

From Subsidies to Sustainability

Microfinance as a Catalyst for Advancing Sanitation in India



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1.

Sanitation and Financing Landscape in India

Research has increasingly highlighted the intricate relationship between sanitation and public health. Inadequate and unsafe sanitation, particularly open defecation, has been strongly associated with adverse health outcomes, including malnutrition, stunted growth, and cognitive impairment in children (Coffey et al., 2017). These adversities are particularly severe in vulnerable communities, where barriers to access safe sanitation contribute to high rates of infant mortality and child stunting (Cutler and Miller, 2005). Every year, inadequate access to clean drinking water, sanitation, and hygiene results in over 1.4 million deaths, most of which occur in low- and middle-income countries (WHO, 2023). Of these, unsafe sanitation alone accounts for 564,000 deaths, largely due to diarrheal diseases. With unsafe sanitation practices posing such severe health risks, understanding its root causes and creating pathways to improved sanitation access have become urgent public health priorities, especially in India (Coffey et al., 2017).

In response to these challenges, the Government of India launched the Swachh Bharat Mission (SBM) in October 2014 — one of the largest public sanitation initiatives globally — aimed at promoting sustainable sanitation and eliminate open defecation (OD) by 2019. This ambitious programme aimed to make India OD-free by 2019, setting into motion

widespread toilet construction and sanitation awareness campaigns. By providing subsidies for toilet construction, SBM significantly accelerated progress in sanitation access, particularly in rural and underserved areas in India. The programme allocated substantial public funds for toilet construction and awareness campaigns. The budgeted expenditure for sanitation stood at ₹3,500 crores (approx. US\$ 472 million) in 2012–2013, marking a more than threefold increase compared to 2009–2010 (Bose & Dutta., 2024). Following the launch of SBM, an additional ₹1,000 crore (approx. US\$ 135 million) was allocated in 2014–2015 (GOI, Union Budget 2009–10 to 2018–19). To put things into perspective, the total budget for India's sanitation campaign was over 40 times that of the Mars mission budget (The Hindu, November 16, 2021).

Despite significant progress in recent years, substantial gaps in sanitation coverage still persist. As of 2016, an estimated 60% of the population in India practiced OD — four times the global average (Alexander et al., 2016). This widespread prevalence of OD not only exacerbates public health concerns but also impedes India's progress toward Sustainable Development Goal (SDG) target 6.2, which aims to achieve universal access to adequate and equitable sanitation by 2030.



Participants of the research mapping the seasonal analysis.

Even in 2020, over 200 million people in India still lack access to toilets, and approximately 15% of the population continued to practice OD. Having said that, OD rates vary significantly across Indian states, with some regions achieving near-universal sanitation coverage, while others report rates as high as 70% (WHO & UNICEF, 2021). These statistics may even understate the issue, as research suggests that individual OD rates are often higher than household-level reports indicate, highlighting deep-rooted social and behavioural challenges that cannot be addressed solely through *infrastructure development* (Vyas et al., 2019).

Data from the National Family Health Survey (NFHS-5, 2021) further reveal stark disparities between urban and rural sanitation access, with only 65% of rural households having access to improved sanitation compared to 87% in urban areas. These disparities

are particularly pronounced among marginalised and economically disadvantaged communities, who face challenges beyond awareness, including affordability, accessibility, and infrastructure deficiencies. For many, financial constraints and inadequate infrastructure continue to hinder access to sanitation facilities. Without targeted interventions and financial support, these households are unlikely to secure the necessary resources for constructing and maintaining safe sanitation facilities, thereby perpetuating cycles of poor health and economic vulnerability.

These challenges, which are not solely related to sanitation infrastructure, open a critical discussion on *transitioning from a subsidy-driven approach to a more sustainable sanitation model in India*. However, to explore this shift effectively, it is first essential to understand how the SBM model operates.

Understanding the SBM Model

The SBM model operates on a reimbursement model, requiring households to initially cover the cost of constructing their own toilets before they can receive financial support. Once households provide the necessary documentation, they are eligible for a reimbursement of ₹12,000 (approximately €135). Despite these subsidies easing the process for many, a significant number of rural households still face substantial barriers.

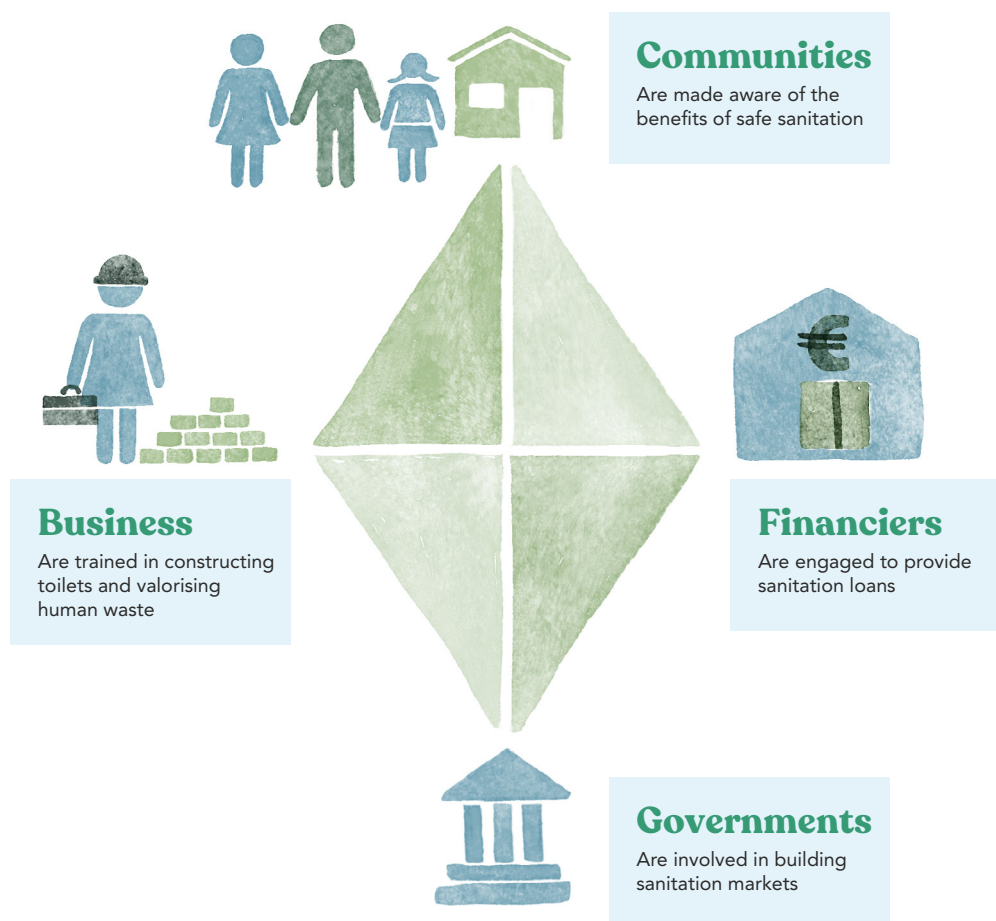
As mentioned in the previous section, one major challenge is raising the initial capital. The actual cost of building a toilet often exceeds ₹20,000 (around €225), a sum that many families cannot afford. Bose & Dutta (2024) finds that in India, only 3.97% of households receiving sanitation subsidies have access to safely managed toilets, compared to 20.74% among non-recipients. This suggests that subsidies alone are insufficient to ensure the long-term sustainability of sanitation infrastructure. Adding to the challenge, the cost of toilets varies widely, making it difficult for households to secure the necessary funds. Additionally, unlike in neighbouring countries, such as Bangladesh where inexpensive pit latrines are common, many rural Indian households opt for toilets with large pits or containment chambers (Coffey et al., 2017). These larger structures require less frequent emptying, which helps avoid the need for paying for emptying services. However, such toilets are often costlier, and far exceed the ₹12,000 subsidy provided by SBM. As a result, many families resort to informal methods like borrowing from relatives or dipping into personal savings, but these options are not accessible to everyone.

Another challenge to this model is that SBM reimbursements can sometimes be delayed due to institutional complexities. For example, unclear

guidelines on the process and timeframe for disbursement. During this delay, households may be forced to pay high interest to moneylenders, which further discourages them from building toilets. Another significant issue is the widespread lack of awareness. Many people are not informed about the importance of safe sanitation, the available technologies, or the appropriate toilet designs for their terrain or geography. The scarcity of trained masons who can construct technically sound toilets exacerbates this problem. This information gap disproportionately affects marginalised groups, such as female-headed households, who may struggle to apply for subsidies or navigate the toilet construction process under the SBM. Moreover, in rural areas, many women remain unaware of whom to contact or what documents are needed to apply for toilet construction. Some articles intended to explain the SBM application process but fail to provide clear guidance, leaving individuals unprepared to handle the institutional complexities. Additionally, previously constructed sanitation facilities may become non-functional and require major retrofitting due to damage, further complicating the sanitation landscape in India.

Addressing these barriers requires not only government support but also **sustainable financial innovations** that empower households to make investments in sanitation. Innovative financial mechanisms, such as microfinance, can play a critical role in bridging the affordability gap for rural communities. In the next sections, we talk about how MFI financing is historically introduced in the WASH landscape, and how within programmes like **FINISH Mondial** (FM) this financing tool is used to bridge the gap between demand and the supply of safe sanitation services.

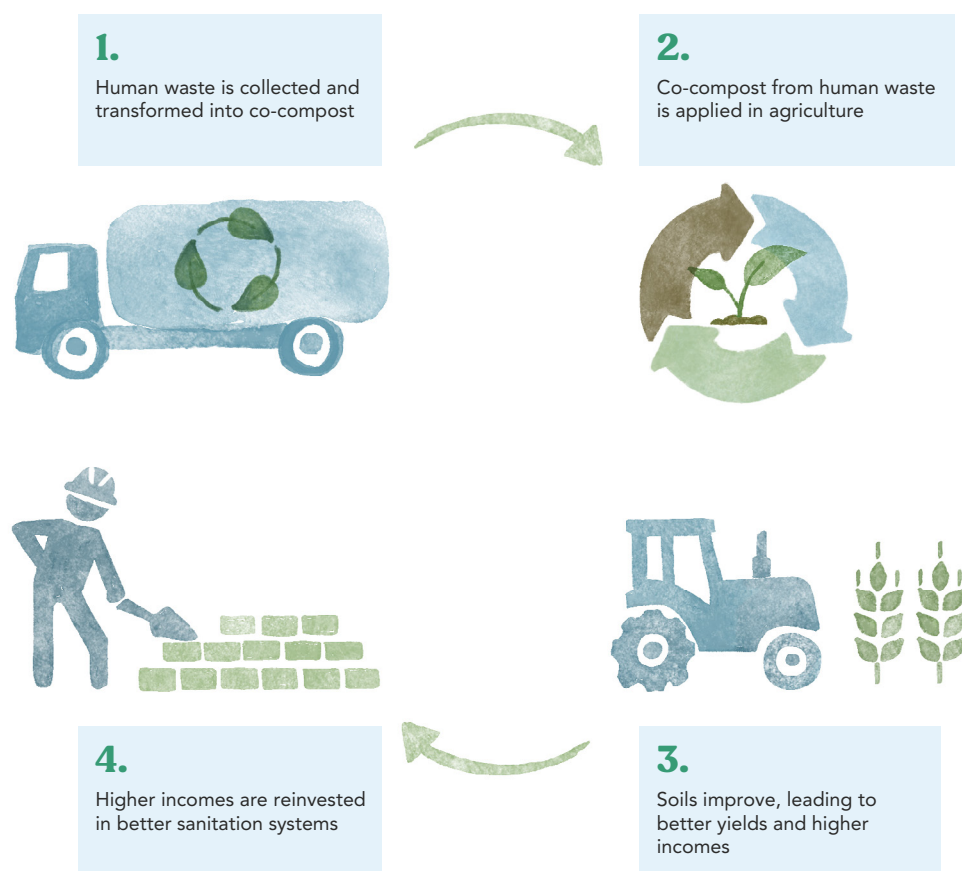
A Market-Based Approach to Sanitation: FINISH Mondial



WASTE's FINISH Mondial (FM) programme, launched in 2009, has grown into a comprehensive initiative that not only focuses on toilet construction but also tackles the underlying barriers preventing widespread access to sanitation access and usage. FM employs a market-based sanitation approach that connects households with financial institutions, making it easier for them to raise the initial capital needed to build toilets. By working closely with microfinance institutions (MFIs) and local banks, the programme helps families access affordable loans, reducing their reliance on informal borrowing or

dipping into limited personal savings. In addition to financial support, FM actively works to bridge the awareness and (or) information gap that has long hindered effective sanitation practices. The programme conducts targeted awareness campaigns to generate demand and educate communities about the importance of safe sanitation, the available technologies, and the appropriate design of toilets tailored to specific terrains.

Furthermore, within FM, local masons are trained in constructing technically sound toilets, ensuring



that households have access to skilled labor for their sanitation needs. The programme emphasises supporting marginalised groups, including women, the elderly, and people with disabilities. It particularly targets female-headed households, who are the primary borrowers of MFI loans, ensuring they receive the necessary information and support. Since its inception, FM has facilitated the construction

of over 2 million toilets, transforming the lives of approximately 10 million people across six countries. The programme has successfully mobilised more than €500 million into the sanitation market in developing regions with its holistic approach—combining financial solutions, education, and technical support with a multi-stakeholder diamond model (as seen on the previous page).

2.

History of Microfinance in WASH

Microfinance, in its modern form, emerged in the 1970s in Bangladesh (Trémolet et al., 2015). MFIs with a strong understanding of local communities, began offering small loans for income-generating activities at lower interest rates compared to traditional lenders and with minimal collateral requirements. Over time, these institutions expanded their services to include loans, savings, insurance, and payments, leading to rapid growth in low- and middle-income countries (Trémolet et al., 2015). Sanitation microfinance, in contrast to most other types of microfinances, is not directly income-generating but rather “income-enhancing.” A loan for a toilet, for example, may not directly generate income; however, it can reduce medical expenses and improve productivity, ultimately leading to long-term savings.

At the household level, sanitation microfinance helps families manage the costs of investing in sanitation solutions, such as toilets and septic tanks. This makes such investments more affordable and is expected to result in increased savings over time. At the business level, it can foster the development of a wide range of sanitation service providers, such as communal toilet block operators or pit latrine emptier (Trémolet, 2013). According to Trémolet’s (2015) definition, “*sanitation microfinance refers to the provision of microfinance to households or small businesses, enabling them to invest in sanitation services*”.

In the Indian context, these MFI loans are especially beneficial, where household incomes are often insufficient to cover the upfront costs of toilet construction, even with subsidies from SBM. By offering financial flexibility, microfinance can ensure that more families have the means to build and maintain safe sanitation facilities, contributing to long-term health and social benefits.

In addition to microfinance, community-based financing models and partnerships with non-governmental organisations (NGOs) can further alleviate financial barriers. These collaborative approaches not only provide the funds necessary for sanitation improvements but also foster a sense of ownership within communities. When households and local organisations work together to improve sanitation, they are more likely to achieve sustainable outcomes, as community members take an active role in maintaining and promoting these facilities.

Ultimately, expanding access to safe sanitation is crucial for improving public health, reducing poverty, and enhancing the overall quality of life in rural India. Investments in sanitation infrastructure, combined with innovative financing solutions, can help break the vicious cycle of disease and poverty. By enabling families to invest in their health and well-being, these initiatives support India’s broader development goals and bring the country closer to achieving equitable and sustainable sanitation for all.

However, Trémolet (2015) argues that there is a need to better understand the demand side of sanitation; who takes out sanitation loans and the specific impact these loans have on customers. Additionally, questions around the inclusion and exclusion criteria in sanitation microfinance remain unclear. On the supply side, research is necessary to determine whether suppliers view sanitation finance products and institutions as beneficial to their business. If the sanitation sub-sector proves to be positive, financial institutions are more likely to continue offering services (Trémolet et al., 2015). Lastly, further action-research projects are needed to evaluate how improving access to microfinance can contribute to the development of sustainable sanitation services. Building on these gaps identified in the literature, this report explores the long-term impact of sanitation financing facilitated by **FINISH Mondial** (FM) in India, with a specific emphasis on the role of microfinance through the partnership with MFI; **Bharathi Women Development Centre (BWDC)** in fostering sustainable sanitation outcomes.

BWDC has been partnering with FM for over a decade, working closely with our partner, Trust of People (TOP) to build their capacity and develop a dedicated WASH portfolio. This collaboration has been pivotal in integrating sanitation into their microfinance services, making a significant impact in the communities they serve.



3.

Overarching Objectives and Questions



One of the respondents of the research

The overarching research question guiding this research is: What is the current state of sanitation systems and their utilisation among households that participated in the FINISH Mondial (FM) programme, and what secondary effects have emerged over time?

This research further looks into both tangible impacts, such as infrastructure development, toilet usage, and maintenance, as well as intangible outcomes, including shifts in health-related behaviours, local norms regarding sanitation, and the broader socio-economic outcomes of improved sanitation access.

Specifically, the study explores how the FM sanitation financing programme has contributed to economic upliftment by creating job opportunities, increasing household savings through reduced healthcare costs, and fostering new economic aspirations among beneficiaries. It also examines the programme's role in advancing gender equality by empowering women through improved health, increased dignity, and active participation in sanitation decision-making. These aspects, along with enhanced community health and long-term behavioral adaptations, form a more rounded view of the outcomes of the FM programme, highlighting the potential of sanitation financing in fostering resilience, equity, and socio-economic development within rural communities.

4. Methodology

Conceptual Framework

The chosen indicators in the framework used to guide the data collection process are designed to measure the full spectrum of long-term impacts from sanitation financing, particularly those supported by FM and BWDC. These indicators are essential for understanding the broader impacts of sanitation programmes on individuals and communities, helping to capture both immediate outputs and subsequent outcomes.

Indicator 1: Availability of Sanitation Facilities

Assessing the presence of sanitation infrastructure at both household and community levels is foundational. Access to toilets is a primary output of sanitation financing, providing a direct measure of the programme's impact on improving sanitation coverage.

Indicator 2: Sanitation System Sustainability and Faecal Sludge Management (FSM)

Beyond installation, the consistent use and maintenance of sanitation facilities are critical for sustained benefits. This indicator examines whether

installed toilets are still in use, whether behaviours around sanitation have shifted meaningfully, and whether retrofitting or updates are required to keep facilities functional.

Indicator 3: Economic Changes due to MFI Interventions

MFIs play a pivotal role in enabling households to finance sanitation improvements. By analysing economic changes at the individual and community levels, this study seeks to determine how financial tools provided by MFIs have contributed to economic empowerment, potentially helping households break cycles of poverty through improved sanitation.

Indicator 4: Financial Habits and Status

Sanitation financing can influence financial behaviours, such as saving, borrowing, and loan repayment. This indicator looks at changes in these habits, which can shed light on the sustainability of financial inclusion and assess whether households manage their finances effectively after accessing loans for sanitation.

Indicator 5: Behavioural Shifts and Aspirations

Sanitation interventions often lead to shifts in attitudes toward hygiene and health. Tracking these changes is essential to understand how people's aspirations and standards for cleanliness and hygiene evolve over time, which can contribute to broader improvements in quality of life.

Indicator 6: Gender Empowerment

Sanitation has a particularly significant impact on women. Access to household toilets not only

enhances women's health and safety but also elevates their social status and empowers them within household and community decision-making processes. This indicator highlights the social gains for women and adolescent girls achieved through sanitation improvements.

Other Outcome Indicators

This category captures additional effects of the programme that may not fall neatly into the other categories but are nonetheless essential to understanding the holistic impact of sanitation financing on communities.

Data Collection Process

Our methodological framework combined structured surveys, observational data, and action-oriented research activities, including a systematic pit-opening exercise in select households. The target sample included individuals who received sanitation-related loans from BWDC between 2010 and 2016. This time frame covers a period when the microfinance sector in India experienced significant challenges, allowing us to examine the resilience and sustainability of these interventions under fluctuating economic conditions.

The beneficiaries in this sample have been associated with BWDC for a minimum of eight years, with some having a relationship lasting up to more than 20 years. Data collection was done from December 2023-February 2024 in Thiruvavur region of Tamil Nadu, India. This duration provides a rich foundation for studying the outcomes of FM's sanitation financing initiatives.

This approach is further enriched by secondary data from the NFHS-5 (2019)¹, providing a national context for sanitation access, demand, and ongoing challenges. By integrating NFHS data, we assess broader trends in sanitation and financial inclusion, informing our conceptual framework for evaluating FM's role in addressing persistent barriers.

Rapid Immersion Research (RIR)

Rapid Immersion Research (RIR) is a qualitative method focused on gathering in-depth insights within a short time frame. This approach, which involves concentrated daytime engagement with the community, is especially suitable for rural and remote settings. RIR is highly relevant to FM's work in Indian villages, where regional sanitation practices and challenges vary. It provides a flexible, scalable approach to collecting contextual data across India's diverse rural landscape, particularly useful for

¹ The National Family Health Survey 2019-21 (NFHS-5), the fifth in the NFHS series, provides information on population, health, and nutrition for India.

evaluating aspects such as toilet utilisation, hygiene behavior, and the overall effectiveness of MFI-funded sanitation interventions. This method allowed the research team to:

- Interact with local households, observing sanitation infrastructure usage and hygiene practices.
- Conduct interviews with beneficiaries, village leaders, and local women involved in sanitation projects.
- Evaluate the sustainability and broader socio-economic impact of sanitation interventions a decade post-implementation.

Qualitative Survey Techniques

The qualitative survey was conducted over a five-day period and included several participatory research activities aimed at gathering community insights and understanding behavioral changes. These techniques include:

- **Participatory Mapping:** Involving community members to map key resources, including sanitation facilities, within the village.
- **Village Mapping:** Creating a spatial representation of sanitation infrastructure and services.
- **Transect Walk:** Walking through the village to observe and assess sanitation infrastructure in different areas.

Timeline Interviews: Understanding the historical progression of sanitation improvements and related events.

Trend Analysis Interviews: Analysing trends in sanitation practices and hygiene behaviors over time.

Quantitative Survey

A structured quantitative survey was conducted with 110 participants, utilising the Kobo app for data collection to ensure accuracy and efficiency. After data cleaning, 96 responses were retained for analysis. The quantitative component complements the qualitative insights by providing measurable data on sanitation facility availability, financial habits, economic impacts, and gender empowerment.

Sampling Strategy

The study employed both random and purposive sampling techniques to ensure a representative cross-section of BWDC beneficiaries from the 2012–2014 period. By selecting participants from BWDC's records, the study captures a diverse demographic and socioeconomic sample that reflects the broader beneficiary pool.

Data Collection and Tools

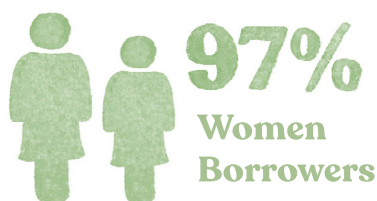
Data collection was facilitated through the Kobo app, a modern tool that enhances data accuracy and streamlines the process, ensuring timely completion within the planned five-day fieldwork period. The combination of quantitative metrics, qualitative insights, and experiential findings will provide a holistic view of the enduring impact of sanitation financing under BWDC's operations.

5.

Findings and Results

This section provides an overview of the key insights gathered through our triangulation approach, combining quantitative data with qualitative research. These highlights set the stage for the detailed analysis that follows.

1. Impact of Microfinance on Access to Safe Sanitation



Our study results find that in the Thiruvavur region of Tamil Nadu, 98% of the studied population has access to a safe sanitation facility. Further, the findings of our study seem to suggest that MFI loans have significantly enhanced access to safe sanitation in this region. With a 99% repayment rate, these loans have proven both sustainable and effective in uplifting communities by enabling investments in safe sanitation facilities. The field data reveals that 97% of these loans were taken by women, who are often primary caregivers and bear the brunt of inadequate sanitation. This high rate of female participation underscores MFIs' focus on empowering women and addressing gender disparities in health and

well-being. Moreover, as the literature suggests, loans given to women borrowers have historically shown higher repayment rates compared to those given to men.

2. Inclusive Reach Across Occupations and Education Levels

Our intervention has effectively reached a diverse range of occupational groups, with agriculture and construction workers comprising 50% of loan recipients. This highlights the accessibility of MFI loans across various employment sectors, particularly for those excluded from traditional banking. Since most beneficiaries lacked collateral to secure bank loans, the success of MFI loans reinforces the idea that vulnerable communities can also access credit and invest in safe sanitation infrastructure.

Further, the majority of household heads in the study have educational levels below Class 10 or 12. Despite limited formal education, these households effectively utilise MFI loans, underscoring the importance of tailored financial products that match the capacities and needs of the population. Notably, awareness efforts by MFIs and partners like TOP have fostered acceptance of microfinance as a valuable financial tool in Thiruvavur.

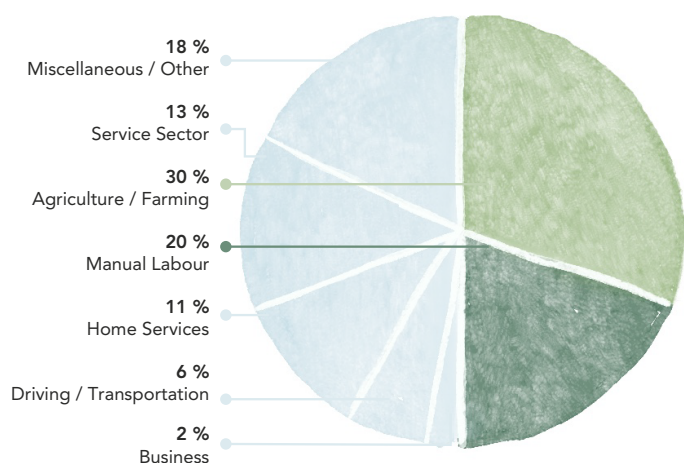


Figure: Distribution of beneficiaries per occupation segment

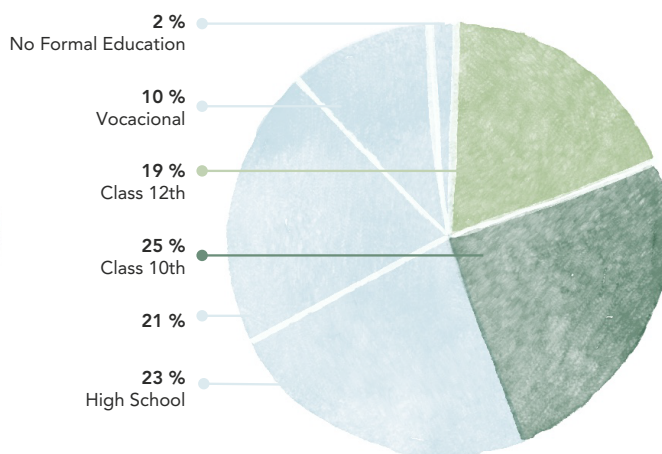


Figure: Distribution of beneficiaries per educational level

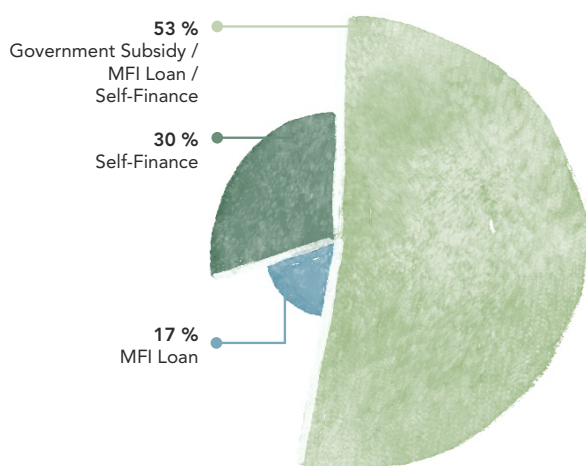


Figure: Distribution of sanitation financing methods

3. Financing Methods and Role of Subsidies

More than half (53%) of the respondents financed their toilets through a combination of government subsidies, MFI loans, and self-financing. This blend has proven highly effective: government subsidies offset some costs, while MFI loans bridge the remaining financial gap, making sanitation investments manageable for families. While the SBM subsidy plays a critical role, it often falls short of covering full costs. By integrating MFI loans, families can construct toilets that meet safety standards. The high uptake of loans during SBM's early years also highlights the role of MFIs in creating demand for sanitation.

4. Quality of Construction and Long-Term Sustainability

Our research indicates that 80% of the assessed toilets have substructures that comply with safe FSM practices. Notably, 60% of these facilities utilise twin-pit systems, ensuring on-site sludge treatment and minimising environmental risks. As demonstrated in the case study below, beneficiaries effectively manage twin-pit systems, allowing for safe sludge decomposition and its subsequent use as compost, reinforcing both environmental and economic sustainability. The remaining 20% of toilets are equipped with septic tanks, which require periodic emptying once they reach capacity. This highlights the need for appropriate desludging services and regulatory oversight to ensure safe and sustainable FSM practices.

Our findings also indicate that toilets financed through MFI loans tend to have a better construction quality and durability compared to those built solely through self-financing. This outcome is largely attributed to FM's comprehensive approach, which includes training local masons in safe and sustainable toilet technologies. Additionally, the durability of these toilets reduces long-term maintenance costs and improves the quality of life for families. The case study (below) of a twin leach pit sanitation system in a coastal village further demonstrated that even in flood-prone areas, these systems perform effectively.

Retrofitting Needs

The results of this study show that nearly 60% of sanitation systems have been retrofitted since their construction, with the majority of these upgrades occurring after 2018. A significant 93% of the beneficiaries have financed these retrofitting improvements through MFI loans. This trend suggests a notable shift in the perception of sanitation, increasingly being viewed as not merely a basic necessity but as an essential household asset. The willingness to invest in the enhancement of sanitation infrastructure highlights a growing recognition of the importance of upgrading from basic to safe sanitation systems. This shift represents a movement up the sanitation ladder, as households prioritise long-term health and hygiene benefits associated with improved sanitation facilities.

Interestingly, our findings reveal that among the toilets solely financed by MFIs, only 16% of those required retrofitting of their substructures. This demonstrates that toilets built with MFI interventions—coupled with mason training and capacity-building efforts—resulted in more sustainable sanitation systems. In contrast, of the total toilets built through self-financing, 48% of them required retrofitting of their substructures. This comparison underscores that overcoming financial barriers alone is insufficient for ensuring long-term sustainability. It is crucial to have an effective service chain, which includes trained masons and the use of appropriate technologies, to ensure that sanitation infrastructure is not only constructed but also maintained and used sustainably over time.

Broader Economic Impact of MFI Loans

Similar to the mason in the case study, our findings indicate that many respondents who initially accessed loans for toilet construction have subsequently secured additional financing for income-generating activities. The data reveals a strong pattern of continued financial engagement, with 25% of the sample population having taken an MFI loan five times after their initial loan, while 35% have accessed loans four times following their first borrowing experience. This trend underscores the role of MFIs not only in facilitating sanitation improvements but also in fostering long-term financial inclusion and economic mobility.



Figure: Distribution of repeat MFI borrowing, showing the proportion of clients taking multiple loans after their initial borrowing.

It seems to suggest that this ripple effect of MFI interventions fosters broader economic development, as evidenced by the ongoing rise in living standards and consumer spending in these communities. The availability of subsequent loans reflects growing community trust in the MFI system. In one typical village near Thiruvapur, MFIs have provided a critical financial safety net since 2014, especially for households without substantial wealth.

With the introduction of WASH loans, MFIs have bridged gaps left by limited subsidies, enabling sustainable sanitation development. Further discussions with community members indicate that the introduction of MFI loans has driven significant economic improvement over the past 10–15 years. Loan access has offered households a financial buffer in emergencies and increased economic opportunities, particularly for women. Visible indicators of improved living standards include increased consumer spending on assets like two-wheelers and housing enhancements. A qualitative interview with a beneficiary further highlights how financial inclusion through WASH loans paved the way for other income-generating activities. His ability to secure loans for motorcycle purchases and later, for setting up an income generating business, illustrates how access to financing through WASH programmes helped build economic resilience.

However, the study also highlights disparities in loan amounts and interest rates. Households with a long-standing history of borrowing receive more favourable terms, while financially weaker families or newer clients face limitations. This disparity underscores the need for more equitable loan practices to ensure that microfinance benefits are accessible to all.

Through triangulated analysis, our study concludes that microfinance has been a pivotal enabler of

improved sanitation access in Thiruvavur region of Tamil Nadu. By combining financial products with capacity-building initiatives, MFIs have made safe sanitation attainable for marginalised communities, evidenced by high repayment rates, better-quality facilities, and broader economic benefits. The success of this approach highlights microfinance's potential to drive transformative social and economic change. As such, it sets a precedent for future interventions aimed at achieving universal access to safe water and sanitation in line with sustainable development goals.

Economic and Social Impacts

The data shows that 98% of beneficiaries report increased comfort and privacy due to the availability of sanitation facilities, and all respondents associate their new facilities with improved social status. Furthermore, the recurring use of MFI loans by beneficiaries demonstrates growing financial independence, with over 92% of participants holding an active loan. These outcomes indicate that WASH interventions are not only meeting basic needs but also contributing to financial resilience and social empowerment. Moreover, our data showed that 99% of the toilet owners express that the construction of toilet has increased their social status in the neighbourhood. And 98% expressed that it increased their convenience and comfort.

Case Study

In February 2024, we interviewed one of the toilet beneficiaries, who also works as a mason in Thiruvapur and built a toilet for his household with the support of the SBM subsidy. Later, through awareness programmes facilitated by FM and local partners, he secured a WASH loan of ₹21,000 (around €240) from BWDC to upgrade his basic toilet to a twin-pit system—an onsite sanitation system designed for long-term use and safe faecal sludge management. As part of our study, we revisited his home to examine how the twin-pit system was functioning. In his coastal village, where seasonal flooding poses challenges to sanitation infrastructure, we found the system operating effectively. One of the pits had reached capacity, while the second was in active use. When we opened the sealed chamber of the filled pit—three years after its last use—we observed that the faecal sludge had fully decomposed into safe, nutrient-rich compost. Within a year, it would be ready for agricultural use, demonstrating how well-managed twin-pit systems support both sanitation and environmental sustainability.



But his story does not end here. Having successfully repaid the WASH loan, he gained confidence in his financial management abilities. Encouraged by this experience, he secured a larger loan of ₹300,000 (€3,400) to start a brick manufacturing business. This shift—from constructing sanitation facilities to becoming an entrepreneur—illustrates how access to WASH financing can serve as a stepping stone for broader economic opportunities. This case highlights the

systemic approach needed for safe sanitation—one that integrates faecal sludge management, financial inclusion, and value chain development. MFI financing not only enables vulnerable households to build resilient sanitation infrastructure but also fosters long-term economic stability. By strengthening both services and the sanitation value chain, such interventions ensure that safe sanitation is not just an endpoint but a foundation for sustainable progress.



Local team and beneficiary showcasing the successful opening of a toilet's owner pit including decomposed faecal sludge (below)



Mason interviewed in Thiruvavur with his sanitation facility



6.

Findings: Qualitative Insights from Participatory Rural Appraisal (PRA) and Seasonal Analysis

The trendline visualizations illustrate the comparative progression of several socio-economic and environmental indicators across three distinct time intervals: 2009–2014, 2014–2019, and 2019–2024. The parameters assessed include agricultural productivity, surface and groundwater availability, forest and tree cover, temperature patterns, rainfall variability, economic development, and women's empowerment. Each indicator/head (seen in the table on the following page) is represented through a visual ranking system, where the frequency of icons denotes the relative trend over time. An increase in the number of icons across successive periods signifies a positive or upward trend in that parameter, while a reduction suggests a negative or declining trajectory. This comparative approach enables a nuanced understanding of both improvements and regressions in key developmental dimensions across the selected villages.

1. Heat and Climate Change

- Heat levels have increased in Villages 1 and 2, aligning with global warming trends. This escalation impacts agriculture, water demand, and energy costs.
- Village 3 shows a slight reduction in heat levels, possibly due to improved vegetation or water management, making it an outlier in the overall trend of warming.

2. Rainfall Patterns and Water Management

- Rainfall has decreased in Villages 1 and 2, hinting at drought risks and water scarcity, which impact agriculture and water security. Village 2 maintains a steady water level ranking, suggesting efforts to counter declining rainfall, though progress is limited.
- Village 3 experiences increased rainfall, correlating with better water levels, underscoring the critical role of natural rainfall in supporting water resources.

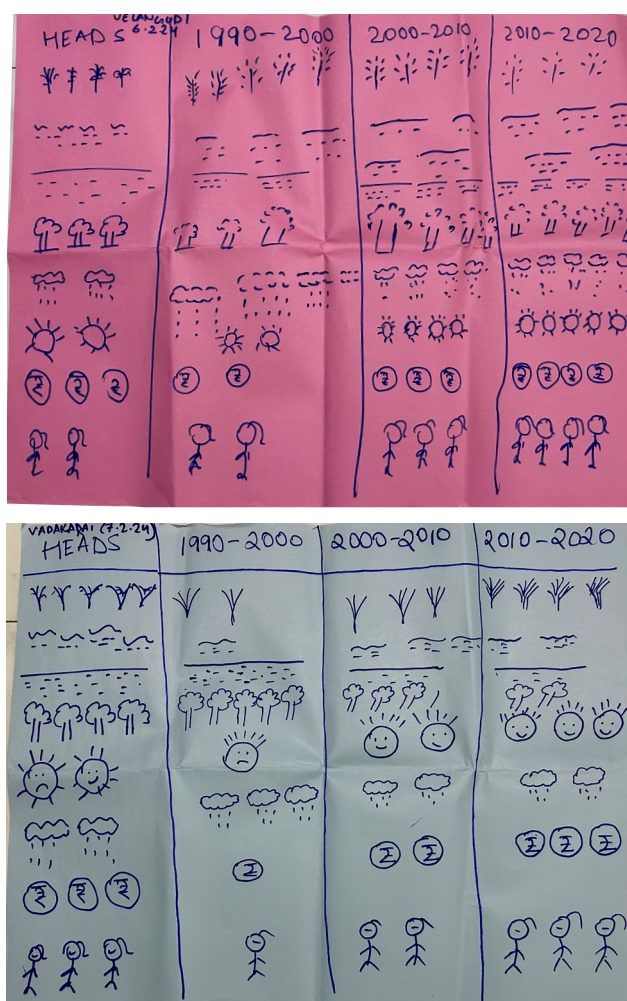


Figure: Output from the PRA activities.

Heads	Meaning
	Trend in agricultural productivity
	Trend in surface water availability
	Trend in groundwater availability
	Trend in availability of trees / forest cover
	Trend in temperature pattern
	Trend in rainfall pattern
	Trend in economic growth
	Trend in women empowerment including women's safety

3. Water Availability and Sanitation Access

- Despite climate challenges, water availability in Village 1 remains low, showing limited advancement in water access solutions. Village 2 shows minor progress, while Village 3 sees a decline despite increased rainfall, indicating possible infrastructure issues.
- Sanitation improvements are notable, especially in Village 2, suggesting successful interventions that support hygiene and health. However, Village 3, initially strong in sanitation, indicates a need for maintenance focus to sustain progress.

4. Women's Empowerment

- Women's empowerment has risen in Village 2, likely due to increased economic and educational opportunities as well as improved WASH infrastructure.
- Village 1 remains stagnant in this area, and Village 3 shows slight regression, suggesting challenges in maintaining prior gains.

5. Economic Trends

- Economic growth varies across villages: Village 1's economic ranking declines, potentially due to climate and water constraints; Village 2 experiences growth, likely linked to WASH and gender equality improvements; Village 3 faces setbacks possibly due to dwindling water availability.

6. Environmental Sustainability and Tree Cover

- Deforestation in Village 1 worsens water scarcity and soil degradation, contributing to economic difficulties. Meanwhile, Villages 2 and 3 show incremental improvements in tree cover, promoting resilience against climate impacts and supporting water retention.

7. Water and Health Impacts

- Seasonality data shows water access drops in summer, impacting Village 1's economic stability. Water quality decreases during monsoons, correlating with a rise in waterborne illnesses, especially in Village 1.

8. Sanitation and Disease Burden

- Sanitation infrastructure, although improved, faces seasonal challenges, with the highest disease burden recorded during monsoons. This highlights the need for resilient WASH facilities, particularly drainage systems, to manage increased disease risks.

9. Women's Empowerment and WASH Linkages

- Enhanced WASH facilities contribute to women's empowerment by freeing time for education and income activities. Village 2's steady empowerment progress aligns with improved WASH, while Village 3's slight decline suggests a need for sustained investments.

10. Climate and Environmental Resilience

- Environmental sustainability, especially tree cover, is pivotal for water resilience. Villages with higher tree cover, like Village 3, maintain better water levels, showing that reforestation positively impacts WASH and economic stability.

11. Socioeconomic-WASH Interlinkages: A Holistic View

- WASH infrastructure improvements are closely tied to economic performance and health. Inadequate WASH, especially during summer and monsoon, reduces incomes and increases healthcare expenses, underscoring the need for robust WASH solutions to foster socioeconomic resilience.

This analysis illustrates that WASH, climate, and economic trends are deeply interconnected, with advancements in one area influencing progress in others. The findings emphasise the importance of sustained investment in WASH, environmental sustainability, and gender equality to achieve holistic, long-term development.

7. Discussion

The findings from this research, when viewed in the context of broader WASH financing, reveal critical insights into the interconnectedness of financial inclusion, social development, and infrastructure sustainability. The implications of these findings go beyond the immediate context of rural sanitation and provide valuable lessons for scaling up WASH interventions in other regions and sectors.

Implications for WASH Financing and Economic Development

At a larger level, the study highlights the pivotal role of microfinance in driving economic development through improved sanitation. Access to WASH financing, particularly through MFIs, not only addresses the immediate need for sanitation infrastructure but also fosters economic resilience. As we see from the findings, the economic upliftment brought about by improved sanitation extends far beyond individual households. It is evident that access to affordable loans for sanitation has a multiplying effect on local economies, leading to increased productivity, higher household incomes, and greater economic independence, especially for women. This finding reinforces the importance of integrating financial inclusion into WASH interventions as a means of tackling poverty and fostering long-term economic growth.

Furthermore, the reliance on MFIs for WASH loans demonstrates the growing potential of financial markets to respond to the sanitation challenge. While governments may struggle to meet the full demand for infrastructure investment, the private sector—particularly through MFIs—can play a central role in financing sanitation. The increasing involvement of MFIs in providing loans for sanitation services signals a shift toward more sustainable, market-based solutions to WASH financing. This approach has the potential to complement traditional public funding and help bridge the financing gap, particularly in low-income communities where access to capital is limited.

Gender Empowerment and Social Transformation

One of the most significant findings from this research is the strong correlation between WASH financing and gender empowerment. The widespread uptake of loans by women, many of whom were previously excluded from formal financial systems, highlights the potential of sanitation financing in advancing gender equality. By facilitating women's access to finance and decision-making in household sanitation, these interventions not only improve hygiene and health outcomes but also contribute to broader social and cultural changes. Women's involvement in sanitation projects is helping to shift gender norms,



“Being able to afford a toilet through the BWDC loan has given me the confidence to take loans for other business that I want to start in the village.”

Priya, a village entrepreneur

with women gaining greater control over household resources, improving their social standing, and playing a more active role in community life.

These findings contribute to the growing body of evidence that links financial empowerment to broader gender equality. They suggest that sanitation financing, when designed with a gender-sensitive approach, can act as a catalyst for social transformation. The increased comfort, privacy, and dignity resulting from improved sanitation are crucial for women’s social and economic well-being, enabling them to participate more fully in both the economic and social spheres of their communities. In this context, WASH financing is not just a matter of health and infrastructure; it is a powerful tool for promoting gender equality and empowering marginalized groups.

Resilience to Climate Change and Seasonal Variability

The study also highlights the need for resilience in WASH infrastructure, particularly in the face of seasonal and climate-induced challenges. Rural communities, as shown in the findings, face significant fluctuations in water availability and quality throughout the year, particularly during the monsoon and summer seasons. These challenges are exacerbated by the broader impacts of climate change, which will likely intensify the seasonal variability of water resources. This underscores the need for WASH infrastructure that is not only financially accessible but also robust and adaptable to the changing climate.

The seasonal variability in sanitation services calls for a shift in how WASH infrastructure is planned, designed, and maintained. There is a growing need for investments in climate-resilient technologies that can withstand changing weather patterns and maintain their functionality throughout the year. These investments will be critical for ensuring the sustainability of sanitation services and ensuring that communities continue to benefit from improved sanitation standards, even in the face of environmental disruptions.

Towards Financial Sustainability and Self-Reliance

A key takeaway from this research is the need for greater financial self-reliance in rural sanitation. While MFIs have proven effective in providing the necessary capital for the installation of sanitation facilities, the reliance on loans for ongoing infrastructure development indicates a need for a shift towards more sustainable financial models. In the long term, communities should be empowered to fund and maintain their sanitation infrastructure without relying heavily on external financing.

This insight points to the importance of financial literacy and savings mechanisms that allow households to gradually take on more of the financial responsibility for their sanitation needs. Moreover, integrating micro-insurance and other financial products can help households manage the costs associated with infrastructure maintenance, particularly during times of economic hardship or seasonal variability. The ultimate goal should be to create a model in which communities can finance, build, and sustain their sanitation systems independently, ensuring long-term resilience and reducing dependence on external aid.

A Broader Framework for WASH Financing

The findings of this research contribute to the growing recognition that WASH financing should be integrated into broader development frameworks, linking sanitation to economic growth, gender equality, climate resilience, and social transformation. The ability to leverage microfinance to address the sanitation gap is a crucial component of this broader vision. The challenge, however, lies in scaling up these models to reach a larger proportion of underserved populations, particularly in rural areas where poverty and infrastructure gaps are most acute.

The success of programmes like FM in fostering partnerships between MFIs, governments, and communities highlights the potential for market-based solutions to address the financing challenges in the WASH sector. However, for these solutions to be effective on a larger scale, there is a need for continued collaboration across sectors, as well as a concerted effort to build the capacity of local institutions to manage and sustain these initiatives over time.

8.

Conclusion: Significance and Future Directions

At its core, the research underscores the significant potential of WASH financing to drive socio-economic development, particularly in rural areas. By addressing the financing gap through microfinance institutions and integrating gender-sensitive approaches, WASH interventions can contribute not only to improved sanitation but also to broader social and economic upliftment. The findings suggest that sustainable WASH financing is a critical lever in promoting health, economic stability, and social empowerment.

Ultimately, these insights feed directly into the overarching research question of how WASH financing can be a tool for rural development. The evidence suggests that WASH financing, when designed to be inclusive, resilient, and adaptable, has the potential to create lasting, transformative impacts that extend far beyond sanitation infrastructure itself. To fully realise this potential, future efforts should focus on scaling up successful models, addressing climate vulnerabilities, and ensuring financial sustainability to achieve equitable and inclusive access to WASH services for all.

In conclusion, the findings from this study reinforce that WASH financing plays a crucial role in improving the socio-economic status of communities, particularly in rural areas. Access to affordable and inclusive financing mechanisms for sanitation not

only enhances health and hygiene but also fosters broader economic empowerment. By enabling households to invest in proper sanitation facilities, WASH financing creates a ripple effect that leads to increased productivity, economic resilience, and greater social mobility.

The socio-economic impact of improved sanitation is multifaceted—it provides families with better living conditions, opens up new income-generating opportunities, and promotes gender equality by enabling women to take a more active role in economic activities. Moreover, as communities embrace financial tools like microloans and savings mechanisms, they build greater self-reliance and reduce dependency on external aid.

Ultimately, WASH financing contributes directly to lifting communities out of poverty, improving their quality of life, and fostering long-term socio-economic development. As such, it serves as a key pillar in advancing the SDGs, particularly in terms of promoting economic growth, reducing inequalities, and enhancing community resilience. The transformative power of WASH financing, when effectively implemented, is not limited to sanitation alone—it serves as a catalyst for broader socio-economic improvements, empowering communities to thrive in both the present and future.

To translate these insights into actionable change, there is a need for targeted strategies that enhance access to WASH financing. This includes strengthening partnerships between governments, microfinance institutions, and development actors to design flexible, low-interest loan products tailored for sanitation. Capacity-building initiatives should be scaled to empower local financial institutions and community-based organizations in managing WASH credit portfolios. Digital financial services can also play a critical role in reaching remote and underserved populations, improving both accessibility and affordability. Furthermore, integrating WASH financing into national development and climate adaptation plans, alongside public awareness campaigns, can foster demand while ensuring sustained behavioral change. Establishing performance-based subsidies or blended finance models can de-risk investments and attract private sector participation—ensuring that WASH financing becomes a viable and scalable pathway to inclusive rural development.

9.

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