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Digital Tools In MGNREGS: An Assessment of Employee Satisfaction and Participation of Kottayam Grama Panchayat, Kannur District, Kerala

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Abstract

The digital revolution in India's rural governance has ushered in new possibilities for transparency, accountability, and participatory development. The rapid integration of digital tools such as NREGA Soft, NMMS, and Geo MGNREGA has revolutionized the implementation and monitoring mechanisms of the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS). These digital interventions aim to enhance transparency, accountability, and efficiency in the execution of rural employment programs by minimizing manual errors, leakages, and delays in wage payments. However, the effectiveness of such technological transformations largely depends on the satisfaction, adaptability, and participation of employees at the grassroots level who act as the backbone of implementation. Assessing their experiences is crucial to understanding whether digitalization is empowering field-level functionaries or creating new administrative and operational challenges. This study, conducted in Kottayam Grama Panchayat of Kannur District, explores the perceived impact of digital tools on employees' work satisfaction, workload, and participation in decision-making processes. The research highlights the practical realities of digital governance in rural development administration, offering insights into both its transformative potential and its limitations. By capturing the voices of employees directly involved in MGNREGS implementation, the study underscores the need for capacity building, continuous technical support, and inclusive digital policies to ensure that technological innovation truly strengthens grassroots governance. The findings of this study thus hold significant implications for policymakers, administrators, and researchers striving to enhance the effectiveness of digital governance in rural India.

Keywords: *MGNREGS, Digital Governance, NREGA Soft, NMMS, Geo MGNREGA, Worker Satisfaction, Digital Literacy, Rural Development, E-Governance, Participatory Governance.*

1. Introduction

In the context of India's accelerating digital transformation, welfare schemes like the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) are undergoing a paradigm shift from traditional bureaucratic delivery to technologically driven governance. Enacted through the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) in 2005, the scheme guarantees 100 days of wage employment annually to every rural household willing to engage in unskilled manual labour (Ministry of Rural Development 2021). It has played a vital role in alleviating rural poverty, reducing seasonal distress, and empowering marginalized communities through grassroots democratic engagement. However, as the scheme integrates digital tools to enhance efficiency, accountability, and transparency, the lived realities of rural workers are becoming increasingly complex. The introduction of digital platforms such as NREGASoft, the National Mobile Monitoring System (NMMS), and GeoMGNREGA represents a significant administrative evolution. These tools facilitate real-time monitoring, biometric attendance, wage disbursement, and geospatial tracking of assets (MoRD, 2022; National Informatics Centre, 2023). Although these innovations have been lauded for reducing corruption and

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strengthening service delivery, they have also exposed new challenges especially in areas with poor digital infrastructure and among workers with low digital literacy (Chopra & Singh, 2022; Khera, 2023).

Against this backdrop, this study undertakes an empirical assessment of the impact of digital governance on worker satisfaction and participation in the Kottayam Grama Panchayat of Kannur District, Kerala a region characterised by high literacy, vibrant civic institutions, and active participation in decentralised planning. The Panchayat offers a valuable microcosm for examining whether digital tools are genuinely enhancing grassroots empowerment or inadvertently reinforcing exclusion and administrative burdens (Joseph, 2022). The study revolves around a broader question that Are digital reforms in MGNREGS making rural employment systems more inclusive and efficient, or are they creating new structural barriers for the communities they intend to serve?

2. Review of literature

The integration of digital technologies in the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) has been a critical policy initiative aimed at enhancing transparency, reducing leakages, and improving service delivery in rural employment (MoRD, 2021; Dey & Bedi, 2010). Tools such as NREGASoft, GeoMGNREGA, and the National Mobile Monitoring System (NMMS) were introduced to overcome systemic inefficiencies such as delayed wage payments, ghost beneficiaries, and inaccurate work records (Khera, 2011; NIC, 2023). Studies have acknowledged the transformative potential of NREGASoft in streamlining administrative workflows and reducing manual errors (Bhatia & Bedi, 2010; Rajasekhar et al., 2011). GeoMGNREGA, developed with ISRO, supports the geo-tagging of assets to ensure visual verification and spatial accountability (ISRO, 2022; Chathukulam & John, 2021). Likewise, NMMS introduced in 2021 digitizes attendance records using geo-tagged images to minimize fraud, though concerns remain regarding its rigidity and accessibility for vulnerable groups (MoRD, 2022; Kumar, 2022).

Several scholars have critically examined the ground-level implications of these digital interventions, especially their inclusiveness and user-friendliness. For instance, Khera (2023) and Drèze & Oldiges (2021) point out that although digitization has helped detect irregularities, it often increases the workload on field-level staff such as Gram Rozgar Sahayaks (GRS), and introduces new exclusionary barriers for workers with low digital literacy or no smartphone access. The literature also highlights the uneven implementation across states, influenced by variations in infrastructure and administrative capacity (Bose, 2021; Chakraborty, 2022). In the Kerala context, digital adaptation has been relatively more successful due to high literacy rates and an established decentralized governance framework (Oommen, 2007; Joseph, 2022). Yet, even here, issues such as power outages, lack of trained staff, and inadequate grievance redressal mechanisms hinder full inclusion and satisfaction (Chopra & Singh, 2022; John & Antony, 2021).

Worker perception studies further emphasize that while digital tools have improved payment timelines and transparency, they have also added procedural complexity and stress (Anand et al., 2018; Singh, 2020). Female and elderly workers often struggle with biometric requirements and NMMS protocols, especially in the absence of flexibility for part-time attendance or emergency leave (Desai & Joshi, 2022; Bhattacharya, 2023). Scholars like Narayanan (2019) and Prakash (2021) advocate for a hybrid approach, combining digital mechanisms with human-centric flexibility to ensure equity. Additionally, literature on participatory governance stresses the need for greater involvement of Panchayat-level functionaries in customizing digital tools to local needs (Rajasekhar et al., 2018; Balasubramanian, 2021). Thus, the literature reveals that while digitization has improved oversight and reduced corruption, it must evolve with adequate training, contextual adaptability, and user-friendly designs to sustain participation and satisfaction among MGNREGS workers.

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The integration of digital tools such as NREGASoft, NMMS, and GeoMGNREGA in the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) has led to significant advancements in transparency, efficiency, and accountability, particularly through real-time monitoring, digital attendance, and geospatial tracking of assets (Kumar & Sharma, 2021; Ministry of Rural Development , 2022; Mohan, 2019). While these technologies have minimized ghost workers and expedited wage payments (Singh, 2022; Rafiq, 2019), numerous studies underscore persistent challenges especially for women, the elderly, and marginalized workers due to limited digital literacy, inadequate infrastructure, and smartphone inaccessibility (Das & Reddy, 2022; Chakraborty, 2023; Nair, 2022). Researchers also highlight the exclusionary impact of systems like NMMS and Aadhaar-Based Payment Systems, noting that wage delays and attendance issues often arise in regions with poor connectivity or weak administrative support (Centre for Policy Research, 2023; George & Menon, 2022). Local studies in Kerala further demonstrate that successful implementation of digital reforms correlates strongly with Panchayat level leadership, staff training, and technical infrastructure (Sukumaran & Elias, 2023; Pyla & Prasad, 2025). Although the potential of digitalization to modernize MGNREGS is well-documented, scholars consistently argue for inclusive policy measures, hybrid attendance systems, and community-based digital engagement to ensure equitable access and worker empowerment (Das & Reddy, 2022; George & Menon, 2022).

3. Research Questions

- What changes have been observed in the implementation and outcomes of MGNREGS in Kottayam Grama Panchayat following the integration of digital tools such as NREGASoft, NMMS, and GeoMGNREGA?
- To what extent are MGNREGS workers in Kottayam Grama Panchayat familiar with the digital tools used for monitoring and administration of the scheme?
- What specific challenges and barriers such as technical, infrastructural, or physical do MGNREGS workers encounter due to the use of digital tools in scheme implementation?
- How satisfied and participative are MGNREGS workers with the digitalized systems, and what factors influence their perceptions and engagement with these tools?

4. Methodology

This study employs a descriptive research design to assess the familiarity, challenges, satisfaction, and participation of MGNREGS workers and supervisors with digital tools in Kottayam Grama Panchayat, Kannur District. A mixed-method approach was adopted, incorporating both primary and secondary data to ensure a comprehensive analysis. Primary data were collected through structured questionnaires, face-to-face interviews with 80 workers and 10 supervisors, and field observations at various MGNREGS worksites to examine the practical use of digital tools such as NREGASoft, NMMS, and GeoMGNREGA. Secondary data, including government reports, policy documents, and academic literature, were reviewed to provide contextual depth and support the primary findings. Respondents were selected using a random sampling technique to ensure representativeness. For data analysis, quantitative data were subjected to percentage analysis to measure familiarity and satisfaction, while qualitative insights from interviews and observations were analyzed thematically to identify key issues and experiences. This methodological framework allowed for a holistic evaluation of the impact of digital integration in MGNREGS at the grassroots level.

The Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) has witnessed extensive digitalization in recent years, aimed at enhancing transparency, efficiency, and accountability in its implementation. The present study, titled “Digital Tools in MGNREGS: An Assessment of Employee Satisfaction and Participation of Kottayam Grama Panchayat, Kannur District, Kerala” investigates the effectiveness of key digital

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platforms namely NREGASoft, the National Mobile Monitoring System , and GeoMGNREGA in facilitating the day to day functioning of the scheme.

These digital tools were introduced with the goal of streamlining processes such as wage disbursal, attendance recording, and real-time monitoring of worksites. This study explores both worker and supervisor experiences with these tools, focusing on levels of awareness, satisfaction, ease of use, challenges encountered, and perceived benefits. While digitalization has brought noticeable improvements in curbing corruption and enhancing wage tracking mechanisms, ground-level implementation reveals critical shortcomings. Digital illiteracy, poor internet connectivity, limited access to smartphones, mobility issues among elderly workers, and insufficient training remain major barriers to effective usage.

5. Overview of Digital Tools in MGNREGS

The integration of digital tools into the Mahatma Gandhi National Rural Employment Guarantee Scheme represents a critical shift in the management of public welfare schemes in India. Among these, NREGASoft is a flagship e-governance platform developed by the National Informatics Centre under the Ministry of Rural Development. It facilitates the digitization of the entire operational lifecycle from job card registration and work allocation to wage disbursal and asset monitoring. Accessible at all administrative levels, NREGASoft supports decentralized planning and public transparency by making real-time records such as muster rolls and wage payments publicly available (Ministry of Rural Development, 2022). Integration with Aadhaar and bank accounts has also enabled direct benefit transfers, which reduces fund leakages and improves payment accuracy (Kumar & Sharma, 2021).

The National Mobile Monitoring System, launched in 2021, is a mobile-based application that mandates the real-time capture of worker attendance using geo-tagged, time-stamped photographs taken at the beginning and end of the workday. Designed for use by field-level officials such as Gram Rozgar Sahayaks (GRS) and Junior Engineers, NMMS aims to eliminate fake attendance, inflated muster rolls, and ghost workers by ensuring that only genuine beneficiaries receive wages (Chakraborty, 2023). Its integration with the Management Information System (MIS) ensures centralized data consolidation and minimizes manual entry errors. However, several studies have noted that the tool poses accessibility issues in areas with poor internet connectivity and has led to unintended exclusions of digitally illiterate and elderly workers (Das & Reddy, 2022; Nair, 2022).

GeoMGNREGA, developed in collaboration with the Indian Space Research Organisation (ISRO), focuses on improving transparency in asset creation under MGNREGS by geo-tagging physical works such as wells, check dams, and roads at three stages pre-execution, during construction, and after completion. These geo-tagged assets, complete with GPS coordinates and photographs, are uploaded to the Bhuvan portal, where they can be accessed by citizens, auditors, and policymakers (Mohan, 2019). This enables visual verification and reduces the chances of ghost assets or misreporting. Although the platform enhances public accountability, challenges related to the availability of trained personnel, smartphone access, and network reliability persist, especially in remote and under-resourced Panchayats (Rafiq, 2019; Pyla & Prasad, 2025). Together, these tools signify a transformative approach in rural governance, but their success depends on inclusive design, proper training, and infrastructural support.

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Table 1: Age wise distribution of MGNREGS worker respondent

Age group	Number of respondents	Percentage
Below 40 years	8	10
40-50 years	13	16.7
51-60	16	20
Above 60 years	43	53.3
Total	80	100

The data clearly illustrates that the majority of MGNREGS workers in Kottayam Grama Panchayat are elderly. More than half of the respondents (53.3%) fall in the above 60 years category, indicating a strong dependence of the older population on the MGNREGS as a source of income and livelihood support. Furthermore, when combined with the 51–60 years group (20%), it becomes evident that 73.3% of the respondents are above 50 years of age. This reflects a limited presence of younger workers in the scheme only 10% are below 40 years, which may suggest that younger individuals either migrate for better job opportunities or do not perceive MGNREGS as economically viable. This age pattern has implications for digital tool adoption. Older workers may face challenges in using digital systems like NMMS, GeoMGNREGA, or NREGASoft, due to issues such as low digital literacy, mobility constraints, and limited smartphone usage, as reflected in other parts of the survey. Therefore, special attention is needed to tailor digital literacy and training programs to meet the needs of this elderly majority.

Table 2: Access to Smartphones Among MGNREGS Workers

Smart Phone Access	Number of Respondents	Percentage (%)
Yes	36	45
No	44	55

The data shows that only 45% of MGNREGS workers in Kottayam Grama Panchayat have access to a smartphone, while a majority of 55% do not. This limited access to smartphones presents a significant barrier to the successful implementation and use of digital platforms such as NMMS, NREGASoft, and GeoMGNREGA, which require mobile devices for attendance marking, payment tracking, and work monitoring.

Since many of the scheme's newer processes like real-time attendance via geo-tagged photos or accessing payment details through apps depend on smartphone usage, this digital gap likely affects workers' participation and efficiency. The fact that more than half of the workers lack this basic digital tool highlights the urgency for infrastructure support, such as shared access devices, community kiosks, or non-smartphone alternatives for better inclusion in the scheme. This issue is particularly concerning given the high proportion of elderly workers, who are less likely to use or afford smartphones, further amplifying the digital divide in rural public service delivery.

Table 3: Familiarity with Digital Tools among MGNREGS Workers

Level of Familiarity	Number of Respondents	Percentage (%)
Almost Familiar	21	26.7%
Very Familiar	11	13.3
Slightly Familiar	40	50
Not Familiar at All	8	10
Total	80	100

(Source: Primary Data)

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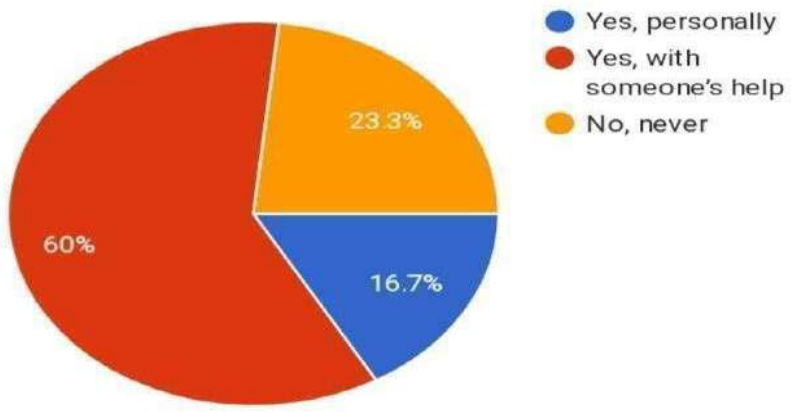
The table shows that 50% of the MGNREGS workers surveyed are only slightly familiar with the digital tools used in the scheme, and 10% are not familiar at all. This means 60% of the respondents lack adequate digital literacy, which directly impacts their ability to independently use platforms such as NREGASoft, NMMS, and GeoMGNREGA. Only a small segment (13.3%) of workers reported being very familiar, suggesting that in-depth understanding of the digital systems is limited. While 26.7% are almost familiar, this still implies the need for further capacity building. This data clearly points to a digital knowledge gap among the beneficiaries. To ensure the transparency, efficiency, and accountability that digital tools aim to provide, targeted interventions such as digital literacy workshops, hands-on training, and simplified user interfaces are necessary. Without these efforts, many workers may remain dependent on others, reducing the empowering potential of digital inclusion in MGNREGS.

Figure 1. Access to MGNREGS Job Card/Payment Details



(Source:- Survey data)

The above diagram illustrate the extent to which MGNREGS workers in Kottayam Grama Panchayat have personally used digital tools such as NREGASoft**,** NMMS**,** or GeoMGNREGA**.** The findings reveal that only 16.7% of respondents have personally accessed or used these digital systems, while a majority 60% have done so with someone's help**.** A significant 23.3% reported never using the digital platforms. The data suggests that while digital tools have been integrated into the scheme's administration, direct user engagement remains limited**.** The reliance on intermediaries indicates that digitalization has not yet translated into complete worker autonomy or transparency at the grassroots level. The partial adoption may, however, have improved record accuracy and monitoring efficiency from the administrative side, even if end-user participation remains constrained.

The relatively small proportion of workers who personally use digital tools reflects low levels of digital familiarity among the workforce. The fact that a majority access the platforms only with assistance highlights partial awareness workers may recognize the tools' existence but lack confidence or skills to use them independently. This pattern aligns with broader findings of limited digital literacy within rural employment contexts. Dependence on intermediaries for digital tasks can affect both satisfaction and participatory ownership. Workers who cannot independently use these platforms may feel less empowered or informed about scheme-related processes. This partial engagement may also influence their trust and satisfaction with digital systems, as they remain indirectly involved in digital monitoring and benefit tracking.

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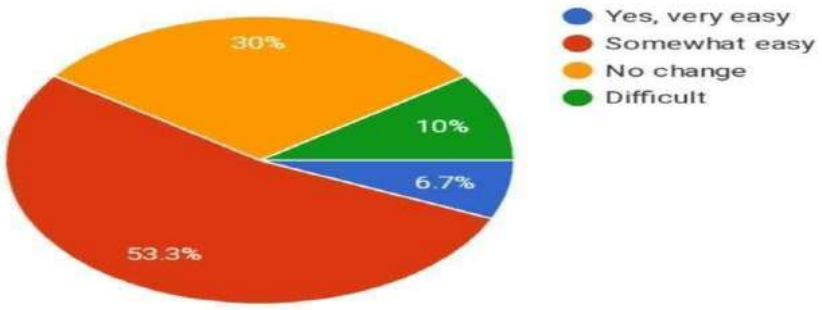
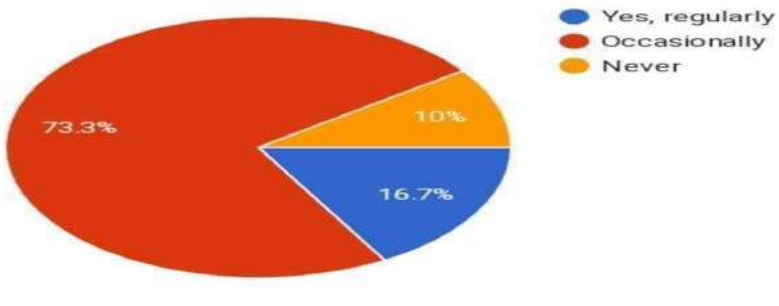
Figure 2. Perception of NREGASoft's effectiveness



(Source:- Survey data)

The data from the chart indicates that the introduction of digital tools such as NREGASoft, NMMS, and GeoMGNREGA in Kottayam Grama Panchayat has produced mixed outcomes in the implementation of MGNREGS. A majority of respondents (53.3%) found the system "somewhat easy," suggesting that while digitalization has streamlined certain processes like attendance tracking and wage payments, users still face minor operational challenges. About 30% reported "no change," implying that for some, the digital transition has not significantly altered their experience with the scheme. Meanwhile, 10% of workers found the system "difficult," highlighting persistent barriers such as lack of digital literacy, poor network connectivity, and limited access to smartphones, particularly among older and female workers. Only 6.7% found the tools "very easy," indicating that a small portion of tech-savvy users are fully comfortable with the digital systems. Overall, the data suggest moderate familiarity and satisfaction among workers, with digitalization improving efficiency and transparency but remaining constrained by infrastructural and skill-related limitations.

Figure 3. Participation in NREGASoft-Based Audits/Meetings



(Source:- Survey data)

The data on participation in NREGASoft-based audits and meetings reveals that the integration of digital tools in MGNREGS has had a moderate impact on promoting participatory governance in Kottayam Grama Panchayat. While 73.3% of workers attend such meetings occasionally, only 16.7% participate regularly, indicating limited but existing awareness of digital monitoring processes. This pattern suggests that although NREGASoft has improved transparency and accessibility of data, consistent engagement with these digitalized audits remains low

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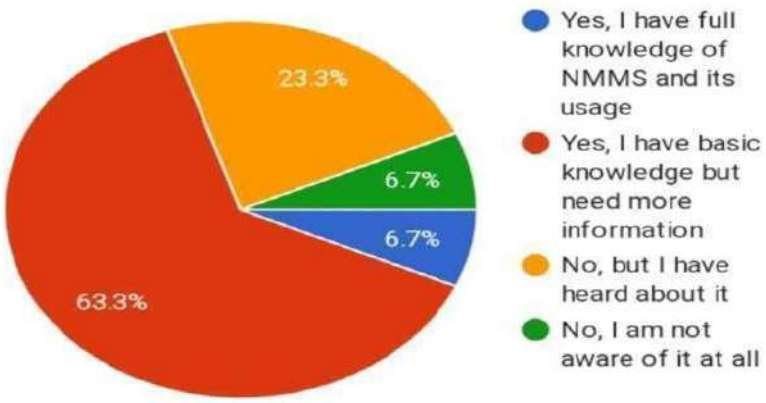
due to factors such as inadequate awareness, time constraints, or lack of confidence in using technology driven platforms. The 10% who have never participated highlight ongoing barriers both informational and infrastructural that restrict full inclusion. Overall, the data suggests that while digital tools have enhanced accountability and made MGNREGS processes more transparent, active participation and familiarity among workers are still evolving, influenced by factors like digital literacy, accessibility, and the extent of institutional support provided for community engagement.

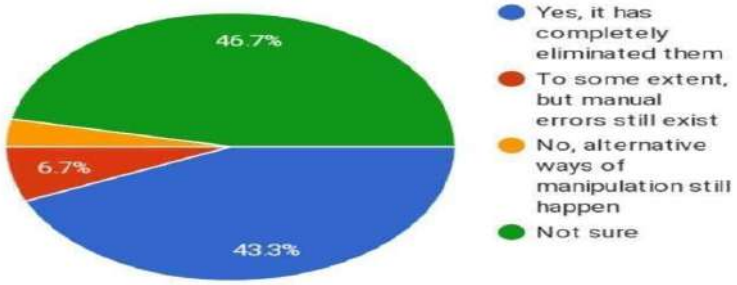
Figure 4. Awareness of NMMS Attendance Tool



(Source:- Survey data)

The data on awareness of the NMMS digital attendance tool shows that while its introduction has modernized attendance monitoring under MGNREGS in Kottayam Grama Panchayat, workers' familiarity with it remains limited. Only 6.7% of respondents possess full knowledge of the tool and its operation, while a majority of 63.3% have only basic awareness, indicating partial understanding without adequate technical competence. Furthermore, 23.3% have merely heard of NMMS but lack clarity about its purpose or use, and another 6.7% are entirely unaware of it. This pattern underscores a significant digital literacy gap among workers and points to the need for structured awareness and training programs. The limited familiarity suggests that while digital tools like NMMS have improved accountability and transparency in implementation, their full potential is constrained by insufficient dissemination of information, lack of hands-on training, and limited access to smartphones or internet connectivity, particularly among older or less-educated workers.

Figure 5. Impact of NMMS on Fake Workers and Attendance Fraud



(Source:- Survey data)

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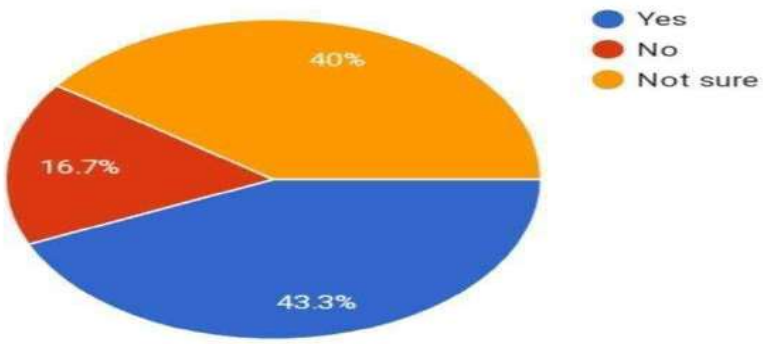
The data on the impact of NMMS on fake workers and attendance fraud indicates that the digital attendance system has significantly improved transparency and accountability in MGNREGS implementation within Kottayam Grama Panchayat, though perceptions among workers remain divided. About 43.3% of respondents believe NMMS has completely eliminated fraudulent practices, suggesting a positive change in worksite monitoring and credibility of attendance records. Another 6.7% acknowledge partial improvement, indicating that while digitalization has reduced manual errors, minor loopholes may persist. However, the fact that 46.7% of workers are uncertain about the system's impact highlights limited awareness of its operational mechanisms and benefits, possibly due to inadequate communication or lack of direct engagement with the digital processes. The small proportion (3.3%) who still perceive manipulation suggests isolated cases or misconceptions. Overall, while NMMS has contributed to enhancing the integrity of MGNREGS operations, its effectiveness from the workers' perspective is influenced by their level of familiarity, digital literacy, and transparency in implementation practices.

Figure 6. Awareness of GeoMGNREGA Monitoring



(Source:- Survey data)

The data on awareness of GeoMGNREGA monitoring reveals that while digitalization has introduced advanced transparency measures such as GPS-based tracking and photographic evidence, worker-level awareness in Kottayam Grama Panchayat remains limited. Only 43.3% of respondents are aware of GeoMGNREGA's role in monitoring worksites, whereas 40% are unsure and 16.7% are entirely unaware of its existence. This indicates that although digital tools have enhanced administrative oversight and accountability, their functioning and purpose are not well-communicated to workers on the ground. The high proportion of uncertainty and unawareness (56.7%) highlights a major gap in digital literacy and information dissemination. Such limited awareness can reduce workers' sense of participation and ownership, as many may not understand how these tools safeguard their rights or ensure transparency in job allocation and payments. Overall, while GeoMGNREGA represents a positive technological advancement, its impact on inclusive and informed participation depends heavily on strengthening communication, training, and awareness among MGNREGS workers.

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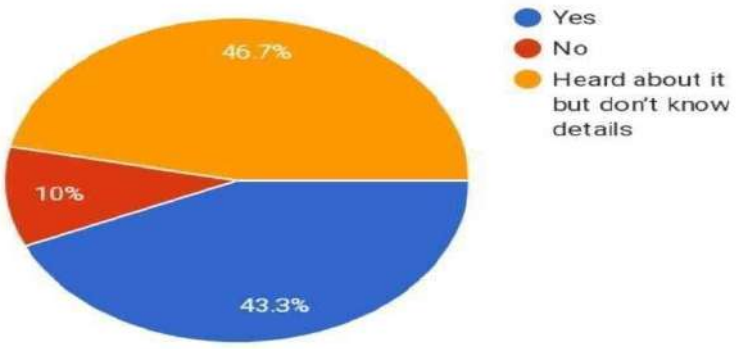
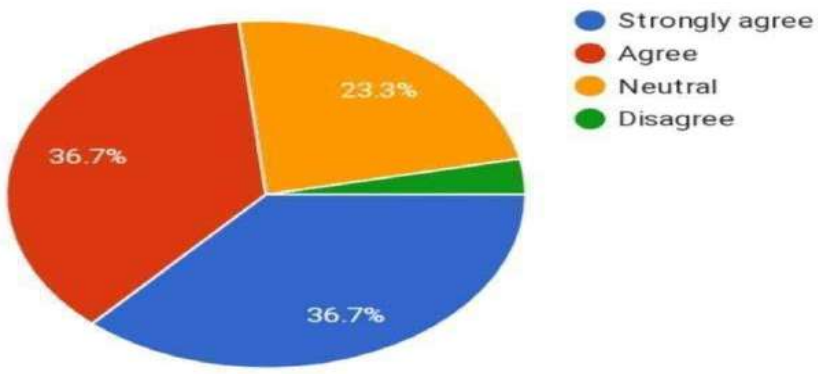
Figure 7. Awareness of Worksite Photo Monitoring in GeoMGNREGA



(Source:- Survey data)

The data on awareness of worksite photo monitoring under GeoMGNREGA shows that while digital monitoring has strengthened transparency and accountability in MGNREGS implementation, worker-level understanding in Kottayam Grama Panchayat remains uneven. About 43.3% of respondents are fully aware that photographs are taken before, during, and after work completion, reflecting some familiarity with the digital documentation process. However, 46.7% have only partial awareness, and 10% are completely unaware, indicating that more than half of the workers (56.7%) lack full understanding of how photo monitoring functions within the system. This limited awareness points to a communication and training gap, as many workers may not fully comprehend how these digital records ensure transparency in wage payments and verification of completed work. While GeoMGNREGA has enhanced administrative efficiency and accountability, the data suggests that without targeted awareness programs and participatory orientation, its potential to build trust and informed participation among workers remains underutilized.

Figure 8. Geo-tagging And Transparency



(Source:- Survey data)

The data on perceptions of geo-tagging and transparency indicates that the integration of this digital tool has been widely accepted as a positive development among MGNREGS workers in Kottayam Grama Panchayat. A significant 73.4% of respondents either strongly agree or agree that geo-tagging enhances transparency,

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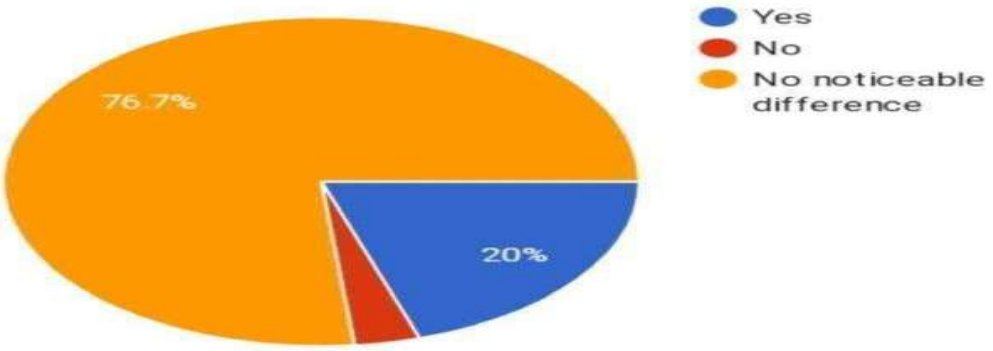
suggesting that workers recognize its role in ensuring accountability, preventing duplication of work, and improving record accuracy. The high level of agreement reflects growing trust in the use of technology for fair implementation and monitoring of MGNREGS activities. However, the 23.3% neutral responses and a small share of disagreement point to lingering uncertainties, possibly due to limited technical understanding, lack of direct visibility of how geo-tagging works, or apprehensions about privacy and data use. Overall, the findings demonstrate that geo-tagging has positively influenced workers' perceptions of transparency and efficiency, though continuous awareness efforts and training are needed to make all workers equally informed and confident in the system's digital mechanisms.

Figure 9. Perceived Impact of GeoMGNREGA on Payment and Verification Speed



(Source:- Survey data)

The data on the perceived impact of GeoMGNREGA on payment and verification speed suggests that while the system has strengthened monitoring and transparency, its influence on administrative efficiency remains limited from the workers' perspective in Kottayam Grama Panchayat. Only 20% of respondents feel that GeoMGNREGA has accelerated the payment and verification process, while a large majority—76.7%—reported no noticeable change, and 3.3% even believe it has not improved the process at all. This indicates that despite the technological upgrade, delays in wage disbursement and verification likely persist due to systemic issues such as data upload lags, network connectivity problems, or coordination delays between field and administrative levels. The findings also suggest that many workers may not fully understand the link between geo-tagging and backend verification processes, contributing to the perception that digitalization has not improved timeliness. Overall, while GeoMGNREGA has enhanced transparency and accountability, its impact on operational efficiency and worker satisfaction appears modest, calling for improved system integration, awareness, and real-time processing mechanisms.

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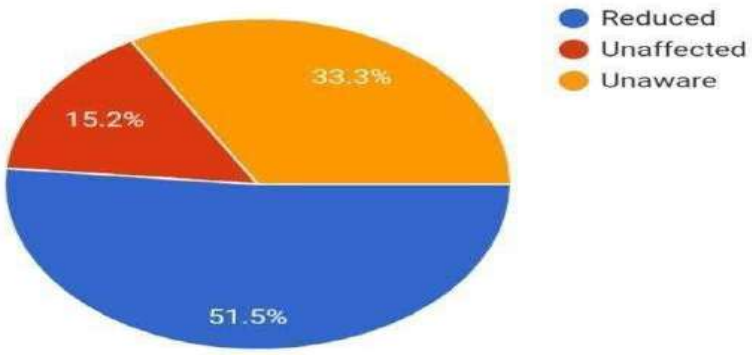
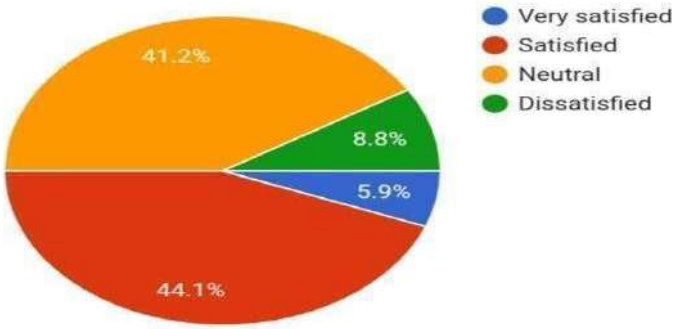
Figure 10. Perception of Corruption Reduction through Digital Tools in MGNREGS



(Source:- Survey data)

The data on the perceived impact of digital tools on transparency and efficiency in MGNREGS implementation reveals that, while technological integration through NMMS, NREGASoft, and GeoMGNREGA has introduced positive reforms, its effectiveness remains only partially realized among workers in Kottayam Grama Panchayat. A combined 43.3% of respondents (13.3% strongly and 30% moderately) acknowledged improvements in transparency and efficiency, indicating that digitalization has enhanced accountability, reduced manual errors, and improved monitoring to some extent. However, the fact that half of the respondents (50%) were unsure or lacked adequate knowledge highlights a significant gap in communication and digital literacy. This uncertainty suggests that many workers are not fully aware of how these systems function or contribute to improved governance outcomes, thereby limiting their engagement and confidence in the process. The small share (6.7%) reporting no change may reflect ongoing operational barriers such as poor connectivity, technical glitches, or limited accessibility to digital interfaces. Overall, while the integration of digital tools has brought measurable gains in transparency and administrative efficiency, their transformative potential is constrained by unequal access, insufficient training, and limited worker-level understanding—underscoring the need for continuous capacity building, awareness campaigns, and inclusive digital governance practices to ensure that all beneficiaries experience the intended benefits.

Figure 11. Satisfaction with Digital Tools in MGNREGS



(Source:- Survey data)

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The data on satisfaction with digital tools in MGNREGS highlights a generally positive but cautious outlook among workers in Kottayam Grama Panchayat. Half of the respondents (50%) expressed satisfaction or high satisfaction with tools such as NREGASoft, NMMS, and GeoMGNREGA, suggesting that these technologies have improved the system's overall efficiency, transparency, and accountability in areas like wage processing, attendance tracking, and worksite monitoring. The substantial neutral segment (41.2%), however, points to limited awareness or indirect engagement with digital processes—many workers may benefit from the outcomes of digitalization without directly interacting with the tools themselves. This neutrality could also stem from inadequate training, communication gaps, or a lack of visible improvements in their day-to-day experience. The relatively low dissatisfaction rate (8.8%) indicates that technical or operational challenges exist but are not widespread. Overall, the findings suggest that while digital integration in MGNREGS has been positively received, deeper worker engagement and sustained capacity-building efforts are essential to translate satisfaction into stronger participation and ownership of digital governance practices.

6. Findings

- The introduction of digital tools, especially GeoMGNREGA and NMMS, has strengthened transparency in attendance recording, work verification, and fund utilization.
- A large proportion of respondents acknowledged that geo-tagging and photo monitoring enhanced the credibility and visibility of MGNREGS activities.
- Around half of the respondents (50%) expressed satisfaction or high satisfaction with the digital systems, showing an overall positive perception.
- However, satisfaction levels were influenced by access to technology, age, and education, with digitally literate workers reporting better experiences.
- Most workers showed only basic awareness of digital tools, with very few having full knowledge of NMMS or GeoMGNREGA.
- Over half of the respondents lacked clear understanding of how these tools function, revealing a major gap in digital literacy and communication.
- Limited awareness and accessibility appear to restrict consistent community involvement in digital monitoring activities.
- While digital systems improved record accuracy and monitoring, most respondents (76.7%) reported no noticeable improvement in payment or verification speed.
- Persistent administrative delays and connectivity issues reduce the perceived efficiency gains from digitalization.
- Nearly half of the respondents believed NMMS had eliminated fake workers and attendance fraud, indicating growing trust in digital transparency mechanisms.
- A significant share of workers were uncertain, reflecting limited understanding of back-end verification processes.
- About 73.4% of respondents agreed that geo-tagging enhances transparency, demonstrating confidence in technology's role in improving accountability in project monitoring.
- A large portion of respondents adopted a neutral stance across multiple indicators, highlighting limited personal interaction with digital tools or lack of visible direct benefits.
- Across all digital platforms, there is a clear need for continuous training, digital literacy initiatives, and orientation programs to ensure that all workers—especially women and elderly participants—can effectively engage with the digitalized system.

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7. Conclusion

The integration of digital tools such as NREGASoft, NMMS, and GeoMGNREGA has undeniably transformed the operational framework of MGNREGS in Kottayam Grama Panchayat, ushering in a new phase of transparency, accountability, and administrative efficiency. However, the findings reveal that while digitalization has improved governance outcomes on paper, its full potential remains unrealized at the worker level due to persistent gaps in digital literacy, infrastructural support, and participatory awareness. The moderate satisfaction and high neutrality observed among respondents underscore the need to move beyond technological deployment toward inclusive digital empowerment. Workers' limited familiarity with digital mechanisms and inconsistent engagement in digitally facilitated processes suggest that technology alone cannot ensure effective implementation it must be accompanied by sustained training, capacity building, and user-friendly design to make governance truly participatory.

The study also opens avenues for further research into the social and behavioral dimensions of digital governance particularly how digital interventions affect inclusion, trust, and empowerment among marginalized groups. Future studies could explore comparative analyses across different Panchayats or districts, assess gendered experiences of digital adaptation, and evaluate the long-term impacts of digital tools on wage security, transparency, and rural livelihoods. Thus, while digitalization represents a progressive step toward good governance, its success ultimately depends on how equitably and meaningfully it integrates the human element into the technological framework.

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