



“Accessibility Of Drinking Water And Its Management In Sawai Madhopur District, Rajasthan: A Scientific Evaluation”

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Abstract: -

It is expected that till 2025 almost 70% rise may be observed in the total water demand of drinking water in India, due to this aspect huge demand supply gap issue can increase in coming years. economic growth of the country has been impacted poorly by this issue. another major concern of the country is depletion of ground water. Qualitative and Quantitative supply of water is required in the rural and urban area for irrigation as well as for maintaining health of human and other animals. Pure and germ-free water is helpful in awarding of various water borne diseases.

Mass population of Sawai Madhopur district depend on surface water for domestic uses and irrigation. The increase in human population and agricultural land has led to over exploitation of water resources. The present research work focuses on the sources of water and assessment of quality of water in Sawai Madhopur district, Rajasthan.

Keyword: water demand, germ free water, water resource, domestic uses.

Introduction: -

The major source of water includes various water reservoirs such as river, lakes, ponds and ground water. Due to industrialization and over use of fertilizers, the quality of water has become very poor. Industries are releasing toxic chemicals into water reservoirs, which is making water unfit for drinking and irrigation. Fertilizers applied in the crop fields are carried out by rain water in to water resources, spoiling the quality of water excessive use of water has led to decline in ground water level, which is serious concern for the human population. In 2022, “Ground Water: Making the invisible visible” comprise information about the world water development report of United nation. challenge and opportunities of managing and governing ground water has been described in these reports around the world (Sonwal 2019). it is important for people to maintain universal access of water sanitation and hygiene in 2030 sustainable development goal.

Development of sanitation management is considered as an effective strategic insight that can contribute in improving quality of ground and surface water. Filtration of

sewage and excreta contamination with ground water has been maintained by this method. Majority of cities in India and villages, has ground water polluted with fluorides, nitrate, pesticides etc. beyond the safety limit. Water born and water related diseases are on the rise as it harbors various infectious species of bacteria, as well as home of mosquitoes as per world health organization (WHO) 80% of diseases worldwide are water born. The recent report reveals water borne diseases in rural area was 22.5% and in urban area it was 12.2% (BMC Public health 2022, Pradeep Kumar).

Objective of the study

- To evaluate proper strategy to ensure ground water preservation in Sawai Madhopur, Rajasthan
- To identify involvement of state and central government in water sanitation in Sawai Madhopur.
- To explore the proper way to improve water availability in Sawai Madhopur, Rajasthan.

Hypothesis of the study

H1: government need to be involved in managing the water supply and demand of water in Sawai Madhopur.

H2: Demand and supply of water and sanitation of water maintained by different policies of state and central government.

Study Area

Data for the research work was collected from six different blocks of Sawai Madhopur district. 2011 census helps to learn that urban population of Sawai Madhopur is almost 1.21 lakhs and 1.19 lakhs of Gangapur city (Gautam 2019). The rain fall mostly occurs during monsoon period, the average rainfall in the city is about 664mm. the climate of the city ranges from semi-arid to subhumid type. Different kinds of climate are also involved in this case. The maximum temperature recorded in the city is 40°C whereas the minimum temperature recorded is 10°C the major rivers of the city. The overall ground water builds up of the district is 134.55 percent (Kumari 2015) and the district is considered as over exploited.

Results and Discussion:

Availability of drinking water in the Sawai Madhopur district: The major source of hand pumps, open well, and tube well are three major source of drinking water in this study area. In Sawai Madhopur and Gangapur city has highest number of hand pump in compare to other urban area. In the rural area maximum number of hand pumps are reported from Bonli block. The maximum number of tubewells were found to be established in Sawai Madhopur district. The Date pertaining to source of water is tabulated in table 1.

Table No. 01 Drinking Water Sources

S.No.	Block/City	Source of drinking water				Working Drinking Water Source			
		TW	OW	SP	HP	TW	OW	SP	HP
1	UWSS Sawai Madhopur	107	4	151	465	107	4	151	368
2	UWSS Gangapur City	49	4	46	290	49	3	48	262
3	Sawai Madhopur	62	1	588	1149	46	1	541	617
4	Khandar	66	1	436	1063	65	1	438	656
5	Bonli	75	9	62	2933	39	10	55	2647
6	Chauth Ka Barwada	59	10	301	1104	57	9	271	503
7	Gangapur	84	14	156	2018	84	14	144	1483
8	Bamanwas	75	3	81	1850	76	2	79	1731
Total		577	46	1821	10872	523	44	1727	8307

Source: PHED Sawai Madhopur

TW: Tubewell

SP: Single Phase OW:

Openwell

HP: Handpump

The availability of ground water in Sawai Madhapur district is variable and it depend on hydrological conditions. Ground water is mostly exploited for agricultural purposes and domestic uses. Dhingra and Singh (2014) stated that, due to poor rain fall, the people of district heavily depend on ground water for agricultural and domestic uses. The annual ground water storage has been evaluated to be 490.06 MCM, whereas annual use of water was calculated to be 449.82 MCM due to over consumption of water for farming and domestic, uses the city is rated as over exploited the data related to covering of safe drinking water in rural areas, is calculated in terms of fully covered habitations, partially covered habitations and quality affected habitations. 40 liters per capital water requirement is noticed in the case of fully habitat region. On the other hand, less than 40 liters per capita per day water requirement is noticed in partially habitat. The quality affected habitations refer to chemically contaminated water. The data has been represented in table 2.

Table 02: Status Drinking Water Supply 2022-2023 in Rural Habitat

S.No.	Category	Total	Total Population (in lacks)	Having Population PWS	Not having Population PWS
1	Total No Of. Habitation	2180	10.92	402	6.89
2	No of Fully Coverd Habitations	1599	6.75	267	4.09

3	No. of Partially Covered Habitations	523	3.54	0.93	2.67
4	No. Of Quality Affected Habitations	63	0.64	0.47	0.9

Source:

NRDWR

Ground water quality:

Physical and chemical parameter are involved in maintaining quality of water. The physical parameter includes color, odour, and turbidity the chemical parameter comprises the various types of chemical constituent present in water. Chemically contaminated water, has greater impact on public health various pathological conditions are related to unhygienic and unsafe born disease includes cholera, typhoid, diarrhea, hepatitis etc. Bureau of Indian Standard is able to conduct effective research that helps to learn that 10500, 2012 is consider as the standard limit for drinking water. Below table helps to learn about the permissible and acceptable limit of drinking water (Alan et al. 2000).

Table: 03 Standard of drinking water

S. No.	Parameter	Desirable Limit	Permissible Limit	Unit
1	PH	6.6 - 8.6	-	mg/l
2	Chloride	251	1000	mg/l
3	Total Alkalinity	202	600	mg/l
4	Total Dissolved Solid	503	2000	mg/l
5	Total hardness	204	600	mg/l
6	Fluoride	1.05	1.5	mg/l
7	Iron	0.4	No Relaxation	mg/l
8	Calcium	76	200	mg/l
9	Magnesium	31	100	mg/l
10	Sulphate	202	400	mg/l
11	Nitrate	47	No Relaxation	mg/l

Source: BIS

In rural area of the study area common contaminants of drinking water is Oxides of nitrogen in the form of nitrates (NO_3^-). There is severe consequence of nitrate rich drinking water as it results in methemoglobinemia in the bottled milk feeding infants. The desirable limit of NO_3^- prescribed by the bureau of Indian standard is 45mg/l, where on the upper limit of NO_3^- in drinking water has not been fixed. Excess of fluoride in water, causes fluorosis leading to deformation of teeth and tooth decay (Brindha et al. 2013). The prescribed fluoride limit has been set to 1.0mg/l and 1.5 mg/l by the Bureau of Indian Standard (BIS). The sum total of cations and anions present in drinking water is referred to as TDS

(Standard for total dissolved solid). TDS corresponds to ion complexes such as carbonate (CO_3^{2-}), bicarbonates (HCO_3^-), chloride (Cl^-), phosphate (PO_4^{3-}), nitrate (NO_3^-) and sulphates (SO_4^{2-}), Ca^{+2} , Mg^{+2} , Na & K. higher concentration of these metallic salts causes various anomalies in human being. The prescribed and desired limit of TDS has been set to 500 mg/l and 2000 mg/l respectively by Bureau of India Standard.

The major habitations of the Sawai Madhopur district are affected by poor quality of drinking water, which comprises Gangapur 150 habitations, Bonli-110 habitations, Bamanwas 82 habitations. The blocks of the city, which are severely affected includes Gangapur, Chauth ka Barwada and Bamanwas. Nitrate contamination are reported in Bonli, Chauth ka Barwada and Gangapur City TDS affected block of the city includes Bamanwas, Bonli and Gangapur (Meena et al. 2016). Iron contamination were not reported in all the 6 Block, which were chooses for drinking water analysis. The analytical data is shown in table 4.

Table No. 04 Quality testing of water in Sawai Madhopur district

S.No	Block	No of Sources (8/11/2022)	No. of Public Taks as on (18/11/2022)	No. of Source of found Contaminated (above IS-10500 Permissible Limit)						No. of Habs Affecte d
				Arseni c (As)	F	NO- 3S	TD	F e t	Bac t	
1	Chauth Ka Barwada	3180	40	0	102	141	59	0	0	57
2	Bamanwas	4569	25	0	172	117	137	0	0	76
4	Gangapur	3630	157	0	183	197	111	0	0	144
5	Bonli	5193	92	0	253	217	148	0	0	105
6	Sawai Madhopur	3183	119	0	14	82	7	0	0	42
7	Khandar	2275	53	0	23	73	6	0	0	44
8	Total	19030	486	0	74	827	468	0	0	468

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Source: NRDWR

Government actions/Initiatives:

Pure, safe and contaminants free drinking water is required to maintain public health. Quality drinking water keeps away the infants, and adults from various water borne diseases. Providing pure and high-quality drinking water towards the people of rural and urban area is consider as a main and potential responsibility of government. Many initiatives have been taken by the central government and state government to provide safe and pure drinking to the people of rural and urban areas (Sharda et al. 2017). Following and implementation of The Exhaustive Scheme can play a pivotal role in providing healthy and pure drinking water to people. Report of Niti Ayog, CWMI helps to learn that only 44% drinking water supply is noticed in rural and urban area of Rajasthan.

This state is involved in implementing tremendous strategies to improve respiration of water. Beyond this, the government of Rajasthan, has improved irrigation condition by restoring and excelling water management by community through developing ponds and tanks. The Mukhayanmantri Jal Swavlamban Abhiyan (MUSA) is also involved in maintaining restoration of surface water. The step was taken to solve the problems related to scarcity by of water by reconstruction multiple water bodies. Following the MUSA-I phase, there is an Average rise of 4.66 feet in water table in 21 rah desert districts. In this region almost 64% rejuvenation of defunct hand pump is noticed and 56.13% present reduction of water supply is also noticed here.

Isarda Dam project of state government can confirm sustainable water supply to 3.36 million people of this district and its nearby also. Saurabh et al. (2014) stated that, this will Solve the water shortage in the area for domestic and agricultural demands. Rajasthan government can fulfil water requirement for drinking and irrigation in 13 districts by using the eastern Rajasthan canal project. The ERCP is committed to maintain supply of water in Bundi, Sawai Madhopur, Kota, Ajmer, Tonk, Baran, Jaipur, Dausa, Karauli, Jhalwar, Alwar, Bharatpur. And Dholpur districts.

Water supply project of Chambal-Sawai Madhopur-Nadauti is improved by state government for better supply of water. Four town including Gangapur, Karauli, Todabhim and Sawai-Madhopur and 926 villages are able to utilise this facility of water supply. There are many districts who are suffered due to huge contamination of ground water, few most common contaminants are chlorides, nitrates and other solid contaminants. This scheme was further intended to 112 inspirational districts identified by NITI-AYOG. Atal Bhujal Yojna has been con ducted by the central government that maintain stressed region of ground water and maintain quality of water with the help of World Bank. As per the report, it was found that 1034 blocks out of the 6584-block analyzed in the country are over exploited, which includes 164 blocks from Rajasthan. Almost 1592 water depleted blocs, water conservation process is conducted with the involvements of The Jal Shakti Abhiyan. Five major water conservation initiatives are conducted in 256 districts (Saini and Khan

2014). This is a time bound scheme for the restoration and conservation of water. The Jal Jeevan mission is an effective initiative which operated by central government for increasing accessibility of water. Purification and filtration of drinking water through connection with household by 2024 is main goal of this initiative.

Conclusion:-

Efforts are needed to maintain adequate supply of drinking water for cultivation to the people of the state. Restoration of water, resources and contaminants free water is required for healthy population to yield agricultural crops.

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