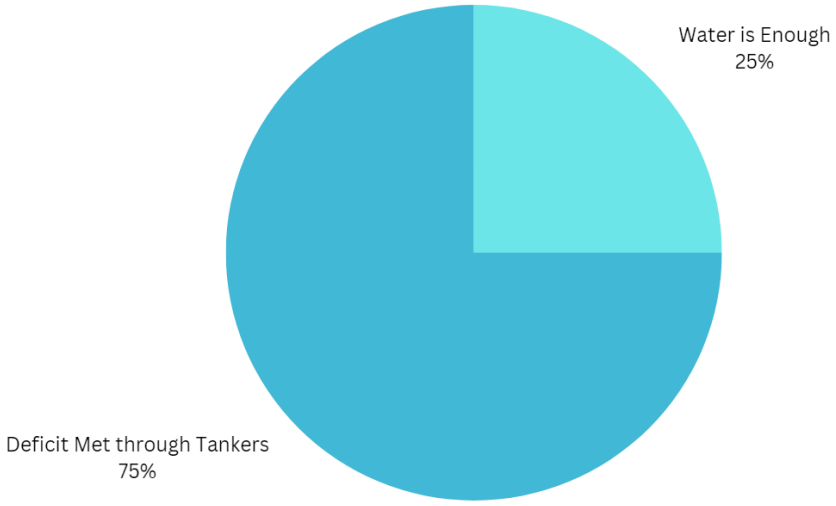


Figure 12: Fulfilment of Deficit Requirements

How is Deficit Met?	Percentage of Households	Number of Households
No Deficit	25%	15
Tankers	75%	45

For the respondents who found the water supplied by the PHED insufficient, complete reliance is on water tankers.

LACK OF DATA

There exists lack of data which leads to information gaps. These information gaps can lead to a number of other issues. One such issue which can be highlighted is that of inadequate information on non-functional meters. There is no data available with the PHED regarding the extent of non-functional meters, due to which most households are charged with a uniform rate, based on average consumption levels. This leads to some houses being charged for more water than has been consumed, and others are charged for less than what has actually been consumed. Another challenge which can be highlighted stemming from the problem of lack of data is that of tankers. Which some proportion of deficit demand is fulfilled by tankers supplied by the PHED, a huge chunk is also fulfilled by tankers supplied

by private operators. There is no data on the extent of water supplied by such privately owned tankers. Thus, in the absence of sufficient data, bridging the gaps becomes difficult.

Absence of Water Treatment Plant

Another major drawback is the absence of a Water Treatment Plant in the city. The water is merely disinfected by the process of chlorination and using bleaching powder. The absence of a robust water treatment mechanism may lead to supply of bad quality water especially during monsoon seasons and thus affect the health of the individuals consuming the same. While the quality of water presently is well within the permissible limits, and disinfection is working well, there is a need to put a water treatment plant in place, considering future needs and health of the population in the times to come.

Low Water Pressure

The water pressure in the pipelines is extremely low. As a consequence of this, the tail end of the pipelines receives a negligible amount of water. Such deficit demand is fulfilled by supplying tankers.

The distance up to which water can travel without pumping is hardly 1 meter, given that the water pressure is extremely low and almost all households have motors installed.

Lack of Proper Rainwater Harvesting and Stormwater Management

Alwar neither has a robust system of rainwater harvesting, nor that of stormwater management in place. It is also known that the level of rainfall is extremely low and the only source of water supply in the city is ground water. This means that in order to sustain the ground water table for longer, the city need to focus on recharging the ground water and collecting the rainwater wherever possible. However, onlya very meagre proportion of houses actually have rainwater harvesting systems in place, which is a major lacuna stemming from non-enforcement.

Power Cuts and Absence of Power Backup Mechanism

Power cuts are frequent, especially during the summer months. The absence of a power backup mechanism leads to a failure of water supply during power cuts, since the entire process of water supply is based upon the supply of electricity.

Lack of a Sufficient Drought Management Plan

As per information provided by the PHED officials, in case of a drought, there are plans to utilize the water from Siliserh Lake. However, the same is only in the proposal stage, and no further action has been taken in this regard yet. The lake cannot be utilized for water supply on a daily basis because of its low and dropping water level. Thus, it can only be used as a resource during exigencies. Moreover, an artificial reservoir to be used in case of exigencies has been constructed in the Lal Diggi area. While the reservoir has been constructed, it has not been supplied with water yet. This is because the canals leading to the reservoir have been encroached upon, which is hindering the water supply route. The source of water for this reservoir is Siliserh Lake. The dimensions of the reservoir are approximately 120 meters in length, 60 meters in width and 10 meters in height.

Issues with Water Quality

Public satisfaction with water quality (as per survey) -

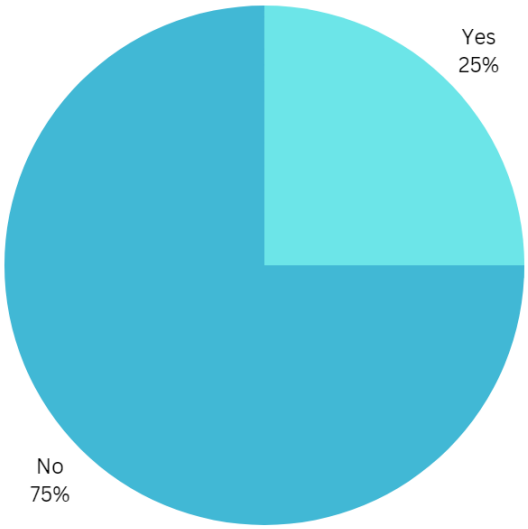


Figure 13: Public Satisfaction with Water Quality

Satisfaction with Water Quality	Percentage of Households	Number of Households
Satisfied	72.9%	43
Not Satisfied	27.1%	16

While a majority of the respondents (72.9%) were by and large satisfied with the water quality, 27.1% were dissatisfied by the same. The major reasons for dissatisfaction cited were muddy water, unpleasant taste/smell, unusual color etc.

Extent of water sample testing by respondents (as per survey) -

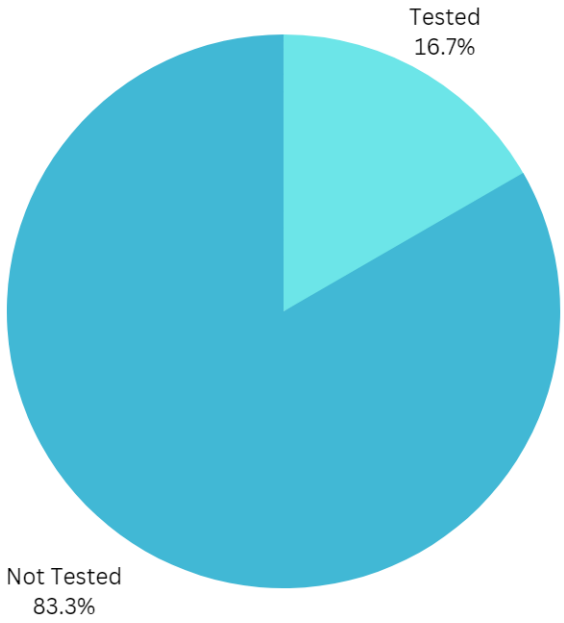
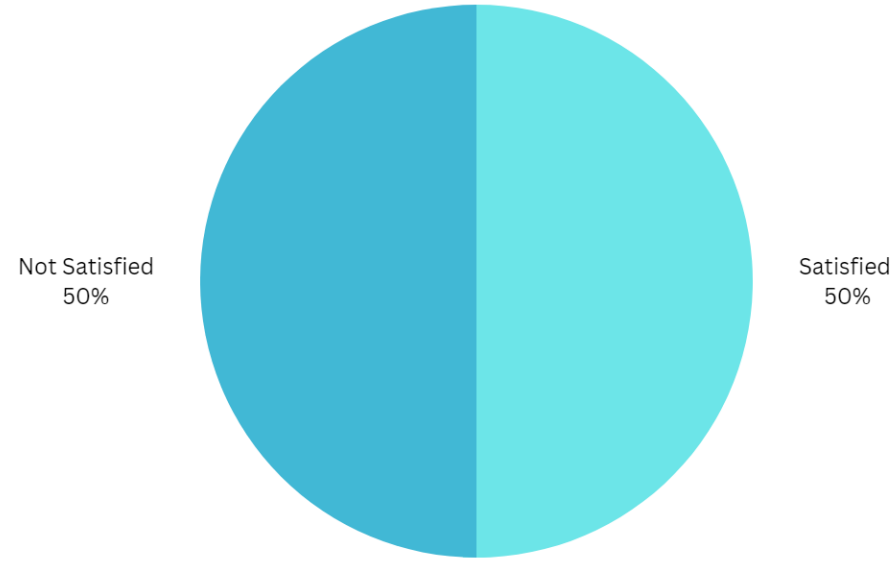


Figure 14: Extent of Water Sample Testing by Respondents

Whether Tested	Percentage of Households	Number of Households
Tested	16.7%	10
Not Tested	83.3%	50

16.7% of the respondents got the water samples of their own consumer taps tested in the laboratory, while 833% did not.

For those who got samples tested (as per survey) –



Whether Satisfied After Testing	Percentage of Households	Number of Households
Satisfied	50%	5
Not Satisfied	50%	5

While half of the respondents were satisfied with the results of the sample testing, half found the quality to be unsatisfactory.

UNSATISFACTORY GRIEVANCE REDRESSAL

Respondents who registered a grievance with the PHED (as per survey) -

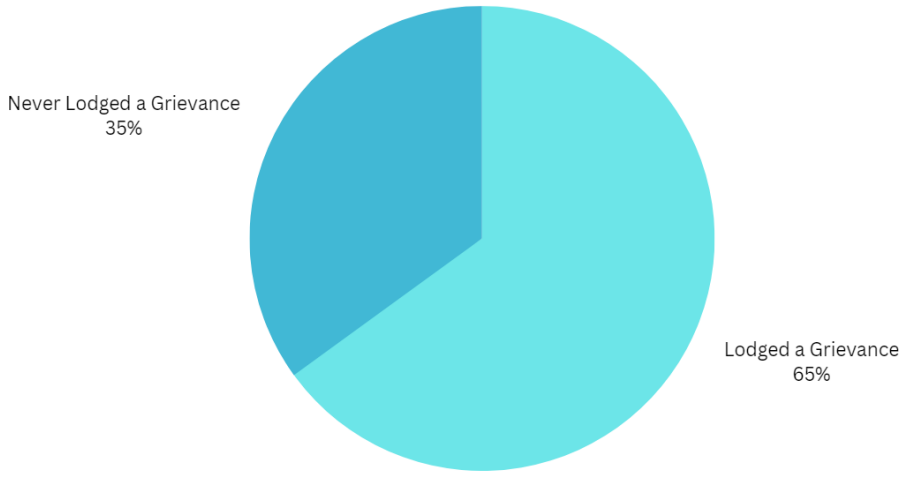


Figure 15: Response of respondents who got the samples tested

Whether Ever Lodged a Grievance	Percentage of Households	Number of Households
Yes	65%	39
No	35%	21

65% of the respondents surveyed had registered grievance(s) at some point with the PHED. 35% of the respondents had never registered any grievance with the Department.

Grievance Issue (as per survey) -

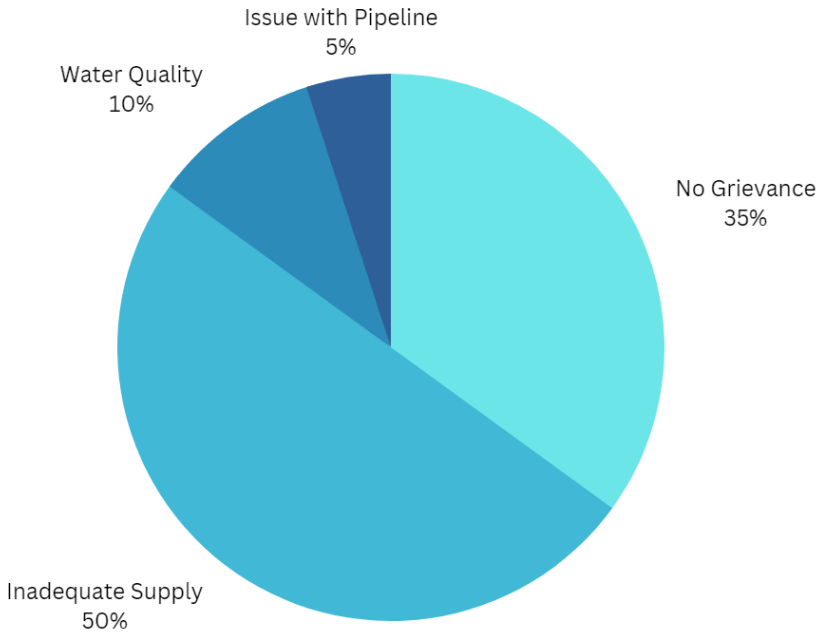


Figure 16: Grievance Issues of Respondents

Whether Ever Lodged a Grievance	Percentage of Households	Number of Households
Never Lodged	35%	21
Inadequate Supply	50%	30
Water Quality	10%	6
Issue with Pipeline	5%	3

50% of the respondents were aggrieved with inadequate water supply, by volume and/or by frequency. 10% had issues with the water quality whereas 5% had issues with the repair and maintenance of water supply pipelines.

Resolution whether achieved (as per survey)

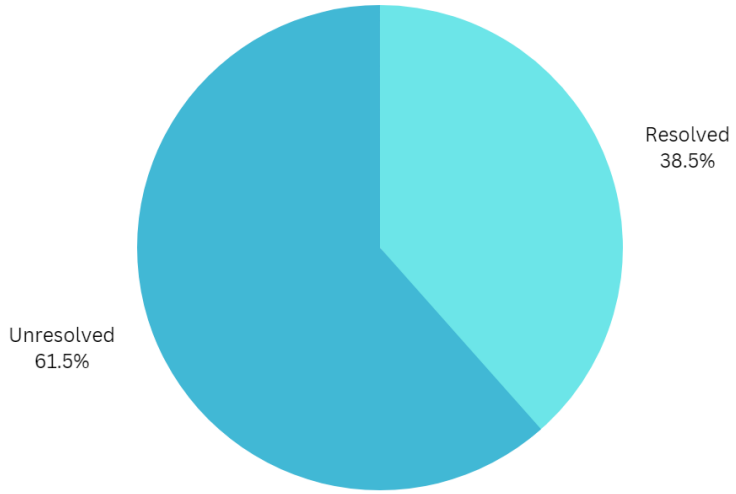


Figure 17: Resolution whether Achieves

Resolution of Grievance	Percentage of Households	Number of Households
Resolved	38.5%	15
Unresolved	61.5%	24

The survey revealed that merely 38.5% of the grievances were redressed and a whopping 61.5% remain unresolved.

Time taken for resolution (as per survey) -

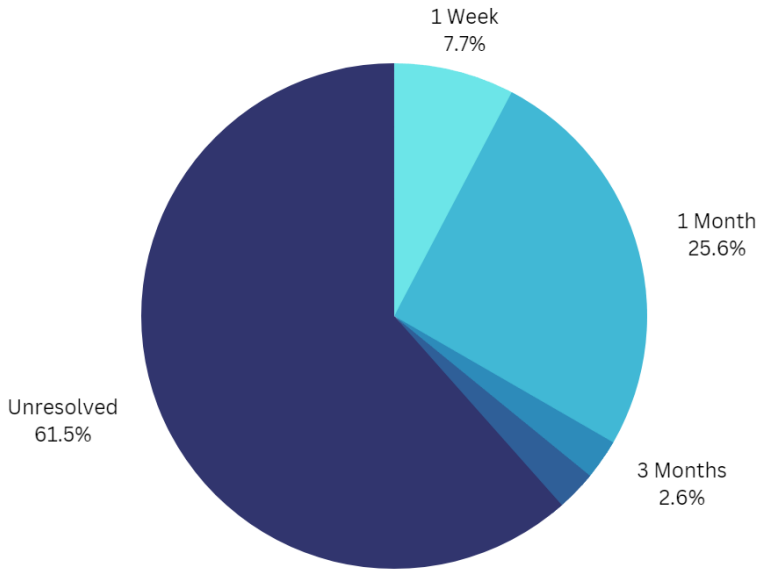


Figure 18: Time Taken for Resolution

Time Taken for Redressal	Percentage of Households	Number of Households
1 Week	7.7%	3
1 Month	25.6%	10
3 Months	2.6%	1
6 Months	2.6%	1
Unresolved	61.5%	24

7.7% of the complaints were resolved within a week. 25.6% grievances were resolved within a month. 2.6% grievances took 3 months to be resolved and the same percentage took 6 months to be resolved. However, 61.5% of the grievances remain unresolved to date.

UNSATISFACTORY BILL AMOUNT

Extent of respondents satisfied with bill amount (as per survey)

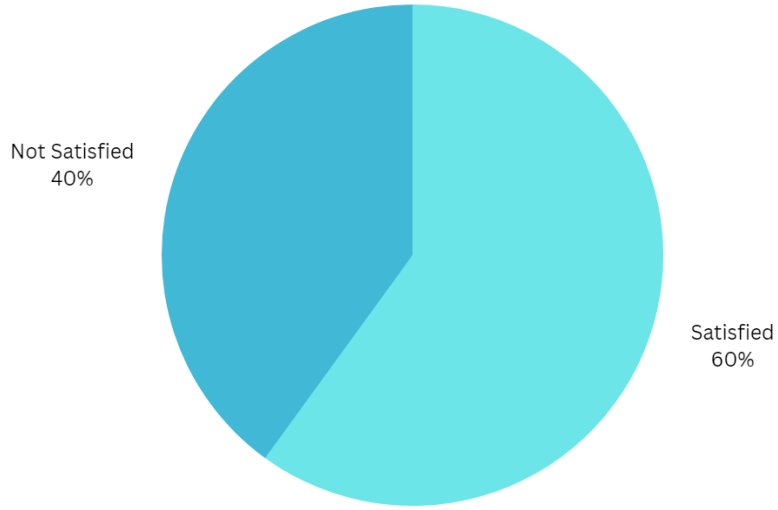


Figure 19: Extent of Satisfaction with Bill Amount

Opinion on Bill Amount	Percentage of Households	Number of Households
Satisfied	60%	36
Not Satisfied	40%	24

Out of not satisfied – 10 are with functional meters

A majority of the respondents (60%) are satisfied as satisfied with the billing amount. 40% are unsatisfied with the same. Out of the respondents who are unsatisfied with the amount, 41.7% are with functional meters, who find the amount billed to be higher than the actual consumption. One respondent believes that the same could be because of air in the water supply in the pipelines. While the meter keeps churning because of the air, no water is received but the bill amount increases.

Absence of Surface Water Source

The absence of a surface water source for supply and distribution of water stands as a major roadblock. While proposals have been made to channelize water from Siliserh Lake, the same is still at the proposal stage and no further progress has been made in this regard. While utilizing water from lakes and reservoirs is a disaster response mechanism, a permanent solution needs to devised.

Considering that there is no sustainable way to supply water from surface water sources, and the levels of rainfall are very low, it is not recommended to depend solely on ground water. The city is yet to get any allocation under the Chambal Project and the ERCP.

NON-FUNCTIONAL METERS

While meters have been installed in almost every household, a huge quantum of those are either defunct or non-functional in nature. The primary reason behind the same is non-cooperation by the public.

NON-INSTITUTIONALIZED TANKERS AND PUBLIC TAPS

Given that ground water is not sufficient to fulfil the water demand of the city, tankers to fulfil the deficit demand are inevitable.As per norms, the tankers have to provide 10 liters of water per member. However, the same is seldom followed due to a number of factors. However, what sometimes happens in the urban areas is that the entire water of the tanker is emptied into the underground storage tank of the house, which deprives the others of their rightful water. However, the percentage of such occurrences is very small. Moreover, the tankers supplied by the PHED are not accessible to all and are available to only the influential and privileged few, and the rest have to pay and call for private tankers.

The cost per private tanker is approximately ₹500, but it varies according to the areas in which the water is supplied as well as the service provider.

A major drawback of this entire process is that the private tankers are non-regularized and not monitored by the PHED.

Public taps, though present, are non-functional due to extremely low water pressure.

Source of tankers for deficit fulfilment (as per survey) -

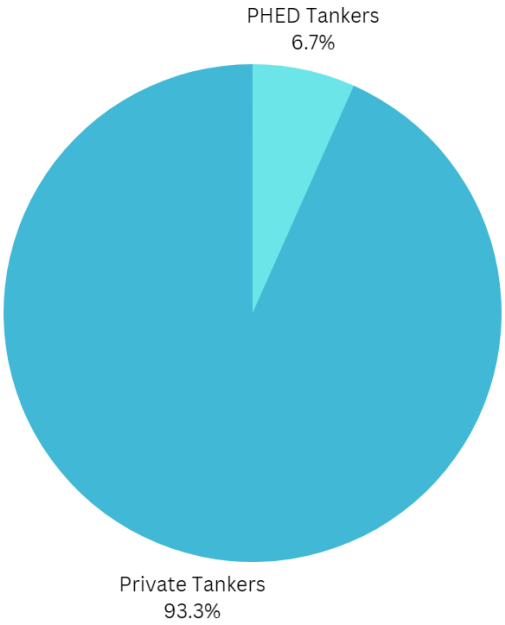


Figure 20: Source of Tankers for deficit Fulfilment

Source of Tankers	Percentage of Households	Number of Households
PHED Tankers	6.7%	3
Private Tankers	93.3%	42

Merely 3% of the respondents who face deficit water supply are able to avail the benefit for free tankers provided by the PHED. A whopping 93.3% rely on tankers supplied by private contractors for deficit fulfilment.

Cost per tanker from private service providers (as per survey)

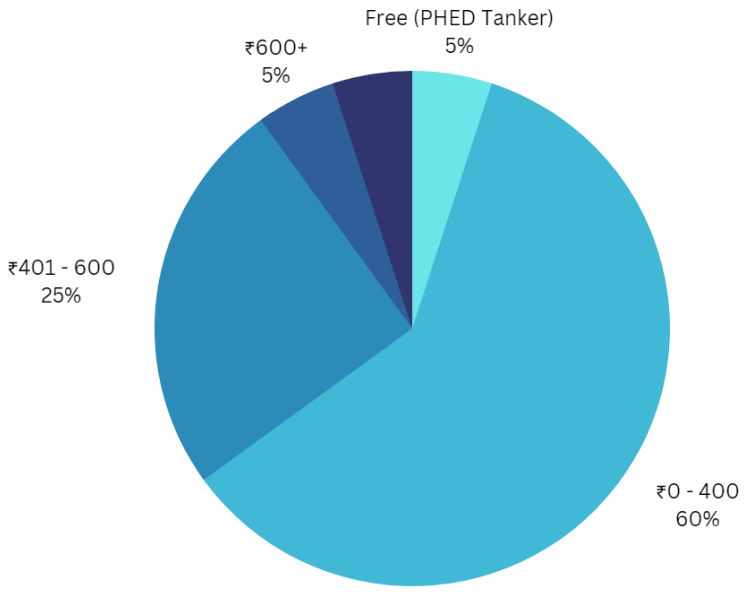


Figure 21: Cost per Tanker from Private Contractors

Cost Per Tanker	Percentage of Households	Number of Households
Free (PHED Tanker)	5%	3
₹0 - 400	60%	36
₹401 - 600	25%	15
₹600+	5%	3
Never Used	5%	3

60% of the respondents pay between ₹0-400 per tanker. 25% pay between ₹401-600 per tanker and 5% pay more than ₹600 per tanker.

RECOMMENDATIONS

Based on a thorough analysis of the current status of service delivery of water supply in Alwar and the major gaps occurring in the same, the following recommendation and solutions can be proposed-

Ensuring Data Availability

The inadequate availability of data leads to a number of issues and challenges as have been discussed above. Therefore, it is extremely important to have sufficient requisite data in place, not only to formulate new plans and policies, but also to effectively implement/manage the existing ones.

Robust Rainwater Harvesting and Storm Water Management

In order to sustain the ground water table for longer, the city need to focus on robust rainwater harvesting and stormwater management plan for collecting and recharging the ground water wherever possible. While there is a mandate to install rainwater harvesting system in all plots with a size of 20 square meters or more, this needs to be actually implemented in practice. The Department needs to ensure that the mandate is adhered to on paper as well as in practice.

Another way to effective recharge and sustain ground water is through stormwater management. Stormwater management essentially refers to managing surface runoff, and using it to recharge ground water or recharge artificial and natural lakes.

In addition, the city shall also resort to the ancient system of Johads for collecting and utilizing rainwater.

Supplementing Water Supply with Treated Used Water

Another way of reducing reliance on fresh water can be by using treating used water and mixing it with fresh water up to safe levels. Also, these can be effectively used for irrigation purposes. This would increase the availability of water by diverting the water earmarked for irrigation purpose to water supply . Therefore, the city shall take the used water management proposal urgently under any of the ongoing schemes as under AMRUT Mission of Government of India Sewerage and septage management is an eligible component for funding. This framework would not only reduce the reliance on fresh water but also avoids existing sources being polluted by them..

Further, Small/medium scale used water treatment plants should be installed at the institutional or community level, which collect and treat the used water generated by them

and use it for non-drinking purposes like gardening, flushing, cleaning etc. This would reduce their complete reliance on fresh water thereby relieving stress on the ground water table and the existing water supply system.

Regularisation of Private Takers

All the private tankers in the city needs to be regularised and operated through the city. The sources for these tankers are also to be regularized so that excessive withdrawal shall be avoided. These steps will be helpful in the effective management of water supply in the area.

Improvement in Grievance Redressal Mechanism

An improvement in the grievance redressal mechanism is the need of the hour. There is evidence of widespread public dissatisfaction with the current mechanism. While the PHED claims that the redressal rate is 100%, the survey shows that redressal rates are considerably lower than that. This calls for the setting up of a dedicated grievance redressal and complaint handling team, which would ensure that all the complaints lodged are disposed of at the earliest, and to the satisfaction of the complainant.

Metering

It is essential to ensure functionality of the water meters that are already installed in households. This would not only ensure that each household would be charged only for the water they actually consumed, but also would helpful in implementing varied tariff rate for excessive users, thus helpful in sustainability of the system. Further, this will be very helpful in exact quantification of the NRWs.

Identifying New Renewable Sources of Water

Considering the current rate of depletion of water, the city would run out of ground water very soon. Therefore, it is important to identify new sources of water which are renewable in nature, in order to ensure sustained supply of water in the future. Also, the city can urge the State Government to allocate a share in any of the ongoing water supply scheme in the State.

Establishment of a Water Treatment Plant

Currently, the quality of water in the city is well within the permissible limits. This means that disinfection of water is functioning well. However, considering the long term requirements and the health of the future population, a water treatment plant becomes a necessity.

Implementing the Proposed Projects

As discussed in the previous section, there are projects such as the ERCP and Chambal Project which have been proposed to aid the availability of water in the city, have not been acted upon yet. These are still in the proposal stage and no further progress has been made to date. If implemented, these would help take water from the water surplus areas and supply them to the water deficit areas. Alwar, being one such area, would greatly benefit if these projects are implemented and some percentage of water is reserved for Alwar under them. However, no reservation has been made under these projects for Alwar yet.

Conclusion

After a thorough analysis of all the information appended above, the conclusion can be reached that a major proportion of the problems with respect to the service delivery of water supply in the city is stemming from factors such as complete reliance on ground water, non-availability of a renewable source water, inadequate water table recharge mechanism and the lack of availability of data. Moreover, a number of projects proposed have not yet seen the light of the day, neither has any allocation been made under them for the city yet.

There are visible and widespread disparities between the information provided by the Department and the outcome of the field surveys conducted, with the latter showing a picture which is much more bleak than what has been claimed by the former.

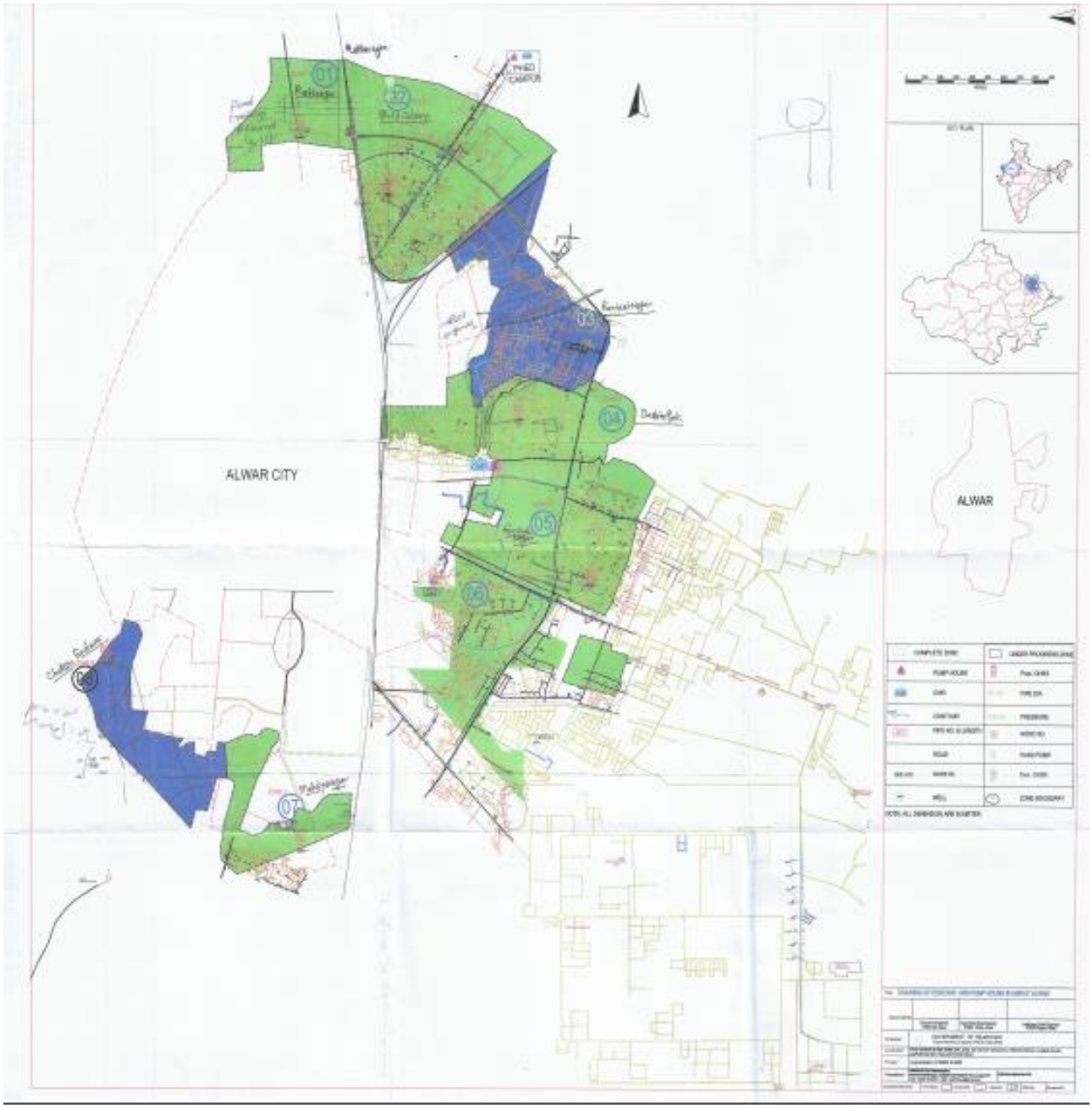
While the city certainly has come a long way, there is still a long way to go. There is no doubt that the geography and climate of Alwar make the situation and the process of improvement very challenging. However, the recommendations, if implemented, would substantially improve the status of water supply as well as the living standards of the residents.

WAY FORWARD

In order to further improve the status of the service delivery of water supply in the city, further studies can be taken up with respect to the identification of new renewable sources of water supply near the city. Studies can also be taken up with regard to treating used water and utilizing it for purposes of irrigation & non-drinking needs of the city especially in the institutions & residential clusters. Moreover, studies can be made on institutionalization and regularization of private tankers by the PHED – its feasibility and implications.

APPENDIX

ESR/CWR UNDER AMRUT ALWAR



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ESR CWR AND PUMP HOUSE UNDER NCR ALWAR

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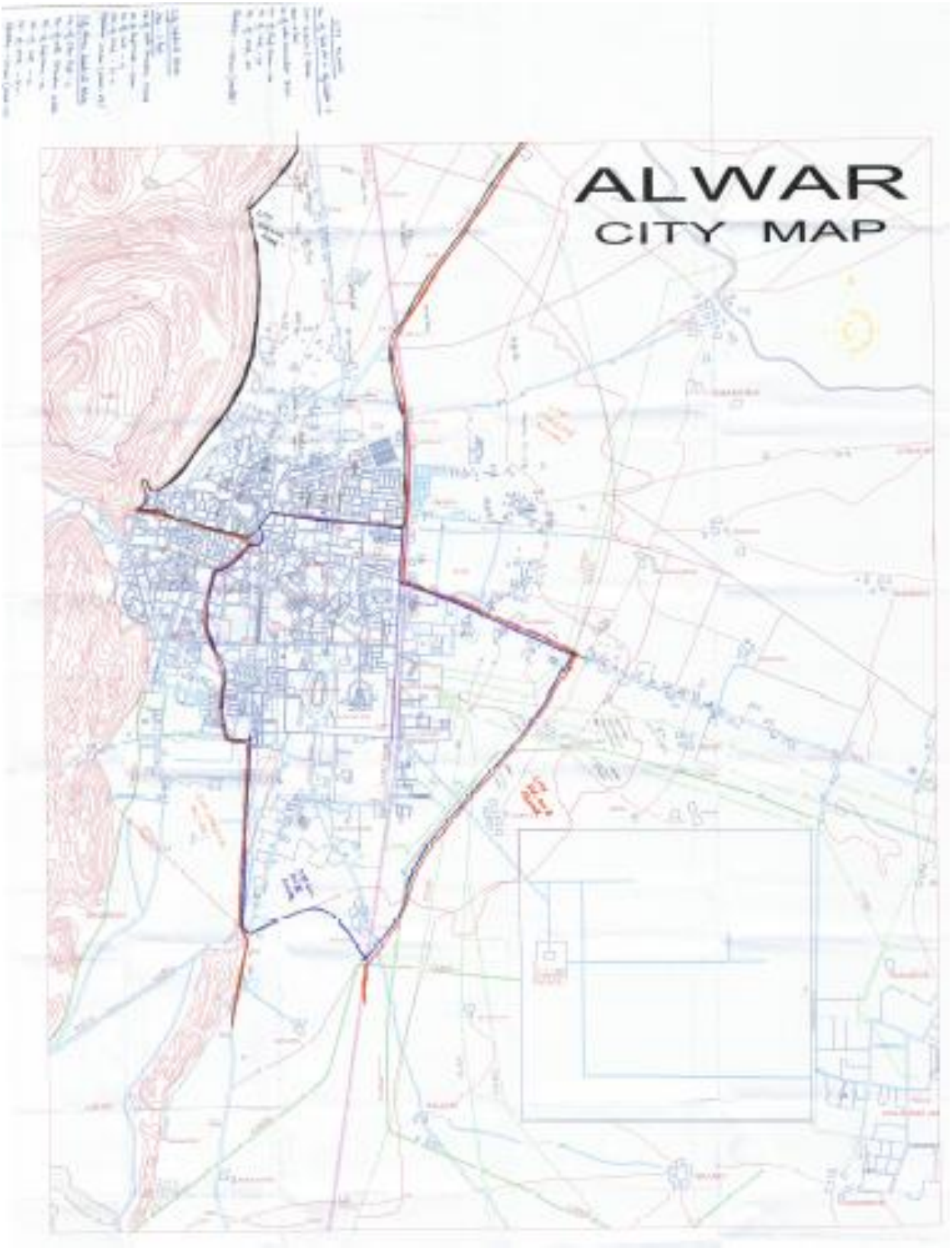
ALWAR CITY MAP



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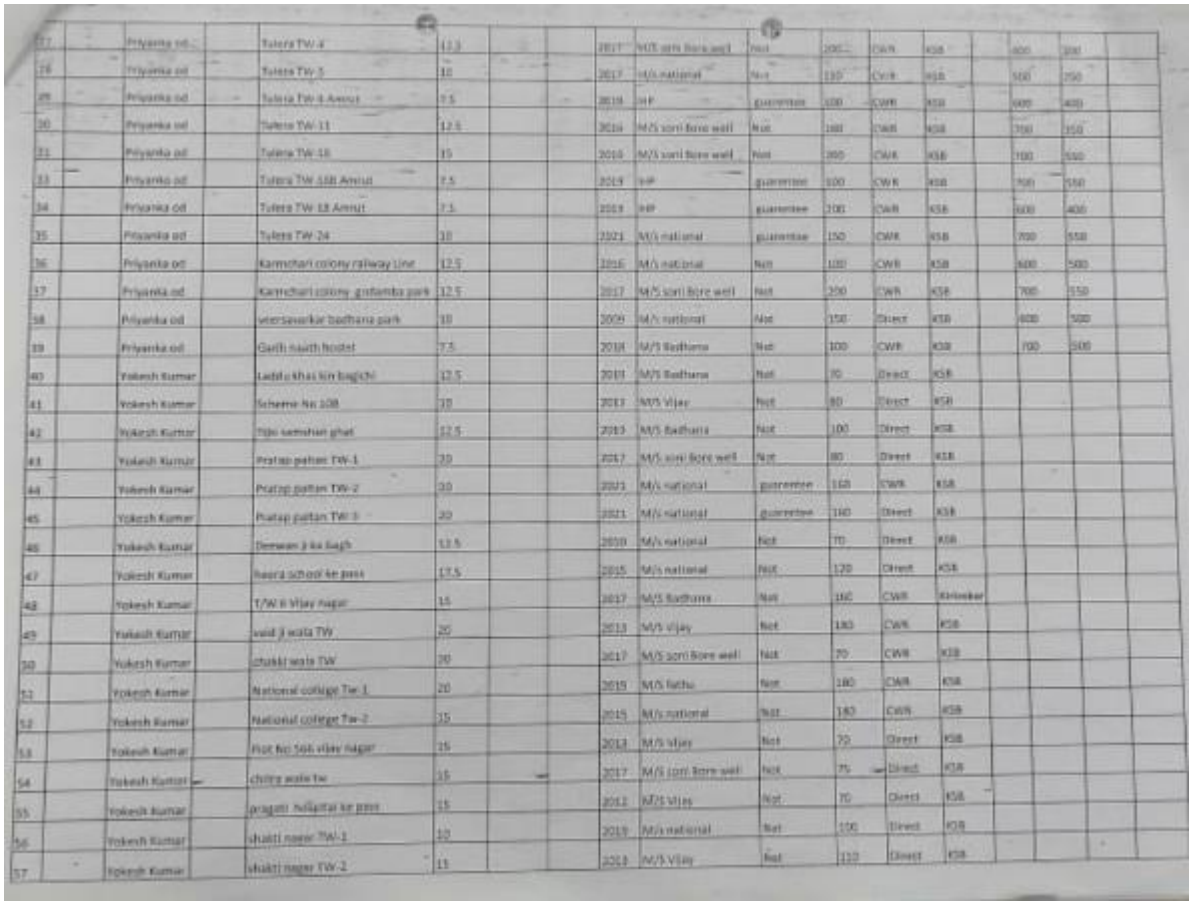
WATER SUPPLY ZONES IN THE CITY

S. NO.	ZONE	STATUS
AEN - I		
01	Scheme 2 (23)	Commissioned
02	HKM – 1	Commissioned
03	HKM – 2	Commissioned
04	Ganesh Guwari	Commissioned
05	Scheme 2 (14)	Commissioned
06	Scheme 2 (22)	Commissioned
07	Veer Sawarkar	Commissioned
08	Budh Vihar - 1	Commissioned
09	Budh Vihar – 2	Commissioned
10	Munshi Bagh (16)	Commissioned
11	Shivaji Park	Commissioned
12	Paharganj	Commissioned
13	Scheme 10B	Commissioned
14	Mansa Devi (8)	Commissioned
15	Munshi Bagh (15)	Commissioned
16	Vijay Nagar	Ready for Commissioning
17	Ashok Vihar	Ready for Commissioning
18	Vikaspath	Remaining for Commissioning
19	Scheme 1	Remaining for Commissioning
20	Scheme 10A	Remaining for Commissioning
21	Scheme 4	Remaining for Commissioning
22	Scheme 3	Remaining for Commissioning
AEN - II		
1	Ranjeet Nagar	Commissioned
2	NEB Extension	Commissioned
3	Daudpur	Commissioned
4	Transport Nagar	Commissioned
5	Subhash Nagar	Commissioned

6	NEB Housing Board	Commissioned
7	Bapu Nagar	Commissioned
8	Mansadevi – 18	Commissioned
9	South West Block Proposed	Commissioned
10	Lalkhan	Commissioned
11	Ladia	Commissioned
12	Akhepura	Commissioned
13	Jodha Patel	Commissioned
14	Pratap School	Remaining for Commissioning
15	South West Block Existing	Remaining for Commissioning
16	Kala Kuan Proposed	Remaining for Commissioning
17	Kala Kuan Old	Remaining for Commissioning
18	Kala Kuan RHB	Remaining for Commissioning
AEN - III		
1	Scheme 5	Commissioned
2	SMD Circle	Commissioned
3	Roopbas	Commissioned
4	Malviya Nagar	Commissioned
5	Shanti Kunj	Commissioned
6	Scheme 8 Proposed	Commissioned
7	Zanana	Commissioned
8	SonawaDoongri 44	Commissioned
9	Bank Colony	Ready for Commissioning
10	SonawaDoongri 39	Ready for Commissioning
11	Tej Mandi	Remaining for Commissioning
12	Manu Marg Housing Board	Remaining for Commissioning

List of Tubewells

S.No	Assistant Engineer	Junior Engineer	Area	Location of Tube well	Electric Load Applied (HP)	Connection of Electric Load (HP)	Electric Acc.	Year of Drilling	Agency of Drilling	Under guarantee or not	Discharge of TW (LPM)	Connected of CWR or D/R	Details of Pump set	water table	Total drilling Depth	M.S Casing Pipe	Remark
1		Priyanka od		Scheme No 2 Jubli Bas	10	15		2006		Not	110	Direct					
2		Priyanka od		Scheme No 2 Plot No 548	10	10		2009		Not		Direct					
3		Priyanka od		Scheme No 2 Plot No 208	10	15		2014		Not	100	Direct					
4		Priyanka od		Arodram Road	10	10		2018		Not	100	Direct					
5		Priyanka od		Scheme No 3 Family Line	10			2017		Not	100	Direct					
6		Priyanka od		Scheme No 3 P K jain	10	15		2012		Not	100	Direct					
7		Priyanka od		Scheme No 3 Galati bridge	10	10				Not	140	Direct					
8		Priyanka od		Scheme No 1 ram vatika	10	20		2004		Not	200	Direct					
9		Priyanka od		Scheme No 1 Kabootar park	10	15		2006		Not	100	Direct					
10		Priyanka od		Scheme No 1 Plot No 222	10	15		2014		Not	80	Direct					
11		Priyanka od		Jay Complex	10	15		2003		Not	70	Direct					
12		Priyanka od		Mahtab Singh ka Nohara Mandir ke samne	12.5			209		Not	90	Direct					
13		Priyanka od		kashi ram chouraha	10	15		2018		Not	80	Direct					
14		Priyanka od		Mahtab singh ka Nohara prem nagar	12.5	15		2009		Not	80	Direct					
15		Priyanka od		vikash path	12.5			2020		Not	200	Direct					
16		Priyanka od		Delhi gate inside	12.5	20				Not	200	Direct					
17		Priyanka od		Delhi gate chawand Padi	10			2022		guarentee	110	Direct					
18		Priyanka od		Meena padi	10	15		2009		Not	50	Direct					
19		Priyanka od		Meena Padi Godhula ke pass	10			2022		guarentee	93	Direct					
20		Priyanka od		Scheme 4 behind campus	12.5	12.5				Not	350	CWR					
21		Priyanka od		Scheme 4 plot no 25	12.5	20		2015		Not	300	CWR					
22		Priyanka od		Scheme 4 plot no 156	12.5	15		2014		Not	350	CWR					
23		Priyanka od		Colletrate gunni wala	10	20				Not	100	Direct					
24		Priyanka od		Colletrate OW	10	25				Not	100	Direct					
25		Priyanka od		Tulera TW-1	10			2016	M/s national	Not	150	CWR	KSB		300	250	



27		Priyanka od		Tulera TW 4	12.5			2017	M/S sini bore well	Not	200	CWR	KSB		600	350	
28		Priyanka od		Tulera TW 5	10			2017	M/s national	Not	110	CWR	KSB		500	250	
29		Priyanka od		Tulera TW 6 Amrut	7.5			2019	HP	guarentee	100	CWR	KSB		600	400	
30		Priyanka od		Tulera TW 11	12.5			2016	M/S sini Bore well	Not	180	CWR	KSB		700	350	
31		Priyanka od		Tulera TW 16	15			2016	M/S sini Bore well	Not	200	CWR	KSB		700	350	
33		Priyanka od		Tulera TW 16B Amrut	7.5			2019	HP	guarentee	100	CWR	KSB		700	350	
34		Priyanka od		Tulera TW 18 Amrut	7.5			2019	HP	guarentee	100	CWR	KSB		600	400	
35		Priyanka od		Tulera TW 24	10			2021	M/s national	guarentee	150	CWR	KSB		700	350	
36		Priyanka od		Karmchari colony railway Line	12.5			2016	M/s national	Not	100	CWR	KSB		600	500	
37		Priyanka od		Karmchari colony gulamba park	12.5			2017	M/S sini Bore well	Not	200	CWR	KSB		700	350	
38		Priyanka od		veersavarkar badhana park	10			2009	M/s national	Not	150	Direct	KSB		600	500	
39		Priyanka od		Garhi nauth hostel	7.5			2018	M/S Badhana	Not	100	CWR	KSB		700	500	
40		Yokesh Kumar		Laddu khas km bagichi	12.5			2010	M/S Badhana	Not	70	Direct	KSB				
41		Yokesh Kumar		Scheme No 10B	10			2013	M/S Vijay	Not	80	Direct	KSB				
42		Yokesh Kumar		Tibi samshan ghat	12.5			2013	M/S Badhana	Not	100	Direct	KSB				
43		Yokesh Kumar		Pratap pattan TW-1	10			2017	M/S sini Bore well	Not	80	Direct	KSB				
44		Yokesh Kumar		Pratap pattan TW-2	10			2021	M/s national	guarentee	150	CWR	KSB				
45		Yokesh Kumar		Pratap pattan TW-3	20			2021	M/s national	guarentee	160	Direct	KSB				
46		Yokesh Kumar		Deewan ji ka bagh	12.5			2010	M/s national	Not	70	Direct	KSB				
47		Yokesh Kumar		Reera school ke pass	17.5			2015	M/s national	Not	120	Direct	KSB				
48		Yokesh Kumar		T/W II Vijay nagar	15			2017	M/S Badhana	Not	160	CWR	Kirloskar				
49		Yokesh Kumar		vaid ji wala TW	20			2013	M/S Vijay	Not	180	CWR	KSB				
50		Yokesh Kumar		chakki wala TW	20			2017	M/S sini Bore well	Not	70	CWR	KSB				
51		Yokesh Kumar		National college Tw-1	20			2019	M/S Nehu	Not	180	CWR	KSB				
52		Yokesh Kumar		National college Tw-2	15			2015	M/s national	Not	180	CWR	KSB				
53		Yokesh Kumar		Plot No 566 vijay nagar	15			2013	M/S Vijay	Not	70	Direct	KSB				
54		Yokesh Kumar		chitra wala tw	15			2017	M/S sini Bore well	Not	75	Direct	KSB				
55		Yokesh Kumar		pragati hillattal ke pass	15			2012	M/S Vijay	Not	70	Direct	KSB				
56		Yokesh Kumar		shakti nagar TW-1	10			2019	M/s national	Not	100	Direct	KSB				
57		Yokesh Kumar		shakti nagar TW-2	15			2013	M/S Vijay	Not	110	Direct	KSB				

58		Yokesh Kumar		near CIC	15			2013	M/S Vijay	Not	30	Direct	KSB					
59		Yokesh Kumar		A block bar khowa	12.5			2012	M/S Vijay	Not		Direct	KSB					
60		Yokesh Kumar		A block ACD office	10			2017	M/S Radhaha	Not		Direct	KSB					
61		Yokesh Kumar		A block park	10			2017	M/S soni Bore well	Not		Direct	KSB					
62		Yokesh Kumar		C block mandir wala tw	15			2017	NTC	Not		Direct	KSB					
63		Yokesh Kumar		C block madhu kite wala tw	10			2012	M/S Vijay	Not		Direct	KSB					
64		Yokesh Kumar		C block railway line tw-1	15			2015	NTC	Not		Direct	KSB					
65		Yokesh Kumar		C block railway line tw-2	15			2015	NTC	Not		Direct	KSB					
66		Yokesh Kumar		C block thana wala	15			2012	M/S Vijay	Not		Direct	KSB					
67		Yokesh Kumar		B block made wala	10			2017	M/S soni Bore well	Not		CWR	KSB					
68		Yokesh Kumar		Vijay nagar TW-9	15			2017	M/S Vijay	Not		CWR	KSB					
69		Yokesh Kumar		Vijay nagar TW-2	21.5			2017	M/S Vijay	Not		CWR	KSB					
70		Yokesh Kumar		Vijay nagar TW-6	20			2016	NTC	Not		CWR	Kirloskar					
71		Yokesh Kumar		Vijay nagar TW-14	25			2016	NTC	Not		CWR	KSB					
72		Yokesh Kumar		Vijay nagar TW-11	15			2012	NTC	Not		CWR	KSB					
73		Yokesh Kumar		Vijay nagar TW-12	25			2013	NTC	Not		CWR	Kirloskar					
74		Yokesh Kumar		Vijay nagar TW-16	20			2013	M/S Vijay	Not		CWR	Kirloskar					
75		Yokesh Kumar		bulla bada TW	15			2000	M/S Radhana	Not		Direct	KSB					
76		Yokesh Kumar		C 651 budh vihar	20			2017	M/S soni Bore well	Not		Direct						
77		Yokesh Kumar		C block complex	20			2013	NTC	Not		Direct						
78		Yokesh Kumar		C block 656	20			2002	M/S Radhana	guarentee		Direct						
79		Yokesh Kumar		D block mandir	10			2012	M/S Vijay	Not		Direct						
80		Yokesh Kumar		D block community hall	25			2017	M/S Vijay	Not		Direct						
81		Yokesh Kumar		A block tawal wala tw	20			2017	M/S soni Bore well	Not		Direct						
82		Yokesh Kumar		A block GSS wala	10				NTC	Not		Direct						
83		Yokesh Kumar		A block park	10			2017	M/S soni Bore well	Not		Direct						
84		Yokesh Kumar		1 k shivalik park	20			2013	NTC	Not		Direct						
85		Yokesh Kumar		1E tatori wala tw	7.5			2013	M/S Vijay	Not		Direct						
86		Yokesh Kumar		2 k sabji mandi tw	10			2014	NTC	Not		Direct						
87		Yokesh Kumar		1 k ramleela ground	12.5			2015	NTC	Not		Direct						

88		Yokesh Kumar		3 k park	12.5					Not		Direct						
89		Yokesh Kumar		3 park new shivaki park	12.5					Not		Direct						
90		Yokesh Kumar		1 kh homo pathic tw	10			2012	M/S Vijay	Not		Direct						
91		Yokesh Kumar		5 k shivaji park	12.5					Not		Direct						
92		Yokesh Kumar		6 k shivaji park	15			2012	M/S Vijay	Not		Direct						
93		Yokesh Kumar		bhumi vikash bank	15					Not		Direct						

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QUESTIONNAIRE

1. What is the frequency of water that you receive? — दो-तीन दिन में इक बार
2. For what duration is the water supplied to your home? — 500-600 लीटर पानी (प्रति दिन 1 बार)
3. Is it enough to fulfil the daily requirements of your household? — पानी जरूरत के अनुसार आता है।
4. Are you satisfied with the quality of water received through the PHED water supply? हाँ।
5. Have you ever tried to get the water samples tested? नहीं।
6. If it is not enough, how do you meet the deficit requirement?
7. Do you call for tankers? If yes, from where? हाँ। साल में दो-तीन बार प्राइवेट टैंकर
8. What is the cost per tanker? 400
9. Have you ever lodged a grievance regarding water supply to the PHED? — नहीं
10. If yes, what was the issue? —
11. Was the complaint resolved to your satisfaction? —
12. How long did the resolution take? —
13. Do you have a water meter installed? — नहीं।
14. Is the meter functional? —

15. If it is not functional, how / you tried to get the issue addressed? ——

16. Are you satisfied with the billed amount that you receive? ——

17. Do you have a rainwater harvesting system in place? नहीं

18. Have you ever brought in any changes to your lifestyle in the last few years to save water? हां ड्रमों व बाल्टियों में एकत्रित करते हैं।

19. Do you use RO systems for water purification at home? नहीं

20. If yes, what do you do with the discharged water? ——

मुकेश कुमार चन्दीजा

(Name & Address)

पुराना भूणासिद्ध, अलवर (राज.)

QUESTIONNAIRE

1. What is the frequency of water that you receive? once in two days
2. For what duration is the water supplied to your home? 2 hours
3. Is it enough to fulfil the daily requirements of your household? yes
4. Are you satisfied with the quality of water received through the PHED water supply? yes
5. Have you ever tried to get the water samples tested? once
6. If it is not enough, how do you meet the deficit requirement? water tanker
7. Do you call for tankers? If yes, from where? yes, Roopbas
8. What is the cost per tanker? 500/ Rs
9. Have you ever lodged a grievance regarding water supply to the PHED? yes
10. If yes, what was the issue? not supply of water for 5 days and Pressure is quite less to lift
11. Was the complaint resolved to your satisfaction? yes
12. How long did the resolution take? one month (approx)
13. Do you have a water meter installed? yes
14. Is the meter functional? yes

15. If it is not functional, have you tried to get the issue redressed? NA

16. Are you satisfied with the billed amount that you receive? yes

17. Do you have a rainwater harvesting system in place? NO

18. Have you ever brought in any changes in your lifestyle in the last few years to save water? yes

19. Do you use RO systems for water purification at home? yes

20. If yes, what do you do with the discharged water? For Plants.

DR. PREENA SUDAN

(Name & Address)
347, SHANTI KUNJ
ALWAR [RAJ]

QUESTIONNAIRE

1. What is the frequency of water that you receive? Daily
2. For what duration is the water supplied to your home? 7:30 AM - 8:30 AM (1 Hour)
3. Is it enough to fulfil the daily requirements of your household? Yes
4. Are you satisfied with the quality of water received through the PHED water supply? Yes
5. Have you ever tried to get the water samples tested? No
6. If it is not enough, how do you meet the deficit requirement?
7. Do you call for tankers? If yes, from where? No
8. What is the cost per tanker?
9. Have you ever lodged a grievance regarding water supply to the PHED? No
10. If yes, what was the issue?
11. Was the complaint resolved to your satisfaction?
12. How long did the resolution take?
13. Do you have a water meter installed? Yes
14. Is the meter functional? Yes

15. If it is not functional, have you tried to get the issue redressed?

16. Are you satisfied with the billed amount that you receive? Yes

17. Do you have a rainwater harvesting system in place? NO

18. Have you ever brought in any changes to your lifestyle in the last few years to save water? Yes

19. Do you use RO systems for water purification at home? Yes

20. If yes, what do you do with the discharged water? Discharged water is used mostly for watering plants.

Jogendra Singh.

(Name & Address)

[Shishak Colony
Surya Nagar]

QUESTIONNAIRE

1. What is the frequency of water that you receive? ONCE IN TWO DAYS
2. For what duration is the water supplied to your home? 25 to 30 MIN.
3. Is it enough to fulfil the daily requirements of your household? NO
4. Are you satisfied with the quality of water received through the PHED water supply? NO
5. Have you ever tried to get the water samples tested? YES
6. If it is not enough, how do you meet the deficit requirement? TANKER
7. Do you call for tankers? If yes, from where? YES
8. What is the cost per tanker? VARIABLE ₹ 300 to 500
9. Have you ever lodged a grievance regarding water supply to the PHED? YES (VERBALLY)
10. If yes, what was the issue? INSUFFICIENT WATER SUPPLY
11. Was the complaint resolved to your satisfaction? NO
12. How long did the resolution take? NA
13. Do you have a water meter installed? YES
14. Is the meter functional? NO

15. If it is not functional, have you tried to get the issue redressed? NO

16. Are you satisfied with the billed amount that you receive? NO

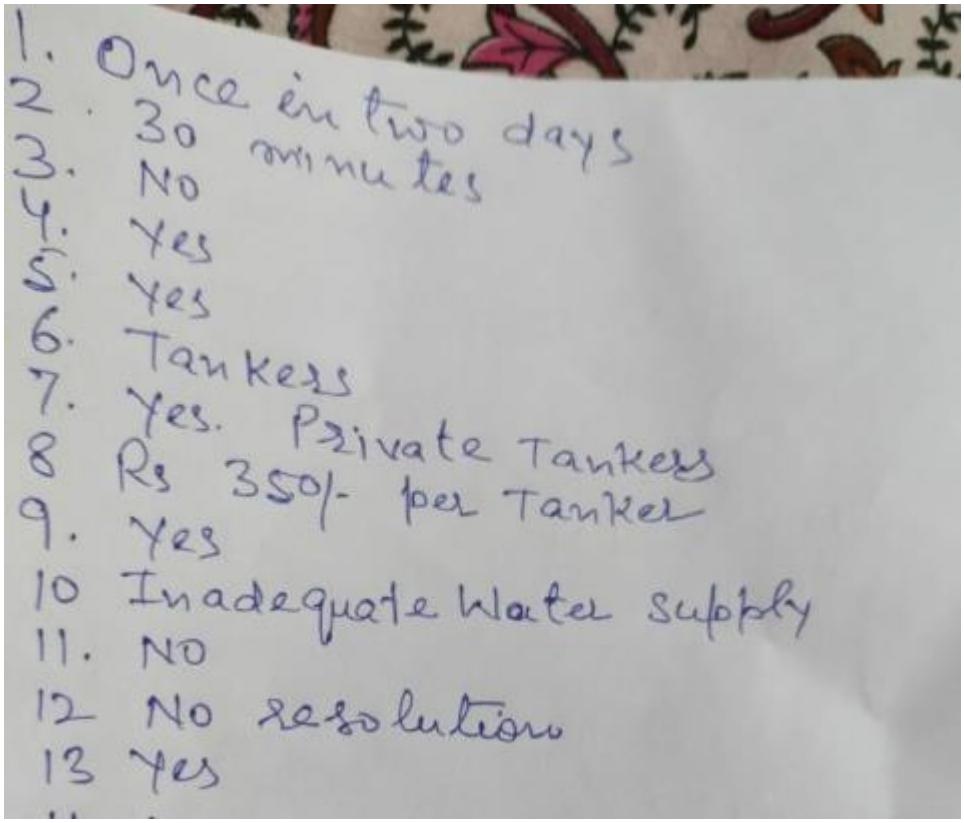
17. Do you have a rainwater harvesting system in place? NO

18. Have you ever brought in any changes to your lifestyle in the last few years to save water? YES

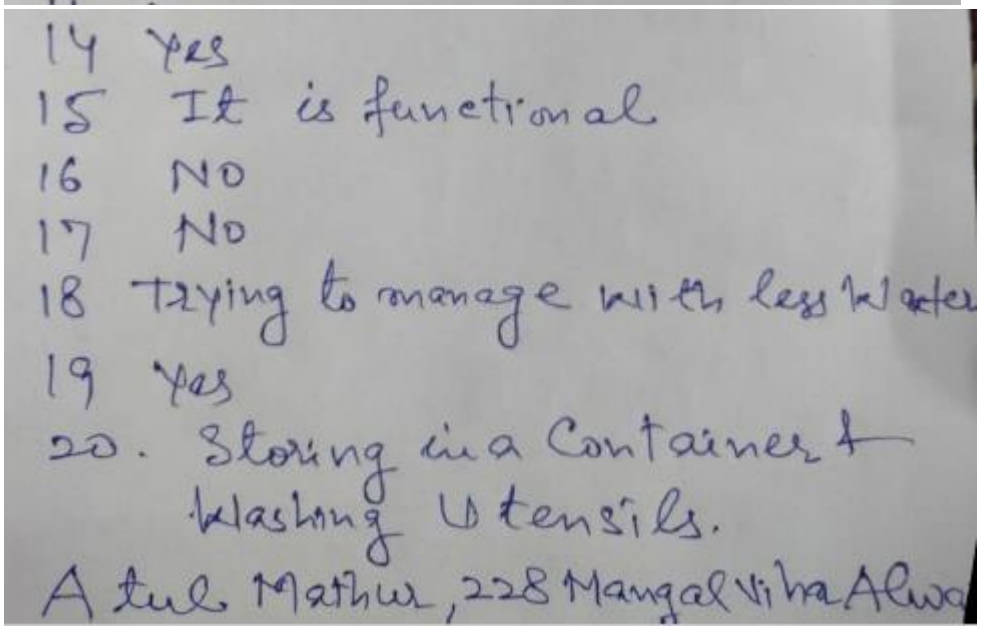
19. Do you use RO systems for water purification at home? YES

20. If yes, what do you do with the discharged water? CLEANING PURPOSE

VIVEK MISHRA
32, SHANT KUNJ
ALWAR
(Name & Address)



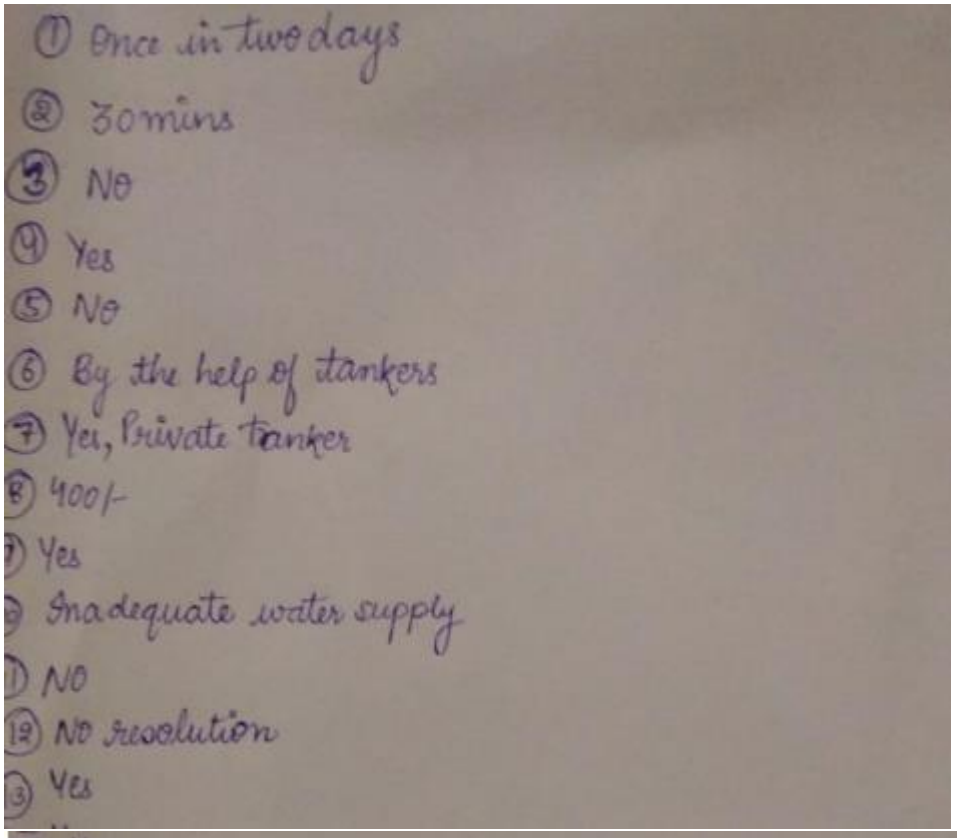
1. Once in two days
2. 30 minutes
3. No
4. Yes
5. Yes
6. Tankers
7. Yes. Private Tankers
8. Rs 350/- per Tanker
9. Yes
10. Inadequate Water supply
11. NO
12. No resolution
13. Yes

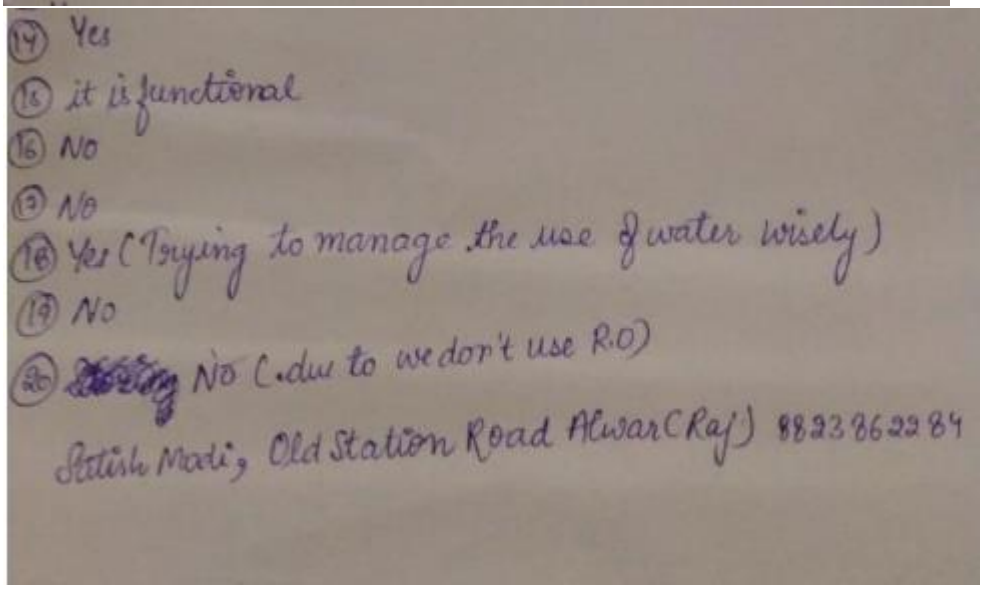


14. Yes
15. It is functional
16. NO
17. No
18. Trying to manage with less Water
19. Yes
20. Storing in a Container for washing Utensils.

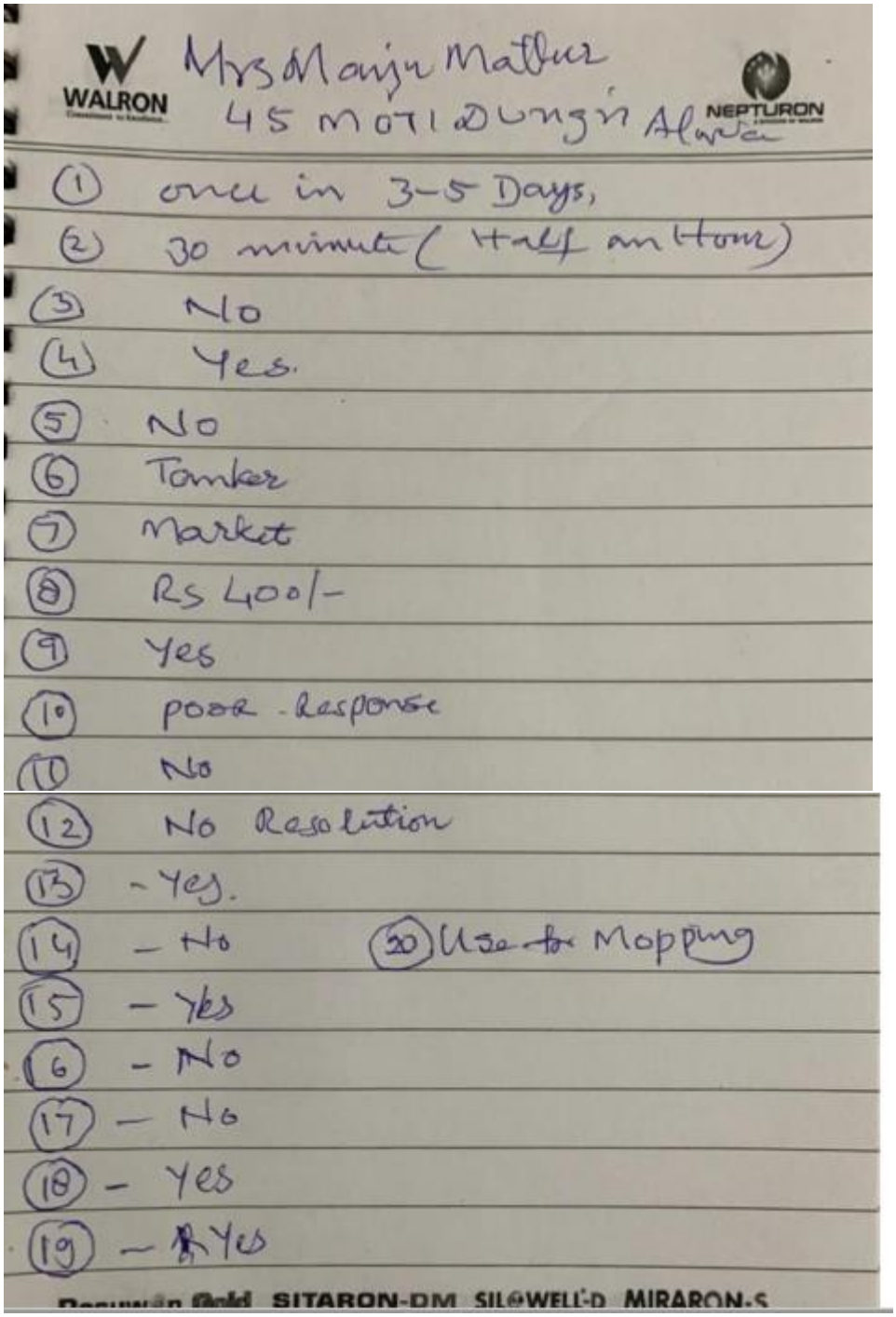
Atul Mathur, 228 Mangal Vihar Alwar

1. Alternate days.
2. 45 min.
3. No, it is not enough to fulfill the daily req. of our households.
4. Yes.
5. No.
6. By Tankers.
7. By nearby suppliers.
8. ₹300 to 350 per tanker
9. Yes
10. Insufficient water supply.
11. No.
12. It will be resolved when the government and its officials will be keen to take step forward.
13. Yes
14. Yes
15. It is functional
16. Yes
17. No
18. Yes
19. Yes
20. For cleaning up utensils.


① Once in two days
② 30 mins
③ No
④ Yes
⑤ No
⑥ By the help of tankers
⑦ Yes, Private tanker
⑧ 400/-
⑨ Yes
⑩ Inadequate water supply
⑪ NO
⑫ No resolution
⑬ Yes


⑭ Yes
⑮ it is functional
⑯ No
⑰ No
⑱ Yes (Trying to manage the use of water wisely)
⑲ No
⑳ No (due to we don't use R.O)

Satish Modi, Old Station Road Alwar (Raj) 8823862284



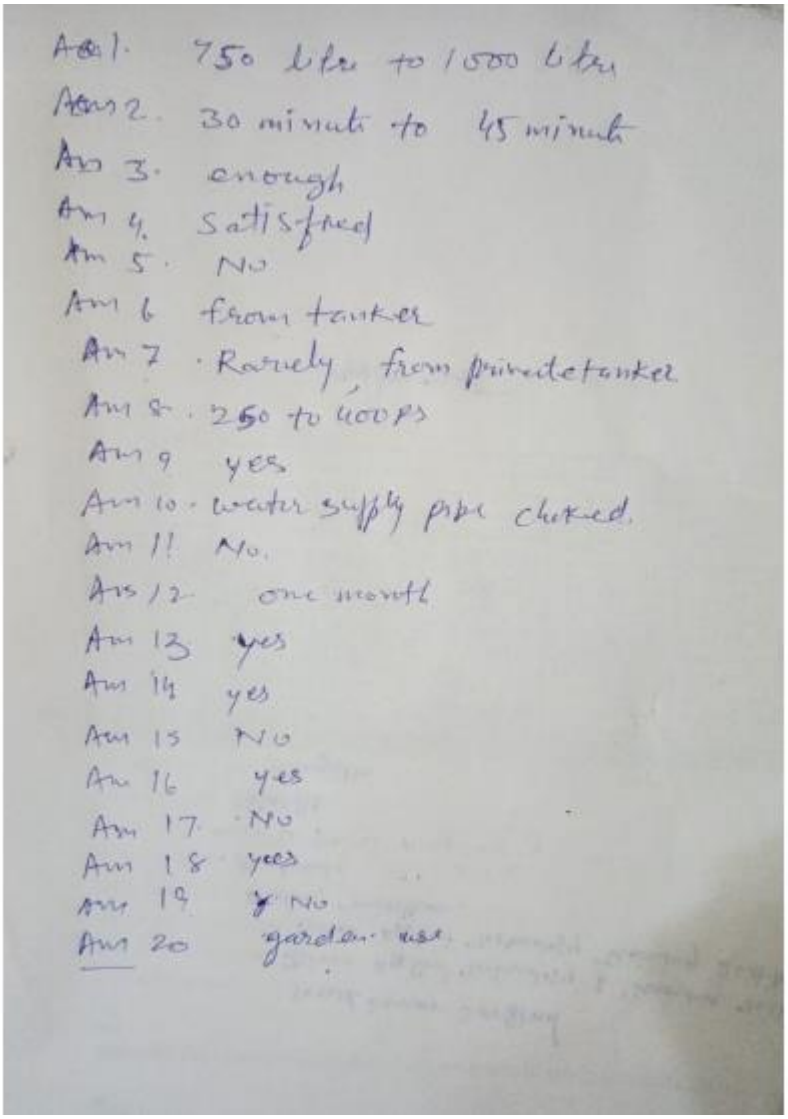
WALRON

Mrs Manju Mathur
45 Motidungri Alwar

NEPTURON

(1) once in 3-5 Days,
(2) 30 minute (Half an Hour)
(3) No
(4) Yes.
(5) No
(6) Tanker
(7) Market
(8) Rs 400/-
(9) Yes
(10) poor Response
(11) No
(12) No Resolution
(13) - Yes.
(14) - No (20) Use for Mopping
(15) - Yes
(16) - No
(17) - No
(18) - Yes
(19) - Yes

SITARON-DM SILOWELL-D MIRARON-S



Ans 1. 750 ltrs to 1500 ltrs
Ans 2. 30 minute to 45 minute
Ans 3. enough
Ans 4. Satisfied
Ans 5. No
Ans 6 from tanker
Ans 7. Rarely from privatetanker
Ans 8. 250 to 400 Rs
Ans 9 yes
Ans 10. water supply pipe choked.
Ans 11 No.
Ans 12 one month
Ans 13 yes
Ans 14 yes
Ans 15 No
Ans 16 yes
Ans 17 No
Ans 18 yes
Ans 19 No
Ans 20 garden use

QUESTIONNAIRE

1. What is the frequency of water that you receive? 2 - 3 Times in a month
2. For what duration is the water supplied to your home? Max 10 Minutes
3. Is it enough to fulfil the daily requirements of your household? No
4. Are you satisfied with the quality of water received through the PHED water supply? No
5. Have you ever tried to get the water samples tested? No
6. If it is not enough, how do you meet the deficit requirement? By Tankers
7. Do you call for tankers? If yes, from where? yes from Private Person.
8. What is the cost per tanker? 400- 450
9. Have you ever lodged a grievance regarding water supply to the PHED? yes
10. If yes, what was the issue? Regarding not getting of water
11. Was the complaint resolved to your satisfaction? No
12. How long did the resolution take? yet not
13. Do you have a water meter installed? yes
14. Is the meter Functional? yes.

15. If it is not functional, have you tried to get the issue redressed? —

16. Are you satisfied with the billed amount that you receive? yes

17. Do you have a rainwater harvesting system in place? No

18. Have you ever brought in any changes to your lifestyle in the last few years to save water? yes

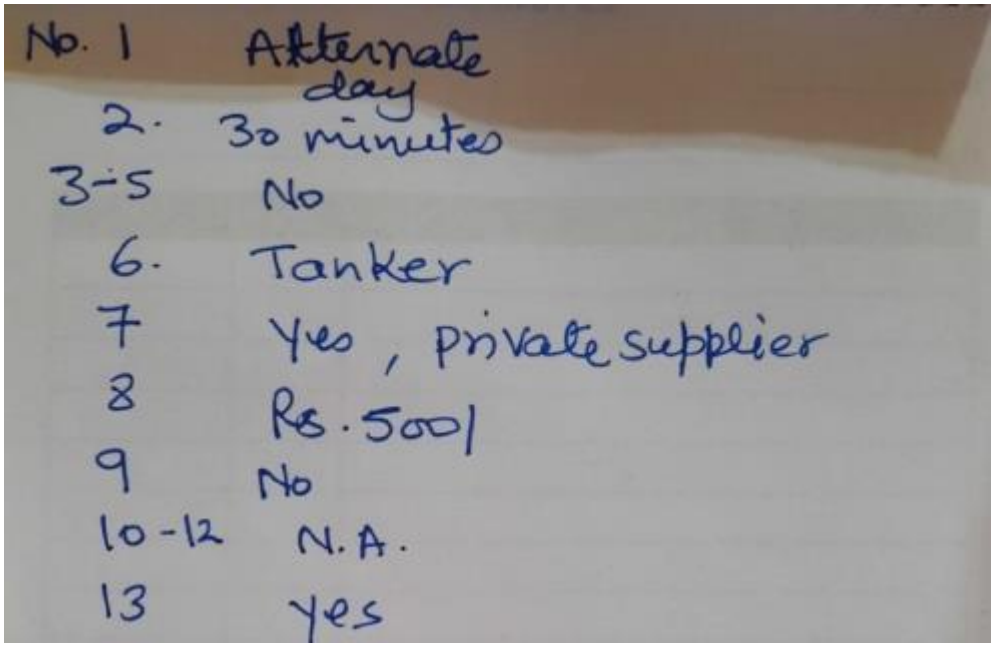
19. Do you use RO systems for water purification at home? yes

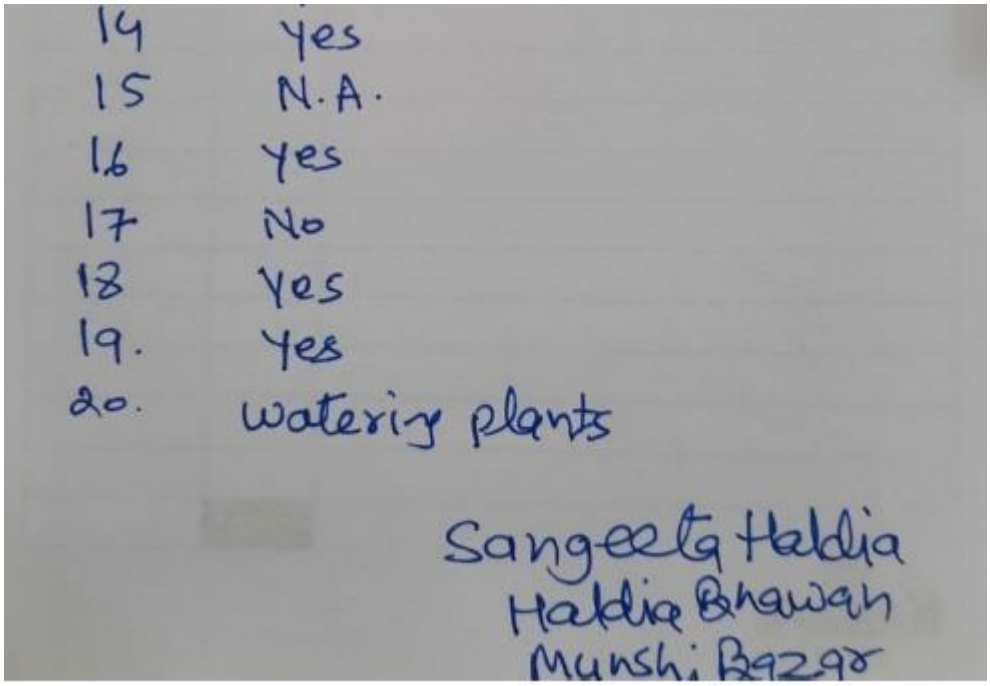
20. If yes, what do you do with the discharged water? for water cut plant & Cleaning House.

Ramesh Thevje
233 Lajpat Nagar

(Name & Address)

Alwar




14 Yes
15 N.A.
16 Yes
17 No
18 Yes
19. Yes
20. watering plants

Sangeeta Haldia
Haldia Bhawan
Munshi Bazar

Q-1 = Once in 3 (Three) Days.

Q 2 = Nearly 30 minutes.

Q 3 = NO

Q 4 = NOT DURING RAINY SEASON

Q. 5 = NO

Q. 6 = SUPPLY BY TANKERS (PRIVATE)

Q. 7 = YES, FROM SATYANTA VILLAGE

Q. 8 = Rs. 700/-

Q. 9 = NOT ABOUT FREQUENCY.
YES. ABOUT DIRTY WATER SUPPLY

Q. 10 - N A ← DIRTY WATER SUPPLY.

Q - 11 - ~~N/A~~ YES

Q - 12 - 3 DAYS.

Q - 13 - NO

Q - 14 - NA

Q - 15 - NA

Q - 16 - NO

Q - 17 - YES

Q - 18 - YES.

Q - 19 - YES.

Q - 20 - WASHING, MOPPING.

NAME - DR AVADH AGARWAL

QUESTIONNAIRE

1. What is the frequency of water that you receive? Alternate day.
2. For what duration is the water supplied to your home? Alternate day at morning 8 to 10 Am.
3. Is it enough to fulfil the daily requirements of your household? YES
4. Are you satisfied with the quality of water received through the PHED water supply? YES
5. Have you ever tried to get the water samples tested? NO
6. If it is not enough, how do you meet the deficit requirement? No need
7. Do you call for tankers? If yes, from where? NO
8. What is the cost per tanker? About 3000 Rs per tanker.
9. Have you ever lodged a grievance regarding water supply to the PHED? NO
10. If yes, what was the issue? N/A.
11. Was the complaint resolved to your satisfaction? N. A.
12. How long did the resolution take? —N. A—
13. Do you have a water meter installed? YES
14. Is the meter functional? NO

15. If it is not functional, have you tried to get the issue redressed? YES, called many time

16. Are you satisfied with the billed amount that you receive? YES

17. Do you have a rainwater harvesting system in place? YES

18. Have you ever brought in any changes to your lifestyle in the last few years to save water? NO

19. Do you use RO systems for water purification at home? YES

20. If yes, what do you do with the discharged water? Some times water to plants some time to use for clearing floor. and some it became waste.

Yogesh Kumar Sharma
(Name & Address) D.O. LIC
A-7, LAXMI NAGAR
ALWAR
9667918430

1. What is the frequency of water that you receive? एक दिन छोड़कर

2. For what duration is the water supplied to your home? ½ hours

3. Is it enough to fulfil the daily requirements of your household? No

4. Are you satisfied with the quality of water received through the PHED water supply? ok

5. Have you ever tried to get the water samples tested? No

6. If it is not enough, how do you meet the deficit requirement? Tanker

7. Do you call for tankers? If yes, from where? own arrangement

8. What is the cost per tanker? Rs. 350 से 400 तक

9. Have you ever lodged a grievance regarding water supply to the PHED? No

10. If yes, what was the issue? N.A.

11. Was the complaint resolved to your satisfaction? N.A.

12. How long did the resolution take? N.A

13. Do you have a water meter installed? yes

14. Is the meter functional? yes

15. If it is not functional, have you tried to get the issue redressed? N.A

16. Are you satisfied with the billed amount that you receive? NO

17. Do you have a rainwater harvesting system in place? No

18. Have you ever brought in any changes to your lifestyle in the last few years to save water? Yes, Collect rain water in bucket and Drums

19. Do you use RO systems for water purification at home? No

20. If yes, what do you do with the discharged water? N.A

(Name & Address)
Manoj Kumar Gupta
5/230, Kala Kuan, Alwar