

ANALYZE THE DRINKING WATER QUALITY AND ITS MANAGEMENT IN RURAL HARYANA: A CASE STUDY OF JIND DISTRICT

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Abstract: Water is an essential component for all living beings. Additionally, it is unimaginable to think of Earth without water. The chemical name of water is H_2O . Water is made up of two atoms of hydrogen and one atom of oxygen. Water availability on earth's surface is 70 percent. For this reason, the earth is called the "**BLUE PLANET**" (Mark R., 2009). The water available on the earth is taken as 100 units. Out of this, 97.5 percent water is found in the oceans. 1.5 percent of water is found in polar ice, and only 1 percent of water is found in the form of rivers, lakes and underground water. Only 3 percent of the water on earth is present in the form of fresh water. Therefore, due to less availability of fresh and clean water on the earth, the problem of water scarcity has started emerging in various areas. As a result, conserving water becomes a far more important step in finding a solution. Under this research work, information related to water resource management in rural areas of the JIND district of Haryana state has been displayed. Under which water sources are available in rural areas of the district, the quality of drinking water, the utility of water in various works, implemented schemes, and water conservation methods related to water conservation in the district have been demonstrated. This research work has been completed based on primary and secondary data. Under this research work, primary data has been collected by random sampling of rural areas of JIND district and secondary data has been gathered from a variety of sources, including magazines, books, research papers, etc. In this manner, information about water conservation in rural areas of the JIND district that was gathered from primary and secondary sources has been described scientifically. As a result, the rural residents of the JIND district are well-versed in water conservation information, and they practice water saving techniques. This research study contributes to the scientific understanding of the data pertaining to the district's rural water resource management.

Key word: Water Conservation, Ground Water, Drinking Water, Scheme, Rainwater, Water Resource, Management.

Introduction

On the surface of the world, water is a precious natural resource. It is commonly referred to as Water, Neer, Pani, Jal, and so on. All living being depend on water for survival. Although there is an abundance of water on the earth, there is a severe shortage of potable water. In general, there are two definitions of water on Earth: terrestrial water and Earth's water. In the modern era, humans have greatly increased their consumption of water to fulfil their developmental activities. Due to this increased water demand, a water crisis has begun to develop in several parts of the world. This is an international issue. India is another of these important nations. To resolve the issue of the water crisis on the surface of the world and to preserve life, water conservation is crucial. This research project includes a thorough examination of the Jind district's water resource management practices. Haryana is the state where this district is located. Several water sources, including the government water system, tube wells, head pumps, and camper systems, are used to provide drinking water in the district's rural sections. The public water system provides service to 65 percent of the population in the district's rural sections. Both fresh and salty water are available in the district's rural sections (Garg V.K., 2009).

Most residents of the district's rural sections use more than 500 litres of water each day, according to research (Table 3). Rainwater harvesting is only done in very tiny amounts by the locals in the district's rural sections. Most of this rainwater is utilised to recharge inverter batteries (Table 4). The summer months bring about a water shortage in the district's rural sections, which has a significant effect on both people and animals. In addition, the district's rural areas were used to gather data on practical water saving techniques. Considering this, it can be stated that rural residents are well-informed on water conservation, and they employ these strategies as well. To encourage water conservation in Jind district's rural areas, the administration has put in place a number of programmes. In which prominently features "Jal Gram Yojana" and "Har Ghar Jal Yojana" (Table 5). Consequently, employing practical water conservation techniques can help to alleviate water-related issues in rural areas. In this manner, the research work offers scientific and analytical data pertaining to the water resource management practised in Jind district's rural areas.

Study Area

Jind is the largest and oldest district located in the north of Haryana state in India. Jind district extends between 29.32°N to 76.32°E in the Haryana state. The geographical area of Jind district is 2709 square kilometer. The average elevation of district is 227 meters (744 feet) above sea level. It is administrative headquarter of Jind district. The primary tourist attraction and significant religious sites in the Jind district include Rani Talab, Pandu Pindara, And Ramrai. Hisar Division, which was established in 1966, includes Jind District. Hisar and Fatehabad form the district's western and northern borders, respectively, as do Kaithal and Karnal. Sonapat, Panipat, and Rohtak are in the Jind district's east and south, respectively. In the Jind district, there is 515 mm of rain per year on average. Rainfall in the Jind district rises from west to east. The Jind district receives roughly 77 percent of its annual precipitation during the south-west monsoon. The average low temperature in the Jind district is 6 °C in January, and the average high temperature is 41 °C in June. Jind district has a total population of 13,34,152, according to the 2011 census. The region that speaks Hindi includes the Jind district (Census Handbook, 2011).

Objective

- To analyse the various water sources in the target area.
- To evaluate the drinking water quality in the study region.
- To suggest the useful methods of water conservation research area.

Research Methodology

This research study has been completed on primary and secondary data have both been used analytically in this study project. In the Jind district's rural districts, primary data were gathered through interviews with a structured questionnaire employing a random sample technique. A total of 400 households in six villages (Nandgarh, Ponkeri Kheri, Padana, Ikkas, Barsola, and Pahlwa) in the Jind district provided the primary data. In addition, secondary information about the management of water resources in rural Jind district areas has been gathered from a variety of sources, including books, periodicals, and research papers that have been published. The information gleaned from the accessible primary and secondary sources was then analytically examined. As a result, these processed data have been used to convey the findings of study linked to water resource management in rural areas of Jind district utilising a variety of research methodologies.

Table 01: Various Sources of Drinking Water

#	Sources	Percentage
1	Govt. supply	65.01
2	Hand Pump	51.36
3	Tube wells	29.78
4	Campers	15.38
5	Private Tap	1.24
6	Tanker	0.74
7	Wells	0.25

Source: Personal Survey, 2021

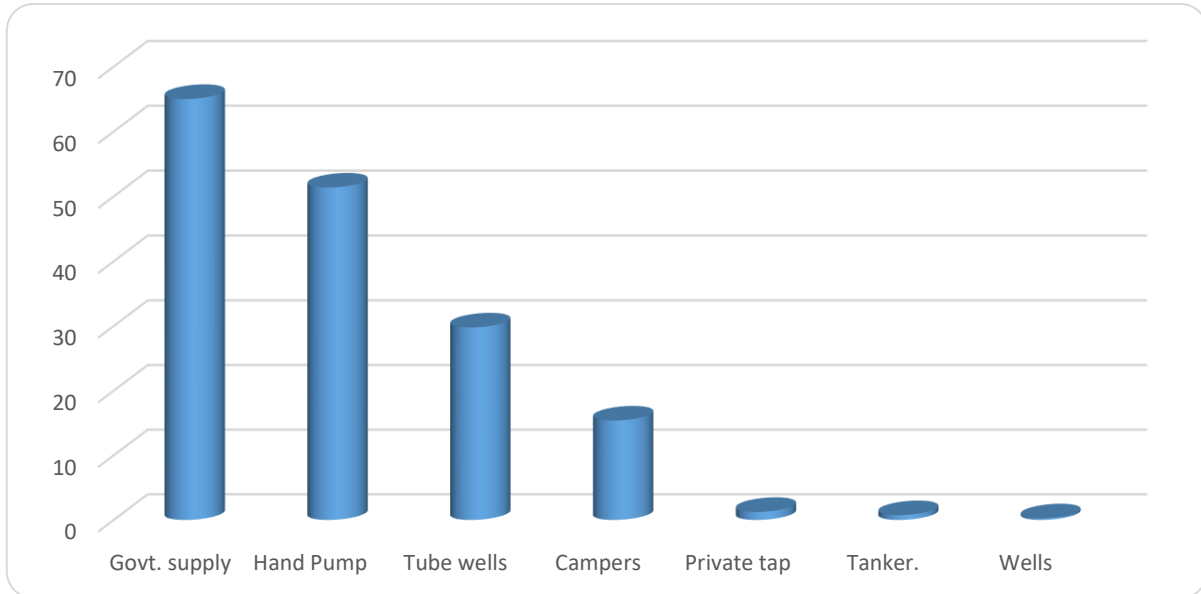
Numerous water sources in Jind district's rural areas supply all the water needed. These water sources mostly include government water supplies, hand pumps, tube wells, camper supplies, private taps, tanks, and wells. This study discovered that 65 percent of residents in the district's rural sections receive drinkable water from the public water system. 51.36 percent of people use hand pumps to get access to potable water. For potable water, 15.38 percent of campers and 29.78 percent of tube wells, respectively, are used in the district's rural areas. This means that in addition to these water sources, 0.25 percent of people also obtain drinkable water from wells, 1.24 percent from private taps, and 0.74 percent from tankers. These water sources in the rural parts of Jind district so meet the needs of the populace for water. In conclusion, it can be claimed that many inhabitants in the district's rural areas obtain potable water from the public water supply system. In addition to this, additional water sources also provide for the requirements of those living in rural areas. (Table 1).

Table 02: Quality of Drinking Water

#	Quality Type	Percentage
1	Salty	58.06
2	Acidic	0.74
3	Chemical	1.24
4	Pure	39.95
5	Total	100

Source: Personal Survey, 2021

Figure 01: Sources of Drinking Water



On earth, water comes in a variety of forms. Due to growing pollution brought on by both natural and human influences, water quality is declining in rural regions. In the district's rural sections, 58.06 percent of residents have access to salt-contaminated drinkable water. In their rural communities, 39.95 percent of the residents claim that there is pure drinking water available. According to 1.24 percent of the populace, their rural location has access to potable water in a chemical state. The acidic quality of the drinkable water in their rural region has also been reported, albeit only by 0.74 percent of the population. This leads to the conclusion that many Jind district's rural communities have drinking water that is salty in nature. (Table 02).

Table 03: Daily Consumption of Water in Household

Home			Animal		
#	Water (Ltr.)	Percentage	#	Water (Ltr.)	Percentage
1	Below 250	5.46	1	Below 250	1.42
2	250-500	18.61	2	250-500	15.34
3	500 above	75.93	3	500 above	83.24
4	Total	100	4	Total	100

Source: Personal Survey, 2021

The amount of water used for home purposes and for raising animals differs in the rural parts of Jind district. The spread of contemporary facilities in rural areas is accompanied by an increase in water demand. 75.93 percent of homes in the district's rural areas use more than 500 litres of water each month for household needs, compared to 18.61 percent of households that use between 250 and 500 litres. On the other hand, activities associated to animal husbandry need more water. In Jind district's rural areas, 83.24 percent of residents are reported to use more than 500 litres of water per day for animal husbandry. Water used for animal husbandry is reported to be consumed in just 15.34 percent of households, or between 250 and 500 litres. This is because there are fewer animals in these residences, and most of the ponds are used for livestock farming. In this manner, it is found that domestic and animal husbandry-related water usage is high in Jind district's rural districts. (Table 03).

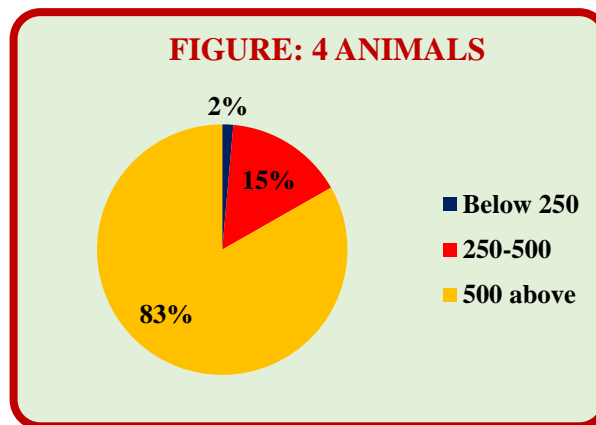
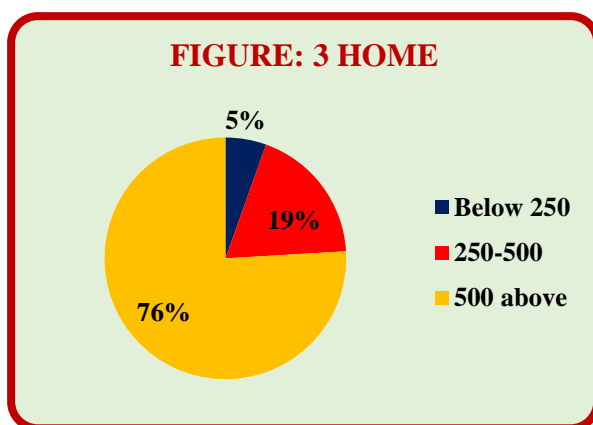


Table 04: Utilisation of Conserved Rainwater by Respondents

#	Purpose	Percentage
1.	Irrigation	3.23
2.	Animals	17.37
3.	Bathing	6.95
4.	Washing	23.08
5.	inverter	37.97
6.	No use	11.41
7.	Total	100

Source: Personal Survey, 2021

Rainwater conservation is the process of preserving water that has been collected through various means of precipitation. In the district, rain-protected water has been applied to a variety of projects. The district's population uses 37.97 percent of the rainwater collected for use in inverter batteries. This is because the district's rainfall is seen as favourable for inverter battery use. 23.08 percent of people use rainwater for cleaning their homes, and 17.30 percent use it for caring for their pets. Aside from this, 6.95 percent of people bathe with rainwater, while 3.23 percent use it for irrigation. Additionally, according to a poll I conducted, 11.41 percent of people do not use rainwater at all. (Table 04). As a result, it can be concluded that many inverter batteries are used in Jind district because to the high quality of the rainwater there. In addition, individuals use water that has been preserved from the rain for other things. As a result, residents of Jind district have been using water efficiently over time to fulfill their demands.

Table 05: Implemented Schemes Related to Water Resource Management

#	Schemes	Percentage
1.	Mara Pani, Meri Virasat Yojana	24.57
2.	Jal Gram Yojana	35.73
3.	Har Ghar Jal Yojana	46.15
4.	Bhujal Yojana	9.93
5.	Nal Se Jal Yojana	23.33
6.	No idea/ no	28.78

Source: Personal Survey, 2021

In the rural parts of Jind district, the government has established several water conservation management programmes, however their execution is quite sparse. The "Har Ghar Jal Yojana" has allegedly been implemented in the district, according to 46.15 percent of the populace. According to 35.73 percent of respondents, the district has received the "Jal

Gram Yojana" in its practical form. Throughout addition, according to 24.57 percent, 23.33 percent, and 9.93 percent of respondents, respectively, "Mera Pani Meri Virasat Yojana," "Nal Se Jal Yojana," and "Bhujal Yojana" have been implemented in the district. Additionally, among 28.78 percent of the population, no information about these water saving initiatives has been discovered. Therefore, it is essential to execute water conservation plans in order to conserve water. (Table 05).

Figure 06: Implemented Schemes related to Water Resource Management

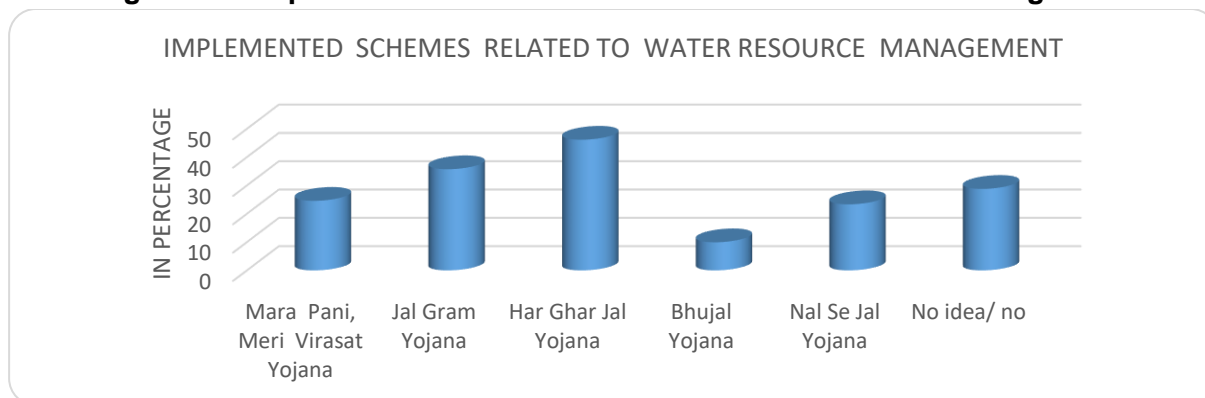


Table 06: Water Conservation Measures Used by Respondent

Planned construction	15.88	Put a layer of mulch around trees and plants	7.69
Bathing of animal	43.92	Turn off the water while shaving	47.39
Stop to overflow of water tanks	31.51	Over-exploiting of ground water	11.17
Minimum use washing of vehicle	39.21	Increased human consumption	35.73
Timely repairing of leakage of pipes	10.92	Drip Irrigation	5.96
Control climate change	7.94	Recycle wastewater	12.16
New conservation technologies	2.73	Ecosystem management	5.96
Education/awareness	28.29	Use of Hand Pump	38.71
Meeting with gram panchayat	27.54	Use Mug While Tooth Brushing	48.14

Source: personal survey, 2021

Water conservation is critical to ensuring the continued availability of this vital natural resource. Water conservation measures are implemented in rural areas of the Jind district. 47.39 percent of people use the method of turning off the water while shaving. Water conservation methods are used by 43.92 percent of people while bathing their animals. Hand pump is used by 38.71 percent of the people. Furthermore, 48.14 percent of people brush their teeth with water in a mug. 2.73 percent of people use novel water-saving methods. Along with this many other water conservation methods are used by the people of Jind district for water conservation. This leads to the conclusion that, in addition to their knowledge of numerous other water conservation techniques, the residents of Jind district use these techniques for water conservation. In essence, it can be claimed that knowledge of various water conservation measures is widespread in Jind district's rural areas and that people adopt these strategies to conserve water (Table 06).

Suggestions

- Organize programmes that focus on how to best use water resources in rural areas.
- Conservation of pristine water sources present in rural areas should be promoted.
- The rural population should use the appropriate amount of water for residential and animal husbandry activities.
- Rain water should be conserved in excessive quantity by the villagers and should use it wisely.

- To maintain the cleanliness of water in rural areas, water purification should be done by natural and chemical methods as per the need.
- Rural people should be made aware of the causes and effects of water pollution and water crisis, so that problems like water pollution and water crisis can be prevented.
- Provisions should be made to prevent the improper use of water to address the problem of water crisis increasing day by day in rural areas.
- Water conservation schemes should be implemented in rural areas by the state government and village panchayats.
- Villagers in rural areas should be given information about the impact of polluted water on health and the utility of clean water.
- Plantation system of local species should be adopted in rural areas, so that the problem of rain water crisis can be solved.
- Strict rules related to water conservation should be implemented by the Gram Panchayats on the rural people.
- Rural people should be made acquainted with modern water conservation methods and information should be made available for their use.
- The availability of water resources in rural areas should be increased by the government.
- Pucca and covered drainage systems should be provided in rural areas so that contaminated surface water does not contaminate ground water.
- Rural residents should make extensive use of auxiliary irrigation techniques to save water for crop irrigation.
- All significant water conservation programmes should be implemented by rural residents.

Conclusion

A water crisis has begun to develop in rural regions as a result of excessive water use and declining water supplies. The scarcity of precipitation and the people' daily increase in water consumption are the primary causes of the water crisis. Focusing on these issues, numerous water conservation programmes, including the "Har Ghar Jal Yojana," have been put in place in these rural areas. In addition, support techniques including drip, sprinkle, conventional, pipe, and others have been employed to conserve water in irrigation systems. This study revealed that residents in the rural parts of Jind district have easy access to knowledge regarding water saving techniques. In addition to this knowledge, rural residents apply these water saving techniques in their daily domestic activities. In this manner, the rural populace and the government may effectively address the water-related issues present in the Jind district's rural areas with the use of beneficial water conservation programmes. The proper use of water by rural residents and the adoption of water conservation measures are essential for addressing issues like water pollution that are constantly occurring in rural regions. As a result, the Jind district's rural areas have broad and organised water resource management, according to the research study's conclusion. If rural residents employ water conservation-related strategies properly, the availability of water resource management in rural regions can be preserved in the future.

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