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## Factors affecting socio-economic situation on open defecation in rural Bihar

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### Abstract

In rural India, open defecation is still a major problem, particularly in Bihar, despite government initiatives like the Swachh Bharat Mission to improve sanitation. This study examines the socioeconomic variables—education, income, caste relations, and infrastructure difficulties—that contribute to the continuation of open defecation in rural Bihar. This research offers a thorough examination of the obstacles to implementing contemporary sanitation techniques as well as the wider environmental and health effects, using both primary and secondary data sources. The results show that sanitation practices are significantly influenced by socioeconomic factors, which has important ramifications for public health and development.

**Keywords:** Open defecation, socio-economic factors, rural Bihar, sanitation, public health, Swachh Bharat Mission, caste dynamics

### Introduction

In India, the habit of utilizing open fields, woods, or bodies of water as a place to defecate instead of a toilet has long been a major public health concern. Approximately 15% of people worldwide engage in open defecation, and Bihar is one of the states where this problem is most prevalent <sup>[1]</sup>. The practice is widespread in rural areas and has significant effects on social development, environmental sustainability, and public health. Open defecation is still practiced in Bihar, especially in rural areas, despite significant government attempts to end it by 2019, such as the Swachh Bharat Mission (SBM), which was introduced in 2014. This emphasizes how complicated the problem is and how many different things contribute to its persistence.

When the Government of India established the Swachh Bharat Mission, it was intended to be a revolutionary sanitation initiative that would encourage the building of toilets, public awareness campaigns, and community involvement in order to achieve the goal of making India open defecation free (ODF). Government sources state that by October 2019, India had formally proclaimed itself to be ODF and had constructed 110 million toilets nationwide, including in Bihar <sup>[7]</sup>. But the reality on the ground paints a different image, especially in rural Bihar. Despite having access to toilets, many homes do not use them or do not have working toilets, which is a reflection of larger socioeconomic and cultural constraints.

Poverty is one of the most important socioeconomic factors contributing to the continued practice of open defecation in rural Bihar. In order to satisfy their fundamental necessities, households below the poverty line frequently put food, healthcare, and education ahead of sanitary infrastructure. Many low-income households cannot afford the ₹12,000–₹15,000 required to build a toilet, hence for many, open defecation is their only practical alternative <sup>[6]</sup>. The situation is made worse by the high cost of building new restrooms and the paucity of government funding for upkeep, especially in rural and isolated locations. Additionally, the unreliability of water supply, which is essential for using the restroom, deters people from using the restroom even more in these areas.

The absence of education in Bihar is a significant contributing reason to the prevalence of open defecation. Research has repeatedly demonstrated a substantial relationship between sanitation practices and educational achievement <sup>[6]</sup>. There is a notable correlation between the completion of secondary school by the family head and the likelihood of accessing and using bathrooms in the home.

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Education raises people's understanding of the health hazards of open defecation, including the potential for the spread of cholera, typhoid, and diarrhea. Nonetheless, there is a general lack of awareness regarding the link between open defecation and public health in many rural regions. This leads to the continuance of dangerous habits since many people still consider it to be easy or natural to defecate in the open. In rural Bihar, caste relations are also a significant factor in sanitation practices. Sanitation has historically been associated with manual scavenging and garbage management, especially with lower caste populations like the Dalits<sup>[2]</sup>. Some higher caste households are reluctant to install or use toilets close to their houses due to cultural ideas about pollution and cleanliness. They prefer to urinate in open settings away from their homes because they view latrines as contaminating their living spaces. This deep-rooted cultural aversion to using the restroom brings attention to the intricate interactions between social structures and sanitary practices.

Finally, even with the Swachh Bharat Mission's infrastructure advancements, many rural families still struggle to maintain a working toilet. A government study claims that even though the state has seen a large increase in the building of latrines, more than 60% of the families that received toilets under SBM still have usability issues because of low water supply or poor maintenance<sup>[7]</sup>. This indicates a disconnect between the growth of infrastructure and sustainable use, necessitating more action.

In order to explain the ongoing presence of open defecation in rural Bihar, this study will examine four socioeconomic factors: poverty, education, caste, and infrastructure. By doing so, it will provide insights into the enduring issues that must be resolved in order to assure long-lasting change.

### Research Objective

This study's main goal is to investigate the ways in which socioeconomic variables affect rural Bihar's continued practice of open defecation. Specifically, we will look at the following:

1. Assessing the relationship between income levels and access to sanitation facilities.
2. Analyzing the role of education in shaping attitudes towards open defecation.
3. Understanding how caste and social structures affect sanitation behaviors.
4. Evaluating the impact of government programs and infrastructure availability on sanitation practices.

### Literature Review

Prior studies have continuously demonstrated the intricate relationship that exists between India's sanitation practices and socioeconomic position. According to Coffey *et al.*<sup>[2]</sup>, the adoption of contemporary sanitary facilities is hampered by ingrained cultural norms and attitudes about purity and hygiene, especially among lower castes. Their research highlights the enduring cultural hurdles that exist because some caste groups, particularly in rural areas, consider latrines to be ritually filthy. Even in situations where restrooms are provided, these attitudes frequently lead to resistance against the use of sanitation technology. In a similar vein, Vyas and Spears<sup>[4]</sup> clarify that these cultural norms impact sanitation practices in a variety of socioeconomic strata, extending beyond lower caste groups.

In addition, the way that sanitary facilities are accessed and used is significantly influenced by economic inequality. According to Spears<sup>[3]</sup>, households with lesser means frequently put more immediate needs—like food and medical attention—above hygiene. Hence, open defecation becomes the norm in low-income homes due to a lack of knowledge about the health dangers involved in the practice as well as financial limitations. According to data from the National Family Health Survey (NFHS-5), around 65% of rural Bihar families with monthly incomes under ₹10,000 lack access to a working toilet<sup>[6]</sup>. This illustrates the state-wide relationship between access to sanitation and income.

In rural India, another important factor affecting sanitation practices is educational attainment. According to Vyas and Spears<sup>[4]</sup>, families led by persons with at least a secondary education are more likely to have and use toilets, indicating a correlation between education and improved hygienic habits. This pattern indicates that more informed people are aware of the health dangers associated with open defecation, including the potential for the spread of waterborne illnesses including cholera, typhoid, and diarrhea. Additional research by Gupta and Narayanan (2018) emphasizes the significance of teaching students about sanitation at the school level, especially emphasizing the part that school-based health programs play in raising children's rates of toilet usage, which in turn affects adult behaviors in their homes<sup>[8]</sup>.

Das *et al.*<sup>[5]</sup> carried out a thorough investigation in the setting of Bihar that demonstrates how high rates of open defecation persist in spite of significant infrastructure improvements made possible by government initiatives like the Swachh Bharat Mission (SBM). Based on their research, it appears that even in homes having the required infrastructure, many people do not consider toilets to be necessities. Mehta and Singh (2020) made a similar discovery, pointing out that rural populations in Bihar frequently see open defecation as a culturally acceptable activity connected to centuries-old practices. Government attempts to eradicate open defecation are still being undermined by this cultural conditioning and inadequate infrastructure<sup>[9]</sup>.

Studies like those by Prakash *et al.* (2019) highlight the part gender plays in sanitation behavior, which lends even more credence to this claim. Due to societal conventions and safety concerns, women in rural Bihar typically encounter particular difficulties when it comes to using the restroom. According to the survey, even with latrines being built, many women still prefer open defecation because it allows for social connection that latrines, which are segregated from public areas, cannot. This draws attention to yet another sociocultural obstacle preventing the widespread use of toilets in rural Bihar<sup>[10]</sup>.

Toilet use in rural locations is further complicated by irregular water supply. According to a Singh *et al.* (2019) study, severe water shortages plague a large number of rural Bihar homes, making it challenging to keep toilets clean. People continue to defecate in the open because of the scarcity of water, which causes them to misuse the sanitary facilities that are accessible<sup>[11]</sup>. Gaps in water availability continue to be a major concern, despite the SBM's goal of addressing both the infrastructure for water and sanitation. This emphasizes the necessity for integrated water and sanitation initiatives.

**Methodology**

Using a mixed-methods approach, this study combines fieldwork that is qualitative with analysis of quantitative data. The National Family Health Survey (NFHS-5) for Bihar was used to collect data, and households in three rural districts—Banka, Madhubani, and Muzaffarpur—were interviewed in-depth. To find trends in sanitation behavior, statistical information on caste distribution, income levels, and educational attainment was examined. Qualitative interviews shed light on the attitudes of individuals and the dynamics of communities with regard to open defecation.

**Findings and Analysis**

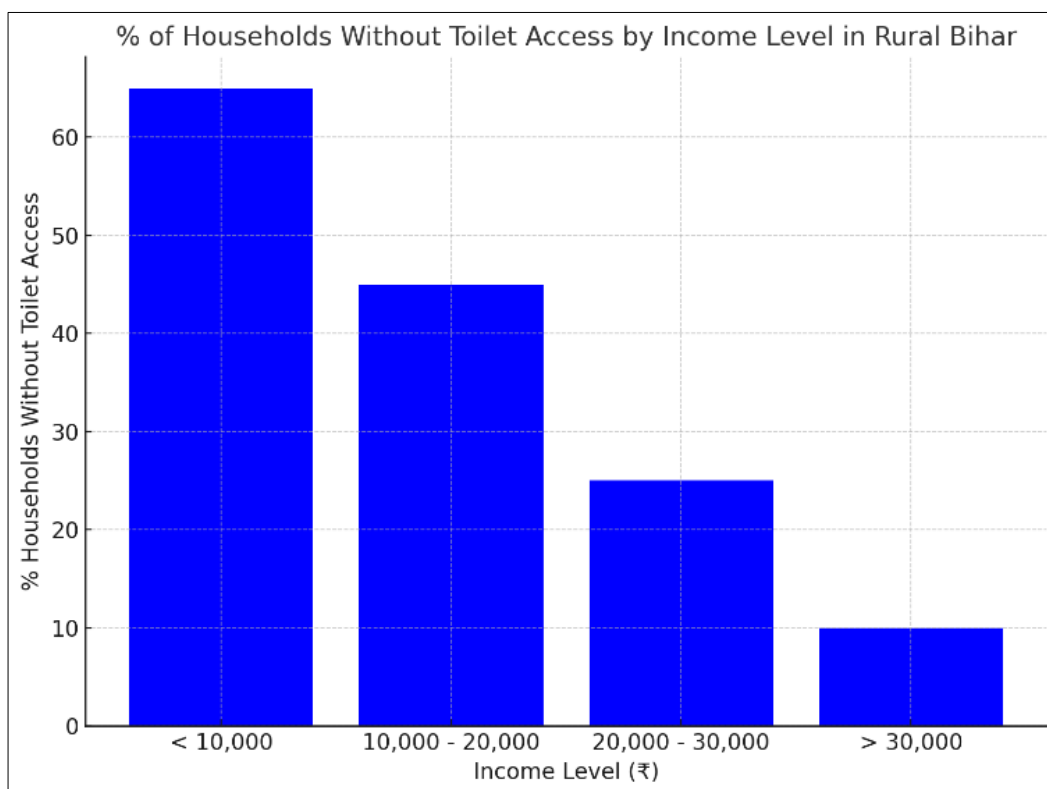
**1. Income Levels and Sanitation Access**

The substantial relationship between income levels and access to sanitary facilities is one of the study's main conclusions. Data from the National Family Health Survey (NFHS-5) show that in rural Bihar, around 65 percent of

families with monthly earnings under ₹10,000 lack access to a working toilet. With an increase in household income, this number declines. For instance, just 10% of households earning more above ₹30,000 don't have access to a toilet. This discrepancy demonstrates how low-income households are forced to rely on open defecation as a default option since poverty limits their access to adequate sanitation.

For families living in poverty, the cost of building a latrine—which is often estimated to be between ₹12,000 and ₹15,000—is unaffordable. Food and medical attention are vital needs that these homes must attend to first, with sanitation coming in second. They are unable to pay for the installation or upkeep of restrooms due to a lack of funds.

"We struggle to put food on the table, so we cannot afford to build a toilet," said a responder from a community in the Banka district. Our only choice is to defecate outside." This emphasizes how open defecation is still practiced in rural Bihar due to socioeconomic limitations.



**Fig 1:** % of Households Without Toilet Access by Income Level in Rural Bihar

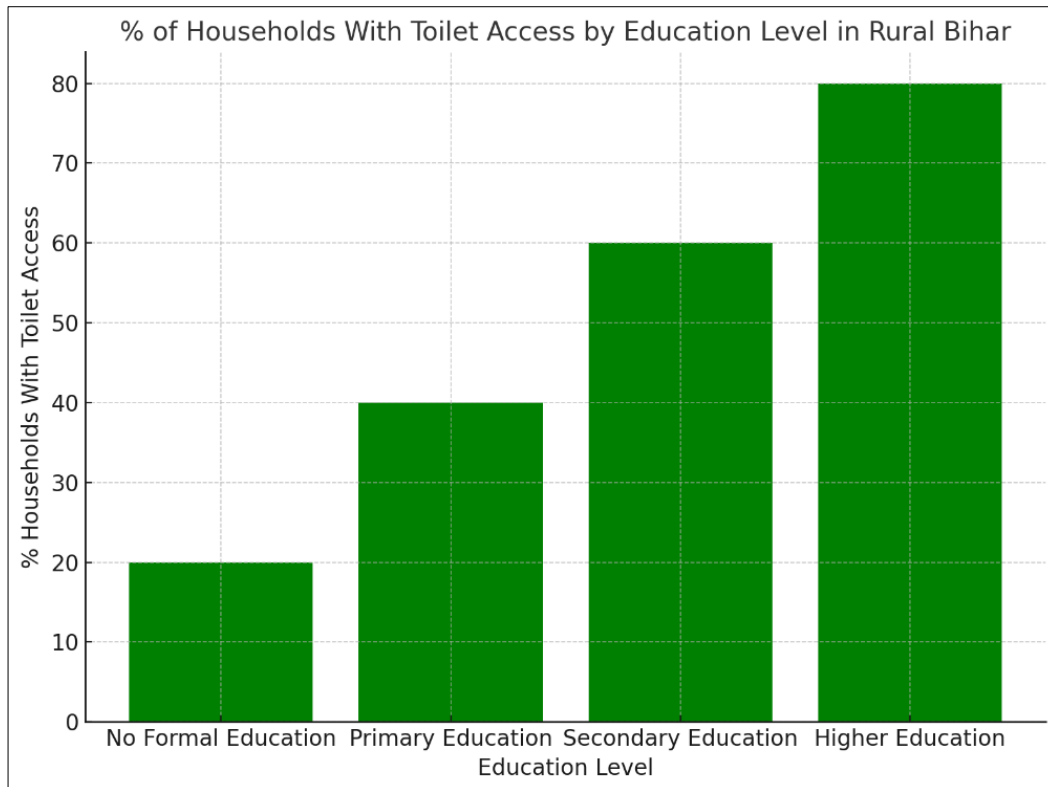
This chart illustrates the significant differences in toilet access across various income levels. The data source for this chart is the NFHS-5 survey.

**2. Education and Sanitation Awareness**

Another important aspect impacting open defecation behaviors in rural Bihar is educational achievement. According to the NFHS-5 statistics, there is a 40% higher likelihood of access to toilets in homes with a head of household who has finished secondary education as compared to those without any formal education. By raising knowledge of the health risks—such as the spread of waterborne diseases—associated with open defecation, education plays a critical role in influencing sanitation habits.

Just 20% of homes with no formal education have access to a working toilet, whereas 80% of households with a head who has completed higher education have access to one. This striking disparity implies that a household's decision to invest in sanitary infrastructure and adopt improved hygiene practices is directly influenced by education.

Health professionals in rural regions like Madhubani district were interviewed, and the results showed that people are still not aware of the health risks associated with open defecation. "Many people here still do not understand why using a toilet is important," said a health professional. They consider it normal and unrestricted to urinate on the fields." This highlights the continuous need for focused educational initiatives to alter long-standing customs related to sanitation in rural Bihar.



**Fig 2:** % of Households With Toilet Access by Education Level in Rural Bihar

This chart visualizes how toilet access improves as the education level of the household head increases. The data source for this chart is the NFHS-5 survey.

### 3. Caste and Social Structures

In rural Bihar, caste relations and cleanliness practises are closely related. Toilet usage has been stigmatized historically because lower caste populations, especially Dalits, have been linked to manual scavenging and waste management. This caste-based stigma is a major obstacle to the adoption of modern sanitation facilities, according to Coffey *et al.* [2]. Higher caste households often object to the construction of restrooms next to their homes because they feel that it would contaminate their interiors.

Citing cultural views, a number of higher-caste households in Muzaffarpur district reported reluctance to use the latrines built under the Swachh Bharat Mission (SBM). "Toilets are unclean; we cannot have them near our homes," remarked one reply. It defies our traditions." This implies that despite infrastructure improvements, deeply rooted cultural values centered on caste and purity continue to pose significant obstacles to the widespread use of toilets. Additionally, the statistics imply that the social shame attached to waste and sanitation in lower caste areas makes people even less likely to use toilets, which perpetuates the practice of open defecation.

### 4. Government Programs and Infrastructure

Even with the Swachh Bharat Mission's advancements, many rural families still encounter difficulties utilizing the offered sanitation services. More than 60% of rural Bihar households received latrine building under SBM, according to a government study [7]. Unfortunately, a lot of these restrooms are underutilized for a variety of reasons, such as inadequate upkeep, erratic water supply, or cultural reluctance.

For example, homes in the Banka district said that their toilets were broken or unusable. "The government gave us money to build the toilet, but it is useless without a water connection," said one of the residents. We thus keep urinating in the meadows." This suggests that building toilets alone is insufficient to assure ongoing usage; other infrastructure, such as water supply and toilet maintenance, is required.

Therefore, even if the SBM has been successful in constructing restrooms, the efficacy of these interventions in rural Bihar is constrained by the lack of infrastructure and supplementary services.

### Discussion

The study's conclusions highlight the pervasive and complex nature of the open defecation issue in rural Bihar, where socioeconomic variables, cultural norms, and inadequate infrastructure work together to support the practice. Even while government programs like the Swachh Bharat Mission (SBM) have significantly improved family access to toilets, they have not been enough to address the underlying issues that continue to support open defecation. An in-depth analysis of these factors reveals the necessity of a more thorough and sophisticated strategy.

Low-income households suffer an economic barrier, which is one of the most prevalent concerns. A startling 65% of households making less than ₹10,000 a month do not have access to toilets, as shown by the NFHS-5 statistics [6]. The budgetary limitations go beyond the ₹12,000–₹15,000 price tag associated with constructing a restroom. The cost of using and maintaining these facilities, particularly ensuring a steady supply of water, puts a heavy load on many households' already limited resources. According to research, a large number of the toilets installed under SBM are either badly built or inadequate, necessitating additional costs that low-income people are unable to pay. Research,



like that conducted by Prakash *et al.* (2019), shows how inadequate financing or delays in SBM reimbursements make it more difficult to build functional latrines, leading to either abandoned or unusable toilets <sup>[10]</sup>.

The fact that many households have to put more pressing needs—like food, healthcare, and education—above sanitation adds to this financial burden. These households' choice to forgo sanitary upgrades is a reflection of their difficult financial circumstances rather than just a statement of ignorance or rejection. For many people, open defecation is still the norm because there is a lack of specific financial assistance designed to handle the continuing expenses of maintaining toilets in settings with limited resources.

But it is not only a money problem. An equally important factor in shaping hygienic practices is education. Compared to households without any formal education, those headed by a person with a secondary education are considerably more likely to use and maintain toilets. Education promotes awareness of the health hazards that come with open defecation, including the potential for the spread of waterborne illnesses including cholera, typhoid, and diarrhea. However, there is more to sanitation instruction than meets the eye. Research such as that conducted by Gupta and Narayanan (2018) suggests that literate people are more inclined to embrace contemporary sanitation techniques; yet, awareness alone may not be sufficient to change deeply embedded societal norms <sup>[8]</sup>.

One of the issues noted is that, despite education about the need of sanitation for children and younger family members, elder generations in rural Bihar still consider open defecation to be a common and acceptable behavior. For several individuals, open defecation is not just a customary practice but also deeply ingrained in ideas of liberty and comfort. It is challenging for behavioral change to spread throughout whole communities due to the age divide in knowledge about the value of cleanliness. According to Mehta and Singh (2020), having a toilet in the home does not always ensure that it will be used, especially if the head of the household—a crucial decision-maker—is unwilling to embrace new behaviors <sup>[9]</sup>.

This issue is made worse by the caste system. Historically, waste handling and other physical work deemed "impure" have been linked to lower castes, especially Dalits, which has contributed to a stigmatization of toilet usage in society. Particularly those from higher castes frequently object to the construction of restrooms close to their homes because they believe it would contaminate their interiors. The caste-based traditions that prohibit disposing of waste close to one's home in many areas reinforce the open defecation habit. Research by Coffey *et al.* (2014) show that, even in cases when sanitation facilities are easily accessible, caste-based ideas of contamination and purity remain a major deterrent to their use <sup>[2]</sup>. Since many rural communities consider open defecation to be culturally acceptable, this resistance is sometimes exacerbated by a lack of social pressure to change.

Although the Swachh Bharat Mission has greatly increased the number of public restrooms in Bihar, the program's emphasis on infrastructure has frequently obscured the more intricate behavioral and cultural problems at hand. A government assessment states that more than 60% of rural Bihar homes received toilets under SBM; but, because of poor construction quality and insufficient water supply, many of them remain unmaintained or unutilized <sup>[7]</sup>.

According to Singh *et al.* (2019), one of the main causes of toilet abandonment is an inconsistent water supply, especially in rural locations where water is scarce and variable <sup>[11]</sup>. The maintenance problem is equally urgent since many homes cannot afford the regular repair that toilets require in addition to water.

There is no one cause for the continued prevalence of open defecation in rural Bihar. It is the outcome of a combination of caste-based social institutions, educational disparities, socioeconomic challenges, and inadequate infrastructure. It will take a multifaceted strategy that goes beyond infrastructure supply to address these problems. Increased funding is required for both the initial building of restrooms and their continuing upkeep. Programs for education must have a wider focus, aiming to change cultural attitudes about cleanliness and addressing not only children but entire communities. Furthermore, community-based interventions that promote collective behavioral change must be incorporated into any future sanitation initiatives, taking into account the cultural and caste-based aspects of the issue.

Any future intervention's capacity to tackle the socioeconomic and cultural realities of rural Bihar will determine how successful it is, as open defecation is not only an infrastructural issue but is ingrained in these communities' social fabric.

#### Conflict of interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

#### Conclusion

Numerous socioeconomic reasons have influenced the complicated issue of open defecation persisting in rural Bihar. The perpetuation of this detrimental practice is facilitated by caste relations, poverty, education, and poor infrastructure. Although the government has achieved significant progress with initiatives like the Swachh Bharat Mission, more work has to be done to overcome the underlying socioeconomic constraints preventing the broad adoption of contemporary sanitation techniques. We cannot expect to eradicate open defecation and enhance public health outcomes in rural Bihar unless we adopt a comprehensive strategy that incorporates education, infrastructural development, and cultural transformation.

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