



# A CASE STUDY ON THE IMPACT OF THE JAL JEEVAN MISSION IN SONTHI VILLAGE OF BILASPUR DISTRICT, CHHATTISGARH, INDIA

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## Abstract:

Jal Jeevan Mission (JJM) is the flagship program of Government of India under the Ministry of Jal Shakti, aims to ensure Functional Household Tap Connections (FHTCs) to all rural households and provide safe, adequate, and regular drinking water. The present study is conducted in the village- Sonthi, District - Bilaspur, Chhattisgarh to analysis the impact of the Jal Jeevan Mission on the daily activities and socio-economic engagement of rural women in the village, and health outcomes of rural households in the village. The study's conclusions illustrate that although the program has greatly lessened the tedious task of collecting water, enhanced hygiene standards, and given more time for home and livelihood activities, a number of issues still exist. Problems including inconsistent supply, poor tank cleaning, low water pressure, and ongoing reliance on conventional sources draw attention to deficiencies in infrastructure upkeep and service provision. Despite these drawbacks, JJM has improved socio-economic activities, health knowledge, and community involvement, especially for women who have historically been responsible for water collecting.

## Key Word :

Jal Jeevan Mission (JJM), Functional Household Tap Connections (FHTCs), Swachh Bharat Mission (SBM), Village Water and Sanitation Committees (VWSCs)

## 1. Introduction :

The Jal Jeevan Mission (JJM), launched on 15 August 2019 by the GOI under the Ministry of Jal Shakti, aims to ensure Functional Household Tap Connections (FHTCs) to all rural households and provide safe, adequate, and regular drinking water (Ministry of Jal Shakti -2021). Guided by the principle of “*Har Ghar Jal*,” the mission seeks to reduce dependence on unsafe sources like wells and hand pumps. It emphasizes not only infrastructure creation but also water quality assurance, source sustainability,

rainwater harvesting, greywater management, and active community involvement through Village Water and Sanitation Committees (VWSCs) and Gram Sabha's. As per WHO (2021) emphasized that household tap water supply plays a crucial role in reducing the incidence of waterborne diseases and promoting better hygiene.

Supporting this, NITI Aayog (2022) noted that JJM has led to major improvements in drinking water access in tribal, remote, and marginalized regions. With a budget of Rs. 3.60 lakh crore, Prime Minister Narendra Modi unveiled the JJM in 2019, making it one of the most significant water management infrastructure projects in India (Singh and Arora 2025, Bhat and Banerjee 2024). At the start of JJM in 2019, only 16.63 percent of rural households had tap connections, but the coverage has since grown to almost two-thirds of rural India. Shah (2023) expressed clean water as a constitutional right and a public health priority. WHO estimates suggest that improved access under JJM could prevent 400,000 deaths and save 14 million DALYs. Distribution of respondent according to assessed India's progress toward SDGs 3 and 6 by evaluating the Swachh Bharat Mission (SBM) and JJM. Their study shows major achievements, with sanitation coverage rising from 38.7 percent in 2014 to nearly 100 percent and tap water access increasing from 16.65 percent in 2019 to over 65 percent.

Chhattisgarh, established in 2000, is the 26<sup>th</sup> state of India. It is a resource-rich region in central India known for its vast forests, abundant mineral deposits (coal, iron ore, bauxite), diverse tribal cultures, and ancient temples. The state has approximately 50.12 lakh rural households, of which about 27.90 lakh 55.68 percent have access to tap water. Chhattisgarh has achieved 55 percent coverage under the Jal Jeevan Mission (JJM). Tap water is available in a total of 43,974 schools 86.78 percent, 41,719 Anganwadi centers 83.39 percent, and 11,658 Gram Panchayats in Chhattisgarh. The present study was conducted to assess the impact of JJM in Sonthi village of Bilaspur district. The objectives of the study were to assess (i) the impact of the Jal Jeevan Mission on the daily activities and socio-economic engagement of rural women in the village, and (ii) the impact of the Jal Jeevan Mission on the health outcomes of rural households in the village.

## 2. Research Methodology :

Sonthi village was selected as the study area because its groundwater was found to have very high levels of arsenic. The present study was conducted to analyze the impact of the Jal Jeevan Mission on the demographic and socio-economic conditions of the village. The research was conducted in Sonthi Village, Masturi tehsil, Bilaspur district of Chhattisgarh state. Sonthi is a tribal-dominated village with a population of 2,955 (Census 2011), including 1,448 males and 1,507 females across 684 households. The literacy rate is 58.21 percent (male 68.92 percent, female 47.91 percent). The village has 1,217 Scheduled Tribe residents and 99 Scheduled Caste residents. Covering 803.38 hectares, it is located 34 km from Bilaspur. In the selected Sonthi village, out of total 684 household, a total of 100 households were chosen for the study using a random sampling table. Information was collected from the adult members of these households through personal interviews using a pre-tested interview schedule. The collected data was then tabulated and analyzed using appropriate statistical tools and methods.

## 3. Result

### 3.1 Demographic and Socio-Economic Profile of Sonthi Village :

According to the demographic profile of 100 houses polled, 95 percent of respondents are married, with 65 percent of respondents being men and 35 percent being women. Total 55 percent of families are joint, and 45 percent are nuclear. Although family sizes vary, most homes consist of four or five people. Every household is Hindu and has a BPL ration card. In terms of caste, 15 percent fall into the General category, 40 percent into OBC, and 45 percent into Scheduled Tribes. Out of total respondents 30 percent of people are illiterate, 35 percent have a primary education, 30 percent have a secondary education, and only 5 percent have a degree. Landholding demonstrates 25 percent own less than one acre, 10 percent hold five to ten acres, 35 percent own two to five acres, and 30 percent own one to two acres. Total 50 percent

respondents make between ₹20,000 and ₹50,000 annually, 40 percent make less than ₹20,000, and 10 percent make between ₹50,000 and ₹1,000,000. The home facilities indicates, 35 percent of homes are cement, 20 percent are semi-pucca, 10 percent are tiled, 5 percent are huts, and 5 percent are tin shelters. Out of total, 90 percent of houses have sanitary facilities, most of which were constructed as part of the Swachh Bharat Mission; 10 percent do not have toilets. Total 95 percent rely on bucket water that has been kept for toilet use.

### 3.2 Sources of Water in Sonthi Village :

Sonthi village's water usage assessment reveals a varied reliance on several water sources, with the JJM playing an increasingly important role. The majority of families use hand pumps-75 percent, JJM tap connections-50 percent, tube wells-15 percent, and ponds-5 percent for drinking. Hand pumps 75 percent and JJM-50 percent continue to be the main sources for bathing, with ponds 40 percent and tube wells-15 percent providing additional support. The primary sources of cooking water are tube wells-15 percent, JJM-45 percent, and hand pumps-70 percent. Households employ ponds-30 percent, tube wells-15 percent, JJM-55 percent and hand pumps-65 percent for laundry. Tube wells-65percent and JJM-55 percent are the primary sources of domestic cleaning, with ponds-15 percent also playing a role. All of the available resources-hand pumps, tube wells, ponds, and JJM (5 % each) are somewhat utilized in gardening operations. Only JJM taps (5 %) and hand pumps 5 percent are utilized in agriculture.

### 3.3 Water Management Practices and Related Issues :

The study looked at wastewater management, water storage, and treatment in homes. Total 45 percent of families stored less than 100 liters, 40 percent less than 1000 liters, 5 percent less than 2000 liters, and 10 percent less than 3000 liters. Prior to JJM, 10 percent of households employed jar-to-jar transfer and 90 percent used cloth filtering. Following JJM, 67 percent of respondents continued to use cloth filtering, while 33 percent said the water was directly drinkable. Thirty percent dumped wastewater into sewers, five percent utilized open pits, and sixty-five percent reused it for gardening.

### 3.4 Infrastructure and Service Delivery under Jal Jeevan Mission :

This study assessed water supply connections, infrastructure, and household satisfaction. Approximately 25 percent of households received connections in 2023, while 75 percent received them in 2024. Water supply commenced in 60 percent of households in 2024, while 40 percent expect it to begin in 2025. Respondents reported that the pipelines were laid at depths of 1.5 feet 30 percent, 1 foot 25 percent, and 3 feet 15 percent. Taps were installed 3 feet above the ground, and 90 percent of the taps had cement platforms beneath them. Only 15 percent of respondents considered the tank height sufficient to maintain adequate water pressure at the taps, while 85 percent found it insufficient. In terms of satisfaction, 56 percent expressed satisfaction with the quality of the taps and pipes, while 44 percent expressed dissatisfaction. Regarding tap or connection repairs, 50 percent reported that they did not require any repairs, 35 percent relied on the panchayat (local council) for repairs, and 15 percent carried out the repairs themselves. No households paid monthly water charges, as 100 percent received water free of cost.

### 3.5 Water Quantity and Supply Methods :

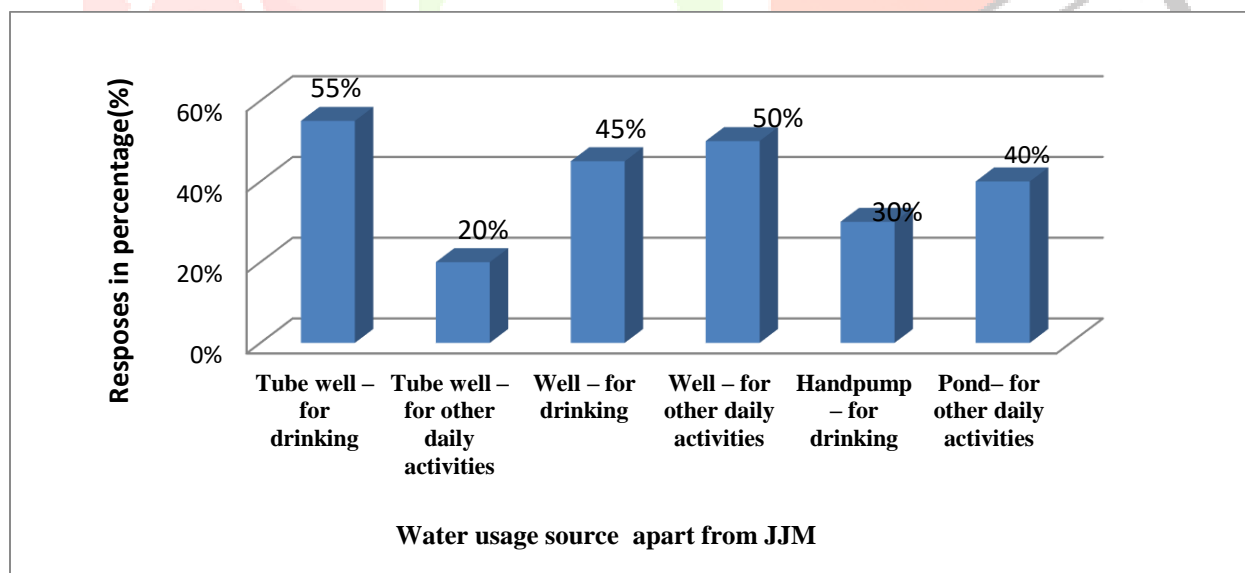
Responses to the JJM water supply satisfaction survey, about the amount of water supplied vary depending on the time of day. 71 percent of households were dissatisfied with the amount of water in the morning, compared to 29 percent who were. Just 10 percent of respondents expressed satisfaction in the afternoon, while 90 percent expressed discontent. Total 34 percent of respondents were satisfied and 66 percent were dissatisfied in the evening, a tiny improvement. This suggests that homes face severe shortages of water, particularly in the afternoon..

### 3.6 Community Participation and Socio-Economic Impact of JJM :

The findings indicate that the JJM has contributed not only to improved access to drinking water but also to enhanced community participation, awareness about health and hygiene, and better livelihood opportunities. Community engagement in the scheme has been encouraging. About 73 percent of households reported that Gram Sabha approval was obtained before the implementation of the scheme, while 62 percent confirmed attending VWSC meetings at least once. Furthermore, 37 percent of respondents regularly participated in water and cleanliness-related meetings, reflecting a gradual increase in awareness and a sense of collective responsibility among the community. The survey results reveal the impact of the JJM on daily routines and community participation. Approximately 20 percent of households reported very little change in their children's daily routines. Similarly, 17 percent of respondents used the time saved by this facility primarily for farming, wage labor, and other livelihood activities. About 33 percent reported increased participation in household chores. A total of 25 percent of respondents observed a change in community participation, indicating a gradual increase in community engagement and responsibility after the implementation of JJM. These patterns are consistent with the findings of Singh and Rani (2020), who reported that improved water security positively impacts household routines, time allocation, and participation in daily and community activities in rural areas.

### 3.7 Water Collection Practices and Impact of Jal Jeevan Mission :

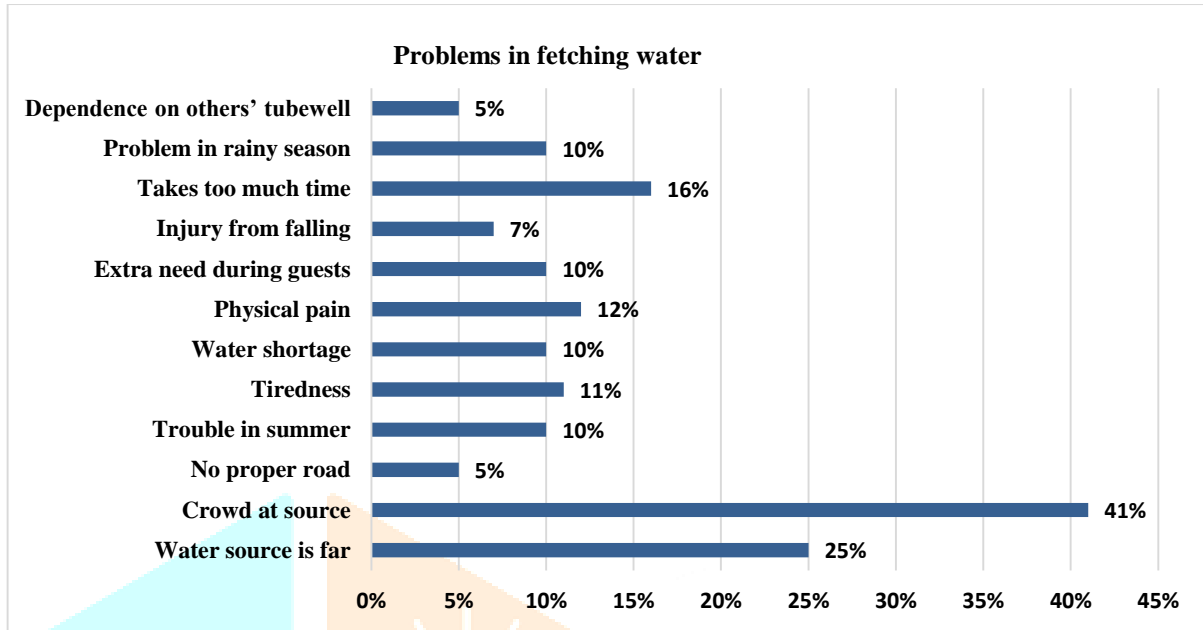
The survey reveals that both traditional and modern vessels are used for fetching water in households. Buckets are used universally 100 percent, followed by steel containers 75 percent and earthenware pots 30 percent, while smaller vessels such as small drums 25 percent, small tins 20 percent, and cooking utensils 15 percent are used less frequently. Water is primarily carried on the head, with only 20 percent using traditional carrying poles and 5 percent using bicycles, indicating a continued reliance on physically demanding methods. Regarding the impact of the JJM, 46 percent of respondents reported that the reduced effort in collecting water has given them more time for other activities.



**Figure 1 : Distribution of respondent according to water usages sources apart from JJM**

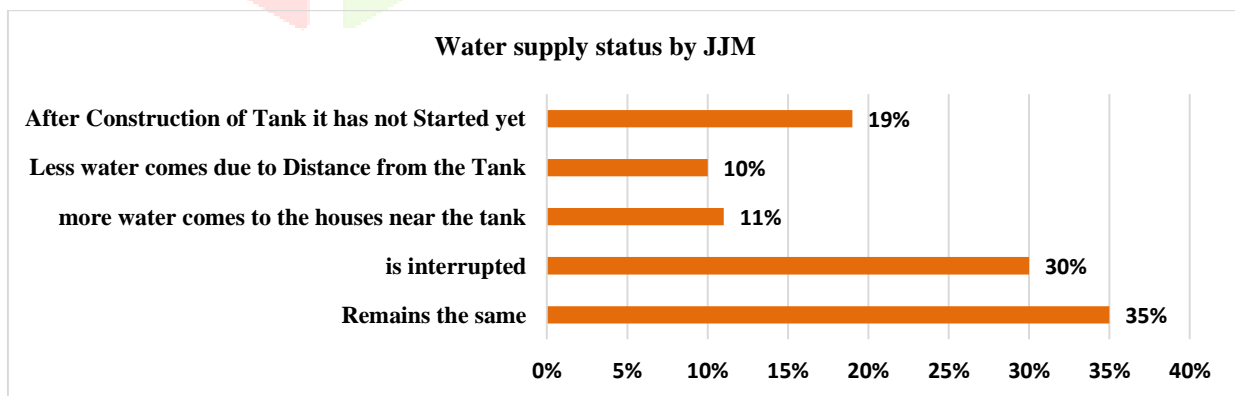
The data represent in Figure 1 shows the continued reliance of households on traditional water sources in Sonthi village despite the JJM. Tube wells are widely used, with 55 percent of respondents depending on them for drinking and 20 percent for other daily activities. Wells are also significant, as 45 percent use them for drinking and 50 percent for daily household needs. Handpumps contribute to drinking purposes for 30 percent of households, while ponds serve as a source for 40 percent of households for other daily activities. These findings indicate that even with the implementation of JJM, traditional sources such as

tube wells, wells, handpumps, and ponds continue to play an important role, particularly in meeting domestic and livelihood-related requirements.



**Figure 2 : Distribution of respondent according to problems faced in fetching water**

The data shows in figure 2, reveals that the problems related to water collection in Sonthi village were identified even before the Jal Jeevan Mission. The most common problem among all respondents was crowding at the water source in the morning and evening 41 percent, followed by distance to the source 25 percent. Other major challenges included the time required to collect water 16 percent, physical pain 12 percent, and fatigue 11 percent. Problems related to weather and conditions, such as water scarcity in summer 10 percent, increased demand during visits 10 percent, discomfort in extreme heat 10 percent, and difficulties caused by rain 10 percent, were also identified. Some households reported injuries from falls 7 percent, dependence on others' tube wells 5 percent, and lack of proper roads 5 percent. These findings indicate that while physical access and crowding are major challenges, households also face a number of smaller but significant challenges related to weather, physical stress, and dependence on external sources. Singh and Naik (2024) found that areas with a high number of JJM tap connections saw a 10 percent reduction in women fetching water from distant sources.

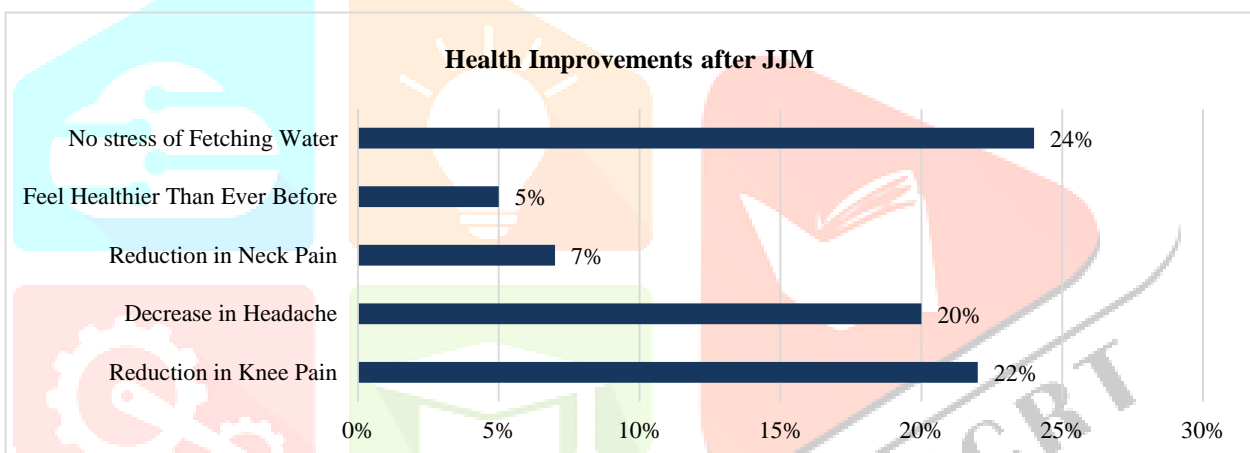


**Figure 3 : Distribution of respondent as per water supply status by JJM**

The above figure 3 shows the status of water supply in Sonthi village. Most households 35 percent have consistent water supply, while 30 percent experience frequent water shortages. While 11 percent of households receive more water due to their proximity to the tank, 10 percent reported receiving less water due to their distance from the tank. Furthermore, 19 percent of households reported that even though the tank has been constructed, water supply has not yet been initiated. These results indicate that while the

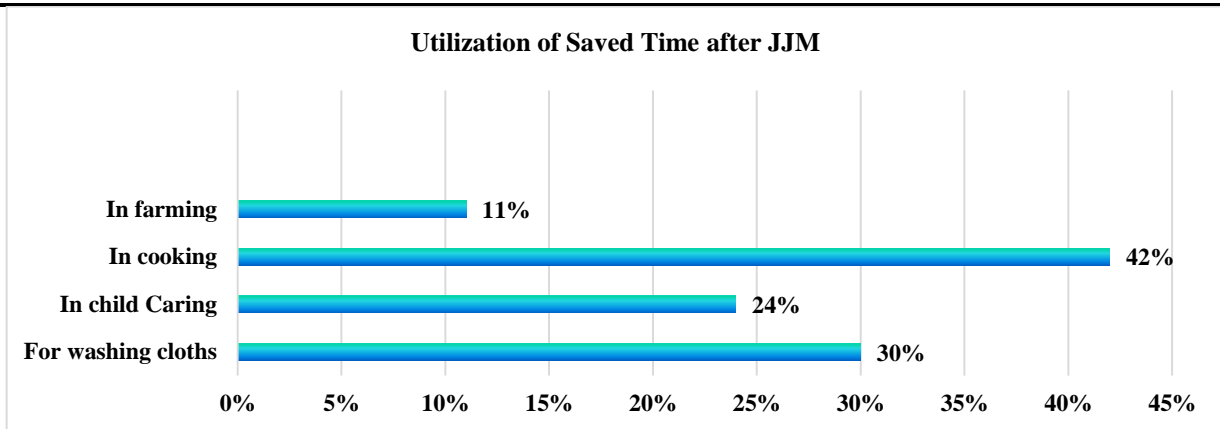
infrastructure is in place, there are still difficulties in equitable distribution and management, impacting reliable water supply to households. When asked about households' dependence on the JJM for daily water use, 39 percent reported "not much" dependence on the JJM, and 28 percent reported "some" dependence. Meanwhile, 28 percent reported "very little" dependence, and only 5 percent reported no dependence on the JJM at all. These results suggest that while the JJM has provided some support, most households in Sonthi village meet their daily water needs from traditional sources.

In Sonthi village, when asked about household water supply from Jal Jeevan Mission, a total of 81 percent reported receiving water for half an hour 40 percent per day. A total of 40 percent reported receiving water for only one hour, while 20 percent reported receiving two hours. These results indicate that despite infrastructure development, the actual water supply duration is still very short, limiting households' ability to fully rely on Jal Jeevan Mission for their daily water needs. After the launch of the Jal Jeevan Mission, 46 percent of people reported that it gave them more time to work, while 54 percent reported no significant change. Among those who experienced time savings, most 87 percent saved about an hour daily, and some 13 percent saved up to two hours. These results indicate that the scheme has positively increased time availability for about half of households. However, further improvements are needed for the Jal Jeevan Mission to have a greater impact. Chaudhary, Patel, and Sharma (2021) found that improved access to water reduced the time spent collecting water, thereby increasing daily productivity.



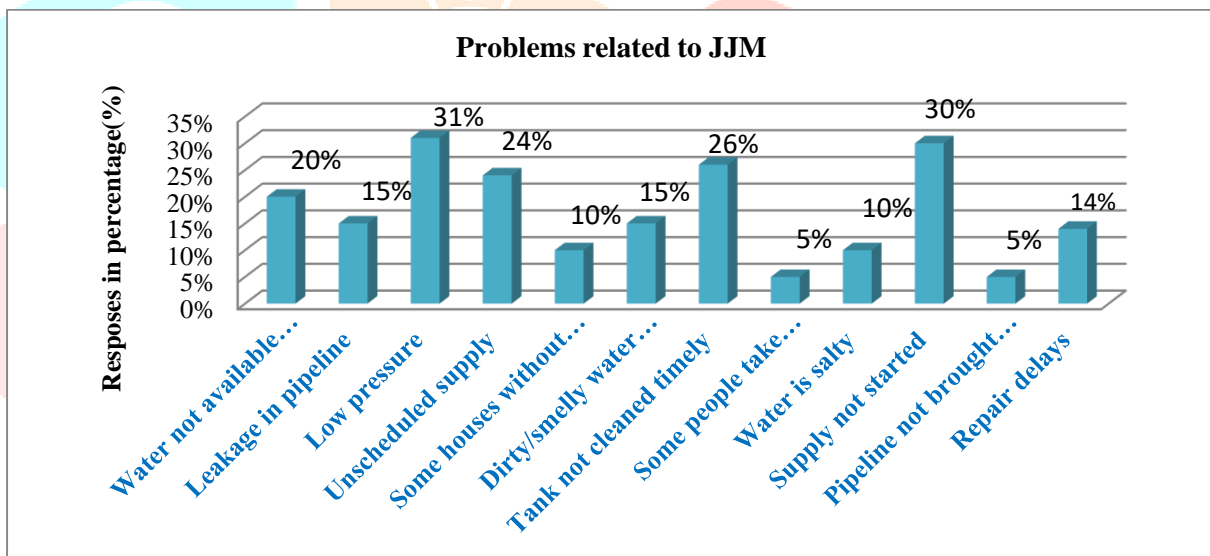
**Figure 4 : Distribution of respondent according to health improvement after implementation of JJM**

The most significant change since the launch of the Jal Jeevan Mission was a reduction in stress associated with fetching water, reported by 24 percent of respondents as shown in figure -4. This was followed by a reduction in knee pain 22 percent and headaches 20 percent, while some households reported relief from neck pain 7 percent and a general improvement in health 5 percent. These findings suggest that the scheme has not only ensured better and easier access to water but also significantly reduced the physical and mental health burdens associated with water collection. These findings are consistent with the observations of Singh and Rani (2020), who found that improved water availability significantly reduces physical stress and improves overall health. The question about the location of tap connections reveals that most households 87 percent have tap connections indoors, providing greater convenience and access. However, 13 percent of households have outdoor connections, which can pose challenges related to water collection, privacy, and sanitation. This demonstrates the significant progress made in improving indoor water access through the Jal Jeevan Mission.



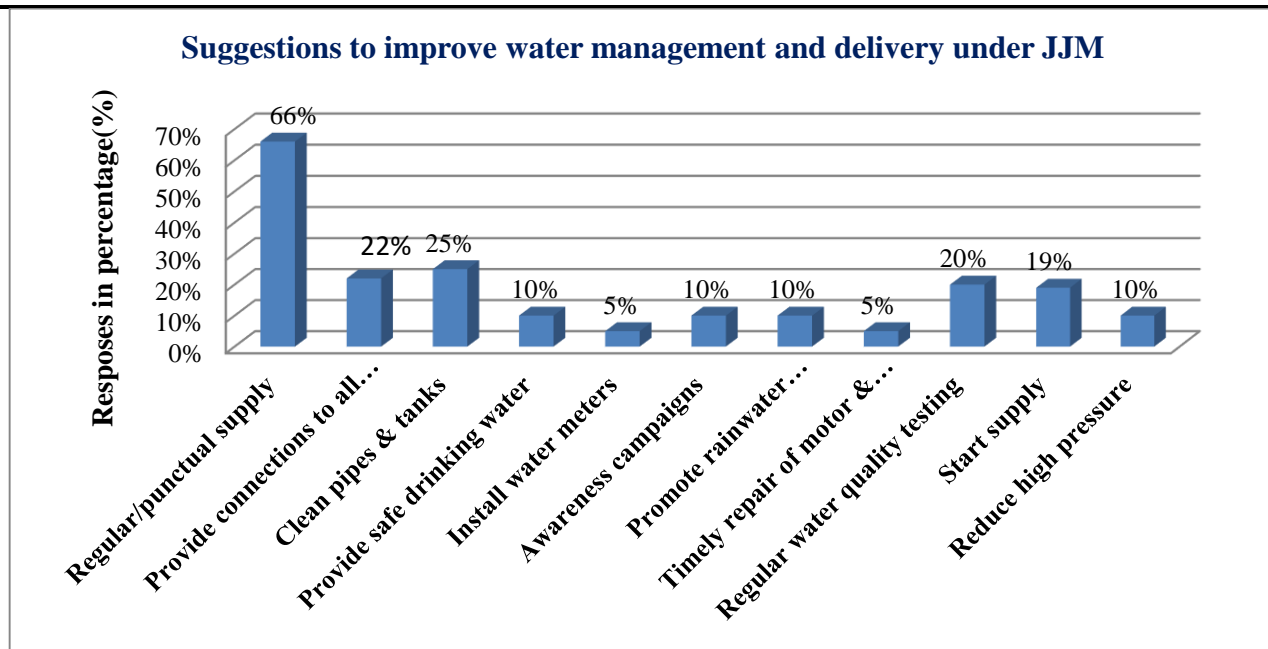
**Figure 5: Distribution of respondent according to utilization of saved time after JJM**

The data revealed (as shown in figure 5), that after the implementation of the Jal Jeevan Mission, 45 percent of households reported a reduction in the time spent collecting water, while 55 percent did not perceive any significant change. Of those who saved time, 42 percent used the extra time for cooking, 30 percent for washing clothes, 24 percent for childcare, and 11 percent for farming. Chaudhury, Patel, and Sharma (2021) reported that access to piped water allows families to dedicate more time to farming, livestock rearing, and other productive livelihood activities. These findings suggest that the impact of time savings varies across households and agricultural activities.



**Figure 6 : Distribution of respondent according to problems related to JJM**

According to Figure 6, the most frequent issues mentioned by the villages were irregular tank cleaning 26 percent, poor water pressure 31 percent, and a shortage of water supply 30 percent. Twenty percent of families said that water was not available every day, and twenty-four percent reported unexpected disruptions in the water supply. Significant complaints also included unclean or foul-smelling tap water 15 percent and pipeline leaks 15 percent. Lack of household connections 10 percent, brackish water 10 percent, maintenance delays 14 percent, and uneven water distribution-where some houses use more water than others-were minor but significant problems. Overall, these results imply that equitable distribution, prompt repairs, appropriate maintenance, and infrastructure upgrades are essential to guaranteeing dependable and secure access to water.



**Figure 7 : Distribution of respondent according to Suggestions to improve water management and delivery under JJM**

As per figure 7, villagers responded by proposing a number of ways to improve water management and delivery. While 25 percent emphasized the need of cleaning tanks and pipelines, the majority 66 percent stressed the necessity of a consistent and timely water supply. Twenty percent of respondents demanded routine water quality testing, and about twenty-two percent suggested making residential connections. Additionally, 10 percent each recommended encouraging rainwater collecting, raising awareness, and lowering high water pressure, while 19 percent emphasized the timely commencement of water supply. The availability of clean drinking water 10 percent, prompt tank and motor repairs 5 percent, and water meter installation 5 percent were noted by smaller percentages. Together, these recommendations represent the community's desire for effective management and infrastructure upgrades in order to provide sustainable, dependable, and safe water supplies.

#### 4. Conclusion :

Sonthi Village's rural water supply has been improved because to the groundbreaking Jal Jeevan Mission (JJM). The study's conclusions show that although the program has greatly lessened the tedious task of collecting water, enhanced hygiene standards, and given more time for home and livelihood activities, a number of issues still exist. Problems including inconsistent supply, poor tank cleaning, low water pressure, and ongoing reliance on conventional sources draw attention to deficiencies in infrastructure upkeep and service provision. Despite these drawbacks, JJM has improved socioeconomic activities, health knowledge, and community involvement, especially for women who have historically been responsible for water collecting. Through VWSC meetings and Gramme Sabha approvals, the program has also promoted collective accountability, demonstrating advancements in decentralized water administration. However, more focus needs to be put on guaranteeing fair distribution, sustainable water management, and prompt repairs if JJM is to realize its goal of "Har Ghar Jal." Long-term success will depend on strengthening drainage infrastructure, encouraging water conservation, and resolving regional inequities. All things considered, the mission has established a solid basis for enhancing rural water security; but, to reach its full potential, consistent efforts in community involvement, infrastructure quality, and service dependability are essential.

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