



Beyond Water Access: A Comparative Analysis Of Implementation And Impact Of Jal Jeevan Mission In Rural Assam

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Abstract: This paper presents a comparative analysis of the implementation and impact of Jal Jeevan Mission (JJM) across the four study area districts of Assam – Tinsukia, Jorhat, Udalguri, and Barpeta. Since its inception, JJM has been one of the most ambitious public policy initiatives of India, aiming to provide safe and adequate drinking water through Functional Household Tap Connections (FHTCs) to every rural household. Drawing insights from primary field data and observations, the paper examines pre-JJM and post-JJM scenarios with respect to sources of drinking water, accessibility, quality, community participation and awareness, and overall impact on rural households and women. The findings reveal a transition from groundwater-based informal sources to a centralized piped water supply in each rural household, with near-universal coverage. While JJM has reduced the age-old drudgery of women fetching water, water insecurity, and has improved hygiene practices, its broader impacts, particularly in terms of decision-making, economic productivity, and community-led water governance, still remain limited. The paper argues that infrastructural development is to a large extent successful, but its long-term sustainability and inclusivity depend on stronger participatory governance, trust-building measures, and gender-sensitive interventions.

Keywords: Jal Jeevan Mission, Comparative Analysis, Gender, Inclusivity, Assam.

1.Introduction

The access to safe and adequate drinking water is recognised as a fundamental human right. However, billions of people are still living without water security. In rural India, there has been water insecurity due to seasonal scarcity, dependence on unsafe water sources, and age-old disparities. A fundamental component of achieving water security for everyone is the realization of the right to water. The right entitles everyone to have access to sufficient, safe, physically accessible, and affordable water for personal and domestic use. In India, the

constitutional right to access to clean drinking water has been protected under the broad umbrella of the Right to Life guaranteed under Article 21 of the constitution. To attain this, India has also adopted many programmes.

Among them, Jal Jeevan Mission (JJM) has been pivotal in mitigating water security challenges by aiming to provide functional household tap water connections in every rural household. Unlike earlier supply-driven schemes, JJM also strives to free mothers and sisters from the centuries-old drudgery of fetching water for their households. It aims to improve their health, education, and socio-economic conditions, bringing ease of living, adding pride and dignity to rural families. The Mission additionally gives equal emphasis to sustainability and community participation. It includes source sustainability measures such as recharge and reuse through greywater management, water conservation, and rainwater harvesting.

As Assam is characterized by diverse physiography and socio-economic vulnerabilities, the assessment of JJM's implementation and impact is of high relevance. This paper undertakes a comparative analysis of JJM's implementation and impact in the four study area districts of Assam – Tinsukia, Jorhat, Udalguri and Barpeta. These districts are distinguished in terms of geography, socio-economic conditions, and pre-existing water infrastructure. The central focus of this paper is that while JJM has achieved a remarkable success in expanding water access to rural household, its transformative potential in terms of women's empowerment and community-led water governance need more targeted policy intervention.

2.Objectives of the Paper

The paper has certain objectives to be fulfilled –

1. To examine the pre-JJM scenario in the four study area districts.
2. To analyse the implementation patterns of JJM across the study area districts.
3. To assess the impact of JJM on rural households and women in particular.
4. To identify the gaps in the JJM's implementation and impact, and provide suggestions.

3.Methodology

The study is based on a mixed-methods approach, combining quantitative and qualitative methods. The primary data were collected as part of an ICSSR sponsored empirical research project. The research covers four study area districts- Tinsukia, Jorhat, Udalguri and Barpeta. The data were collected through structured questionnaire by interviewing rural households, community members, and local officials. The quantitative data were analysed through descriptive method and qualitative data were analysed thematically.

4.Jal Jeevan Mission in Assam: An Overview

Assam's rural water insecurity is mainly the resultant of groundwater contamination, distant water sources, and physical drudgery of women. Prior to the JJM, water supply schemes were mainly suffered from poor maintenance and limited household level access. Under the JJM, the state witnesses rapid expansion of piped water infrastructure to every rural household.

A study in 2025 which categorised the districts into five sub categories [Aspirant (tap connection coverage: 0 to 25 %), Performers (tap connection coverage: 25 to 50 %), Achievers (tap connection coverage: 50 to 75 %), High Achievers (tap connection coverage: 75 to 100%), Front runners (tap connection coverage: 100%)] showed improvements in some underperforming districts, with Tinsukia progressing to the High Achiever category, while Jorhat, previously above the state average, declined to the Achiever category, making it a critical area for further analysis. To evaluate the mission's impact on rural households and women empowerment, the study therefore selected four districts - Tinsukia and Jorhat from Upper Assam, and Udalguri and Barpeta from Lower Assam. These selections were based on progress reports from 2022 to 2025, highlighting variations in their performances. Barpeta has maintained its High Achiever status, while Udalguri remains in the Achiever category, representing the Bodoland Territorial Region.

Hence, to present a justified representation geographically by taking two districts from both the divisions of Assam, a comparative analysis implementation and impact of JJM in two High Achiever districts with two Low Achiever districts is intended.

5.Comparative Analysis of Implementation and Impact of JJM in the Four Study Area Districts of Assam

This section would do a comparative analysis of implementation and impact of the Jal Jeevan Mission in the four study area districts – Tinsukia, Jorhat, Udalguri and Barpeta, to have brief idea how far it has able to reach, and which areas require more specific and targeted improvements. The analysis is mainly categorised in five categories- Pre-JJM scenario, Post-JJM scenario, impact on rural households, impact on women, and the responses of the local officials of the districts in thematic pattern.

5.1 Comparative Analysis of Pre-JJM in the Four Study Area Districts

The pre-JJM scenario largely presents a picture of traditional access and informal water management practices in rural Assam. Women, in particular bore the physical drudgery of these inadequacies, as the responsibility of fetching and managing water rested predominantly upon them. The condition prior to the introduction of JJM thus highlights the critical gaps in water governance, gender-equity and community participation.

5.1.1 Sources of Drinking Water

Table 1: Sources of Drinking Water

	Handpumps	Borewell	Well	River/stream	Public tap
Tinsukia	89.6%	5.3%	0.2%	2.8%	2.1%
Jorhat	65.3%	6.9%	18.3%	-	9.5%
Udalguri	87.5%	1%	11.5%	-	-
Barpeta	92.9%	4.1%	0.6%	1.3%	1.1%

Source~ *Field visit*

From the above table it is analysed that across all the four districts, handpumps were the primary source of drinking water, indicating a heavy dependence on direct groundwater consumption. Barpeta (92.9%) and Tinsukia (89.6%) recorded the highest reliance, followed by Udalguri (87.5%) and Jorhat (65.3%). Among these, Jorhat has relatively greater diversifications in terms of using wells (18.3%), and public taps (9.5%) indicating partial exposure to the earlier schemes. Moreover, the use of packaged and filtered water in Jorhat, Udalguri and Barpeta reflects trust deficit in those sources due to unsafe water quality. This also indicates additional economic burden imposed on the rural households.

5.1.2 Distance and Time Spent on Water Collection

Table 2: Distance of the water source

	Less than 1km	Between 1-2km	More than 2km
Tinsukia	100%	-	-
Jorhat	92.8%	7.2%	-
Udalguri	100%	-	-
Barpeta	100%	-	-

Source~ *Field visit*

The above table shows that in all the four districts, most water sources were within the range of 1 km. Tinsukia, Udalguri and Barpeta reported 100% accessibility within this range, while Jorhat has 92.8%. However, this distance does not alone qualifies for ease of access. Women, in particular bore the physical drudgery of fetching

water, which also results in time poverty. In the hill adjacent areas of Udalguri, the topography further intensifies the physical labour of women. Thus the distance though seem to be modest on papers, the gender inequity in water management is of concern.

5.1.3 Quality of Drinking Water

Table 3: Satisfaction level regarding the quality of water

	Satisfied	Uncertain	Dissatisfied
Tinsukia	32.9%	56.3%	10.8%
Jorhat	4%	42%	54%
Udalguri	9.5%	42.5%	48%
Barpeta	9.9%	42.5%	47.6%

Source~ *Field visit*

The table 3 signifies that all the four districts have high degree of dissatisfaction and uncertainty regarding water quality, indicating weak water governance prior to JJM. Among them, Jorhat recorded highest dissatisfaction (54%), followed by Udalguri (48%), Barpeta (47.6%) and Tinsukia (10.8%). The primary concern was the iron contamination, reported by more than 80-98% of the respondents across the districts.

5.2 Comparative Analysis of Post-JJM in the Four Study Area Districts

The implementation of the JJM has brought a profound transformation in the rural water supply scenario in the selected study area districts. Earlier the households were dependent on handpumps, and had uneven access to water, whereas now it has evolved into a structured, piped water system reaching every rural household. This section presents an analytical account of the post-JJM situation in these districts, focusing on dimensions such as sources of water supply, household coverage, quantity and quality of supply, and the extent of community participation in operation and maintenance.

5.2.1 Sources of Water Supply for Tap Connections

Table 4: Source of Water Supply for tap connection

	River/Stream	Borewell	Canal	No idea
Tinsukia	-	98.8%	-	1.2%
Jorhat	16.5%	83.5%	-	-
Udalguri	-	98.3%	-	1.7%
Barpeta	-	98.5%	-	1.5%

Source~ *Field visit*

In the post-JJM period across all the four districts, there is a clear transition from handpumps based individual water access to a centralised piped water supply system. The above table shows borewell based ground water sources for tap connections were prevalent in Tinsukia (98.8%), Udalguri (98.3%), and Barpeta (98.5%). While, Jorhat shows diversification with river based supply (16.5%), alongside borewells (83.5%). This transition shows improved technological integration of water extraction, treatment and distribution mechanism, showcasing infrastructural development and easy accessibility of water to every rural household.

5.2.2 Households with Tap water Connections

Table 5: Household Tap Connections

	Yes	No
Tinsukia	100%	-
Jorhat	99.5%	0.5%
Udalguri	100%	-
Barpeta	100%	-

Source~ *Field visit*

The above table highlights that the mission has achieved a near-universal to universal household coverage in all the study area districts. Tinsukia, Udalguri and Barpeta have reported 100% FHTCs, while, Jorhat having 99.5%. In all the districts, the field-level household with tap coverage exceeded the official district wise

averages, reflecting effective last-mile implementation of the mission. Thus ensuring uniform accessibility irrespective of geographical conditions.

5.2.3 Quantity and Regularity of Water Supply

Table 6: Quantity of Water received per day

	Less than 50 litres	75 litres	More than 75 litres	No idea	No idea (use of own source)
Tinsukia	-	-	69.6%	24.2%	6.2%
Jorhat	-	-	91.2%	8.8%	-
Udalguri	-	-	76.3%	23.7%	-
Barpeta	-	-	86.5%	13.5%	-

Source~ *Field visit*

Table 7: Regularity of Water flow from the tap

	Daily	On alternate days	Weekly	Rarely	No idea (use of own source)
Tinsukia	96.9%	-	-	-	3.1%
Jorhat	87.7%	-	-	-	12.3%
Udalguri	99.5%	-	-	-	0.5%
Barpeta	99.9%	-	-	-	0.1%

Source~ *Field visit*

From the table 6 and table 7, it is assessed that after the implementation of the JJM, all the four districts meet or exceed the national norm of 55-75 lpcd. The majority of the households receive more than 75 lpcd, which is highest in Jorhat (91.2%), followed by Barpeta (86.5%), Udalguri (76.3%) and Tinsukia (69.6%). The regularity of water supply is also decent, with more than 87% households in all districts reported daily water

provision, reaching nearly universal levels in Udalguri and Barpeta districts. This marks a significant transformation from distant and unreliable to regular and reliable water accessibility.

5.2.4 Quality of Water Supplied

Table 8: Satisfaction regarding Quality of Tap water

	Yes	No	Not sure
Tinsukia	81%	-	19%
Jorhat	78.4%	3.8%	17.8%
Udalguri	81.3%	-	18.7%
Barpeta	83.6%	-	16.4%

Source~ *Field visit*

Table 9: Water supplied safe and reliable for drinking purpose

	Yes	No	May be	No idea
Tinsukia	41.5%	-	39.4%	19.1%
Jorhat	68.9%	-	26.6%	4.5%
Udalguri	73%	-	-	27%
Barpeta	77.6%	-	-	22.4%

Source~ *Field visit*

Table 10: Water supplied free from smell/odour

	Yes	No	Not sure	No idea (use of own source)
Tinsukia	69.1%	-	-	30.9%
Jorhat	91.7%	-	8.3%	-
Udalguri	92%	-	8%	-

Barpeta	96.9%	-	-	3.1%
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Source~ *Field visit*

The above tables 8, 9, and 10 showcase high user satisfaction regarding water quality in all the districts. With more than three-fourths of respondents expressing their satisfaction regarding water quality. Barpeta and Udalguri, followed by Jorhat reported highest confidence in odour free and treated water, with regular water testing of essential parameters within desirable limits. However, in Tinsukia a little inconsistencies persist, mainly due to trust deficit in adapting to treated tap water supplied. However, the households of Tinsukia and then Jorhat districts seem to use packaged drinking water or relying on their own water source. This indicates though the quality of JJM water is good, the lack of trust and awareness hinder the proper functioning and utilisation of the mission by the beneficiaries.

5.2.5 Community Participation and Institutional Sustainability

Table 11: Awareness campaign in village about water conservation

	Yes	No	No idea	Maybe
Tinsukia	-	-	92.1%	7.9%
Jorhat	-	-	53.3%	46.7%
Udalguri	-	-	82%	18%
Barpeta	-	-	82.5%	17.5%

Source~ *Field visit*

Table 12: Local Committee responsible for monitoring the water supply in village

	Yes	No	Not sure
Tinsukia	14.8%	-	85.2%
Jorhat	26.6%	-	73.4%
Udalguri	15%	-	85%
Barpeta	24.2%	-	75.8%

Source~ *Field visit*

The table 11 and table 12 clearly highlight that despite the infrastructural success of the JJM, community participation remains the weakest dimension across all the four districts. The majority of respondents were not aware of the existence of local committees, such as VWSCs, and no idea of having any awareness campaigns regarding water conservation. Among the four districts, Jorhat shows marginally better awareness. Overall, the lack of awareness reflects a continued beneficiary oriented approach rather than a participatory governance model, posing challenges for the long term sustainability, operation and maintenance of the JJM schemes.

5.3 Comparative Analysis of Impact of JJM on Rural Households

The JJM has emerged as one of the most transformative rural development initiatives in India, aiming to provide Functional Household Tap Connections (FHTCs) to every household. Beyond its infrastructural achievements, the mission's significance also lies in its socio-economic implications, particularly its impact on the everyday lives of rural families.

5.3.1 Impact on Daily Life and Time Use

Table 13: Time saved on water collection

	More than 2 hours	1-2 hours	Less than 1 hour	No time saved	Not sure
Tinsukia	-	60.6%	11%	21.9%	6.5%
Jorhat	-	77.4%	12.3%	-	10.3%
Udalguri	8.5%	52.5%	17.3%	9.8%	11.9%
Barpeta	-	73.3%	-	-	26.7%

Source~ *Field visit*

Table 14: Availability of Tap water improved Family's daily life

	Yes	Maybe yes	No	Not sure
Tinsukia	33.1%	44.2%	-	22.7%
Jorhat	59.4%	34.1%	-	6.5%
Udalguri	63.2%	25.3%	-	11.5%

Barpeta	56.8%	34.6%	-	8.6%
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Source~ *Field visit*

The above tables 13 and 14 indicates that across all the four districts, JJM has significantly reduced the time spent on water fetching, particularly of women. The maximum time saved is 1-2 hours daily. Jorhat reported 77.4%, followed by Barpeta (73.3%), Tinsukia (60.6%) and Udalguri (52.5%). Though the households acknowledged improved convenience and reduced physical drudgery, but irregular supply time and gendered role of water management are some ways limiting the maximum benefits of the mission.

5.3.2 Health, Hygiene and Sanitation

Table 15: Availability of clean water Impacted overall hygiene

	Greatly improved	Slightly improved	No improvement	No idea
Tinsukia	-	67.3%	25.2%	7.5%
Jorhat	-	92%	-	8%
Udalguri	7.5%	75.3%	9.8%	7.4%
Barpeta	-	85.4%	-	14.6%

Source~ *Field visit*

The above table shows improved water accessibility has led to better hygiene practices across all the districts, with highest improvements observed in Jorhat (92%), followed by Barpeta (85.4%), Udalguri (75.3%), and lastly Tinsukia (67.3%), where there seems trust deficit on tap water and continued reliance on the traditional sources. The increased frequency of bathing, washing and cleanliness also reflects positive outcomes of Water, Sanitation & Hygiene (WASH) outcomes. However, the impact on health is moderate.

5.3.3 Rural Household Productivity

Table 16: Household able to use saved time for economic activities

	Yes	No	Not sure
Tinsukia	-	75.2%	22.1%
Jorhat	8%	83%	9%
Udalguri	3.3%	90.7%	6%
Barpeta	4.5%	48.1%	47.4%

Source~ *Field visit*

The table 16 indicates that implementation of JJM has saved time on water fetching. Despite this, utilisation of the saved time on productive economic activities remained minimal across all the districts. More than three-fourths of households in Tinsukia, Jorhat and Udalguri, and nearly half in Barpeta district have reported no income generating activities using the saved time. Only a small number of 3-8% have used time for handicrafts, skill development or engaging as direct stakeholders in JJM. This indicates that JJM's impact on economic productivity are low, and proper integration with Self Help Groups (SHGs) and other beneficial programmes are needed in these districts.

5.3.4 Agricultural Productivity

Table 17: Availability of water affected Agricultural productivity

	Yes	No
Tinsukia	-	100%
Jorhat	4.5%	95.5%
Udalguri	-	100%
Barpeta	-	100%

Source~ *Field visit*

From the above table, it is clear that JJM has had no direct impact on agricultural productivity across all the four districts. This aligns with mission's focus on drinking water rather than on irrigation. However, there is potential indirect and long term benefits on agricultural productivity, through improved health, reduced

physical drudgery and better household time management of the beneficiaries, which later could be beneficial while doing farming.

5.3.5 Community Awareness and Participation

Table 18: Awareness of Jal Jeevan Mission in Community

	Yes	No	Not sure
Tinsukia	52.3%	46.9%	0.8%
Jorhat	86%	14%	-
Udalguri	73.5%	26.5%	-
Barpeta	82.6%	27.4%	-

Source~ *Field visit*

Table 19: Participation in Community meetings or discussions about Jal Jeevan Mission

	Yes	No
Tinsukia	9.4%	90.6%
Jorhat	23.2%	76.8%
Udalguri	13.1%	86.9%
Barpeta	16.8%	83.2%

Source~ *Field visit*

Table 20: Adequate information and education on Water management

	Yes	No	Maybe yes	Not sure
Tinsukia	-	-	12.3%	87.7%
Jorhat	-	-	26.4%	73.6%
Udalguri	-	-	16%	84%
Barpeta	-	-	7.1%	92.9%

Source~ *Field visit*

From the tables 18, 19, and 20 it can be analysed that the awareness of JJM is high in Jorhat and Barpeta, moderate in Udalguri, and comparatively lower in Tinsukia. However, the actual participation in meetings, decision making and water management are low across all the districts, despite near universal formation of Village Water and Sanitation Committees (VWSCs) and Village Action Plans (VAPs). Again, most of the respondents lacked clarity on water management education and participation, reflecting a top-down implementation model rather than community ownership and participation.

5.4 Comparative Analysis of JJM's Impact on Women Empowerment

Traditionally, women have been the primary custodians of household water management, responsible for fetching, storing, and utilizing water for all domestic chores. This unpaid and often invisible labour has historically limited women's time, mobility, and opportunities for education, social and economic participations. Within this framework, the JJM represents not merely an infrastructural intervention but also a potential social transformation with the power to reduce drudgery, enhance dignity, and open new opportunities for women's empowerment. Their empowerment depends on women's inclusion in decision-making processes, institutional representation, and control over resources. Therefore, the impact of JJM on women, must be evaluated along multiple dimensions- time use, workload reduction, access to information, and participation in governance.

5.4.1 Time Management and Workload Reduction

Table 21: Access to Tap water reduced Overall burden on women

	Yes	Maybe yes	No	Not sure
Tinsukia	14.8%	56.3%	8.8%	20.1%
Jorhat	30.1%	62.23	-	7.7%
Udalguri	28.5%	54%	-	17.5%
Barpeta	29%	57.8%	-	13.2%

Source ~Field visit

From the table above, it is evident that JJM has to some extent reduced the physical drudgery of women associated with water collection. The districts of Jorhat and Barpeta show relatively higher acknowledgement of workload reduction, while Tinsukia and Udalguri show uncertainty. The uncertain response like "maybe" in all the districts reflects that women continue to bear water related responsibilities in one way or the other, either

due to trust deficit in tap water quality or gendered role of water management within their household premises. Thus, though the infrastructural level has been improved, but gender disparities still prevalent in household chores management which hinder the achievement of mission's objectives.

5.4.2 Access to Information and Participation

Table 22: Access to information about water supply and its management

	Yes	Maybe	No	Not sure
Tinsukia	11%	52.3%	-	36.7%
Jorhat	21.9%	69.7%	-	8.4%
Udalguri	7.2%	63.5%	-	29.3%
Barpeta	8.9%	58.8%	-	32.3%

Source~ *Field visit*

The table above indicates that the access to information regarding water supply and management remains limited across all the districts to women. Jorhat district is performing marginally better, whereas the districts of Udalguri and Barpeta record the lowest direct access to information. Although JJM has created institutional opportunities for women through roles of Jal Mitra and VWSC members, these reached only a small segment of women. Overall, the information gaps and weak participation constrain women's engagement in broader water governance.

5.4.3 Decision Making Power

Through field interaction, it is evident that women's decision making power within households remain largely unchanged in all the four districts. Though there is visible confidence and having decision making power to those engaged as Jal Mitra or VWSC Secretaries, but this empowerment rarely could be seen in the private sphere of family decision making. The deep rooted patriarchy has limited women's participation in decision making, and raising their voices. Thus, along with the economic inclusion, it is much needed to have sufficient social and gender sensitisation programmes for women's upliftment.

6. Conclusions and Way Forward

Overall, across all the districts, the beneficiaries assess the JJM's impact through regular reliability, trust and meaningful participation in the governance. The JJM's successes in expanding water infrastructural facilities and its positive impact on rural households and women, beside these there is the need for district specific strategies, mainly focusing on community participation focusing on women's leadership, trust-building mechanisms, and gender-sensitive interventions to ensure long-term sustainability, and inclusive, participatory and gender-responsive water governance in rural Assam.

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