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Talking toilets: evaluating software and hardware oriented rural sanitation approaches in northern India

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**DELIVERING WATER, SANITATION AND HYGIENE SERVICES
IN AN UNCERTAIN ENVIRONMENT**
**Talking toilets: evaluating software and hardware oriented
rural sanitation approaches in northern India**

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This paper presents a 2011 study of India's Total Sanitation Campaign (TSC). Qualitative methods were used to study six villages in Haryana and Uttar Pradesh. The research aimed to determine how implementations and outcomes compare in Community-led Total Sanitation (software-oriented) and conventional (hardware-oriented) TSC approaches. Despite a national guideline that called for a demand-driven, community-led, incentive-based TSC, in reality most interventions were supply-led, infrastructure-centric, and subsidy-based. CLTS interventions were more awareness-focused, involving longer-term interaction with households. In conventional TSC interventions, excessive focus on construction and subsidies drove supply-led tendencies, neglect of software and participation, and exclusion of non-poor and lower-caste households. CLTS villages tended to achieve more sustainable and equitable access and usage than conventional villages. Levels of local government capacity and village leadership quality were key to intervention success.

Despite an aim to achieve 100 percent household sanitation coverage by 2012, a majority of India open defecates in 2013. The Government has been working to close India's sanitation gap since 1999 via the Total Sanitation Campaign (TSC), now called Nirmal Bharat Abhiyan (NBA). Census and family health surveys accurately indicated India achieved 31 percent sanitation coverage by 2011, shown in *Figure 1*. In 2013, the Government of India's faulty reporting system shows latrine coverage of 91 percent (Gol 2013).

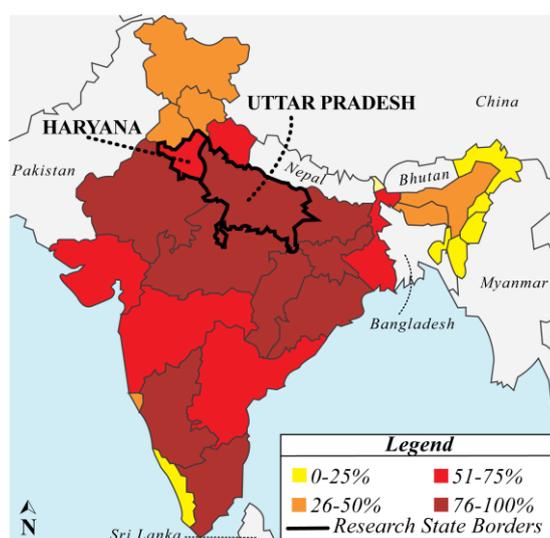


Figure 1. India sanitation coverage access gaps

Source: Bell 2011, UNICEF 2010, DLHS-3 2008, NFHS-3 2006

As Jairam Ramesh, India’s former Minister of Rural Development, said in 2011, the “Total Sanitation Campaign has been a failure. It is neither total, nor sanitation nor a campaign.” The TSC provided an ideal policy for rural sanitation. Its guideline aligned with accepted principles of being demand-driven, community-led, and incentive-based. In reality, policy did not translate to practice (Tandon 2011, GoI 2010).

Rather than being demand-driven, implementations tended to be supply-led and target-driven. Local leaders focused on expenditure of government resources and achievement of latrine numbers. Implementations were not community-led, but government-led with limited villager interaction. Ancient defecation practices continued while behaviour change and toilet usage lagged. Since subsidies continued regardless of approach, implementations did not become incentive-based. Even when subsidies were well distributed toilets were not always used, or at least not for defecation (WaterAid, 2008; Bongartz, 2009).

Objective

Due to the failure of the TSC, this study aimed to determine how outcomes vary by approach in India’s Total Sanitation Campaign, with attention to effectiveness of hardware subsidies and awareness raising. The study explored India’s two broadly defined rural sanitation approaches including the Community-Led Total Sanitation and conventional Government TSC approaches. To the extent investigation could expand understanding, the research aimed to identify barriers and opportunities for improvement in India’s TSC.

Key questions addressed in this research study include: Why hasn’t India’s Total Sanitation Campaign returned more sustainable and equitable latrine outcomes of access and usage? What role does hardware subsidization and awareness raising have in India’s rural sanitation achievement? How can India’s rural sanitation program return more effective outcomes?

Methodology

Research occurred in Haryana and Uttar Pradesh, which followed community-led and conventional rural sanitation approaches, respectively. Research methods were qualitative, mainly involving semi-structured interviews, focus group discussions, and village immersion. Interviewees included 35 officials and experts from central to block levels. Our team interviewed village sanitation leaders in 19 Gram Panchayats (GPs). Field research occurred in three GPs in Panipat, Haryana and three GPs in Bareilly, UP, shown in Figure 2.

Village research included 37 village worker interviews, 210 household interviews, and nine focus group discussions over six weeks of local immersion. In the operational framework, shown in Figure 3, sanitation is defined by intervention and outcome. Intervention components are operationalized using hardware and software adequacy. Outcomes were assessed by sust-equity of access and usage. Sustequity, referring to sustainability and equity of outcomes, was a concept used in evaluating the reality of TSC projects.



Figure 2. TSC case study locations

Source: Bell 2011

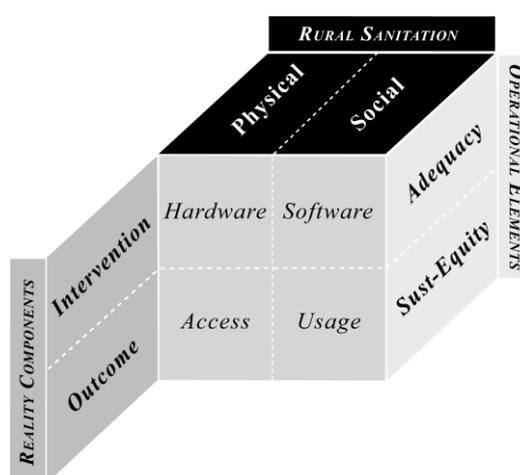


Figure 3. Research operational framework

Source: Bell 2011

Total Sanitation Campaign Implementations

TSC implementation methods were found to diverge as officials converted national policy to state strategies and village projects. States are responsible for developing implementation plans, which explains variation between Haryana and Uttar Pradesh with their community-led and conventional approaches.

While Haryana's state officials call their TSC approach Community-Led Total Sanitation, in practice projects didn't follow CLTS principles exactly. Still, projects in Haryana were more awareness-oriented, interactive, and demand-driven than in UP. Differences in approaches aligned with state level mentalities and strategy. Haryana's state officials valued participation and awareness alongside toilet construction.

Meanwhile, UP's conventional strategy guided a more rigid top-down approach to sanitation. TSC leaders from state officials down to village leaders focused on latrine subsidy and construction. Leaders did not fully understand the meanings of the terms participation or community-led. Forced rigidity and lack of local innovation in conventional projects prevented full participation, equitable outcomes, or latrine usage.

Hardware

All village interventions in Haryana and Uttar Pradesh provided upfront hardware subsidy. Subsidy distribution modality varied from approach to approach and village to village.

In Haryana's CLTS approach subsidy types included infrastructure material, direct cash and output-based cash. Leaders were supposed to provide 1,200 Rs (\$22) to below poverty line (BPL) households to subsidize latrines. Village leaders in Haryana sometimes provided subsidies to households based on socio-economic condition, not just Government poverty status. Also, households in Haryana joined in latrine construction. While non-poor households in Haryana could afford to build lasting latrines, the poor couldn't always.

UP conventional project leaders provided subsidies as materials or cash up front. Subsidy amounts ranged from 2,200 to 4,540 Rs (\$41 to \$84) per below poverty line household in UP. Households had to contribute a fixed 400 Rs (\$7) to show demand and receive a subsidy. Conventional leaders often excluded households without BPL cards. UP leaders distributing material subsidy hired masons, purchased materials, and dictated toilet designs while limiting involvement of residents to ensure compliance with Government specifications.

Software

Skilled facilitation was critical for achieving demand-driven interventions with adequate awareness raising.

Leaders of CLTS villages in Haryana included poor and non-poor households in software activities. Haryana's state officials recognized importance of awareness, participation, and local innovation in projects, not just one-time use of non-interactive Information, Education, Communication (IEC) methods. Local leaders were trained to motivate villagers through more effective means of awareness raising. Haryana's interventions were more awareness-focused and less subsidy-driven than projects in Uttar Pradesh.

In UP, village TSC leaders received little software training and interacted minimally with households. Leaders in UP tended to organize latrine materials and labour for households without community involvement to more quickly achieve construction targets. Due to low software in UP interventions, BPL households receiving subsidies exhibited improved access compared to above poverty line households.

Outcomes

Based on implementation method, outcomes of access and usage varied widely between CLTS and conventional approaches. Values for access and usage are meta-values determined based on estimates from Gram Panchayat leaders, community workers, and community resident interviews.

Access

In Haryana's CLTS villages, projects characterized by infrastructure subsidy and low awareness raising resulted in quick latrine installation and limited community interaction. The highest latrine access occurred in Haryana where a high level of awareness raising was accompanied by technical support and material subsidy. In CLTS, improved software and household interaction resulted in non-poor households investing in improved sanitation while poor households sometimes started latrine installation but faced incomplete construction. In UP's conventional projects where leaders built the latrines, toilets were often well constructed and unused. Where UP conventional project leaders distributed direct cash, households did not use the funds for latrines or did not finish construction. Haryana and UP's interventions brought 58 percent and 36 percent increases in access, respectively, shown in *Figure 4*. In this graph the blue bars show latrine access before TSC intervention. Red bars indicate latrine access after TSC intervention in mid-2011.

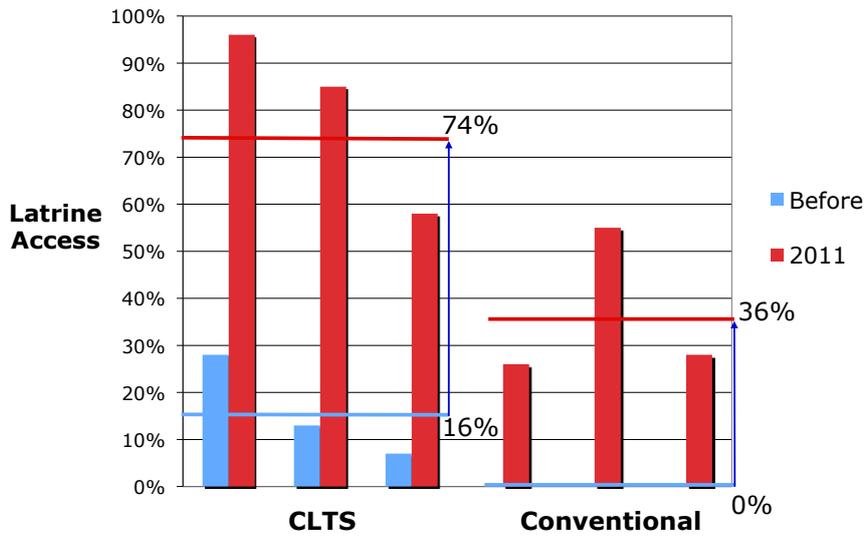


Figure 4. Latrine access before and after rural sanitation interventions

Source: Bell 2011

Usage

Conventional projects struggled to achieve latrine usage due to poor understanding of consequences of open defecation. Usage was better in Haryana’s CLTS projects because owners more fully appreciated the benefits of improved sanitation for health, convenience, and dignity. In conventional interventions latrine usage remained low regardless of subsidy type and households often took advantage of latrines for what they perceived to be more practical purposes. Findings suggest awareness is especially critical to achieve usage. Interventions in Haryana and UP saw a 49 percent and 15 percent increase in latrine usage, respectively, shown in *Figure 5*. The blue bars show latrine usage before TSC interventions and the red bars show latrine usage after TSC interventions in mid-2011. Access and usage were more equal in Haryana than UP, indicating a software shortcoming in UP conventional interventions.

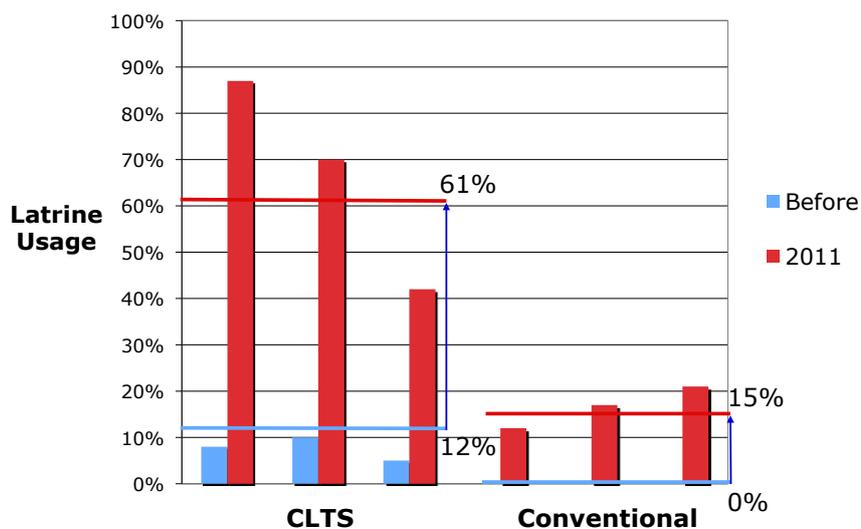


Figure 5. Latrine usage before and after rural sanitation interventions

Source: Bell 2011

Barriers and opportunities for rural sanitation improvement

The study resulted in realization of barriers and opportunities for rural sanitation improvement, as follows.

Barriers for rural sanitation improvement

Institutional Barriers

- Exclusion of households based on socio-economic status, caste, and political lines.
- Lack of a sanitation workforce at state, block, district, and village levels.
- Institutional resistance to software-oriented methods due to novelty, competition, and subsidy issues.

Financial Barriers

- Hardware subsidies reduce emphasis on software and lead to exclusionary outcomes.
- Subsidies persist for the wrong reasons: to fulfil career, financial, and political goals of officials.
- National sanitation funding is 75 percent for hardware and 25 percent for software and administrative costs, causing officers to neglect software training, awareness raising and community interaction.

Physical Barriers

- Where access and usage were not achieved, it was often because households could not complete construction of the upper walls, roof, or door due to cost limitations or loss of motivation.
- Latrines are built too close to hand pumps or overflow to street drains, contaminating water sources.

Social Barriers

- Village leaders cannot provide sanitation software to villagers due to inexperience or low motivation.
- Even with latrines, households continue open defecating if unaware of the hazards or due to habit.

Opportunities for rural sanitation improvement

Institutional Opportunities

- Financially and socially inclusive interventions will go a long way to enhance sanitation in India.
- Full-time sanitation employees at district, block, and village levels responsible for TSC facilitation.
- Establishing a reliable online monitoring and reporting system to enhance funding transparency.

Financial Opportunities

- Though ‘subsidy’ was replaced by ‘incentive’ in the TSC, more than a word change is needed to improve practices. Subsidies should be given as a partial material or partial cash incentive, if at all.
- Districts should be encouraged to spend a larger percentage of funds and efforts on software activities.

Physical Opportunities

- Technical support should be provided alongside awareness raising to ensure quality construction.
- A low-cost demonstration latrine should be constructed in a public place of each village.
- Latrine materials should be sold within villages so households can purchase materials.
- Household members should be involved in organizing labour, buying materials, and building latrines.

Social Opportunities

- TSC facilitators should be required to have training certification prior to leading interventions.
- Facilitators should lead interventions with a community group based on a joint strategic action plan.
- Significantly more focus should be placed on software activities and community interaction over time.
- All poor and non-poor households should participate in sanitation intervention software and hardware.

Conclusion

The study determined that where targeted financial assistance and strong software support occurred together in rural sanitation interventions, consequences of a supply-led paradigm could be diminished. In the case of software-focused CLTS interventions in Haryana, officers were aware of subsidy shortcomings, which led them to take practical steps to emphasize participation and awareness raising at the local level. Although the Government always required districts to provide subsidies, the subsidy effect became less relevant to

achieving positive outcomes with software and institutional support in focus. In conventional interventions in Uttar Pradesh, consequences of a supply-led paradigm were apparent. Officers and village leaders prioritized subsidies and construction, neglected awareness, and undervalued participation.

The study suggests subsidies can induce perpetuation of supply-led tendencies and cause deficient awareness raising even under a demand-driven, community-led, incentive-based national guideline. In addition, subsidies can cause both poor and non-poor to be excluded from involvement in projects due to faulty Government poverty classification. The study found that transitioning focus at all levels from hardware subsidization and construction for some to real participation, long-term interaction, and well-facilitated awareness raising for all would encourage more successful software-based interventions. Software-based interventions, with or without subsidy, are key for achieving sustainable community-wide rural sanitation outcomes of access and usage in rural areas in India and other developing countries.

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References

- Bell, B. (2011) Homing in on household sanitation access-usage gaps: A comparative study of sustainability and equitability of the total sanitation campaign in northern India. Utrecht University.
- Bongartz, P. and Chambers, R. (2009) Beyond subsidies: Triggering a revolution in rural sanitation. In focus policy briefing: Issue 10 Community-Led Total Sanitation. Sussex, UK: Institute of Development Studies.
- Delhi Household Survey 3 (DLHS-3) (2008) Government of India. <http://www.jsk.gov.in/dlhs3.asp>
- Evans, B. E., van der Voorden, C., and Peal, A. (2009) *Public funding for sanitation: The many faces of sanitation subsidies*. Geneva, Switzerland: Water Supply and Sanitation Collaborative Council.
- Government of India (2010) Guidelines: Central Rural Sanitation Programme Total Sanitation Campaign June 2010. Ministry of Rural Development. Department of Drinking Water Supply. Rajiv Gandhi National Drinking Water Mission.
- Government of India (2013) Ministry of Drinking Water and Sanitation. Nirmal Bharat Abhiyan. http://tsc.gov.in/TSC/Report/Physical/RptPerwiseAchCensus_net.aspx?id=PHY
- National Family Household Survey 3 (NFHS-3) (2006) Government of India. <http://hetv.org/india/nfhs/nfhs3/NFHS-3-NA.pdf>
- Tandon, Aditi (2011) Sanitation campaign has come a cropper: Jairam. The Tribune India. <http://www.tribuneindia.com/2011/20111022/nation.htm#6>
- UNICEF (2010) How close to the goal of becoming “open defecation free.” State fact sheets: Total Sanitation Campaign. New York, NY: UNICEF.
- WaterAid (2008) Feeling the pulse: A study of the Total Sanitation Campaign in five states. New Delhi: WaterAid India.

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