



Safe Drinking Water: A Myth or Reality in the Indian Subcontinent?

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Abstract

Using the case study method in the rural area of Raghunathapur village of the state Odisha, this paper tries to investigate the functionality of the central government's scheme Jal Jeevan Mission. Simple random sampling method has been used to select the study village. As per the secondary data sources the selected village was having 100 percent tap water connections. However, it was observed that none of the connections were functional from the beginning and when villagers reported this to the respective authority, they did not seem bothered. The villagers are still dependent on community well and community tube well for their daily requirement of drinking water and for supply of water for their daily chores and home farming. Therefore, government at all level should take necessary action to make all these connections functional.

1. Introduction

Drinking water is an essential amenity for the survival of human civilization. Water is present everywhere, and approximately 71 percent of the world is covered with water (Khullar, 2017). However, only 3 percent of it can be used as drinking water for the animal kingdom. In 1977, the Mar del Plata conference in Argentina created an Action Plan on "Community Water Supply", declaring that all people have the right to access drinking water in quantities and quality equal to their basic needs (United Nations, 1977). The importance of water was further raised by the International Drinking Water Supply and Sanitation Decade from 1981 to 1990 (United Nations, 1980) and in 1992 at the UN Conference on Environment and Development in Rio de Janeiro (Agenda 21, Chapter 18, United Nations, 1992) as well as at the International Conference on Water and the Environment (ICWE) in Dublin (ICWE, 1992). In 1993, the UN General Assembly designated World Water Day on March 22 (United Nations, 1993). In 2000, the Millennium Development Declaration called for the world to halve the proportion of people without access to safe drinking water (United Nations, 2000) and in 2003 the International Year of Freshwater was declared by the General Assembly (United Nations, 2003), followed by the "Water for Life" Decade from 2005 to 2015 (United Nations, 2005). Water is also at the heart of milestone agreements such as the Sendai Framework for Disaster Risk Reduction (United Nations, 2015a) and the 2015 Paris Agreement (United Nations, 2015b). In December 2016, the United Nations General Assembly unanimously adopted the resolution "International Decade for Action – Water for Sustainable Development" (2018–2028) in support of the achievement of SDG 6 and other water-related targets.

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In recent decades, over-exploitation of water, pollution, and climate change have caused severe water stress worldwide. With rapid population expansion, the provision of safe drinking water is becoming a challenge, especially in rural areas (Bhar, 2017). One of the 17 sustainable goals of the United Nations was to ensure the availability and sustainable management of water and sanitation by 2030 (United Nations, 2021). The depletion of the groundwater table and the destruction of water quality threaten the sustainability of water supply in both rural and urban areas in many parts of India. With this backdrop, the Government of India has undertaken many initiatives since the 1970s such as Accelerated Rural water supply program 1972-73, Rajiv Gandhi National Drinking water mission 1991-92, Swajaldhara 2002, National Rural Drinking water program 2009, and Atal Bhujal Yojana 2019 to manage the water supply in rural and urban India (UN, 2021). Jal Jeevan Mission (JJM) was added to these schemes on 15th August 2019 to provide Functional Household Tap Connection (FHTC) to every rural household in the country by 2024 to enhance the quality of life and ease the living of people. The uniqueness of Jal Jeevan mission was not to create infrastructure for water, but to supply potable water to every rural household. The aim was to enhance life across the nation by delivering consistent, long-term access to high-quality piped water to all households nationwide (Ministry of Jal Shakti, 2019).

1.1 Potentials of Jal Jeevan Mission

JJM has huge potential to improve rural socio-economic conditions in India. It generates employment directly and indirectly in two phases: the construction phase and operation and maintenance (O&M) phase. Employment generation in the construction phase is expected to be larger than that in the O&M phases. However, as the employment generated during the construction phase is one time, employment generated during the O&M phase is expected to be permanent in the long run (Ministry of Jal Shakti, 2019). Indirect employment generation occurs in the production, storage, transportation, and distribution of materials directly or indirectly required for JJM. Pipes, valves, meters, and construction materials are directly required for JJM, whereas steel and other raw materials used for making pipes, valves, etc., are indirect materials (Ministry of Jal Shakti, 2019).

JJM has the potential to prevent waterborne diseases such as cholera, dysentery, and gastroenteritis by directly eliminating the use of polluted drinking water. An adequate supply of water is at the core of maintaining good hygiene and sanitation practices (World Health Organization (WHO), 2023). JJM will enable communities to establish appropriate sanitation facilities. In addition, clean water promotes personal hygiene and facilitates improved waste management. Improved sanitation reduces exposure to pathogens, thus improving quality of life (WHO, 2023). A study by the World Health Organization (WHO) estimated that if JJM could provide safely managed drinking water to all in India, this would avert almost 400,000 diarrheal disease deaths along with almost 14 million Disability Adjusted Life Years (DALYs) from diarrheal disease (WHO, 2023). This achievement alone would result in estimated cost savings of up to US\$ 101 billion. WHO study findings also suggest that investing in water and sanitation results in many economic, environmental, quality of life, and health benefits (WHO, 2023).

In most Indian villages, women along with children are primarily responsible for the water collection. This can be a dangerous, time-consuming, and physically demanding task, particularly in dry areas. Long journeys with bare feet in unfriendly weather, sometimes more than once a day, leave women and children vulnerable and exclude them from earning an income (Ministry of Jal Shakti, 2019). In this connection JJM has the potential to improve women's lives and can also bring back the children in classrooms.

2. Literature Review

The literature on the Jal Jeevan Mission (JJM) and related initiatives in India provides a comprehensive overview of the mission's progress, challenges, and impact. The mission, aimed at providing safe and adequate drinking water through individual household tap connections to all rural households by 2024, has been the focus of various studies. Sadhya *et al.*, (2021) and Wasuja (2021) discuss the critical role of state governments, infrastructure needs, and funding mechanisms in driving the mission forward, highlighting operational challenges such as technical difficulties, administrative delays, and community engagement issues. Singh *et al.* (2023) focus on the unique challenges in Uttarakhand, emphasizing sustainable practices and the use of innovative

technologies like IoT for water management. Chetty (2016) highlights the limitations of quantitative research methods in capturing complex social programs, emphasizing the need for qualitative insights.

Further, Joshi and Patel (2023) evaluate the progress of JJM in ten rural villages, discussing community involvement, health impacts, sustainability measures, and policy recommendations. Singh and Naik (2024) use sample survey data to assess the early impact of JJM, identifying moderate success and highlighting wealth-related inequities in coverage. Samant (2023) provides a comprehensive analysis of India's water crisis, discussing challenges, ongoing reforms, and the need for public awareness about water conservation, reuse, and recycling. Sachan (2023) emphasizes the critical role of groundwater management and the need for integrated governance solutions to address water sustainability in rural areas.

Dhingra and Batra (2023) explore the relationship between water management and livelihoods, emphasizing the role of decentralized interventions and the need for integrated water management. Narayanan *et al.* (2023) examine the evolution of state involvement in rural drinking water governance, discussing the shift towards community-centric models and the need for integrated governance.

These studies collectively highlight significant research gaps, including the failure of quantitative studies to capture the actual situation on the ground, the gap between planning and implementation, and the lack of awareness among households about the mission's goals and sustainable water practices. Addressing these gaps is crucial for the successful implementation of JJM and ensuring access to clean drinking water for all rural households in India. While significant progress has been made under the JJM, the mission faces several challenges that need to be addressed to fully realize its objectives. The reliance on quantitative data often fails to capture the complexities and nuances of rural water access and usage, necessitating the inclusion of qualitative insights to understand the real impact. Additionally, there is a considerable gap between the planned objectives and actual implementation, with issues such as inadequate infrastructure, funding constraints, and bureaucratic hurdles impeding progress. Furthermore, there is a lack of awareness among households about the benefits and functioning of JJM, leading to underutilization and neglect of the provided infrastructure. Comprehensive awareness campaigns and community engagement are essential to educate and empower rural communities, ensuring the sustainability of water resources. Overall, while the JJM has the potential to significantly improve rural water supply and public health, a more holistic and integrated approach is necessary to address these challenges and achieve the mission's goals.

2.1 Objective of the study

Existing literature shows that there is a gap in status of water connectivity after implementation under JJM scheme. Therefore, the objective of the present study is to evaluate the status of water connectivity after implementation under Jal Jeevan mission in the Indian subcontinent. According to the official data (<https://ejalshakti.gov.in/>) 75 percent of the rural households have already got tap water connections in India. In this connection, the present study investigates the functionality of these connected taps through a case study conducted in a village of Kendujhar district of Odisha.

So, our null hypothesis is as follows –

Null Hypothesis: Implementation of JJM is completely functional

3. Data methodology

3.1 Sampling method:

This study collects data from rural households and a multistage random sampling process has been used to select sample households. At the first stage the state of Odisha has been selected as it is the most deprived state (Jal Jeevan Samvad, 2024). This deprivation index is constructed by using indicators such as the percentage of households fetching water from outside premises. In the second stage Kendujhar district has been selected as it has the highest percentage of households with tap water supply under JJM (Jal Jeevan Samvad, 2024). As this study aims at finding the gap between implementation and functionality, it is important to investigate the district with the highest number of households with tap connections. Kendujhar district has 13 blocks. In the next stage

of sampling one block has been selected from these 13 blocks. Being an aspirational block Harichadanpur block is relevant for this study. This block consists of 201 villages, of which 176 villages are with 100 percent household tap connections under JJM. According to the aim of the study these 176 villages are of our interest. Using simple random sampling method Raghunathapur village has been selected from these villages with 100 percent household tap connections. This sampling method ensures that the study is able to accurately measure the gap between the implementation and functionality.

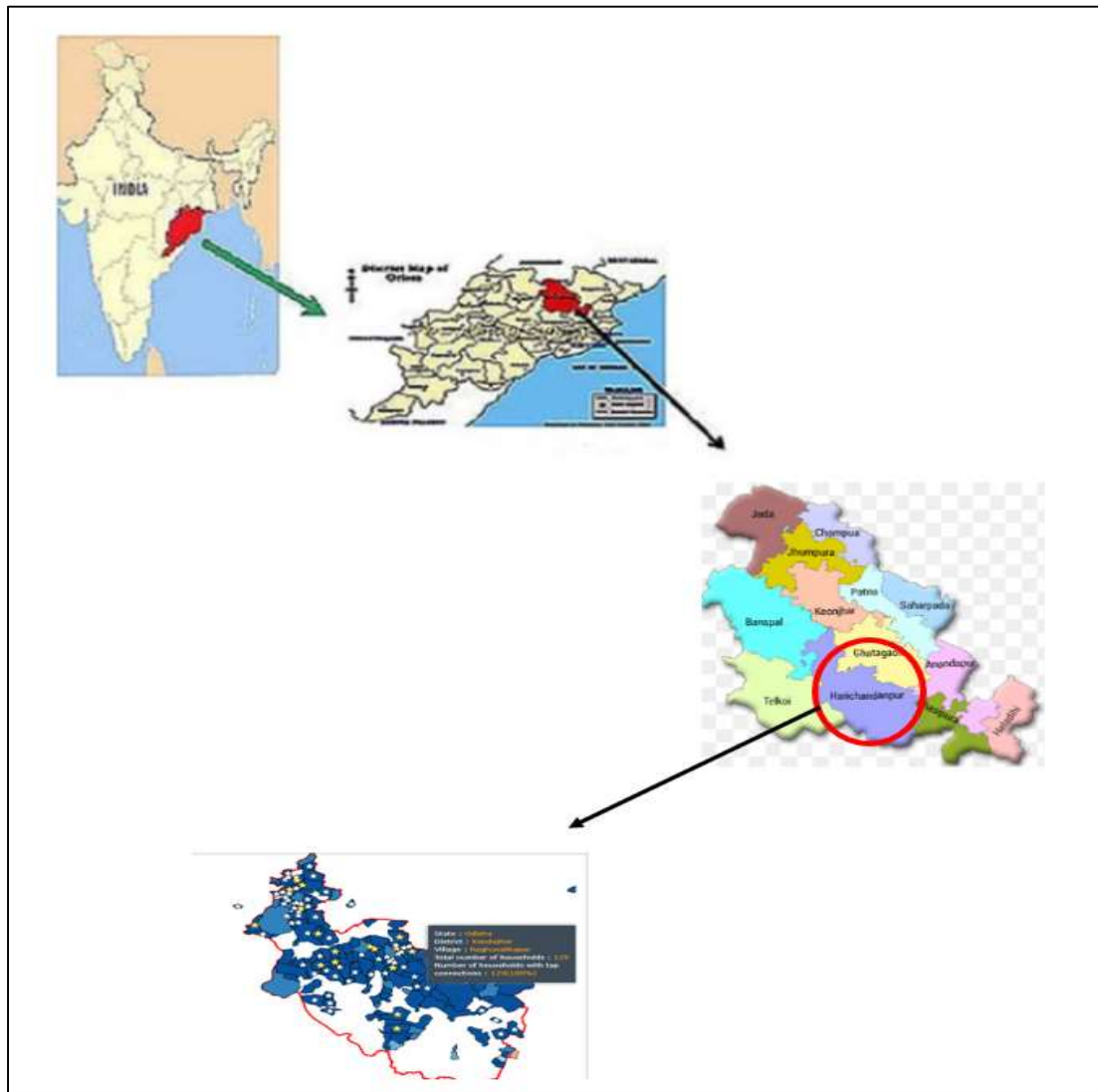


Figure 1: Study area
Source: www.googlemaps.com

3.2 Demographic characteristics of the study area

This case study is conducted in Raghunathapur village of Kendujhar district of Odisha. Raghunathapur is a small village with 129 households near Kanjhari dam and is surrounded by small mountains. According to the census of 2011, the population size of the village is 205 of which 106 are males and 99 are female. Residents are mainly dependent on agricultural activities for their livelihoods. Others are dependent on fishing in the nearby Kanjhari dam. The literacy rate of the village is higher than the average literacy rate of the state Odisha. In 2011 the literacy rate of the villages was 92.06 percent. However, it was observed that most of the villagers fail to finish their school education.

4. Analysis

4.1 Reality of JJM

Secondary data shows that the sampled village got 100 percent tap water connection under the government project JJM. Primary survey was conducted in the village in the first week of December, 2024. Personal interview method was adopted in the village for collecting information about implementation of Jal Jeevan Mission. The same scenario is observed for all the households of the villages. Broken and non-functional taps were seen in all households of the village. Inhabitants are mostly ignorant about the water line connection installed by the government.

Case Study 1

Mrs. P who is living in the sample village with her 7 family members stated that the water taps were installed but no water connection was there when we asked her about the 'Har Ghar Nal Yojana'. They use water from a shared well for drinking purposes as well as for their daily use. In the summer, they bring drinking water from dams nearby the village as wells become dry. They generate income from different sources. Her husband works as a contractual worker in the town Puri whereas she, her sons and her daughters-in-law work as agricultural workers.

4.2. Discussion

To achieve the 6th goal of sustainable development goals, the government of India adopted the Jal Jeevan Mission in 2019 to facilitate all rural households with functional tap connection by 2024 (Ministry of Jal Shakti, 2019). As it has numerous potentials on rural society, it is likely to improve the living standards of rural India. Secondary data confirms that the progress towards functional tap connection is impressive. However, a question arises in use of the word 'functional'. Are the taps really functional? Reality is somewhat different.

Case Study 2

Mrs. Q is a 21year old woman working as an agricultural worker lives with her 2-year-old son and husband is a driver in the Keonjhar town mentioned similar state of the water taps. These are not functional according to her. We also witnessed the same. She also brings up about the inoperative 'Subhadra Yojana' when mentioning non-functional state of the water taps that she has bank account of her own but they didn't receive any money from this Yojana even after successfully submitting the necessary documents (Aadhaar details, Pan Card details etc.).



Figure 2: Interview session with the respondents
Source: Field survey

Conversation with the villagers of Raghunathapur reveals a picture which is completely different from what is obtained from secondary data sources. Though all households are connected with water taps under Jal Jeevan Mission, not a single tap was noticed to be functional during the survey. Inhabitants are still dependent on wells and community tube wells for water. In most of the cases dwellers are reluctant about water connectivity from the government as they do not get other government facilities in spite of having all relevant documents.

Case Study 3

Conversation with Mr. Y of age around 25 years reveals that he does not know why a water pipeline was installed in their household by the local authority. He was so reluctant that he did not even ask the personnel who were setting up the connection in his house. So, while asking about JJM, he was absolutely silent.

Case Study 4

Mrs. T is a woman of 45 years who is the wife of a local school teacher also shared the same story with us. Community tubewell is their main source of water. Along with school teaching the family is also attached with agriculture. The tap connection given by the government under Jal Jeevan Mission is under a pile of hay, so it is not even visible to us.



Figure 3: Current scenario of functional tap

Source: Field Survey

Case Study 5

Mrs. Z is a young lady of just 19 years who was residing in the village for last three months after her marriage was hopeful that they will get water through the pipeline connection during monsoon. She also uses community well and tubewell to do her daily chores.

Case Study 6

Mrs. S is a homemaker also complained that their water tap is non-functional. It was installed a year ago but there is no water connection to it. They use a shared tube well for the purpose of drinking water.

This mission is highly ambitious of achieving the 6th sustainable development goal by 2024 and started with huge investment by the government. Under union budget 2025-2026, a total provision of Rs 67,000 crore has been allocated for the Jal Jeevan Mission. This is 195 percent higher than the revised budget allocation of Rs 29,916.8 crore for the financial year 2024-25 (Government of India, 2024). Though the government is spending a large amount of money on supplying potable water to rural India at their doorsteps, reality is far behind the objective.

Case Study 7

We also visited the only Anganwari of the village where children were attending classes during that time. We distributed chocolates among them with the permission of the teachers. After eating the small chocolates, kids have to go to the tubewell which was outside their school gate for drinking water and washing their hands. Mrs. X who teaches in that Anganwari informed us that the children along with the teachers and other employees of the Anganwari always use that tubewell for drinking water and washing their hands after their mid-day meal. For this they have to wait in a prolonged queue for a long time hampering their study time.



Figure 4: Sources of water in Keonjhar District, Odisha
Source: Field Survey

Case Study 8

When surveying at the village we spotted a kuccha house with a field where seasonal vegetables were planted, two big wells was there. The owner of the house Mr. R responded, one is for drinking water and another one for other household work including watering the plants. His main source of income is from agricultural cropping. One of his sons works as a mining engineer. He commented the same thing as other respondents that water taps are non-functional. He pointed out that the work is not completed due to the change of the government.

The case studies presented highlight significant issues concerning the implementation of water supply schemes in rural India, raising the question of whether safe drinking water is a myth or reality in the Indian subcontinent. Mrs. P's experience under the 'Har Ghar Nal Yojana' reflects the gap between policy and practice, with installed water taps remaining non-functional and forcing reliance on shared wells and dams. Similarly, Mrs. Q and Mrs. S's accounts of inoperative taps and unmet promises of the 'Subhadra Yojana' reveal systemic inefficiencies. Mrs. T's tap hidden under a pile of hay and Mrs. Z's reliance on community wells indicate a broader issue of neglected infrastructure and seasonal variability. The Anganwari visit demonstrates how water scarcity impacts educational institutions, disrupting children's learning due to long queues for water. Lastly, Mr. R's pragmatic use of wells for different purposes, coupled with his observation about governmental changes hindering project completion, highlights political and administrative challenges. Collectively, these case studies emphasize the need for improved monitoring, maintenance, transparency, and community involvement to ensure reliable and safe drinking water in rural India. Addressing these gaps is essential to transform policy promises into tangible benefits, thus making safe drinking water a reality for all.

As the taps installed in the Raghunathapur village under JJM scheme are completely non-functional and villagers are still completely dependent on community well and tubewell for their daily uses of water, we are unable to accept the null hypothesis. Addressing these issues requires a multifaceted approach, including better monitoring, increased accountability, and active community involvement. Only through such concerted efforts can the vision of safe and reliable drinking water for all become a reality in the Indian subcontinent.

5. Conclusion

This paper delves into the process of implementation of the central government scheme of Jal Jeevan Mission undertaken in 2019 to achieve the 6th SDG by stipulate time. The main emphasis of this paper is on functionality of water lines in rural India. It is a qualitative study, based on personal interview method in a small village of the Kendujhar district of Odisha. It was observed that all households of the sampled village were connected with tap water. However, all of the connections were not functional for long. Villagers were not also aware of the central

government scheme and they were using community well and tubewell wasting their valuable times which they could invest for earning incomes.

The findings from these case studies starkly illustrate the ongoing challenges in the quest for safe drinking water in rural India. While government initiatives like the 'Har Ghar Nal Yojana' and the 'Jal Jeevan Mission' are commendable in their intent, the implementation often falls short, leaving many rural households without reliable access to clean water. The recurring themes of non-functional water taps, seasonal water scarcity, and reliance on communal wells and tubewells highlight systemic inefficiencies and a lack of proper oversight. Furthermore, the impact of these water issues extends beyond individual households to affect educational institutions and the broader community. The stories from the Anganwari and the pragmatic yet challenging adjustments made by villagers underscore the far-reaching consequences of inadequate water supply. The mention of political and administrative challenges, as seen in Mr. R's case, further complicates the effective realization of these schemes. To turn the myth of safe drinking water into a reality, it is crucial to address these gaps through improved monitoring, regular maintenance, greater transparency, and active community involvement. Only by bridging the divide between policy and practice can we ensure that the basic human right to safe drinking water is accessible to all rural residents in India.

Therefore, the Government should be more careful about the functionality of the mission. Mere installation of water pipelines will not take us to achieve the goals of sustainability. As awareness among the mass is important, government especially at grass root level should take initiatives to educate rural people about the importance of the mission.

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