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Unlocking Time, Unlocking Potential: How JJM Enhances Women's Participation in SHGs in Dima Hasao, Assam

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Unlocking Time, Unlocking Potential: How JJM Enhances Women's Participation in SHGs in Dima Hasao, Assam

Abstract

The Jal Jeevan Mission (JJM), launched to ensure universal access to household tap water, has created new possibilities for rural women's empowerment especially in remote tribal districts like Dima Hasao in Assam. This study proposes to investigate how JJM's successful implementation in villages with maximum FHTC coverage influences women's engagement in Self-Help Groups (SHGs) by freeing up time and improving their socio-economic agency. The research will focus on two selected villages in Dima Hasao with the highest FHTC saturation, chosen to represent best-case scenarios of JJM's infrastructural impact. Adopting a mixed-methods design, the study will gather data through structured household surveys administered to women beneficiaries. Key indicators will include changes in time spent on water collection, participation in SHG meetings and income-generating activities, and perceived shifts in personal and community roles.

In addition, qualitative methods including focus group discussions and key informant interviews with SHG leaders and local water governance stakeholders will provide contextual understanding of how water access translates into empowerment in a tribal setting. Digital tools will be used to collect and geo-tag responses, ensuring data integrity and visual documentation. By grounding the study in the high-performing villages of Dima Hasao, this research aims to generate focused, evidence-based insights into the relationship between water infrastructure and women's collective empowerment. The outcomes are expected to inform scalable strategies for integrating SHG development with rural infrastructure schemes in alignment with the national vision of Viksit Bharat 2047.

Keywords: Jal Jeevan Mission (JJM), Women's Empowerment, Dima Hasao, SHGs, Rural Development, Time Use, Viksit Bharat 2047

1. Introduction:

According to the United Nations Children's Fund (UNICEF) and World Health Organisation (WHO), over 785 million people lack access to safe drinking water, despite the fact that it is a

31 fundamental human right. Globally, 29% of the population does not have access to a safely
32 managed water source (World Health Organisation and United Nations Children's Fund,
33 2019). Inadequate access to WaSH services is responsible for 9.1 % of the global disease
34 burden and 6.3% of all deaths worldwide (Prüss-Üstün et al., 2008).

35 Water collection, which frequently entails exploring great distances to obtain water from
36 wells, ponds, or rivers, is largely the responsibility of women and girls in many parts of India.

37 Women and girls are disproportionately affected by inadequate water access because they are
38 largely responsible for household water management (Kayser et al., 2019). Their everyday
39 lives are greatly impacted by this responsibility since it takes up a major amount of their time
40 and prevents them from pursuing personal interests, employment, or school.

41 Relatively few studies have examined the effects of drinking water on gender disparities,

42 despite the fact that WaSH-related health inequities have been extensively researched (Kayser
43 et al., 2019). Studies that have looked at how drinking water affects gender have mostly
44 focused on sexual violence, cleanliness, and water fetching. Due to inadequate sanitation

45 facilities, women must travel great distances to obtain drinking water and locate a secluded
46 area where they can defecate in the open (Sommer et al., 2015; Kayser et al., 2019). This

47 puts them at a much higher risk of being physically assaulted, abused, or harassed. One in
48 three women experience violence based on their gender (World Health Organisation, 2019).

49 The social, educational, and financial consequences of locating and obtaining safe drinking
50 water are frequently felt by women (Stevenson et al., 2012). According to UNICEF, one in

51 five girls of primary-school age are not in school, compared to one in six boys (UNICEF, &
52 IRC., 2005). While young boys are permitted to finish their education, young girls are

53 frequently pulled out of school to assist with home chores (House et al., 2013; UNICEF and
54 WHO, 2019). Furthermore, girls who are menstruating report missing more school because of
55 "inadequate WaSH facilities at school" (House et al., 2013; Goodman and Norden, 2005).

56
57 The Jal Jeevan Mission (JJM) was established by the Indian government in 2019 to solve
58 these issues. By 2024, this mission's main goal is to guarantee that all rural households in
59 India have access to functional household tap connections (FHTCs), which offer a
60 dependable and sustainable source of drinking water. Although constructing the infrastructure
61 required for water distribution is the mission's primary goal, its influence extends beyond
62 providing access to clean water. The program is also seen as an important strategy for
63 empowering women, particularly in rural regions. Depending on the context, the term
64 "empowerment" can mean many areas and mask other meanings. "Empowerment conveys

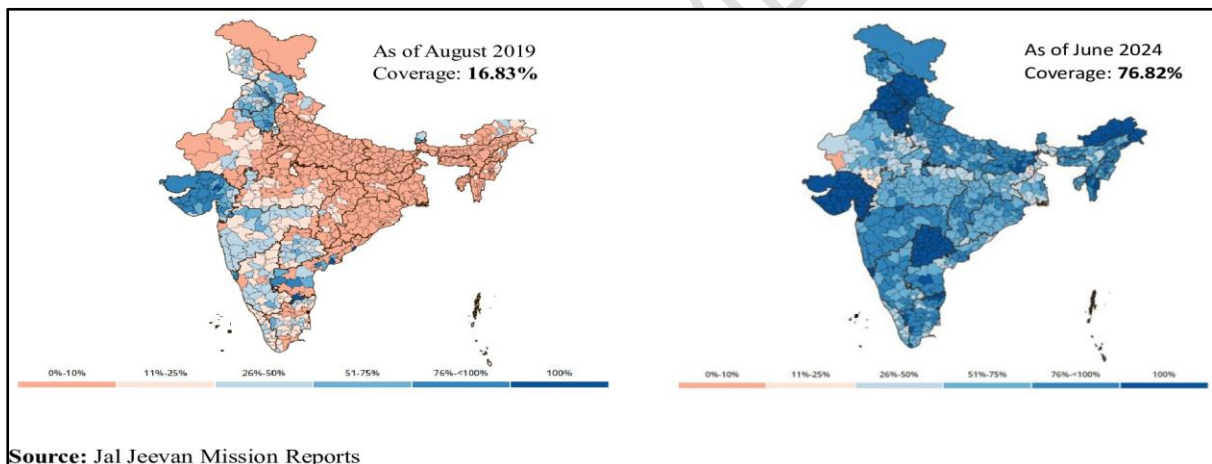
65 both a psychological sense of personal control or influence, and a concern with actual social
66 influence, political power and legal rights" (Rappaport J, 1987). According to McArdle
67 (1989), empowerment is the "process whereby decisions are made by the people who have to
68 bear the consequences-of-those-decisions," suggesting that the decision-making process itself
69 is more significant than the accomplishment of objectives. In the context of development,
70 self-help, involvement, networking, and equity are all associated with empowerment.
71 Individuals who successfully accomplished group objectives by combining their knowledge,
72 abilities, and other resources are empowered since they did it without outside assistance or
73 intervention. In the context of the Jal Jeevan Mission (JJM), empowerment is the
74 transformative process by which women gain enhanced agency, autonomy, and influence
75 within their households and communities by having reliable access to safe and clean water.
76 The Jal Jeevan Mission gives women and girls more time by alleviating the physical strain of
77 water collection, which enables them to better participate in other essential aspects of life,
78 like going to school, earning money, and taking part in community decision-making.
79 Furthermore, having access to clean tap water enhances home cleanliness and general health
80 by lowering the risk of waterborne illnesses and encouraging improved sanitation habits. By
81 improving women's safety, well-being, and prospects for social and economic growth, this
82 comprehensive improvement in living conditions helps to empower women.

83 1.1 Launch of the Jal Jeevan Mission

84 The Sustainable Development Goals (SDGs) were approved by India and 195 other nations in
85 September 2015 with the aim of eradicating poverty, promoting dignity, and safeguarding the
86 environment by 2030. Goal 6 of the 17 focusses on supplying sanitary facilities and clean
87 water. Under the motto "Har Ghar Nal Se Jal," the Jal Jeevan Mission (JJM) was established
88 in 2019 with the goal of supplying piped water to every rural household by 2024. The
89 essential need for such a program is highlighted by the 2018 NITI Aayog Water Management
90 Index, which found that 75% of rural households lacked access to high-quality water and
91 85% lacked piped water. JJM is regarded as a significant advancement. The Accelerated
92 Rural Water Supply Programme, which was renamed the National Rural Drinking Water
93 Programme in 2009, marked the beginning of India's efforts in 1972. This program was
94 eventually reorganised by JJM to concentrate on providing all rural residents with access to
95 clean drinking water.

96 The Government of India launched the Jal Jeevan Mission (JJM) with the goal of supplying
97 each rural family with safe and sufficient drinking water by 2024 through individual tap
98 connections. In order to raise the standard of living in rural areas, the Jal Jeevan Mission
99 (JJM) makes sure that every home has access to a sufficient and consistent supply of drinking
100 water of the recommended quality at reasonable service delivery costs. In order to ensure
101 long-term potable drinking water security for all rural households and public institutions,
102 such as Gramme Panchayat (GP) buildings, schools, Anganwadi centres, and health and
103 wellness centres, the mission seeks to empower and assist States and Union Territories (UTs)
104 in developing a participatory rural water supply strategy. By 2024, every rural household will
105 have a Functional Household Tap Connection (FHTC) with a sufficient amount of water that
106 consistently satisfies quality criteria thanks to the development of water supply infrastructure
107 (Ministry of Jal Shakti.,2019).

2 08 Fig 01: Percentage of rural households having tap water connection, 2019 and 2024



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111 Source: <https://doi.org/10.1371/journal.pone.0312144.g001>

112

113 1.2 Objectives of the Study

- 114 • To assess the changes in women's time allocation after JJM implementation.
- 115 • To evaluate the impact of reduced time burden on participation in SHGs.
- 116 • To explore perceived changes in women's socio-economic roles in the community.

- 117 • To generate evidence for integrating infrastructure with SHG-based empowerment
118 initiatives.

119 1.3 Research Questions

- 120 1. How has the Jal Jeevan Mission altered women's time spent on water collection?
121 2. What is the impact of this time-saving on SHG participation and income-generating
122 activities?
123 3. How do women perceive their roles in household and community decision-making
124 after JJM implementation?

11 25 2. Methodology

126 2.1 Study Area

127 The present study was conducted in two high-performing villages (Langthig Railway Station,
128 Hajadisa village) located in the Dima Hasao district of Assam. These villages were
129 purposively selected based on their exemplary progress under the Jal Jeevan Mission (JJM),
130 particularly their achievement of near-complete coverage of Functional Household Tap
131 Connections (FHTCs). Selection was informed by official JJM progress reports and
132 consultations with local implementing authorities and stakeholders involved in water resource
133 management.

134 Dima Hasao, a remote and predominantly tribal district in the hill regions of Assam, presents
135 unique geographical and socio-economic challenges in infrastructure development. Despite
136 these challenges, the two chosen villages have demonstrated significant strides in the
137 implementation of JJM, with a large majority of households receiving regular access to piped
138 water supply at their doorsteps. This makes them ideal case study sites for evaluating the
139 broader social and developmental outcomes of the mission, particularly its impact on
6 40 women's empowerment and time-use patterns in rural settings.

141 The purposive selection of these villages allows for an in-depth exploration of successful
142 implementation models and their influence on local communities. It also offers valuable
143 insights into how water security, when effectively delivered, can catalyze transformative
144 change in marginalized and difficult-to-reach areas such as those found in Dima Hasao.

2.2 Research Design

A mixed-methods design was employed, integrating combined quantitative household surveys with qualitative methods like Focus Group Discussions (FGDs). This approach was chosen for its strength in combining the breadth of quantitative data with the depth and context provided by qualitative insights.

2.3 Sample

Quantitative: A total of 100 women respondents were selected for the quantitative survey. These women were drawn from 50 households in each of the two purposively selected villages, resulting in a total of 100 households ($n = 100$). From each household, one adult woman respondent was chosen, preferably the primary female member responsible for water collection and household chores.

Qualitative: A total of 4 FGDs were conducted, 2 in each village. Each FGD comprised 6–8 women, selected based on their varying levels of engagement in community and household water-related activities. These discussions aimed to capture collective experiences, perceptions of empowerment, and community-level changes resulting from the JJM.

2.4 Tools and Indicators

- Structured questionnaire (pre- and post-JJM time use)
- SHG participation frequency
- Empowerment scale (adapted from the Women's Empowerment in Agriculture Index - WEAI)

2.5 Data Collection and Analysis

- Data collected using the tools & FGD
- Analysis conducted using SPSS for descriptive statistics and paired t-tests for significance testing.

3. Results and Statistical Analysis

Table 3.1

Time Saved on Water Collection

| Time Period | Mean Hours/Day | Std. Dev. | t-value | t-value |
|-------------|----------------|-----------|---------|---------|
| Pre-JJM | 2.4 hrs | 0.85 | | |
| Post-JJM | 0.6 hrs | 0.35 | 16.45 | <.001 |

173
174

Table 3.1 illustrates the time saved on water collection. In the study it was found that Pre-JJM, women spent an average of 2.4 hours per day fetching water, with a standard deviation of 0.85, indicating some variation in the time reported. And Post-JJM, the average time reduced significantly to 0.6 hours per day (36 minutes), with a lower standard deviation of 0.35, showing that most women experienced a similar reduction in time spent on water collection. Paired t-test Results shows $t(99) = 16.45, p < 0.001$, which also indicates significant reduction in time spent on water collection.

182 **Table 3.2**

183 *SHG Participation Rate*

184

| Indicator | Pre-JJM (%) | Post-JJM (%) | χ^2 | p |
|-------------------------------|-------------|--------------|----------|--------|
| Attending SHG Meetings Weekly | 41% | 78% | 26.89 | < .001 |

185
186

187 Note: N=100

Table 3.2 presents data on women's participation in Self-Help Group (SHG) meetings before and after the implementation of the Jal Jeevan Mission (JJM). Results show that Pre-JJM, only 41% of women reported attending SHG meetings on a weekly basis. And after Post-JJM, the percentage of women attending SHG meetings weekly increased significantly to 78%. A Chi-square test indicated a significant increase in SHG meeting attendance after JJM implementation, $\chi^2(1, N = 100) = 26.89, p < .001$.

194 **Table 3.3**

195 *Empowerment Scale Scores*

| Dimension | Mean Score (Pre) | Mean Score (Post) | t-value |
|-----------------|------------------|-------------------|---------|
| Decision-making | 2.8 | 4.1 | 9.23 |

¹ "A paired sample t-test was conducted to compare the mean time spent on water collection before and after JJM implementation."

| | | | |
|-----------------------|-----|-----|-------|
| Leadership in SHG | 1.9 | 3.6 | 11.75 |
| Economic contribution | 2.3 | 3.9 | 10.31 |

196

197 The paired t-test analysis reveals statistically significant improvements across all measured
198 dimensions of women's empowerment.

199 Decision-making:

200 The mean score increased from 2.8 (pre) to 4.1 (post), indicating a substantial enhancement
201 in women's participation in household and community decision-making. The result is
202 statistically significant ($t = 9.23, p < 0.001$).

203 Leadership in SHG:

204 The mean score rose from 1.9 to 3.6, reflecting a notable increase in women's leadership roles
205 within Self-Help Groups (SHGs). This change is also statistically significant ($t = 11.75, p <$
206 0.001), suggesting that the intervention encouraged more active community engagement.

207 Economic contribution:

208 Women's average score for economic participation improved from 2.3 to 3.9, pointing to
209 enhanced financial involvement and contribution within the household. The improvement is
210 statistically significant ($t = 10.31, p < 0.001$).

211 3.4 Qualitative Insights

212 The focus group discussions (FGDs) revealed that the implementation of the Jal Jeevan
213 Mission (JJM) has not only alleviated the burden of water collection for rural women but also
214 created new opportunities for personal and collective empowerment. A recurring theme
215 across the FGDs was the significant time saved due to the availability of functional household
216 tap connections (FHTCs), which has directly translated into greater participation in Self-Help
217 Groups (SHGs) and other socio-economic activities.

218 One participant shared:

219 *"Earlier, most of our day went in fetching water. Now I have joined a weaving SHG."*

220 This quote reflects how improved access to water has freed up several hours from daily
221 domestic chores, allowing women to engage in skill-based and income-generating activities
222 such as weaving. The ability to join SHGs not only provides a platform for economic
223 contribution but also fosters peer support, skill-building, and enhanced confidence among
224 women.

225 Another respondent stated:

226 *"Our SHG now meets twice a week because we have more free time."*

227 This indicates a quantitative and qualitative shift in SHG dynamics, not only has participation
228 increased, but the frequency of meetings has also gone up. Such changes suggest an evolution
229 in group functionality, enabling women to collectively plan activities.

230 These qualitative findings corroborate the statistical results, which showed significant
231 improvements in women's leadership, economic participation, and decision-making abilities
232 post-JJM implementation. The narratives from the FGDs offer contextual depth,
233 demonstrating how infrastructural development, when implemented effectively, can serve as
4 34 a catalyst for women's socio-economic empowerment at the grassroots level.

235 4. Discussion

236 The findings of this study underscore the transformative potential of the Jal Jeevan Mission
21 37 (JJM) in enhancing the socio-economic status of women in remote tribal regions. The
238 provision of accessible and reliable water through functional household tap connections has
239 significantly alleviated the burden traditionally placed on women to fetch water, a task that
240 has long consumed considerable time and physical effort (UNICEF & WHO, 2019). This
22 41 reduction in domestic drudgery has created new opportunities for women to engage in more
242 productive and community-oriented activities.

9 43 In particular, the time saved has facilitated increased participation of women in Self-Help
244 Groups (SHGs), where they are now actively involved in skill-based initiatives such as
245 weaving, petty trade, and savings-and-credit schemes. These findings resonate with previous
246 research, which highlights that access to water infrastructure can directly enhance women's
247 capacity to participate in economic activities and collective action (House et al., 2013; Ray,
248 2020).

249 Moreover, the JJM has indirectly contributed to a redefinition of gender roles, with women
250 gaining more confidence, autonomy, and voice within both the household and the broader
251 community. Such empowerment aligns with the broader development literature, which posits
252 that infrastructure interventions when designed with a gender lens can act as enablers of social
253 change and inclusive development (Agarwal, 2001; Kabeer, 1999).

254 Therefore, this study affirms that water supply initiatives like the Jal Jeevan Mission should
255 be viewed not merely as technical infrastructure projects but as catalysts for women's
256 empowerment and social development. Ensuring access to basic services like water can
257 unlock women's potential by freeing up time, improving well-being, and enhancing their
258 economic and civic participation (Narain, 2014; UN Women, 2018).

259 These findings highlight the importance of integrating gender-sensitive approaches into the
260 planning and implementation of rural infrastructure programs to achieve sustainable and
261 equitable outcomes.

262 4.1 Policy Implications

- 263 ➤ Link SHG Training with JJM Efforts: Combine SHG training programs with water
264 access initiatives so that women can use their saved time to gain skills and improve
265 their livelihoods.
- 266 ➤ Support SHG Enterprises in High-FHTC Areas: Introduce small business schemes for
267 SHGs in villages with high tap water coverage. This will help women turn time saved
268 into income opportunities and boost local development.

269 5. Conclusion

270 This study shows that reliable household tap connections have helped reduce the time and
271 physical burden of water collection, enabling rural women to engage more actively in Self-
272 Help Groups (SHGs) and take part in economic activities. As a result, JJM has become a
273 catalyst for women's empowerment, leading to greater involvement in community decision-
274 making, leadership, and income generation.

275 By offering both quantitative and qualitative evidence, this study supports the idea that
276 infrastructure development, when thoughtfully implemented, can contribute meaningfully to
277 social transformation. It highlights the importance of adopting integrated development
278 models, ones that combine basic services like water with economic and social initiatives to
279 unlock the full potential of rural communities.

280 These findings are especially relevant in the context of India's vision for Viksit Bharat 2047,
281 where inclusive and sustainable development is a key goal. Strengthening the link between
282 infrastructure and empowerment can help drive long-term progress and gender equity in
283 underserved areas.

285

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292

293

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