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Community perceptions of a multi-level behavior change sanitation intervention in Odisha, India: a qualitative study

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An abstract of
A thesis submitted to the Faculty of the
Rollins School of Public Health of Emory University
in partial fulfillment of the requirements for the degree of
Master of Public Health
in Behavioral Sciences and Health Education
2019

Abstract

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By Renee Nicole Cerovski De Shay

BACKGROUND: India has a long history of government programs to fight open defecation which have mainly focused on latrine construction to increase latrine use uptake. Odisha has one of the lowest rates of individual household latrine coverage in India and research has shown that households owning latrines do not necessarily use them. Cost-effective and culturally appropriate interventions targeting behavioral barriers are necessary to bridge the gap between latrine ownership and use. Understanding how communities perceive behavior change interventions is needed to optimize effectiveness.

OBJECTIVE: This qualitative study broadly examined general perceptions of how communities view sanitation interventions in Odisha, and specifically investigated community perceptions and spillover of Sundara Grama, a multi-level behavior change intervention in Odisha, India which aimed to increase latrine use.

METHODS: Sixteen sex-segregated focus group discussions, eight with women (n=72) and eight with men (n=80), were held in six rural villages. Three villages received the intervention, and three did not. General perceptions of sanitation interventions were assessed in all six villages, perceptions of Sundara Grama were assessed in the three villages that received the intervention, and spillover was evaluated in two villages that did not receive the intervention but were in close proximity to those that did. Data were analyzed using thematic analysis.

RESULTS: Sundara Grama was largely well-received, but not all experienced the intervention as intended. Some lower caste women were missed during recruitment. Unclear messaging led to misunderstandings of the purpose of the transect walk, and may have led villagers to punish open defecators. Internal conflicts and divisions made it difficult for communities to work toward a common sanitation goal. However, the intervention may have boosted community self-efficacy toward cleanliness, though not necessarily latrine usage. Communities were already familiar with sanitation messaging but were often reluctant to encourage members to use a latrine because they could not provide latrines and they considered sanitation a personal decision. Instead, participants expected outsiders to initiate and support sanitation efforts. Intervention spillover into control villages depended on the relations between the villages.

CONCLUSIONS: Post-intervention qualitative work in communities can bring insight to the intervention delivery and explain endline results. Implementers of community interventions in Odisha should consider the different groups, and divisions in a village, and target those most likely to be excluded, such as women and lower castes. Future sanitation interventions aimed at producing collective action should first assess underlying social divisions and cultural norms about sanitation. By including activities to strengthen collective efficacy, communities may become more empowered to act. In a similar way, integrating relationship-building activities and encouraging inter-village cooperation should increase spillover to nearby villages.

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Acknowledgements

This research and thesis would not have been possible without the support and contributions of many people

I would first like to thank Dr. Bethany Caruso for making this project possible and allowing me to conduct this research on the Sundara Grama intervention. Her direction as PI of the Sundara Grama trial, as well as my thesis committee member were vital to the data collection process and writing of the thesis.

This work could not have been done without the guidance and support of my thesis chair, Dr. Dawn L. Comeau. Her guidance in qualitative research methods and mentorship were invaluable throughout this project.

I would like to thank all of the community members who took the time to participate in my focus group discussions. Their contribution to the ongoing discussion about sanitation in India is of paramount importance.

Heartfelt thanks to the research team based in Bhubaneswar, led by Dr. Parimita Routray. Dr. Routray gave critical support and guidance during the data collection phase, as well as ensured the translation of transcripts and answered many questions about the context of sanitation in India. I especially want to extend a special thanks to the data collection team that assisted me to collect data in the villages: research assistants Rajani Barik, Sadasiva Kothia, Subhrakanta Pattanayak, Abinash Mishra, Sushreeta Mishra, and Rajashree Nayak, as well as Indrajit Samal, who arranged the logistics of data collection, as well as introduced me to a wide range of local street food.

Fellow researcher Rebekah Williams – thank you for being an amazing co-researcher who was a valuable source of insight and emotional support, an excellent travel buddy, and one of the most hard-working and organized people I know. Collecting data for our studies together was a great experience. This thesis benefitted greatly from discussing and sharing ideas with you throughout the writing and analysis process.

I would like to thank Gloria Sclar for her insight and feedback on the data collection tools and preliminary findings. I would also like to thank Dr. Karen Andes for guidance in qualitative analysis methods and advice about the codebook.

Thank you to the Global Field Experience Committee and Rollins School of Public Health practicum scholarship for providing much-needed funds for a summer of data collection in India.

A special thanks to my husband, Orion, for his patience and encouragement throughout this process. Thank you to Dr. Comeau's thesis group for so much positive energy and inspiration, and my BSHE friends, who have challenged, encouraged, and inspired me during these last two years.

Finally, I thank my God for blessing me with this opportunity to learn and grow through this experience.

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Chapter I: Introduction and Study Purpose

Background on open defecation

Open defecation contributes to many serious health outcomes, including child malnutrition and stunting (Spears, Ghosh, & Cumming, 2013), waterborne and soil-transmitted parasitic diseases (Grimes et al., 2015; Speich, Croll, Furst, Utzinger, & Keiser, 2016). Open defecation also is associated with other risks, particularly for women and girls, including bodily exposure, harassment and violence (Sclar et al., 2018), and higher prevalence of non-partner sexual and/or physical violence (Jadhav, Weitzman, & Smith-Greenaway, 2016; Winter & Barchi, 2016).

Reducing fecal pathogen exposure through improved sanitation has been linked to reduced rates of diarrheal disease and death in children under 5, and protection against soil-transmitted helminthes, and active trachoma (Freeman et al., 2017; Nandi, Megiddo, Ashok, Verma, & Laxminarayan, 2017). Sanitation may also be associated with improved cognitive development (Sclar et al., 2017) through a reduction in exposure to fecal pathogens (Khalil et al., 2016; Kosek et al., 2017; Pinkerton et al., 2016; Watanabe & Petri, 2016).

Sanitation in India

The majority of the world's open defecators live in India, where 40 % of the population practices open defecation (WHO/UNICEF JMP, 2017). The burden of open defecation is particularly heavy in rural areas: only 36.7 % of rural households use an improved sanitation facility (NFHS-4, 2017). In Odisha (formerly known as Orissa), where this study took place, only 23 % of rural households used an improved sanitation facility (NFHS-4 : Odisha Factsheet, 2017).

Government sanitation programs

In order to understand the issue of sanitation in India and challenging states like Odisha, it is helpful to understand how government sanitation programs have evolved over time. Government efforts to end open defecation across India began more than 30 years ago and have undergone significant developments from one program to the next (see Table 1.1 for a list of country-wide programs in India).

Table 1.1 *Sanitation programs sponsored by the Government of India*

Name	Year	Program
Central Rural Sanitation Programme (CRSP)	1986-1998	Promotion of a double pit pour-flush toilets through hardware subsidies (Water and Sanitation Program, 2010)
Total Sanitation Campaign (TSC)	1999-2012	Incentivized community-led approach to achieve community total sanitation using Information, Education, and Communication (IEC) and capital incentives to build latrines only for households below the poverty line (Water and Sanitation Program, 2010)
Nirmal Bharat Abhiyan, or "Clean India Campaign" (NBA)	2012-2014	Latrine subsidies for both below and above poverty line households, IEC campaign, sanitation in schools, solid and liquid waste management. Goal: Country-wide **100% latrine coverage** by 2022 (Government of India, 2015)
Swachh Bharat Mission (SBM)	2014-2019	Re-launch of NBA with a higher latrine subsidy, financial and administrative restructuring, more hardware options, and monitoring of latrine construction and usage Goal: Country-wide **open defecation-free status** by October 2, 2019 (Government of India - MDWS, 2017)

While the overall trend in these programs has been toward increased emphasis on latrine usage, most of these initiatives still focus heavily on latrine construction. They have resulted in little to no effect on reducing open defecation or improving health. Two trials evaluating the Total Sanitation Campaign (TSC) in Odisha and Madhya Pradesh found that TSC increased latrine coverage to some extent, but had little impact on open defecation rates and no impact on health (Clasen et al., 2014; Patil et al., 2014). The following initiative, Nirmal Bharat Abhiyan (NBA) increased the number of households eligible for a latrine subsidy, but still struggled to promote latrines and increase demand for them (Routray, Torondel, Jenkins, Clasen, & Schmidt, 2017).

Drawing from lessons learned from previous initiatives, the current initiative, Swachh Bharat Mission, aims for all of India to be open-defecation free by 2019, the 150th birthday of Mahatma Gandhi. In 2014, Prime Minister Modi restructured and relaunched the Nirmal Bharat Abhiyan (NBA) as the Swachh Bharat Mission (SBM) (Press Information Bureau, 2014). SBM is the first of the initiatives to monitor both outputs (latrine coverage) and outcomes (latrine usage) (Press Information Bureau, 2014). This focus on behavior change is distinctive to SBM, and is hoped to address previous shortcomings in the previous initiatives.

Recent research has identified a number of socio-contextual factors and barriers to SBM's goal of an ODF India. These barriers to exclusive latrine use include any combination of improper or incomplete construction, lack of a nearby water source for post-defecation cleansing, social norms, strong cultural support for open defecation, to a potential loss of mobility for women (Coffey, Spears, & Vyas, 2017; Dreibelbis et al., 2015; Routray, Schmidt, Boisson, Clasen, & Jenkins, 2015).

Sanitation in Odisha

The gaps between latrine ownership, latrine use, and reduced exposure to fecal pathogens have been well-documented in Odisha (Barnard et al., 2013; Clasen et al., 2014; Routray et al., 2015). In order to address these gaps, particularly the issue of latrine use, it is necessary to design and implement interventions targeting behavioral barriers (Luby, 2014; Routray et al., 2015). As Odisha is one of the remaining states to achieve ODF status, interventions here are particularly relevant.

The Sundara Grama Intervention

Funded by a grant from the International Initiative for Impact Evaluation (3ie), Dr. Bethany Caruso led a team of researchers from Emory and the London School of Tropical Medicine to develop Sundara Grama, a multi-level behavior change intervention to increase latrine use. Through formative research in rural Odisha, the team identified eight barriers to latrine use, six of which were selected for the Sundara Grama intervention (Caruso, Clasen, DasMohapatra, et al., 2018). Theory-informed activities to address these barriers were developed and pilot-tested (Caruso, Clasen, DasMohapatra, et al., 2018). The intervention's activities and theory of change utilized three behavioral theories: Behavior Centered Design (BCD) (Aunger & Curtis, 2016), COM-B system (Michie, van Stralen, & West, 2011), and RANAS Model (Mosler, 2012). After pilot testing and integrated lessons learned, the Sundara Grama intervention was expanded to a larger cluster randomized trial (CRT) conducted in 66 villages in the Puri District of Odisha.

Sundara Grama activities were developed using the aforementioned behavior change theories in order to address these key barriers: non-functional latrines; lack of

access to hardware to dispose child feces; limited practical knowledge of how to dispose of child feces; limited practical knowledge of how to use a latrine and empty the latrine's pit; preference for open defecation; and limited understanding of benefits to latrine use (Caruso, Clasen, DasMohapatra, et al., 2018). Activities are aimed at the community and household levels, with the mothers' group meetings specifically targeting mothers with children under 5 (Caruso, Clasen, DasMohapatra, et al., 2018). Activities include a palla (traditional theater) performance, transect walk through open defecation sites, a community meeting, community wall painting, mothers' group meetings, household visits with a demonstration of how fecal pathogens spread, poster distribution, and latrine repairs for a limited number of those in need (Caruso, Clasen, DasMohapatra, et al., 2018). Activities are described in more detail in Chapter 2.

Qualitative and quantitative data was collected at the baseline for the 66 villages, and will also be collected at the endline in order to measure the impact of the intervention (Caruso, Clasen, Sclar, & Sola, 2018). Additionally, qualitative data was needed shortly after the intervention was implemented to assess the "satisfaction" aspect of the intervention's process evaluation (Saunders, Evans, & Joshi, 2005). Within this aspect of process evaluation, there was a need to qualitatively understand how the members of intervention communities perceived the various activities and if the messaging spread beyond those communities to villages in the surrounding area.

Purpose of this Qualitative Study

The purpose of this qualitative study is to understand the perceptions of community members from villages in Odisha, India who received the Sundara Grama intervention. This study also examines potential spillover of information from Sundara

Grama intervention villages to non-intervention control communities within close proximity.

Research Questions

The different experiences of the control and intervention villages required separate research questions with related sub-questions for each group. In the villages which had received the Sundara Grama intervention, I explored community perceptions of the intervention through the following research question and sub-questions in Table 1.2.

Table 1.2 *Research Questions for Intervention Villages*

Main Question:	What are the community perceptions of the Sundara Grama multi-level latrine use intervention in the Puri district, Odisha, India?
Sub-Questions:	1. How did community members understand the purpose of the intervention?
	2. What was their perception of each intervention activity?
	3. How did the intervention influence the village, especially for latrine use?
	4. How could the intervention be improved?

The control villages had not received the intervention, but most were located within close proximity of an intervention village, allowing for the possibility of spillover effects from the intervention. Spillover of the intervention was explored in these villages, as well as their perceptions of other sanitation interventions that had occurred within the village or the nearby area. The following research question and sub-questions in Table 1.3 guided the data collection in the control villages.

Table 1.3 *Research Questions for Control Villages*

Main Question:	What was the spillover of the Sundara Grama intervention in Odisha, India to surrounding communities?
Sub-Questions:	1. What did community members know about the intervention?
	2. What was their perception of each intervention activity?
	3. How did the intervention affect the village, if at all?
	4. How could the intervention be improved?
	5. What is the history of sanitation interventions in the village?

The information generated by this study will help the Emory research team interpret the quantitative results of the CRT and better adapt the intervention to the needs and perceptions of the communities where it is implemented. It will also increase knowledge about community perceptions surrounding latrine use and help inform tools for post-trial qualitative data collection and potential intervention scale-up.

Chapter II: Review of the Literature

The problem of open defecation

Global problem of open defecation and importance of sanitation

Open defecation is a global issue that contributes to numerous health hazards. These include chronic diarrhea, parasitic infections, malnutrition, and child stunting (Freeman et al., 2017; Grimes et al., 2015; Spears et al., 2013; Speich et al., 2016; Wolf et al., 2014). Multiple systematic reviews have supported the protective benefits of improved sanitation to physical and mental health. These have included protection against diarrhea, soil-transmitted helminthes, active trachoma (Freeman et al., 2017), intestinal protozoa infections (Speich et al., 2016) and schistosomiasis (Grimes et al., 2015). Another systematic review found some support that sanitation is associated with improved cognitive development (Sclar et al., 2017) through a reduction in exposure to fecal pathogens causing diarrhea and environmental enteropathy (Khalil et al., 2016; Kosek et al., 2017; Pinkerton et al., 2016; Watanabe & Petri, 2016).

Aside from physical health and cognitive outcomes, issues related to poor sanitation conditions can affect mental well-being and safety, especially for women and girls. Research has shown that open defecation in particular carries the risk of bodily exposure, harassment and violence (Sclar et al., 2018). In Kenya and India, significantly higher prevalence of non-partner sexual and/or physical violence was found among women who practiced open defecation compared to those who do not (Jadhav et al., 2016; Winter & Barchi, 2016). The perception and experience of loss of privacy, harassment and violence lead to fear, anxiety, shame, embarrassment, and loss of dignity (Sclar et al., 2018). In rural Odisha, women were found to experience multiple types of

stressors when engaging in sanitation-related activities, particularly open defecation (Caruso, Cooper, et al., 2018; K. R. S. Hulland et al., 2015; Sahoo et al., 2015).

Because of the numerous benefits of improved sanitation, eliminating open defecation is an international priority. Goal 6.2 of the Sustainable Development Goals set by United Nations aim to "achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations" by 2030 (Inter-Agency and Expert Group on SDG Indicators, 2017). Ending open defecation is no small task; the World Health Organization estimates that 892 million people still practice open defecation (WHO/UNICEF JMP, 2017). And this number may be an underestimate, since it excludes those who have a latrine but do not use it (Garn et al., 2017).

It is important to note that achieving access to adequate and equitable sanitation does not necessarily lead to ending open defecation. In order to achieve the positive health outcomes of sanitation and becoming open defecation free, communities must have adequate latrine coverage, as well as sufficient uptake in latrine use (Freeman et al., 2017; Garn et al., 2017). Beyond the presence of latrine hardware, a number of factors have been found to influence whether a latrine is used, including functionality and maintenance, hygiene amenities, type, accessibility, privacy, age of latrine, and cleanliness (Garn et al., 2017). In addition, perceived benefit, self-efficacy, and social norms were found to strongly affect whether or not water, sanitation, and hygiene (WASH) behaviors, including latrine use, continued to be practiced beyond the life of a sanitation intervention (Hulland, Martin, Dreibelbis, De Bruicker Valliant, & Winch, 2015).

Open Defecation in India

For years, India has represented a formidable challenge for the elimination of open defecation. More than half of the world's open defecators live in India, where 40% of Indians are estimated to practice open defecation (WHO/UNICEF JMP, 2017). The burden of open defecation is particularly heavy in rural areas: only 36.7 % of rural households use an improved sanitation facility (NFHS-4, 2017). Neighboring countries Bangladesh and Pakistan, despite having lower GDPs and lower percentages of rural drinking water access, have lower open defecation rates than India (Coffey et al., 2015). Despite numerous government efforts to increase latrine coverage, studies have shown these efforts have resulted in only modest reductions in open defecation, and no impact on child health (Clasen et al., 2014; Luby, 2014; Patil et al., 2014). Many studies have explored the barriers and challenges to ending open defecation in India, which will be addressed in a later section.

Open defecation in Odisha

Odisha (formerly known as Orissa), has lagged behind the rest of the country in latrine uptake. Located in northeast India (see Figure 2.1), it is the country's eleventh most populous state (Statistics Times, 2018) and only 29.4% of households use an improved sanitation facility (NFHS-4 Odisha Factsheet, 2017). Factors identified as contributing to these low statistics in Odisha include: geography resulting in poor water access, poverty, low levels of awareness, lack of household resources to construct a latrine, improper program implementation, and attitudes that prevent latrine construction and use (Mania, 2013).

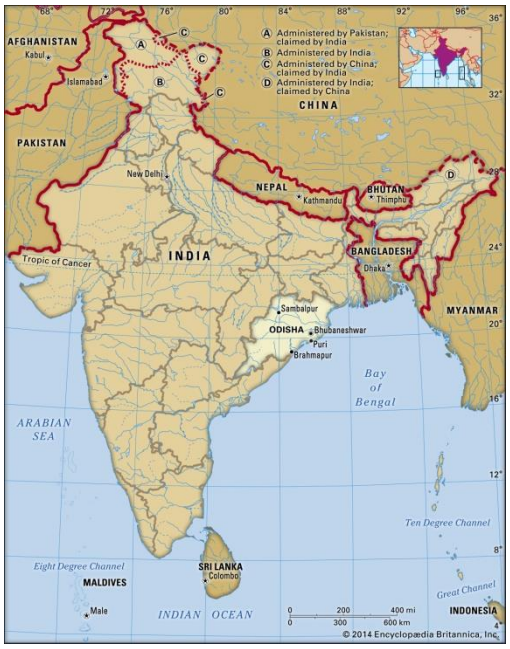

Figure 2.1, Odisha is located in northeast India, bordering the Bay of Bengal (Encyclopaedia Britannica, 2014).

Efforts to end open defecation in India

A History of Sanitation Interventions in India

In order to understand the context of current sanitation interventions in India, it is important to understand the history of the government sanitation programs. Since the mid-1980s, each successive government sanitation program has built on the lessons learned from its predecessor. Recognition that latrine coverage is meaningless without accompanying promotion of use has driven successive programs toward emphasizing behavior change. Specifically, behavior change at the community level, resulting in villages becoming open defecation free (ODF), is essential for eliminating fecal-oral pathways and achieving the positive health outcomes of improved sanitation.

Central Rural Sanitation Programme 1986-1998

India's first national rural sanitation program, the Central Rural Sanitation Programme (CRSP), lasted from 1986 to 1998. It consisted of constructing double pit pour-flush toilets through hardware subsidies. This program was generally regarded as unsuccessful because it did not encourage people to use the toilets or end the practice of open defecation (Water and Sanitation Program, 2010).

Total Sanitation Campaign 1999-2012

Following CRSP, the Government of India restructured the program into the Total Sanitation Campaign (TSC) (1999-2012). This initiative sought to improve on CRSP in two key ways: first, by recognizing the need to motivate people to end open defecation, and second, to emphasize community-wide change in order to achieve positive health outcomes (Water and Sanitation Program, 2010).

The first improvement addressed the lack of demand for latrines. Part of the problem with CRSP was its sole reliance on subsidies to increase demand. A survey conducted in 1996-1997 by the Indian Institute of Mass Communication found that only 2 % of respondents claimed to be primarily motivated by the subsidy (Government of India, 2011). As a result, TSC adopted a “demand-driven” approach, using Information, Education, and Communication (IEC) to convince communities of the importance of latrines, a critical step missing in CRSP (Government of India, 2011). IEC funding was limited to 15 % of total project cost (Government of India, 2011).

The second improvement resulted from the idea that the entire community needed to abandon open defecation in order to experience the health benefits of reduced exposure

to fecal pathogens (Water and Sanitation Program, 2010). Therefore, TSC implemented a community-led approach that rewarded communities for achieving 100% total sanitation.

Practically speaking, these two improvements were made through the primary focus of TSC being on IEC to achieve sanitation goals, and subsidies for latrine construction were only given to households living below the poverty line (Government of India, 2011). Later, the TSC program guidelines shifted beyond household toilets to include schools and all establishments (Water and Sanitation Program, 2010).

Despite these changes, TSC was found to be largely unsuccessful in reducing negative health outcomes, though it performed marginally better in increasing latrine coverage. Two separate trials in Odisha and Madhya Pradesh evaluated TSC on the basis of latrine coverage and health outcomes (Clasen et al., 2014; Patil et al., 2014). The Odisha trial found a significant increase in latrine coverage following the TSC (Clasen et al., 2014); though these increases were lower than targeted (Boisson et al., 2014). The Madhya Pradesh trial found only modest increases in latrine coverage – and even smaller decreases in open defecation (Patil et al., 2014). Both studies showed TSC to be unsuccessful in improving child health outcomes, namely diarrhea, highly credible gastrointestinal illness, parasitic infections, anemia, and growth (Clasen et al., 2014; Patil et al., 2014).

Nirmal Bharat Abhiyan 2012-2014

As seen in the evaluations of TSC, ending open defecation continued to be elusive. In 2012, the TSC was succeeded by the Nirmal Bharat Abhiyan (NBA, or "Clean India Campaign"). The goal of NBA was to accelerate rural sanitation coverage through “renewed strategies and a saturation approach” and to achieve 100% sanitation access

(defined by 100% latrine coverage) to all rural households by 2022 (Government of India, 2015; Routray et al., 2017).

In order to make NBA more effective than TSC, several changes were made. Key differences between TSC and NBA included increased focus on capacity building, community mobilization, behavior change, and IEC materials, while expanding financial support for latrine construction to households above the poverty line (Government of India, 2015). Funding for IEC, start-up and capacity building remained the same percentage of the budget (15 %) as under TSC (Shome, 2012). To make latrines more attractive, households were also given more choices under NBA. This was done through a menu of technology options which allowed households' individual preferences and needs to be better met (Government of India, 2015). Another key development was the shift from using districts under TSC to using the 'Gram Panchayat' (GP) under NBA as the base unit for implementation (Shome, 2012). Since the GP is one of the smallest units of rural governance, NBA placed the sanitation effort close to the village level.

Swachh Bharat Mission 2014-2019

In 2014, India's newly elected Prime Minister Narendra Modi restructured NBA into a similar, but accelerated program known as the Swachh Bharat Mission (Press Information Bureau, 2014). In SBM, the ultimate goal pertained to behavior change: improved cleanliness and elimination of open defecation in India by October 2, 2019, Mahatma Gandhi's 150th birthday. This is more than two years sooner than the original goal of NBA (PMINDIA).

A significant change from NBA to SBM was the strengthening of the program's monitoring system, which now monitored latrine coverage and latrine usage, specifically,

ODF status (Government of India - MDWS, 2017). Under SBM, ODF status is defined as: “a) no visible faeces found in the environment/village; and b) every household as well as public/community institutions using safe technology option for disposal of faeces” (Prasad, 2015).

Other changes included an increase in subsidies per latrine from Rs. 10,000 under NBA to Rs. 12,000 but a decrease in the percentage of the budget allotted to IEC from 15 to 8 % (Government of India - MDWS, 2017). Despite having a lower percentage of the budget, IEC was affirmed as a critical way to bring about behavior change. “Conventional IEC” such as posters, pamphlets, etc. were downplayed and a strong emphasis was placed on participatory methodologies and inter-personal communication that would “trigger” communities toward sanitation (Government of India - Ministry of Drinking Water and Sanitation, 2017). SBM changed the basic unit of intervention from the GP back to the district, tasking each district to implement a locally-adapted behavior change strategy to make each of their gram panchayats ODF (Government of India, 2017).

Throughout the past 30 years, efforts to end open defecation have become more and more focused on behavior change. While increased behavior change may be the solution, behavior change strategies often lack details for implementation. Although SBM guidelines speak extensively about behavior change and its role, there seems to be little difference between IEC and behavior change strategies and activities between TSC, NBA, and SBM.

India's sanitation initiatives and CLTS

The mention of "triggering" in the SBM guidelines may sound familiar: triggering is a fundamental part of Community Led Total Sanitation (CLTS). CLTS was developed by Kamal Kar, a development consultant from India, with Village Education Resource Centre in Bangladesh (Community-Led Total Sanitation, 2019a). CLTS mobilizes communities to eliminate open defecation through collective action, mutual support and local innovation and has been widely adopted throughout Asia, Africa, Latin America, the Pacific and Middle East (Community-Led Total Sanitation, 2019a).

Though it has been implemented in India, and partially inspired the SBM behavior change strategy (Government of India, n.d.), CLTS experiences significant challenges in India because of the government latrine subsidies and the complexities of rural India (Community-Led Total Sanitation, 2019b). One criticism of India's Swachh Bharat Mission and other initiatives is the subsidy of toilet construction, which is said to interfere with the concept of ownership. Within the model of CLTS, it is believed that those who construct their own latrines are more likely to use, maintain, and repair them (Chambers & Myers, 2016). This may represent a barrier to use, as those who receive a latrine may not feel any personal connection to it, or desire to use it.

Barriers to end open defecation in India

Barriers to latrine use in India

The context of rural India presents many complex barriers to achieving latrine usage and coverage. Studies have shown that interventions aimed at increasing latrine coverage in India do not necessarily lead to increased latrine use, though interventions

specifically targeting latrine use were more successful (Garn et al., 2017). This is because in addition to providing a functional latrine to a household, socio-contextual factors and behavioral patterns need to be understood and addressed in order to increase uptake (Coffey et al., 2017; Dreibelbis et al., 2015; Routray et al., 2015). A number of barriers to latrine usage have been identified, which could include any combination of issues related to construction, lack of a nearby water source for post-defecation cleansing, strong socio-cultural support for open defecation, and cultural beliefs surrounding purity and caste (Coffey et al., 2017; Dreibelbis et al., 2015; Routray et al., 2015).

Improperly constructed latrines

One pitfall of India's subsidy system for latrine construction is its vulnerability to exploitation and corruption, resulting in a common barrier to latrine use: a non-functional latrine. Widespread corruption has been known to be entrenched within the water and sanitation sector, particularly with construction service providers (Davis, 2004). Corruption at many levels has prevented vulnerable rural communities from receiving the government subsidies and latrines promised under TSC (Hueso & Bell, 2013). Subsidies or incentives often resulted in improperly or partially constructed latrines, built only for the purpose of collecting the subsidy (Hueso & Bell, 2013). Households have been known to repurpose dysfunctional and unwanted latrines (Gupta, Coffey, & Spears, 2016).

A qualitative study in Odisha found that while privacy can be a benefit of using a latrine, poor construction of a household latrine may lead to more privacy issues, especially for women (Routray et al., 2015). Incomplete or poorly located latrines did not meet women's privacy needs, particularly if the position of the latrine allowed for men to

see them entering and exiting (Routray et al., 2015). In another study, 23% of respondents cited privacy as a reason for OD instead of using a latrine (Barnard et al., 2013). Routray et al. found that going to the defecation site was seen as more private for women, since men do not see them there (2015). While it was noted that men's need for privacy was not as great, there was still concern if the latrine was located too near to the entrance of the home (Routray et al., 2015).

Water availability

Water availability has been identified as a potential barrier to latrine use, though findings on this issue are mixed. A qualitative study in rural Odisha found that water availability in the latrine was considered necessary in order to carry out the required cleansing rituals following defecation (Routray et al., 2015). Because defecating causes one to become ritually impure and unable to touch a water source, the water needed for anal cleansing, flushing waste, and washing of the body and clothes had to be in the latrine before use (Routray et al., 2015). Fetching water for these tasks was considered more work, and practicing open defecation near a water source was a more convenient solution to this problem (Routray et al., 2015).

Despite this, quantitative evidence to support access to water as a barrier in India is weak. Households with piped water have not been found to be more likely to have a latrine, and only a small percentage of respondents cite access to water as a reason to not use a latrine (Banda et al., 2007; Coffey et al., 2014; Coffey et al., 2017; Lahiri, Yegbemey, Goel, Mathew, & Puri, 2017). On the other hand, a mixed methods study among 306 women from rural Maharashtra suggest that water availability is important to both latrine users and open defecators (Hirve et al., 2015).

Socio-cultural support of open defecation

In direct contrast health messaging surrounding the dangers of open defecation, socio-cultural norms in Indian culture support open defecation as healthier than using a latrine. Survey data from rural households in northern India support this preference for open defecation, associating open defecation with health, wholesomeness, longevity, and strength (Coffey et al., 2014; Coffey et al., 2015). In this survey, 74% of individuals practicing open defecation despite having access to a latrine in their home explained that they did this because it was pleasurable, comfortable, or convenient (Coffey et al., 2014).

Preference for open defecation extends beyond perceived health benefits or virtuousness. Open defecation is also associated with social benefits, especially for women, who typically go in groups. The evening trip to defecation sites is considered a time to socialize, gossip, and relieve stress. For younger married women, this may be the only time they are allowed to leave the house and socialize with their friends, or get fresh air and exercise (Routray et al., 2015).

Purity

Beliefs about ritual purity also support open defecation as a way to keep a home pure. In Hindu culture, purity is highly compartmentalized. Different parts of the body are assigned different levels of purity. To some degree, this concept is applied to the home, the temple, and the world (Lüthi, 2010). A study in Kottar, south India found this concept to be old, and divided life, and in particular, the village into concentric circles, where the temple and high-caste areas were in the middle and the lower caste areas on the outside (Lüthi, 2010). This ideology is evident in the way Kottar residents viewed cleanliness: as having little relevance beyond their own homes and the temple (Lüthi,

2010). In this context, open defecation does not carry any stigma, and has traditionally been the preferred way to dispose of feces, as it is seen as unacceptable for human feces to be near a home and the worship shrine (Banda et al., 2007; Coffey et al., 2015; Routray et al., 2015).

Purity and Pit Emptying

Beliefs about ritual purity which support open defecation also complicate the process of emptying the latrine pit. Often, the most practical and cost-efficient way to empty the government subsidized household latrines is by hand (Coffey et al., 2015). In other countries, markets have sprung up around the need for manual pit emptying. However, this would be unacceptable in India where complex rules about ritual purity and uncleanness are woven into the fabric of Hindu society and feces and bodily fluids are considered ritually polluting (Coffey et al., 2014; Coffey et al., 2015; Harper, 1964; Khare, 1962).

As concepts of ritual purity result in a compartmentalized view of spaces, they also contribute to stratifications in society. Ritual purity forms the basis for the caste system, which in turn dictates the division of labor and interdependence of a community (Harper, 1964). In this system, lower castes were considered less pure and permanently polluted, and relegated to dirty and degrading tasks, including cleaning feces (Shah, Mander, Baviskar, Thorat, & Deshpande, 2006). As a result, emptying a pit is unthinkable for most Hindus and considered a symbol of caste-based oppression to those who have been historically responsible for “dirty work” (Chambers & Myers, 2016; Coffey et al., 2015).

Research has explored how the issue of pit emptying affects latrine usage and the expectations and concerns rural Indian populations have about their latrines. Coffey et

al's SQUAT survey in 3,235 rural households in five states in northern India found that government-subsidized latrines do not meet their expectations (2014). Government latrines were much less likely to be used than privately constructed latrines, and privately constructed latrines were found to have much larger pits than government latrines (Coffey et al., 2014). This reflects the concern of many rural Indians expressed about the pit filling up and needing to be emptied (Coffey et al., 2015). In fact, concern about pits filling up is one reason why men choose to defecate in the open, in order for the latrine to be reserved for women, children, the elderly and disabled (Chambers & Myers, 2016; Coffey et al., 2014; Gupta et al., 2016).

The Sundara Grama Intervention

Emory CRT of Sundara Grama in Odisha

In the face of the considerable health consequences of open defecation, the need for contextually-appropriate behavior change interventions, and the impending deadline of SBM, a need exists for cost-effective, scalable interventions that increase latrine usage in India.

A research team at Emory is conducting a cluster randomized trial (CRT) to evaluate the Sundara Grama intervention, which they designed to increase latrine use in rural Odisha. This multi-level, theory-informed intervention package included low-cost latrine repairs and behavior change activities focused at the community, household, and individual levels. Behavior change messaging was delivered through the following activities held in this order: palla, transect walk, community meeting, mother's meeting, household visits, community wall painting. Table 2.1 gives descriptions of each activity.

Table 2.1 *Description of Sundara Grama Behavior Change Activities*

Activity	Level of Change	Aim	Description
Palla	Community	To educate and engage community members on the health and non-health benefits to latrine use through a traditional palla that utilizes folk song, music, and skit.	A traditional folk theater performance featuring songs, skits, and music centered on the theme of sanitation and latrine use
Transect walk	Community	To show the amount of human feces present in each village by having village members, including children, walk around their village and mark defecation sites with colored holi powder.	An early morning walk through the village and defecation fields with the community. Participants are given brightly-colored powder to sprinkle on any feces that they find. Community mobilizers share key messages and end the walk with a handwashing demonstration.
Community meeting	Community	To facilitate community motivation, action, and commitment toward achieving the intervention motto of a "clean, healthy, beautiful village" through interactive, participatory community meetings.	A meeting with the community to share more key messages about sanitation and latrine use. The community is encouraged to create and commit to an action plan to achieve a "clean, healthy, beautiful village."

Mother's meeting	Group	To provide action knowledge on the materials and practices used to safely dispose of infant and young children's feces into latrine through interactive learning groups among mothers and primary caregivers.	A meeting with mothers of young children to instruct them on safe child feces disposal and to distribute a child potty and scoop to each mother in attendance.
Household visits	Household	To provide household-level counseling on barriers to latrine use and facilitate motivation and commitment toward achieving the intervention motto of a "clean, healthy, beautiful village" through interactive, participatory household visits.	Individualized visit to each household with a latrine in the village. Community mobilizers encourage all household members to use the latrine every time. Demonstration of how flies can transmit feces is given. Households are given either a poster to remind them to use the latrine every time, or a poster to celebrate their exclusive use of their latrine, depending on their status.
Community Wall Painting	Community	To display publicly the community-identified goals and action steps for achieving a "clean, beautiful, healthy village" alongside a community map that identifies households who have a latrine and households who are also using their latrine, in order to track progress towards the community goals.	A map of the village and village households is painted in a prominent location in the village. Households with latrines are identified, as well as household that use latrines exclusively. *Not completed at the time of this study*

This combination of latrine repairs and behavior change activities is hoped to increase behavioral uptake both in the short and long term.

Theoretical framework:

In designing the Sundara Grama intervention , the team utilized three behavioral theories to craft activities and the theory of change: Behavior Centered Design (BCD) (Aunger & Curtis, 2016), COM-B system (Michie et al., 2011), and RANAS Model (Mosler, 2012).

Sundara Grama borrowed several elements from Behavior Centered Design (BCD), an approach that includes a theory of change, behavioral determinants, and a program design process (Aunger & Curtis, 2016). BCD draws from a number of general behavior theories, including Reinforced Learning, Behavioral settings theory, evolutionary psychology, and a five-step process to design an intervention called Assess-Build-Create-Design-Evaluate (Aunger & Curtis, 2016). Key features of BCD include its single-minded focus on behavior change as the outcome, the social and physical context of the behavior, and a theory of behavior *change* instead of behavior *determination* (Aunger & Curtis, 2016).

BCD also makes distinctions between three levels of behavioral control by the brain: reactive, motivated and executive (Aunger & Curtis, 2015). Reactive behavior refers to habits built through regular rewarding behavior (Aunger & Curtis, 2016), though disgust is sometimes argued as also reactive behavior. Motivated behavior ties behavior to evolutionary beneficial motives (Aunger & Curtis, 2016). Elements of the intervention related to motivated behavior seek to encourage the desired behavior of latrine use by associating it with motives such as justice, comfort, status, nurture and disgust (Caruso,

Clasen, DasMohapatra, et al., 2018). Executive behavioral control refers to behavioral choices made in order to prioritize long-term payoffs over short-term gains (Aunger & Curtis, 2016). Table 2.2 shows how Sundara Grama activities fit within the reactive, motivated, and executive levels of behavior.

Table 2.2 *Levels of behavioral control in BCD, Sundara Grama activities, and messages*

Activity	Type of behavior		
	Reactive behavior	Motivated behavior	Executive behavior
Palla		Status for household and community Latrine use contributes to community dignity and pride	Perceived vulnerability and severity
Transect walk		Latrine use contributes to community dignity and pride	
Community Meeting		Comfort and convenience Status for household	Perceived vulnerability and severity Barrier Planning
Mother's Group Meeting		Nurture of children	Perceived vulnerability and severity
Household Visits/Poster distribution	Disgust can also be seen as motivated behavior	Disgust can be seen as reactive or motivated behavior	Perceived vulnerability and severity Barrier Planning
Wall Painting			Status of household

Finally, BCD considers the behavior as it fits within a social and physical setting and in the context of other behaviors (Aunger & Curtis, 2016). Modifications to the environment are designed in order to disrupt the undesired behavior, promote the revaluing of the desired behavior as the best response to the new situation, and support continued performance of said behavior (Aunger & Curtis, 2016). All activities except for the palla were designed to affect the environment through self-regulating factors, norms, and physical opportunity (Caruso, Clasen, DasMohapatra, et al., 2018).

The COM-B System describes behavior in the context of three essential conditions: capability, opportunity, and motivation (Michie et al., 2011). Capability includes both psychological and physical capacity to perform the behavior (Michie et al., 2011). Motivation covers all brain processes related to behavior, including habits, goals, analytical decision-making, and goals (Michie et al., 2011). Finally, opportunity relates to all outside factors that either make the behavior possible or prompt it (Michie et al., 2011). Table 2.3 shows how Sundara Grama activities fit within the COM-B System.

Table 2.3 *Sundara Grama activities and the COM-B System*

Activity	Essential Conditions				
	Capability		Opportunity		Motivation
	Psychological	Physical	Prompt	Possible	
Palla					X
Transect walk					X
Community Meeting					X
Mother's Group Meeting with potty and scoop distribution	X	X – if household already had latrine)		X – if household already had latrine)	X
Household Visits/Poster distribution	X		X		X
Wall Painting			X		X
Latrine Repairs		X		X	

The third theoretical model used in the Sundara Grama intervention is the RANAS model. The RANAS model assumes that five factor blocks have to support a new behavior in order for it to be adopted: risk, attitudes, norms, abilities, and self-regulation (Mosler, 2012). Behavioral factors from other theories of behavior change are organized into these five factor blocks, which influence the target behavior, as well as competing behaviors (Mosler, 2012). Target behaviors are broken down into use, intention, and habit, with habit being the most important outcome because it signifies that the behavior will persist in the long-term (Mosler, 2012). To influence toward the target

behaviors, each factor block has a corresponding behavior change intervention technique which should efficiently change that factor (Mosler, 2012).

Risk factors were highlighted in the Sundara Grama intervention through the palla, in which skits were used to influence perceived vulnerability and severity of fecal exposure (Caruso, Clasen, DasMohapatra, et al., 2018). These factors were reinforced through the community meeting, mother's meeting and household visits (Caruso, Clasen, DasMohapatra, et al., 2018).

Attitudinal factors include beliefs about outcomes as well as feelings associated to the behavior (Mosler, 2012). Activities from Sundara Grama that were designed to provide motivations and reactions address this factor. For example, the palla's appeal to latrine use as elevating to the community and community meeting's messages about the convenience of latrine use both provide motivations to perform the desired behavior (Caruso, Clasen, DasMohapatra, et al., 2018).

Descriptive and injunctive norms were addressed in the intervention as well. The wall paintings and posters addressed a descriptive norm by showing that latrine use is commonly practiced in the village (Caruso, Clasen, DasMohapatra, et al., 2018). Injunctive norms, which pertain to perceptions of community approval or disapproval, were addressed in the transect walk, wall painting, banner, and household visit (Caruso, Clasen, DasMohapatra, et al., 2018).

Ability factors were only addressed during the mother's group, which taught mothers how to handle the feces of children, the elderly, and disabled (Caruso, Clasen, DasMohapatra, et al., 2018).

Finally, self-regulation factors action control, remembering, coping planning, and commitment (Mosler, 2012) were addressed in the activities. During the community meetings, the communities agreed upon and made a plan for keeping the village clean, which relates to action control (Caruso, Clasen, DasMohapatra, et al., 2018). The community meetings also facilitated discussion about barriers to latrine use and their solutions, addressing the coping planning factor (Caruso, Clasen, DasMohapatra, et al., 2018). The community meetings, wall paintings and poster fostered community commitment to the action plan and their goal of sanitation (Caruso, Clasen, DasMohapatra, et al., 2018). Finally, the holi powder in the transect walk, wall painting and poster served to remind the community of their commitment to latrine use and the state of their sanitation (Caruso, Clasen, DasMohapatra, et al., 2018).

Justification for this thesis project

In summary, open defecation is a source of many negative health outcomes and years of effort have gone into eliminating open defecation in India. Since behavior change is the key to bridge the gap between latrine coverage and exclusive latrine usage, there is a need for interventions to address the myriad socio-contextual barriers in rural India. To address this need, the Sundara Grama Intervention is a low-cost intervention based on several behavior theories and frameworks that was evaluated as a cluster-randomized trial in Odisha, India. However, in order to interpret the results of the Sundara Grama CRT, it is necessary to understand the experiences perceptions of the communities that receive it. Community input is needed to know if the intervention and its activities were appropriate and effective in their socio-cultural context. In addition,

researchers need to understand spillover effects: whether or not key messages from the intervention spread to and influenced inhabitants in surrounding villages. This thesis project qualitatively explores community perceptions of the Sundara Grama Intervention, sanitation interventions in general, and spillover effects in intervention and control communities. The findings from this study will be able to give context to the results of the CRT, inform potential modifications and scale-up of the intervention, and contribute to the body of literature on sanitation interventions in Odisha.

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Chapter III: Student Contribution

Journal Choice

International Journal of Environmental Research and Public Health

Overview of the Sundara Grama Intervention

The Sundara Grama Intervention is a multi-level behavior change package designed to promote latrine use among rural households in Odisha, India. It was developed by a team from Emory and the London School of Hygiene and Tropical Medicine (LSHTM) and funded by a grant from 3ie: International Initiative for Impact Evaluation. The principal investigator is Dr. Bethany Caruso from Emory University. After formative research, the team pilot-tested and finalized the Sundara Grama intervention. It was then implemented by Rural Welfare Institute and evaluated by the Emory and LSHTM team as part of a cluster-randomized trial (CRT) (Caruso et al., (Accepted)).

The Sundara Grama intervention manual states that the intervention goal is for all feces to end up in a latrine (Caruso et al., 2018). Formative research identified eight barriers to achieving this goal: “poor design and poor quality latrines; non-functional latrines; limited water access for flushing/post-defecation cleansing; no access to hardware for child feces disposal; limited practical knowledge regarding child feces disposal; limited practical knowledge regarding how to use a latrine and empty the latrine’s pit; preference for open defecation; and limited understanding of the health and non-health benefits to latrine use” (Caruso et al., 2018)(p.7). The team chose behavior change techniques to address six out of the eight barriers (Poor latrine design and lack of water were excluded. Addressing these factors would not be feasible because the funders

required interventions to cost no more than an average of 20USD per household) and developed activities targeting the community, group (mothers with children under age 5), and household levels (Caruso et al., 2018).

The CRT involved 66 villages, 33 which received the intervention and 33 which did not (Caruso et al., (Accepted)). In addition to the CRT, qualitative research was conducted with six additional villages: three of the villages received the intervention and 3 did not (Caruso et al., (Accepted)). Baseline quantitative data on latrine use and coverage was collected in the CRT villages (Caruso et al., (Accepted)). Quantitative data will also be collected at endline for these villages to evaluate intervention impact (Caruso et al., (Accepted)). No quantitative baseline or endline data was collected in the six qualitative villages; qualitative activities designed to understand community member perceptions of the intervention were carried out shortly after most of the intervention activities were implemented. This thesis focuses on understanding perceptions of the intervention activities delivered at the household and community levels. Another student thesis focused on the perceptions of the mother's group activities.

Role of Student Project within Sundara Grama

My role in this project was to conduct qualitative research in the aforementioned six qualitative villages to understand community perceptions of the community and household level intervention activities, and possible spillover into control villages. The project contributed to assessing the "satisfaction" element of the intervention's process evaluation (Saunders, Evans, & Joshi, 2005) and will also help explain the success or failure of the intervention. Findings from this study will help the team better understand

intervention impact, inform revisions and possible scale-up of the intervention, and guide endline qualitative research in the CRT villages.

Student Contribution to Thesis

Dr. Caruso provided the research question for this study. Under her supervision and guidance, as well as that of Dr. Routray, the India-based principal investigator and Gloria Sclar, program associate, I planned the evaluation methods, designed data collection tools, recruited and trained research assistants, and collected primary data from the villages. I wrote this thesis and developed all figures and tables with guidance and feedback from Dr. Comeau and Dr. Caruso.

Methods

Study setting and population

Odisha, located in northeast India, is the country's eleventh most populous state (Statistics Times, 2018) currently has the second-lowest latrine coverage level (29%) of all the states in India (National Family Health Survey - 4 : Odisha Factsheet, 2017). Factors identified as contributing to these low statistics in Odisha include: geography resulting in poor water access, poverty, low levels of awareness, lack of household resources to construct a latrine, improper program implementation, and attitudes that prevent latrine construction and use (Mania, 2013).

In addition to the CRT, qualitative research was conducted with six additional villages not engaged in trial activities: three of the villages received the intervention and 3 did not (Caruso et al., (Accepted)). This study included these six villages. Two of the intervention villages (I2 and I3) were paired with two control villages (C2 and C3,

respectively) within close proximity. The third intervention village (I1) and control village (CA) were not paired to each other.

Data collection

Qualitative research methods were employed as they are best suited to researching the perspectives and context of a study population (Hennink, 2011). Focus groups, which provide an opportunity for participants to interact and prompt conversations from the emic perspective (Hennink, 2011), were used to collect community-level perceptions of the intervention. Sixteen sex-segregated focus group discussions (8 with men, 8 with women) were conducted in six villages, three of which had received the Sundara Grama intervention, and three of which had been designated as control villages (80 total male participants; 72 total female participants). (see Table 3.1). Sex segregation was used in order to encourage open discussion among group members of the same sex.

Focus group discussion guides were developed through a careful review of Saunder's guide to process evaluations (Saunders et al., 2005), and the Sundara Grama Intervention Manual (Caruso et al., 2018), which included the intervention Theory of Change. The main questions in the FGD guide explored community perceptions and experiences with the intervention activities: palla, transect walk, community meeting, mother's meeting, household visits, poster distributions, and the wall painting. Because the latrine repairs were not yet completed at the time of the study, questions about latrines were not included in the discussion guide.

The intervention FGD guide was piloted with women from a village that received the Sundara Grama intervention during the training of the implementers. After the first five focus groups, revisions were made to the guides in order to improve the quality of the

data. Specifically, a section was added to the control FGD guide to explore the history of sanitation programs in the villages to better understand context. Additionally, because the initial male focus groups were very short, a set of separate probes were developed for the male intervention FGDs to encourage more participation.

Table 3.1, Focus group participants by village and sex

	Intervention Village 1 (I1)	Control Village A (CA)	Intervention Village 2 (I2)	Control Village 2 (C2)	Intervention Village 3 (I3)	Control Village 3 (C3)
FGD participants	15	38	23	26	27	23
Female	6	15	18	14	11	8
Male	9	23	5	12	16	15

Community members were eligible to participate if they were 18 or older and had attended several of the intervention activities. Men and women from intervention villages were asked how many activities they had attended. If they had attended more than one activity, they were recruited for the focus groups. In control villages, eligibility was determined only by age. Those who were willing to participate were recruited.

Recruitment for focus groups was conducted in two ways. Primarily, the anganwadi worker (female village child care worker) or ward member (local leader) recruited participants in advance for the focus groups. When they were not willing or available to recruit, participants were recruited on the day of the focus groups through convenience sampling by the research assistants who would conduct the focus groups. Specifically, SK, AB, and SM went from house to house and asking for volunteers. At times, snowball

sampling was used when participants recommend other qualified potential participants for the FGD.

Focus group size ranged from five to 15 participants. Although the goal was to recruit six to eight participants per group, focus group size depended on the recruiter and community interest in the discussion. When the focus group was larger than desired, the participants who did not attend many intervention activities were asked not to participate.

Demographic data (See Table 3.2) were collected via paper survey before each focus group discussion. Data collected included age, marital status, education level, number of children, and exposure to each activity in the Sundara Grama intervention.

Focus group discussions were facilitated by research assistants who were from the region and fluent in Oriya. Most FGDs were held in the anganwadi (women) or at the village temple or clubhouse (men), as suggested by participants. Discussions were recorded on a cell phone or a research assistant's phone and then uploaded to shared folders in Google Drive and Box. RD wrote detailed observational notes during each focus group and debriefed with the research assistants after each focus group.

Table 3.2 – Demographics of Focus Group Participants

	N	%
Sex	152	
Female	72	47.4%
Male	80	52.6%
Intervention Status	152	
Intervention	65	42.8%
Control	87	57.2%
Caste	152	
Scheduled Caste	13	8.6%
Scheduled Tribe	3	2.0%
General Caste	99	65.1%
Other Backward Castes	37	24.3%
Latrine Ownership	152	
Yes, functional	101	66.4%
Yes, non-functional	9	6.0%
No	42	27.6%
Frequency of Latrine Use for Defecation	110	
Always	96	87.2%
Sometimes	10	9.0%
Never	4	3.6%
Attended the Palla (intervention villages only)	59	
Yes	32	54.2%
No	27	45.8%
Attended the Transect Walk (intervention villages only)	58	
Yes	30	51.7%
No	28	48.3%
Attended the Community Meeting (intervention villages only)	55	
Yes	31	56.4%
No	24	43.6%
Attended the Mother's Group Meeting (intervention villages only)	43	
Yes	23	53.5%
No	20	46.5%
Attended the Household Visit (intervention villages only	23	
Yes	20	87.0%
No	3	13.0%

Data management and analysis

Recordings were translated and transcribed into a word document by a contractor. The transcripts were then coded and analyzed in MaxQDA software ("MaxQDA," 2018). Demographic data were entered into an Excel spreadsheet by RD, and other volunteers.

Data were analyzed with thematic analysis as described by Braun and Clarke (Braun & Clarke, 2006). Transcripts were reviewed and memos were written to record first impressions of the data. Data were then coded and analyzed using a "bottom-up" inductive approach (Braun & Clarke, 2006). A codebook was developed based on a few deductive codes from questions in the FGD guides, as well as inductive codes identified by reviewing the transcripts. Feedback on the codebook was obtained from BAC, GDS, and other colleagues, the codebook was revised, and then the transcripts were re-coded. Data were reviewed village-by-village in order to gain a sense of common patterns and themes at the village level. Codes were grouped into themes. The themes that were closely aligned with the research question were selected and examined further. A conceptual diagram was developed to explain community perceptions of sanitation change.

Ethics

This study was approved as an amendment to the parent CRT study protocol. Protocols were reviewed and approved by the Institutional Review Board at Emory University in Atlanta Georgia (00098293) and the Ethics Review Committee at Xavier Institute of Management in Bhubaneswar, Odisha, India. Before the collection of any data, verbal consent was obtained from all participants, who were each given a copy of the consent form. Identifying data were not collected in the demographic surveys or on

the recordings of the focus group discussions. Participants were not compensated for being in the study.

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Chapter IV: Manuscript

Article

Community perceptions of a multi-level behavior change sanitation intervention

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Received: date; Accepted: date; Published: date

Abstract: In Odisha, India, household latrine coverage is estimated to be 29% and household latrines are not necessarily used. Cost-effective, culturally appropriate behavior change interventions are necessary to bridge the gap between latrine ownership and use. We examined community perceptions and knowledge spillover of *Sundara Grama*, a multi-level behavior change intervention designed to increase latrine usage in rural Odisha. We also examined how communities view sanitation interventions. Sixteen sex-segregated focus groups (n=152) were held in three intervention villages and three control villages. Two control villages were chosen based on proximity to the intervention villages to study spillover. Data were analyzed using thematic analysis. *Sundara Grama* was well-received, but intervention recruitment challenges prevented some from attending activities. Delivery issues contributed to misunderstandings and negative feelings about the transect walk and community meetings. Many were familiar with sanitation messaging, but were reluctant to tell others to use a latrine since latrine ownership was considered a household issue. Intervention spillover into control villages depended on village relations. Findings suggest future interventions should identify and target recruitment to all village groups, castes, and neighborhoods to ensure better coverage of messages. Assessing and integrating collective efficacy into community-centered sanitation interventions should increase community-level action.

Keywords: Sanitation, behavior change, WASH, rural India, qualitative research, community perceptions, latrine usage

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1. Introduction

Open defecation is associated with chronic diarrhea, parasitic infections, malnutrition, and child stunting [1-5]. Improved sanitation has been shown to be protective against diarrhea, soil-transmitted helminthes, active trachoma [4], intestinal protozoa infections [2] and schistosomiasis [3]. Sanitation is also associated with cognitive development [6] through exposure to fecal pathogens causing diarrhea and environmental enteropathy [7-10]. Issues related to poor sanitation conditions can also affect mental well-being and safety, especially for women and girls.

Research has shown that open defecation in particular carries the risk of bodily exposure, harassment and violence [11-13].

Goal 6.2 of the UN Sustainable Development Goals aims to eliminate open defecation by 2030 [14]. The World Health Organization estimates that 892 million people still practice open defecation [15]. This number may be an underestimate, since it excludes those who have a latrine but do not use it [16].

More than half of the world's open defecators live in India, where 40% of Indians are estimated to practice open defecation [15]. The burden of open defecation is particularly heavy in rural areas: only 37% of rural households use an improved sanitation facility [17]. Neighboring countries Bangladesh and Pakistan, despite having lower GDPs and lower percentages of rural drinking water access, have lower open defecation rates than India [18]. Despite numerous government efforts to increase latrine coverage, studies have shown these efforts have resulted in only modest reductions in open defecation, and no impact on child health [19-21].

Sanitation Programs in India

Since the mid-1980s, the Indian government has implemented national sanitation programs, gradually shifting from solely providing latrines to promoting latrine uptake.

India's first national rural sanitation program was the Central Rural Sanitation Programme (CRSP), (1986- 1998). It consisted of constructing double pit pour-flush toilets through hardware subsidies. This program was unsuccessful because it did not encourage people to use the toilets or end the practice of open defecation [22]. Following CRSP, the Government of India restructured the program into the Total Sanitation Campaign (TSC) (1999-2012). TSC improved on CRSP by recognizing the need to motivate people, and by emphasizing community-wide change in order to achieve positive health outcomes [22]. TSC introduced Information, Education, and Communication (IEC) to achieve sanitation goals; and subsidies for latrine construction were only given to households below the poverty line [23]. Despite these changes, TSC was largely unsuccessful in reducing negative health outcomes, though it performed marginally better in increasing latrine coverage [19,20,24]. A cluster randomized trial found a significant increase in latrine coverage following the TSC [20]; though these increases were lower than targeted [24]. Similarly, a trial in Madhya Pradesh found only modest increases in latrine coverage – and even smaller decreases in open defecation [19]. Both studies showed TSC to be unsuccessful in improving child health outcomes, namely diarrhea, gastrointestinal illness, parasitic infections, anemia, and growth [19,20].

In 2012, the TSC was succeeded by the Nirmal Bharat Abhiyan (NBA). The goal of NBA was to accelerate rural sanitation coverage and achieve 100% sanitation access (defined by 100% latrine coverage) to all rural households by 2022 [25,26]. Key differences between TSC and NBA included increased focus on capacity building, community mobilization, behavior change, and IEC materials, while expanding financial support for latrine construction to households above the poverty line [26].

In 2014, NBA was restructured into a similar, but accelerated program known as the Swachh Bharat Mission (SBM) [27]. SBM has a strong focus on behavior change and its goal is to end open defecation in India by October 2, 2019 [28]. "Conventional IEC" such as posters, pamphlets, etc. were downplayed and a strong emphasis was placed on participatory methodologies and inter-personal communication that would "trigger" communities toward sanitation [29].

Barriers to latrine use in India

Studies have shown that interventions aimed at increasing latrine coverage in India do not necessarily lead to increased latrine use, though interventions specifically targeting latrine use were more successful [16]. This is because in addition to providing a functional latrine to a household, socio-contextual factors and behavioral patterns need to be understood and addressed in order to increase uptake [30-32]. A number of barriers to latrine usage have been identified, including improper or incomplete construction, lack of a nearby water source for post-defecation cleansing, cultural beliefs surrounding purity and caste, expectations about pit size and how it will be emptied, and strong socio-cultural support for open defecation [18,30-33].

Emory CRT of Sundara Grama in Odisha

Researchers at Emory University designed the *Sundara Grama* intervention, a multi-level behavior change package, to increase latrine use among rural latrine-owning households in Odisha, India. The intervention was delivered by Rural Welfare Institute (RWI) and is being evaluated as part of a cluster-randomized trial (CRT) involving 66 villages, 33 of which received the intervention and 33 serving as controls [34].

With low-cost latrine repairs and behavior change activities focused at the community, group, and household levels, the intervention aimed to address the six barriers to latrine use identified via formative research: non-functional latrines; no hardware for child feces disposal; limited knowledge regarding child feces disposal; limited practical knowledge of how to use a latrine and empty the latrine's pit; preference for open defecation; and limited understanding of the benefits to latrine use [35]. The following activities were carried out in this order: palla (traditional performance), transect walk, community meeting, mothers meeting, household visits, community wall painting. See Table A1 in the supplemental material for descriptions of each activity.

The purpose of this study was to understand perceptions of the community and household level intervention activities, and possible spillover of the intervention messages into villages that did not receive the intervention. This research contributes to assessing the "satisfaction" element of the intervention's process evaluation [36]. Findings from this study will help explain intervention success or failure, inform revisions and possible scale-up of the intervention, and guide endline qualitative research in the CRT villages.

2. Materials and Methods

Study setting and population

Odisha, located in northeast India, the country's eleventh most populous state [37] currently has the second-lowest latrine coverage level (29%) of all the states in India [38]. Factors identified as contributing to these low statistics include: geography resulting in poor water access, poverty, low levels of awareness, lack of household resources to construct a latrine, improper program implementation, and attitudes that prevent latrine construction and use [39]. This qualitative study was conducted with six villages not engaged in trial activities: three of the villages received the intervention and three did not [34]. Two of the control villages were in close proximity to the intervention villages and in these villages, spillover was assessed.

Data collection

Qualitative research methods were used to explore perspectives of the intervention, spillover, and broad perceptions latrine use and sanitation interventions[40]. Focus groups, which provide an opportunity for participants to interact and prompt conversations from the emic perspective [40], were used to collect community-level perceptions of the intervention. Sixteen sex-segregated focus group discussions (eight with men, eight with women) were conducted. (See Table A2). FGDs were sex segregated to encourage open discussion among group members of the same sex.

Focus group discussion guides were developed through a careful review of Saunder's guide to process evaluations [36] and the *Sundara Grama* Intervention Manual [35], which included the intervention Theory of Change for intervention villages and descriptions of the palla, transect walk, community meeting, mother's meeting, household visits, poster distributions, and the wall painting activities.

The intervention FGD guide was piloted with women from a village that received the *Sundara Grama* intervention during the training of the implementers. After the first five focus groups were conducted in the control and intervention villages, revisions were made to the guides in order to improve the quality of the data. Specifically, a section was added to the control FGD guide to explore the history of sanitation programs in the villages to better understand context. Additionally, because the initial male focus groups were very short, a set of separate probes were developed for the male intervention FGDs to encourage more participation.

Community members were eligible to participate if they were 18 or older and had attended more than one of the intervention activities. Men and women from intervention villages were asked how many activities they had attended. If they had attended more than one activity, they were recruited for the focus groups. In control villages, eligibility was determined only by age. Those who were willing to participate were recruited.

Recruitment for focus groups was conducted in two ways. Primarily, the anganwadi worker (female village child care worker) or ward member (local leader) recruited participants in advance for the focus groups. When they were not willing or available to recruit, participants were recruited on the day of the focus groups through convenience sampling by the research assistants (RAs) who would conduct the focus groups. RAs went from house to house asking for volunteers and elicited recommendations from participants for other eligible individuals.

Focus group size ranged from five to 15 participants. Although the intended group size was six to eight participants, focus group size depended on the recruiter and community interest in the discussion. When the focus group was larger than desired, the participants who did not attend many intervention activities were asked not to participate.

Demographic data were collected via paper survey before each focus group discussion. Data collected included age, marital status, education level, number of children, and exposure to each activity in the *Sundara Grama* intervention.

Focus group discussions were facilitated by research assistants who were from the region and fluent in Oriya. Most FGDs were held in the anganwadi (women) or at the village temple or clubhouse (men), as suggested by participants. Discussions were recorded on a cell phone or a research assistant's phone and then uploaded to shared folders in Google Drive and Box. RD wrote detailed observational notes during each focus group and debriefed with the research assistants after each focus group.

Data management and analysis

Recordings were translated and transcribed into a word document by a contractor. The transcripts were then coded and analyzed in MaxQDA software [41]. Demographic data were entered into an Excel spreadsheet by RD, and other volunteers.

Data were analyzed with thematic analysis as described by Braun and Clarke *[42]*. Transcripts were reviewed and memos were written to record first impressions of the data. Data were then coded and analyzed using a "bottom-up" inductive approach [42]. A codebook was developed based on deductive codes from questions in the FGD guides, as well as inductive codes identified by reviewing the transcripts. Feedback on the codebook was obtained from BAC, GDS, and other colleagues. The codebook was revised, and then the transcripts were re-coded. Data were reviewed village-by-village in order to gain a sense of common patterns and themes at the village level. Codes were grouped into themes. The themes that were closely aligned with the research question were selected and examined further. A conceptual diagram was developed to explain community perceptions of sanitation change.

Ethics

This study was approved by the Institutional Review Board at Emory University in Atlanta Georgia (00098293) and the Ethics Review Committee at Xavier Institute of Management in Bhubaneswar, Odisha, India. Before the collection of any data, verbal consent was obtained from all participants, who were each given a copy of the consent form. Identifying data were not collected in the demographic surveys or on the recordings of the focus group discussions. Participants were not compensated for being in the study.

3. Results

Demographic data from focus group participants can be found in Table A3. Results are divided into three themes: first, community perceptions of the *Sundara Grama* intervention activities; second, community perceptions of sanitation interventions in general; and third, circumstances surrounding knowledge spillover between villages.

3.1. Theme 1: Community Perceptions of Sundara Grama Activities

3.1.1. Palla

Of all the activities discussed in the focus groups, the palla was the best-known and liked. The *Sundara Grama* palla attracted participants because people enjoyed watching pallas. The palla activity was appreciated by focus group participants in multiple villages for its entertaining and educational aspects. One woman explained, "Yes, we found the palla very funny. We enjoyed it," and a man stated, "They had talked about keeping a village clean...I liked hearing about that."

Focus groups in all intervention villages identified the purpose of the palla as promoting sanitation and awareness. Out of the six skits performed in the palla, participants named two skits that they enjoyed most: the story of the goddess Laxmi and that of Uncle Nindhi. Material in the palla was not considered new or surprising by many participants. One participant said, "Nothing was new; one good thing was they reminded us through their stories."

The only complaints about the palla were related to recruitment, weather, and location. Recruitment for the palla was done by community mobilizers who recruited from door to door. In I1, members of the women's focus group, which was held in a lower-caste section of the village, complained that no one had told them about the palla until it was over. In this village, it

rained during the palla, resulting in a lackluster performance by the actors. Members of the male focus group mentioned that the palla should have been performed for a hamlet in a neighboring village that often came to their village to defecate in their fields. In Village I3, participants complained that the location of the palla lacked visibility and space.

3.1.2. Transect Walk

The transect walk produced a more varied and emotional response than the palla. While many participants gave positive comments about the transect walk, it also was a source of shame, both in the intervention villages, and in one control village.

In I2, the feeling of shame seemed to be balanced with the novelty of the approach. Among the women, the transect walk created feelings of guilt, while also producing positive results. One woman said, "[We felt] bad because outsiders came and saw bad things and discussed about us. Good [about the transect walk], is that it was a different thing." The women said that they did not go to the fields to defecate after the transect walk.

In I3, a similar response was found in the male focus group. Some participants felt ashamed because red holi powder, closely associated with worship, was used. A participant explained that red holi powder "should be used for god [laughs], they used the holi powder on the feces." Red holi powder had been identified as problematic in pilot trials of the transect walk, but was accidentally used in this village. Despite some disliking the activity and feeling awkward, other participants understood the purpose of the activity. One man said, "Could you not understand? They made us feel ashamed of our open defecation acts by sprinkling holi powder on the feces, and this activity would motivate the villagers to not defecate outside."

In I1, some of the participants in the women's focus group misunderstood the purpose of the transect walk. Many of them had not attended the transect walk, possibly because the announcement of the activity was made at the palla, which they also had not attended. One woman learned about the transect walk because it passed by her house and she joined it. The women referred to the holi powder as "medicine," and one believed it was different from holi powder used for worship because the transect walk powder had stung when it got in her eyes. The appearance of outsiders and the application of "medicine" on the feces made an impression on the women, who thought the powder somehow sanitized the excrement. One woman said, "I liked it, because for our benefit this medicine was put on the feces. That is why, [I] liked it."

The women also appreciated the transect walk's effect on behavior. One woman said, "I liked it; it made me happy. Because, people just defecate next to my house, and we can see them clearly right from my home. Since that day, it has totally stopped, no one is going there."

Aside from the use of red holi powder in I3, most negative comments about the transect walk resulted from the feeling of shame when someone was caught in the act of open defecation. In these cases, shame was felt both by those who were caught defecating, as well as participants on the transect walk. One man in I1 said, "As the group walked towards the field, I was scared that we would see some open defecators doing the act. That was more shameful." A woman from C2 who knew about the transect walk said, "While people were squatting, they came in a car, and scolded, so, I felt bad." One man in I1 described an incident during the transect walk where they saw a woman defecating and told her that her ration card would be suspended. "Then, that woman got scared and she was the one to come first to the village meeting [community meeting]," he said.

3.1.3. Community Meeting

Of the community-level activities, the community meeting was discussed the least among participants. The men in both I1 and I3 said that the community meeting contained no new information for them. They also said that it was good, though it seems they had hoped the meeting would bring them latrines. A man from I1 said, "It was good. If households are given more latrines, especially the bigger families, then people would have benefitted more." The men from I3 said they had asked about what could be done for those who did not have latrines. They were told to, "go and meet the block development officer." In both of these villages, the women focus group participants had either not attended the community meeting, or did not speak about it.

In contrast, the community meeting in I2 was viewed as a vehicle of change. One woman said of the meeting, "We liked the idea that whatever we don't like, we can make changes. If something is not clean, then we can clean it." One woman said that of all the intervention activities she attended, she liked the community meeting most. The only thing participants did not like was learning that the intervention could not give them latrines after they had shared their problems of broken latrines in the meeting.

3.1.4. Mothers group meeting and household visits

Perceptions of the mothers group meetings were explored more deeply in another study and so will not be reported here. The household visits and poster distribution only occurred in households that owned a latrine, which at least one participant interpreted as the activity occurring only on a certain "side" of the village. Participants said that the household visits were about latrines, hand washing, how to dispose of child feces and the feces of the elderly. The men who were present during the household visit said that they did not learn anything new.

3.2. Theme 2: General perceptions of sanitation interventions

Focus group discussions from the intervention and control villages provided insight into the general perceptions communities have about sanitation interventions, which included sanitation as a household issue, limited community capacity to intervene in sanitation issues, and high expectations from outsiders.

3.2.1. Sanitation is a household issue

Cleanliness was seen largely as an individual household issue. Two comments illustrate this mentality. "Everyone should keep their own houses clean. The village's garbage should be burnt or buried under compost." and "If everyone cleans their houses properly, then the village won't be dirty anymore." Women described the success of the intervention as household-level change. "No one else is keeping their house dirty any longer." and "Yes, each household is cleaner now."

Latrine use was also a household issue. The decision to build and use a latrine appeared to be personal, as participants were often reluctant to force their neighbors to use a latrine. If the individual did not have a latrine, participants felt they should not be required to adhere to rules about open defecation. A woman from an intervention village asked, "Those who don't have money…going out to defecate, is that wrong?"

3.2.2. Community capacity to intervene is limited

Because sanitation is generally seen as a household issue, communities often do not have the capacity to achieve sanitation goals. While perceived village efficacy varied among participants,

no participant said that the village could provide latrines, or that latrines could come from anyone except an outside entity, or the private funds of the individual. This inability to provide latrines undermined the villagers' ability to enforce latrine use. One participant said: "Those who don't have a latrine, they will counter us and ask us for a latrine. How can we stop them from open defecation, when we can['t] provide them a latrine?" This concept was echoed in an intervention village; "[Penalties] may not succeed in making those people use latrine, because, they are poor. And if we are not capable to give them food security, then, who are we to penalize or punish them?"

Similarly, many felt that they did not have the authority to enforce latrine policies to their neighbors, because of fear of conflict, and sometimes violence. Men from CA said, "People can softly tell the open defecators not to defecate outside, and cannot say it strongly. If they said strongly, then they would raise fights."

3.2.3. Expectations about outsiders

While communities themselves feel unable to enact change related to sanitation, communities envision outsiders as filling in the gap between the village life and household decisions. A woman from a control village explained, "Change is not possible within the village. Then who is going to change other people? The outsiders."

Participants in all six villages placed high expectations on the government and outsiders to support their development, particularly with sanitation and latrine construction. When asked about what they expected the government to do for them, a woman answered, "Construct latrines. If you have come to give these latrines, then, give them to us." When people did not have latrines, the women in a control village blamed the government for not giving latrines to them. "We are waiting for when the Government will give us the money to build a bathroom and we haven't got it yet. Hence we can't build a bathroom," they said. The government was also credited for the latrine construction over the activities of the intervention. Although one woman said that the palla had motivated her to build the latrine, another woman immediately disagreed with her, saying that she wouldn't have built the latrine if the government hadn't given her a subsidy.

Outsiders were also sometimes seen as potentially being more influential than village leadership or neighbors to enforce latrine use. This view was especially prevalent among women. One woman said, "If we restrict the people, then, they don't listen to us, but if you all do, then, they will at least listen. People will pay attention if a man speaks, but if a woman tells them, they couldn't care less." However, men felt that outsiders could influence the community in a way they could not. An exchange between men in a control village and the facilitator illustrates this: Participant: "If outsiders can go to our backyards and clean our household surroundings, then the household members will learn something good." Facilitator: "What will they learn?" Participant: "If government people can come and do some sensitization programs, then things might improve."

3.3. Theme 3: Knowledge Spillover between villages

Knowledge spillover from the *Sundara Grama* intervention from one village to another was variable, and seemed dependent on the relationships between villages. Two of the control villages were close enough to an intervention village for spillover to be possible, but spillover occurred in only one of the villages.

Even when villages are physically close, strained relationships can block communication. In C3, participants knew that the intervention had taken place in I3, but did not know what it was about. As one man said, "No, we don't have good terms with them, so, we don't know what happened or not, in that village."

In addition to the poor relationship between the villages, poor relationships within I3 may have contributed to less information sharing. Participants in I3 described their village as one where fights occurred and people were afraid to speak freely. Men also spoke of the lack of judicial process and their fear of speaking out. "We don't have the freedom to say what is right," one said. "You are ten people present, and one cannot speak. If we speak out, then we might even get beaten." Aside from outright conflict, participants in four out of the six villages appeared to perceive divisions within the village, often describing their village in terms of "this side" and "that side."

In contrast, relationships within C2 and I2 were described as relatively good by all the focus group participants in this area, which resulted in more knowledge sharing between villages. Women in C2 said, "All people are nice and have good relationships," while men from I2 said, "The mentality of people here is very good. They are very good and cooperative. Everyone is eager to participate or contribute in some activities." This environment may have contributed to the spillover that did occur between I2 and C2. Information about the palla and transect walk spread through various channels, including family members, children at school and passersby. While C2 knew the palla and community meeting had occurred in I2, neither of those activities made the impression that the transect walk made. The only instance of direct communication of intervention messages occurred after the transect walk. A woman from C2 said, "So, few known people of that village, they telephoned us and told that such things are happening, and cautioned us not to defecate in the open." The transect walk brought shame to C2. Participants from C2 said, "Our village's name got exposed, and outsiders got to know that people are defecating on the road side." They also thought that the implementers had done things that were not part of the intervention, including recording open defecators and posting files on the internet for all to see.

4. Discussion

Implications for Sundara Grama

Lessons learned from community perceptions of *Sundara Grama* and sanitation interventions should be able to inform future community sanitation interventions. For *Sundara Grama*, findings indicate improvements could be made in recruitment practices, activity protocol adherence, and some adjustments to specific activities.

Issues with certain groups being left out of the *Sundara Grama* activities illustrate the need for broader recruitment and clearer communication. The women's focus group in I1 was composed of women from a lower-caste section of the village who did not know about the palla until after it had occurred. They also had some misunderstandings about the transect walk. Future interventions should be sure to target all groups in a village, especially ones that are most likely to be excluded, like women and members of lower castes.

While the transect walk appeared to have successfully triggered awareness of feces, it brought shame and threat of punishment to those were caught in the act. Interventions including a transect walk activity should consider how to raise awareness and disgust without shaming those who still practice open defecation. This is of particular concern for women. Given the amount of care that young, recently married women take to avoid being seen defecating [30], being seen on a transect walk may result in devastating social and economic consequences for

those who may have no other choice. In the *Sundara Grama* intervention, transect walks were held in the early morning, which may coincide with when people are defecating in the fields. Transect walks could be arranged for a time when participants will be unlikely to find others defecating, but would still have the opportunity to mark the feces and raise awareness of their presence. While the *Sundara Grama* intervention manual did not include photography or threats to open defecators during the transect walk, evidence that these things may have occurred during the intervention are concerning. Implementers should be carefully trained to follow the intervention protocol and discourage harmful behaviors within villages.

In the future, the community meeting activity may need to provide more specific direction about what the community should do to support latrine use. In *Sundara Grama*, the community meeting aimed to encourage community action and vision. However, the desired behavior of latrine use was still ultimately an individual or household decision, which may why two out of the three villages did not identify the meeting as empowering them to change. The community meeting activity may also have to make stronger efforts to affect community norms and encourage collective action. Villagers generally appeared reluctant to involve themselves in the affairs of others to enforce latrine use, even as they were sometimes reluctant to engage in cleaning of public spaces and general development.

Community sanitation interventions

SBM was the first Indian government program to utilize behavior change communication to achieve community level change [43]. However, the literature and study findings suggest that communities in India do not naturally see themselves as capable of taking charge of sanitation. Aside from potentially lacking the resources to provide latrines and the authority to impose latrine rules, communities are often divided. This has also been found in the literature. Social hierarchies, caste and religious divisions can contribute to a village where people may live in proximity to each other but may not necessarily work together as a community [44]. Divisions in a village are considered natural, as Hindu purity culture divides and categorizes aspects of life, the body, the home, the village, and the world, into varying levels of purity [45,46].

Communities with such a mindset may not respond to community triggering as a call to collective action. Social divisions and conflict within the village may also inhibit recruitment for the intervention and the accurate dissemination of messages. Cultural beliefs may also promote an individualistic attitude toward cleanliness, leading villages to assume a more passive role in achieving sanitation.

As a result, literature has suggested that villages are not an effective proxy for a community intervention in India, and targeting social networks may be more effective [47]. Despite this, location-oriented interventions are still relevant for sanitation interventions. Villages must become open defecation free in order eliminate exposure to fecal pathogens. Interventions will need to reach all members, regardless of social network, caste, or income level.

In this study, social divisions, caste, and possibly other factors created divides within and between villages. This affected dissemination of information, as well as inclusivity during intervention activities. Implementers of village-level interventions will need to make a conscious effort to include all groups in recruitment efforts. The anganwadi worker or ward member may not be sufficient, and recruiters will need to seek out key informants from all groups in the village to ensure that information travels through the whole village.

The results of this study suggest that sanitation interventions built around triggering communities to achieve total sanitation themselves should consider the level of collective efficacy within a community. Delea, et al has devised a scale to measure collective efficacy, which has

found to successfully pinpoint certain factors such as social capital, which may influence uptake of WASH behaviors [48,49]. Building social capital could increase the likelihood that a community could work together to achieve sanitation. Such a measure should help program planners design and target their interventions.

Building collective efficacy may occur gradually, and other types of community cleaning may be easier to address before moving on to latrine use. For example, while it may not have affected sanitation in the way it was intended, the *Sundara Grama* intervention messaging may have boosted perceived self-efficacy among participants. In I2, female participants credited the *Sundara Grama* community meeting activity for impressing on them their ability to change things. In the same village, these women said that the intervention had resulted in other village developments, such as planting trees, removing weeds, cleaning the village, and working on temple roof.

Social networks and spillover

Social networks, while not effective against the spread of fecal pathogens, could be utilized to reach people and spread messages [47]. Study findings support this research. Knowledge sharing within and between villages appears to depend on social relationships. This was seen in Village CA, where social divisions determined who had access knowledge of events and meetings. When examining pathways for spillover between villages, it was less likely to be affected by physical proximity and more likely to be influenced by social factors, such as familial relationships and interpersonal conflicts. In Villages I2 and C2, which had a relatively harmonious relationship, knowledge about the intervention was shared through social networks: family members, passersby, and children in school. In villages, I3 and C3, which had a poor relationship, no knowledge of the intervention was shared.

Therefore, knowledge can travel through social networks, and seems to be largely dependent on the quality of the relationships in the villages. This reveals a potential for increased spillover through social networks, if the sharing of knowledge were more explicitly emphasized in the intervention itself. This also emphasizes the importance of building relationships and conflict resolution, which would also contribute to collective efficacy.

Future Research

More research needs to be done to understand what is meant by "awareness" in this context. Participants repeatedly used the word "awareness" to describe *Sundara Grama* and other sanitation interventions. A participant from Village I2 said; "Through the means of this palla, they had explained how we could bring about our own development. They had tried to make the people more aware through this palla." It is difficult to tell from the context of the translated transcripts if participants are referring to passive knowledge or some form of knowledge that leads to action. From the context of the transcripts, it is unclear whether "awareness" refers only to a state of having knowledge, or if there is an opinion or action attached to it. The repeated use of "awareness" shows it to be an important aspect of change for villagers.

For example, a participant from I3 expressed a desire for awareness to be recurring in order to bring about change; "Do some awareness programs at regular intervals," he said. "Only then people will change. Otherwise, people tend to forget, so such programs will help them remember the good things." In this context, awareness appears to pertain to a reminder of lessons learned. Not all efforts to increase awareness are well-received, however. In a control village, women were asked if they would like a palla to be performed in their village. One woman answered, "We are no more fools, that palla will convey. We know things, so, how is palla going to be

different?" After this statement, the women said that they wanted latrine construction, showing that though they had "awareness," the lack of latrines was still a barrier.

More research should also be done to determine ways villages can create a system that encourages accountability without punitive measures that would instill shame, stigma, or contradict the purpose of improving sanitation. For example, the *Sundara Grama* intervention may have empowered villages to use the intervention activities as a springboard for stronger latrine use enforcement. Men and women in Village I1 mentioned favorably about the transect walk and how it lead to the threat of punishment for open defecators. If interventions encourage the enforcement of latrine use, they should discourage suggestions of penalties that may result in worse sanitation outcomes (such as locking the latrine of someone who does not use it) or adverse household effects (such as revoking ration cards, arrest, or dismissal from a job).

Strengths and limitations

This study encountered several limitations. Recruitment for this study often utilized anganwadi workers and ward members, which may have introduced an element of bias into recruitment. As a result, certain groups or parts of the village may not have been represented in the study. Timing of the study could also be a limitation. The timing may have influenced villagers' perceptions and impressions of the intervention because the focus groups were sometimes held only a few days after the activities were implemented, making it impossible to determine mid-term or long-term effects. Also, holding the study before the latrine repair activities may have influenced villagers' perceptions of the intervention. As with many behavior studies, social desirability bias and strong messaging from SBM may have encouraged responses that favored latrine use, even if the participant felt the opposite. This can be seen in the high levels of latrine use reported in the demographic surveys.

Strengths of this study include a focus on a topic that, to the knowledge of the authors, is previously unexplored. This study was also able to produce specific recommendations for *Sundara Grama* and other interventions. Also, this study was conducted by research assistants that for the most part came from nearby villages. They were able to leverage their network of contacts to recruit for the focus groups, as well as relate well to the participants.

5. Conclusions

Post-intervention qualitative work in communities can bring insight to the intervention delivery and explain endline results. Implementers of community interventions in Odisha should consider the different groups, and divisions in a village, intentionally targeting those most likely to be excluded, such as women and lower castes. Future sanitation interventions aimed at producing collective action should first assess underlying social divisions and cultural norms about sanitation. By integrating activities to strengthen collective efficacy into the intervention, communities may become more empowered to act. In a similar way, integrating relationship-building activities and encouraging inter-village cooperation should increase spillover to nearby villages.

Supplementary Materials: The following are available online at www.mdpi.com/xxx/s1, Figure S1: title, Table S1: title, Video S1: title.

Author Contributions: For research articles with several authors, a short paragraph specifying their individual contributions must be provided. The following statements should be used "conceptualization, X.X. and Y.Y.; methodology, X.X.; software, X.X.; validation, X.X., Y.Y. and Z.Z.; formal analysis, X.X.; investigation, X.X.; resources, X.X.; data curation, X.X.; writing—original draft preparation, X.X.; writing—

review and editing, X.X.; visualization, X.X.; supervision, X.X.; project administration, X.X.; funding acquisition, Y.Y.", please turn to the CRediT taxonomy for the term explanation. Authorship must be limited to those who have contributed substantially to the work reported.

Funding: This research was funded by the International Initiative for Impact Evaluation (3ie) [TW14.1006].

Acknowledgments: We extend thanks to the India-based team for valuable insight, translation, and data collection assistance: Rajani Barik, Sadasiva Kothia, Subhrakanta Pattanayak, Abinash Mishra, Sushreeta Mishra, Rajashree Nayak, and Indrajit Samal.

The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, or in the decision to publish the results.

Appendix A

Table A1: Description of Sundara Grama Behavior Change Activities

Activity	Level of Change	Aim and Description
Palla	Community	Educate and engage community members on the benefits to latrine use through traditional folk theater
Transect walk	Community	Show the amount of human feces through an early morning walk through village and defecation fields. Participants were encouraged to sprinkle holi powder on any feces they found.
Community meeting	Community	Facilitate community motivation, action, and commitment toward achieving sanitation through a meeting and creation of a community action plan.
Mother's meeting	Group	Provide mothers with practical knowledge on the materials and practices used to safely dispose of infant and young children's feces into latrine.
Household visits	Household	Provide household-level counseling on barriers to latrine use and facilitate motivation and commitment toward achieving sanitation. Posters were distributed during the visits.
Community Wall Painting	Community	Publicly display the community-identified goals and action steps for sanitation alongside a painted community map in order to track progress towards the community goals. *Not completed at the time of this study.*

Table A2 –Focus group participants by village and sex

	Intervention Village 1 (I1)	Control Village A (CA)	Intervention Village 2 (I2)	Control Village 2 (C2)	Intervention Village 3 (I3)	Control Village 3 (C3)
FGD participants	15	38	23	26	27	23
Female	6	15	18	14	11	8
Male	9	23	5	12	16	15

Table A3 – Demographics of Focus Group Participants

	N	%
Sex	152	
Female	72	47.4%
Male	80	52.6%
Intervention Status	152	
Intervention	65	42.8%
Control	87	57.2%
Caste	152	
Scheduled Caste	13	8.6%
Scheduled Tribe	3	2.0%
General Caste	99	65.1%
Other Backward Castes	37	24.3%
Latrine Ownership	152	
Yes, functional	101	66.4%
Yes, non-functional	9	6.0%
No	42	27.6%
Frequency of Latrine Use for Defecation	110	
Always	96	87.2%
Sometimes	10	9.0%
Never	4	3.6%
Attended the Palla (intervention villages only)	59	
Yes	32	54.2%
No	27	45.8%
Attended the Transect Walk (intervention villages only)	58	
Yes	30	51.7%
No	28	48.3%
Attended the Community Meeting (intervention villages only)	55	
Yes	31	56.4%
No	24	43.6%
Attended the Mother's Group Meeting (intervention villages only)	43	
Yes	23	53.5%
No	20	46.5%
Attended the Household Visit (intervention villages only	23	
Yes	20	87.0%
No	3	13.0%

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Chapter V: Public Health Implications

This study explored community members' perceptions of sanitation and sanitation interventions. As community buy-in is critical to the sustainability of any project, their perspectives on the issue are important to understand.

Implications for Intervention Activities

The women's focus group in Village I1 was composed of women from a lower-caste section of the village who did not know about the palla until after it had occurred. They also had some misunderstandings about the transect walk. These issues illustrate the need for broader recruitment and clearer communication in sanitation activities. Sanitation interventions should also carefully consider which groups would benefit most from the intervention and target them specifically.

Interventions including a transect walk activity should consider how to raise awareness and disgust without bringing too much shame to those who still practice open defecation. While the transect walk appeared to have been successful in triggering awareness of feces, it also brought shame and threat of punishment to those were caught in the act. One woman was caught defecating during the transect walk in Village I1, and she was threatened with the loss of her ration card. Given the amount of care that young, recently married women take to avoid being seen defecating (Routray, Schmidt, Boisson, Clasen, & Jenkins, 2015), being seen on a transect walk may result in devastating social and economic consequences for those who may have no other choice. In the Sundara Grama intervention, transect walks were held in the early morning, which may coincide with when people are defecating in the fields. Transect walks could be arranged for a

time when participants will be unlikely to find others defecating, but would still have the opportunity to mark the feces and raise awareness of their presence.

While the Sundara Grama intervention manual did not include photography or threats to open defecators during the transect walk, evidence that these things occurred during the intervention are concerning. Implementers need to be carefully trained to follow the intervention protocol and discourage harmful behaviors within villages.

In the Sundara Grama intervention, the community meeting aimed to encourage community action and vision. However, the desired behavior of latrine use was still ultimately an individual or household decision, which may have been the reason that two out of the three villages did not identify the meeting as empowering them to change. In the future, this activity may need to provide more specific direction about what the community should do to support latrine use.

The community meeting activity may also have to make stronger efforts to affect community norms and encourage collective action. Villagers generally appeared reluctant to involve themselves in the affairs of others to enforce latrine use, even as they were sometimes reluctant to engage in cleaning of public spaces and general development.

Implications for Community Interventions

Community-level interventions are a critical part of public health work, as well as instrumental to sanitation. Targeting a community has many benefits, such as a reaching a larger group of people, and having the ability to affect social norms in a group. For sanitation, community-level change is essential to eliminate fecal pathways caused by open defecation. As latrine usage in India is tied to beliefs about purity, interventions that

can affect social norms should be more effective and persuasive than individual-level efforts.

Since TSC, Indian sanitation programs have recognized the value in pushing for community level change. SBM, the current sanitation intervention, was the first to utilize behavior change communication to achieve this community level change (Government of India, 2017). In order to do so, the guidelines suggest adopting Community Approaches to Sanitation (CAS) and focus efforts on awareness generation and triggering communities to collective action against open defecation (Government of India, 2017). CAS is the government of India's adaptation of CLTS and UNICEF's Community Approaches to Total Sanitation (CATS) (Government of India, n.d.).

However, the literature and study findings suggest that communities in India do not naturally see themselves as able to intervene in the area of sanitation. Aside from potentially lacking the resources to provide latrines, and the authority to impose latrine rules, Hindu culture and the caste system often means that villages don't necessarily feel a sense of unity to operate as a community. Because of social hierarchies, caste and religious divisions, people that may live in proximity to each other in a village may not necessarily work together as a community (Hathi, Spears, & Coffey, 2016). Participants at times described their village in terms of "this side" and "that side," suggesting a pervasive perception of divisions within the village. This agrees with the literature on Hindu purity culture, which divides and categorizes aspects of life, the body, the home, the village, and the world, into varying levels of purity (Harper, 1964; Lüthi, 2010). Communities with such a mindset may not respond to community triggering as a call to collective action. Social divisions and conflict within the village may also inhibit

recruitment for the intervention and the accurate dissemination of messages. Cultural beliefs may also promote an individualistic attitude toward cleanliness, leading villages to assume a more passive role in achieving sanitation. Therefore, village members' concepts of the intentions of an intervention and their intended role may be different from those of the implementer.

As a result, the literature has suggested that villages are not an effective proxy for a community intervention in India and that targeting social networks may be more effective (Shakya, Christakis, & Fowler, 2014). Despite this, location-oriented interventions are still relevant in sanitation interventions because as long as feces remain in the environment, those who live in proximity will be at risk of exposure to fecal pathogens. Thus, villages will have to become open defecation free in order to see health benefits. In order to eliminate open defecation in a village, the intervention will need to be able to reach everyone, not just those in a particular social network, caste, or income level. In this study, social divisions, caste, and possibly other factors were found to create divides within and between villages. This was found to affect the dissemination of information, as well as inclusivity during intervention activities. This means that implementers of village-level interventions will need to make a conscious effort to include all groups in recruitment efforts. The anganwadi worker or ward member may not be sufficient, and recruiters will need to seek out key informants from all groups in the village to ensure that information travels through the whole village.

The results of this study suggest that sanitation interventions built around triggering communities to achieve total sanitation themselves may experience limited success in India without additional work in collective efficacy. If further research supports these

findings, designers and implementers of community-level sanitation interventions in India will to develop strategies to address these issues.

First, future public health sanitation interventions in India should consider both the level of collective efficacy within a community, as well as consider the best targeting unit for the activities. Delea, et al has devised a scale to measure collective efficacy, which has found to successfully pinpoint certain factors such as social capital, which may influence uptake of WASH behaviors (Delea et al., [unpublished]; Delea et al., 2018). Building up social capital could increase the likelihood that a community could work together to achieve sanitation. Such a measure should help program planners design and target their interventions. In areas where collective efficacy is low, targeting a particular social network or group may be more effective in reaching those in need of the intervention.

In villages where collective efficacy is low, sanitation interventions will first need to address the social norms that divide communities, and the worldview that prioritizes individual sanitation to the detriment of communal sanitation.

Next, sanitation programs will need to designate clear expected outcomes for the community. Although the Sundara Grama intervention conducted activities in the community, the expected outcomes were individual and household level behaviors. In this study, no evidence was found that communities felt compelled by the intervention or any other outside entity to help its members build their latrines. If, as in CLTS, the community is expected to provide material support to its members to build latrines, this will need to be specifically outlined in the program design.

When implementing a community sanitation intervention, the community and targeted individuals should be empowered to carry out the roles promoted by the intervention. Action steps to be taken by a village or a group should be clearly expressed and these entities should be given the tools, resources, and/or authority to carry them out. In the case of sanitation, if the goal is for communities to support each other to build and use latrines, as it is in CLTS, this needs to be explicitly included in the design.

Spillover

Social networks, while not effective against the spread of fecal pathogens, could be utilized to reach people and spread messages (Shakya et al., 2014). Study findings support this research. Knowledge sharing within and between villages appears to depend on social relationships. This was seen in Village CA, where social divisions determined who had access knowledge of events and meetings. When examining pathways for spillover between villages, it was less likely to be affected by physical proximity and more likely to be influenced by social factors, such as familial relationships and interpersonal conflicts. In Villages I2 and C2, which had a relatively harmonious relationship, knowledge about the intervention was shared through social networks: family members, passersby, and children in school. In villages, I3 and C3, which had a poor relationship, no knowledge of the intervention was shared.

Therefore, knowledge can travel through social networks, and seems to be largely dependent on the quality of the relationships in the villages. This reveals a potential for increased spillover through social networks, if the sharing of knowledge were more explicitly emphasized in the intervention itself. This also emphasizes the importance of

building relationships and conflict resolution, which would also contribute to collective efficacy.

Future Research Questions

The Sundara Grama intervention was described often as bringing "awareness." Villagers in both intervention and control villages spoke of spreading awareness as one of the primary ways they could bring about change in their village. In public health, awareness is often considered a passive act, which may not lead to action. However, it is difficult to tell from the context of the translated transcripts if participants are referring to passive knowledge or some form of knowledge that leads to action. It would be interesting to learn what they mean by "awareness." If the "awareness" that they refer to is similar to what it means in English, then perhaps the current interventions have encouraged a sort of passivity among communities, as they expect that only knowledge is necessary for change. This reliance on "spreading awareness" may not produce results. For example, villagers acknowledged that spreading awareness would not affect those who chose not to care. However, if "awareness" includes a call to action, it would be important to understand the different facets of what "awareness" means in these communities, in order to ensure that future interventions address all aspects of the idea.

Enforcement was also identified as necessary to improve sanitation. More research should be done to determine ways villages can create a system that encourages accountability without punitive measures that would instill shame, stigma, or contradict the purpose of improving sanitation. Some villagers were very keen on the idea of punishing those who open defecated in spite of having a latrine. Some of their suggested punishments included asking the offender to pick up their feces with their hands and

throw them in the latrine, or have their latrine locked until they could pay a fee to the village committee. Aside from whether or not these punishments would be effective in persuading the offenders to use the latrine, they would actively negate the purpose of the sanitation rules. Invoking outside authorities could be more effective: while villagers felt they could enforce latrine use in some cases, they also deferred to higher organizations to give more weight to their penalties. Weightier penalties included revoking ration cards, sending names to higher authorities, arrest, and dismissal from a job. These punishments may have more adverse effects on the household, and ultimately create a worse situation, regardless of latrine use.

Other area of future research could be to investigate what collective sanitation actions would be acceptable to a rural community, such as sponsoring educational campaigns, constructing public latrines, community-sponsored household latrines, or even other development goals identified by the village, such as cleaning the village ponds. Perhaps, as villages complete more projects together, they will be more empowered to address latrines.

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Appendices

Appendix A - Definition of Terms

Anganwadi Center	Center for providing health services and non-formal pre-school education for children ages 0-6 years (Ministry of Women and Child Development, 2009)
Anganwadi worker	Community-based frontline worker in the ICDS program who runs the anganwadi center and works as an agent of social change (Ministry of Women and Child Development, 2009)
BCD	Behavior Centered Design
CRSP	Central Rural Sanitation Programme (1986-1998)
CRT	Cluster-randomized trial
FGD	Focus Group Discussion
Gram Panchayat, or GP	Smallest unit of rural governance, which may be made up of one or several villages. Led by a president elected by the GP, and a council of representatives elected from each ward (Toppr, 2019).
IDI	In-depth Interview
IEC	Information, Education, and Communication
Improved sanitation facility	Place to deposit feces that separates them from any human contact
NBA	Nirmal Bharat Abhiyan, or "Clean India Campaign" (2012-2014)
Open defecation, or OD	Practice where people defecate in fields, bushes, forests, open bodies of water, or other open spaces instead of using a toilet (UNICEF - India, n.d.)
Open Defecation Free, or ODF	Defined by the Government of India for Swachh Bharat Mission as “a) no visible faeces found in the environment/village; and b) every household as well as public/community institutions using safe technology option for disposal of faeces” (Prasad, 2015).
Palla	Theatric tradition from rural Odisha, consisting of short skits that are spoken/sung by a troupe of male performers

Sundara Grama Intervention	A multi-level theory-informed activity package including low-cost latrine repairs and behavior change activities to increase latrine uptake developed by a team at Emory and funded by 3ie. The behavior change activities are comprised of a series community-level events, including a "palla" performance, transect walk, community meeting and wall painting, as well as individualized household visits, acknowledgment of positive deviants, and a mother's group promoting safe child feces disposal.
SBM	Swachh Bharat Mission, "Clean India Mission" campaign launched by India's Prime Minister in 2014. Restructured from the previous NBA campaign, it focuses on elimination of open defecation (2014-2019)
TSC	Total Sanitation Campaign (1999-2012)
Ward member	Individual elected to represent a section of a village (ward) at the Gram Panchayat (Toppr, 2019).

Appendix B - IRB Approval for parent study

EMORY UNIVERSITY

Institutional Review Board

TO: Bethany Caruso PhD
Principal Investigator
*SPH: Environmental Health

DATE: August 15, 2017

RE: **Expedited Approval**
IRB00098293
Implementing and evaluating a multi-level intervention to increase latrine use and safe faeces disposal among latrine owning households in rural Puri district, Odisha, India

Thank you for submitting a new application for this protocol. This research is eligible for expedited review under 45 CFR.46.110 and/or 21 CFR 56.110 because it poses minimal risk and fits the regulatory category F[7] as set forth in the Federal Register. The Emory IRB reviewed it by expedited process on **August 15, 2017** and granted approval effective from **August 15, 2017** through **August 14, 2018**. Thereafter, continuation of human subjects research activities requires the submission of a renewal application, which must be reviewed and approved by the IRB prior to the expiration date noted above. Please note carefully the following items with respect to this approval:

- Protocol Document: Latrine Use Eval 3ie Phase 2 IRB 21JULY17 clean.docx
- Consent Document: Census Consent English 21JULY17.docx
- A waiver of documentation of consent has been granted for this study.

Any reportable events (e.g., unanticipated problems involving risk to subjects or others, noncompliance, breaches of confidentiality, HIPAA violations, protocol deviations) must be reported to the IRB according to our Policies & Procedures at www.irb.emory.edu, immediately, promptly, or periodically. Be sure to check the reporting guidance and contact us if you have questions. Terms and conditions of sponsors, if any, also apply to reporting.

Before implementing any change to this protocol (including but not limited to sample size, informed consent, study design, you must submit an amendment request and secure IRB approval.

In future correspondence about this matter, please refer to the IRB file ID, name of the Principal Investigator, and study title. Thank you

Emilie Scheffer
Research Protocol Analyst
This letter has been digitally signed

CC: Clasen Thomas *SPH: Environmental Health
Sclar Gloria *SPH: Environmental Health

Appendix C – Oral Consent Form for Focus Group Participants

Emory University
Oral Consent for Focus Group Discussions
ଏମୋରି ବିଶ୍ୱବିଦ୍ୟାଳୟ
ଗୋଷ୍ଠୀ ଆଲୋଚନା ପାଇଁ ମୁଖିଆ ଙ୍କ ସହମତି

Title: Understanding Perceptions of a Sanitation Intervention in Rural Odisha
ଶୀର୍ଷକ: ଗ୍ରାମିଣ ଓଡିଶାରେ,ପରିମଳ ହସ୍ତକ୍ଷେପ/କାର୍ଯ୍ୟକ୍ରମ ସମ୍ବନ୍ଧରେ ଧାରଣା

Introduction/Study Overview
Hi, my name is [FACILITATOR'S NAME] and this is [NOTETAKER'S NAME]. We are working with a team from Emory University. Emory University is working with the London School of Hygiene and Tropical Medicine to conduct a trial sanitation project in the district of Puri. Today, we are here to learn what people thought about this project.
ପରିଚୟ/ଗବେଷଣା ଅବଲୋକନ

ନମସ୍କାର ! ମୋର ନାମ.....ଏବଂ ଯେ ମୋ ସହକର୍ମୀ[.....ନୋଟ ନେଉଥିବା କର୍ମୀ] । ଆମେରିକା ରେ ଅବସ୍ଥିତ,ଏମୋରି ୟୁନିଭରସିଟି ର ଏକ ଗବେଷକ ଗୋଷ୍ଠି ଙ୍କ ସଙ୍ଗେ ମୁଁ କାମ କରୁଛି । ବର୍ତମାନ,ଏମୋରି ୟୁନିଭରସିଟି ଓ ୟୁକେ ର ଲଣ୍ଡନ ସ୍କୁଲ ଅଫ ହାଇଜିନ ଏବଂ ଟ୍ରପିକାଲ ମେଡିସିନ ନାମକ ଏକ ସଂସ୍ଥା,ର ମିଳିତ ସହୋଯଗ ରେ ପରିମଳ ସମ୍ବନ୍ଧୀୟ ଗବେଷଣା,ପୁରୀ ଜୀଲ୍ଲା ରେ କରୁଛନ୍ତି । ଆଜି,ଆମେ ଆପଣଙ୍କୁ ଠାରୁ ଜାଣିବା ପାଇଁ ଚାହୁଁଛୁ,ଏହ ପ୍ରୋଜେକ୍ଟ/କାର୍ଯ୍ୟକ୍ରମ କୁ ନେଇକି,ଲୋକଙ୍କର କଣ ଚିନ୍ତାଧାରା ।

Procedures
Our discussion today will last between one hour and two hours. We want to know your thoughts about the recent sanitation events that happened in this area. We will ask about each of the different activities. We would like to know what people in this community thought about the activities, even if you did not attend them.

Everyone's opinions are important to us. If you agree with others in this room, please tell us. If you don't agree, please tell us. There are no right or wrong answers. I do not want anybody to feel bad about sharing opinions. You do not have to talk about your personal experiences. If you're not comfortable talking, you do not have to. We want to record the interview and we will also take notes. The recordings will be written down afterwards and translated into English.
ପକ୍ରିୟା
ଆପଣଙ୍କ ସାଙ୍ଗେ ଆମର ଏହି ସାକ୍ଷତକାର ଟି,ଏକ ରୁ ଦୁଇ ଘଣ୍ଟା ଚାଲି ପାରେ । ଏହି କିଛି ଦିନ ତଳେ ହେଇଥିବା ପରିମଳ ଉପରେ କାର୍ଯ୍ୟକ୍ରମ ବିଷୟ ରେ ଆମେ ଆପଣଙ୍କ ଚିନ୍ତାଧାରା ଜାଣିବା ପାଇଁ ଚାହୁଁଛୁ । ସେହି କାର୍ଯ୍ୟକ୍ରମରେ ହେଇଥିବା ବିଭିନ୍ନ କାର୍ଯ୍ୟ ବିଷୟରେ ଆମେ ଆପଣ ଙ୍କୁ ପଚାରିବୁ,ଆମେ ଜାଣିବା ପାଇଁ ଚାହୁଁଛୁ କି,ଗ୍ରାମବାସୀ ଏହି କାର୍ଯ୍ୟ ବିଷୟରେ କଣ ଭାବୁଛନ୍ତି ।

ସମସ୍ତଙ୍କ ବିଚାର,ଆମ ପାଇଁ ମହତ୍ୱ ରଖେ । ଏଠି ବସି ଥିବା ଅନ୍ୟ ଗ୍ରାମବାସୀ ଙ୍କ ମତ ରେ ଯଦି ଆପଣ ରାଜି,ତେବେ,ଆପଣ ଆମକୁ କହିବେ । ଯଦି,ତାଙ୍କ କଥା ରେ ଅରାଜି,ତାହା ବି କହିବେ । ନିଜର ବ୍ୟକ୍ତିଗତ ସମସ୍ୟା ବିଷୟରେ କିଛି ଆଲେଚନା ଦରକାର ନାହିଁ । କୌଣସି ସମୟରେ ଆପଣ କଥା କହିବା ପାଇଁ ଆରାମ ମନେ କରୁ ନାହାନ୍ତ,ତେବେ,ଆପଣ ଶାନ୍ତ ରହି ପାରିବେ । ଏହି ଆଲେଚନା କୁ ଆମେ ରେକର୍ଡ କରିବା ପାଇଁ ଚାହୁଁଛୁ,ଏବଂ ନୋଟ ଭି ଲେଖିବୁ । ପରବର୍ତୀ ପର୍ଯ୍ୟାର ରେ,ଏହି ରେକର୍ଡି ଏବଂ ନୋଟ ସବୁ,ଇଂରାଜୀ କୁ ଅନୁବାଦ କରାଯିବ ।

Risks and Discomforts
There are few risks to participation. Some questions may be uncomfortable to talk about. You do not have to answer any questions that are uncomfortable. You are free to stop the discussion at any time. We aim to protect your privacy. But, privacy may be breached. Others may hear what you say. We will try to prevent this. If people are in hearing distance of our conversation, we will stop.
ଆଶଙ୍କା ଓ ଅସୁବିଧା
ଅଶଂଗ୍ରହଣ କରିଲେ,କିଛି ଆସଙ୍କା ନାହିଁ । କିଛି ବିଷୟ ବସ୍ତୁ କୁ ଆଲେଚନା କରିବା ଅସୁବିଧା ମନେ କରି ପାରନ୍ତି । ପତ୍ୟେକ ପ୍ରଶ୍ନ ଯାହା ଆପଣ ଅସୁବିଧା ମନେ କରୁଛନ୍ତି,ସେହି ପ୍ରଶ୍ନ ଉତର ଦେବା ଯରୁରୀ ନାହିଁ । ଆଲେଚନା କୁ କୌଣସି ସମୟ ରେ ବନ୍ଦ କରି ପାରନ୍ତି । ଆପଣଙ୍କ ଗୁପ୍ତତା କୁ ଆମେ ବଜେଇ ରଖିବା ପାଇଁ ଲକ୍ଷ୍ୟ କରୁଛୁ । ଆମ ଆଲେଚନା କୁ ଯଦି ଅନ୍ୟ କେହି ଶୁଣିବା ପାଇଁ ଚାହୁଁଛନ୍ତି,ତେବେ ଆମେ ବନ୍ଦ କରିଦେବୁ ।

Benefits
This study is not designed to directly benefit you. We hope that what we learn will help improve new sanitation programs.

ଫାଇଦା:

ଏହି ଗବେଷଣା ଦ୍ୱାରା ଆପଣ ସିଧାସଳଖ କିଛି ଫାଇଦା ପାଇବେ ନାହିଁ । ଆମ ଆଶା ଜଣୁଛୁ,ଆପଣଙ୍କ ଠାରୁ ଆମେ ଯାହା ଶିଖିବୁ,ତାହା ପରିମଳ ସମ୍ବନ୍ଧୀୟ ନୂଆ କାର୍ଯ୍ୟକ୍ରମ ଯୋଜନା କରିବାରେ,ସହାୟକ ହେବ ।

Compensation
Participants will not be offered payment for being in this study.

କ୍ଷତିପୂରଣ

ଏହି ଗବେଷଣା ରେ ଯୋଗ ଦେବା ପାଇଁ,ଆମେ ଆପଣଙ୍କୁ କିଛି ଟଙ୍କା ଦେବୁ ନାହିଁ ।

Confidentiality
I will not be telling others in the community what you have said. I will only be sharing the ideas you have with the people in the project. None of your names will be written down. You may introduce yourselves with another name to assure your privacy. Members of the Emory and LSHTM research teams will be the only people that listen to the recording of our conversation. The only instance in which I would share information outside of our group would be if I think that your security or the security of others is in danger. I also ask that each of you keep this conversation private. Please do not share it with others outside the group. People are sharing their personal opinions and experiences and we want to respect everyone's privacy. Please keep this discussion between us.

Are there any questions?

ଗୁପ୍ତତା

ଆପଣଙ୍କ ସଙ୍ଗେ ଯାହା ଆଲେଚନା ହେଲା,ତାହା ଆମେ ଗ୍ରାମରେ ଅନ୍ୟ ଲୋକଙ୍କୁ କହିବୁ ନାହିଁ । ଆପଣ ଦେଇଥବା ମତ କୁ,ଆମ ପ୍ରୋଜେକ୍ଟ ରେ କାମ କରୁଥିବା ସଦସ୍ୟ ଙ୍କୁ ହି କହିବୁ । ଆପଣ ମାନଙ୍କ ନାମ ଲେଖାଯିବ ନାହିଁ । ଆପଣ ମାନେ,ନିଜର ପ୍ରକୃତ ନାମ ନ କହି,ଡାକ ନାମ ରେ,ନିଜର ପରିଚୟ ଦେଇ ପାରନ୍ତି,ଏହା ଦ୍ୱାରା ଆପଣ ଙ୍କ ଗୁପ୍ତତା ରକ୍ଷା କରି ହେବ । କେବଳ ଏମୋରି ଓ ଏଲ.ଏସ.ଏଚ୍.ଟି.ଏମ ସଦସ୍ୟ ହି,ଆମର ଏହି ରଜର୍ଡିଂ କୁ ଶୁଣି ପାରିବେ ।

ଆପଣଙ୍କ ର ଆଉ କିଛି ପ୍ରଶ୍ନ ଅଛି କି ?

Contact Information
If you have any questions or concerns about this research, you may contact: **ParimitaRoutray, Researcher, London School of Hygiene and Tropical Medicine: Flat no. 301, Plot no. 676, Jayakrushnagar, Lingipur, Post office - Shishupalgarh, Khordha, 751002, ph. 9861072266**

If you have any questions about your rights as a participant in this research study, please contact the **Emory University Institutional Review Board** at irb@emory.edu / +1 404 712 0720

ଯୋଗାଯୋଗ ଠିକଣା

ଆପଣଙ୍କ ର ଯଦି କିଛି ପଶ୍ନ ଥାଏ,ତେବେ-ପରିମିତା ରାଉତରାୟ ଙ୍କୁ ଯୋଗାଯୋଗ କରିପାରନ୍ତି । ତାଙ୍କ ଅଫିସ ଠିକଣା ହେଉଛି- ଲଣ୍ଡନ ସ୍କୁଲ ଅଫ ହାଇଜିନ ଏବଂ ଟ୍ରପିକାଲ ମେଡିସିନ,ଫ୍ଲାଟ ନଂ-୩୦୧,ପ୍ଲଟ ନଂ-୬୭୬,ଜୟକୃଷ୍ଣ ନଗର,ଲିଙ୍ଗିପୁର,ପୋଷ୍ଟ ଅଫିସ-ଶିଶୁପାଳଗଡ,ଖୋର୍ଦ୍ଧା,୭୫୧୦୦୨,ଫୋନ-୯୮୬୧୦୭୨୨୬

ଯଦି ଏହି ଗବେଷଣା ରେ,ଅଶଂଗ୍ରହଣକାରୀ ଭାବେ,ନିଜର ହକ ଜାଣିବା ପାଇଁ ଚାହୁଁଛନ୍ତି,ତେବେ,ଏମୋରି ୟୁନିଭରସିଟି ରିଭ୍ୟୁ ବୋର୍ଡ କୁ ଇ ମେଲ ଦ୍ୱାରା-irb@emory.edu/ଫୋନ ଦ୍ୱାରା +୧୪୦୪୭୧୨୦୭୨୦,ଯୋଗାଯୋଗ କରନ୍ତୁ ।

Consent
If you are willing to participate, please say 'Yes, I will participate' once I turn the recorder on.

ସହମତି

ଯଦି ଯୋଗ ନେବା ପାଇଁ ଇଚ୍ଛୁକ,ତେବେ, 'ହଁ,ମୁଁ ଯୋଗ ନେବା ପାଇଁ ଇଚ୍ଛୁକ' କୁହନ୍ତୁ ।

Appendix D - FGD Demographic Survey

PART A. To Be filled out by RA at start of Activity					
A.1	Community Name: _____	**A.2**	Community ID#: _____	**A.3**	Hamlet: ☐ 1. Yes ☐ 2. No
A.4	RA Initials: _____	**A.5**	Date: (y/d/m) __ __ __ __ / __ __ /__ __		
A.6	Participant Type: ☐ 1. Female – Control village ☐ 2. Male – Control village ☐ 3. Female – Intervention village ☐ 4. Male – Intervention village				

PART B. To be asked of and answered by participant			
B.1	Age: _____	**B.2**	How many members are in your household? _____ What is your relation to the head of household? ❑ Self ❑ Spouse ❑ Son / Daughter ❑ Other: _____
B.3	How long have you been living in this village? _____		
B.4	Education: ☐ 1. None ☐ 2. Some Primary School ☐ 3. Primary Completed ☐ 4. Some Secondary ☐ 5. Secondary Completed ☐ 6. Some Tertiary / University ☐ 7. Tertiary / University Completed ☐ 8. No formal education, but literate	**B.5**	Caste: ☐ General ☐ Schedule caste ☐ Scheduled tribe ☐ Other backward classes
B.6	Religion: ☐ Hindu ☐ Islam/Muslim	**B.7**	Does your household have a Ration Card? ☐ 1. Yes ☐ 2. No
B.8	Marital Status (check one): ☐ 1. Single ☐ 2. Married → **B.8_1 If married, number of years married:** _____ ☐ 3. Widowed ☐ 4. Divorced/Separated		
B.8.1	Children (check one)? ☐ 1. No ☐ 2. Yes → **B.8_1 If yes, fill in table below:**		

	Gender	Age	Ability to Walk
#1	☐ Male ☐ Female		☐ No ☐ Crawling ☐ Walking
#2	☐ Male ☐ Female		☐ No ☐ Crawling ☐ Walking
#3	☐ Male ☐ Female		☐ No ☐ Crawling ☐ Walking
#4	☐ Male ☐ Female		☐ No ☐ Crawling ☐ Walking

B.9 Does someone in your household have a mobile phone? ☐ 1. Yes ☐ 2. No

B.10 Do you have a latrine?
☐ 1. Yes
☐ 2. No **→ If no, skip to B.14**

B.11 How long have you had your latrine? _____ **Months**

B.12 Is the latrine functional?
☐ 1. Yes
☐ 2. No **If non functional, how long has it been non-functional _____Months**

B.12 How often do you use the latrine for urination? ☐ 1. Always ☐ 2. Sometimes ☐ 2. Never

B.13 How often do you use the latrine for defecation? ☐ 1. Always ☐ 2. Sometimes ☐ 2. Never

B.14 Intervention activities (Fill in the table for intervention activity involvement)

Activity Name	**Heard of Activity (Y/N)**	**Attended (Y/N)**	**# of household members who attended or saw it**
1. Palla			
2. Transect Walk			
3. Community Meeting			
4. Community Wall Painting		Seen it? (Y/N) Participated in planning it? (Y/N)	
5. Positive Deviant Posters		Seen it? (Y/N) Received a poster? (Y/N)	
6. Mother's Group			
7. Household Visits		Received a visit? (Y/N) Received a poster? (Y/N)	If received a visit, how many household members attended? _____

ASK if Participant has any questions OR anything else to ADD, then Thank Participant

Appendix E - Intervention FGD guide

Community Intervention Focus Group Discussion Guide

CONSENT FORM
DEMOGRAPHIC SURVEY

Opening Question: (Encourage discussion, break the ice)

1. Let's go around the circle and tell everyone your name, favorite food, and a line from your favorite song.

Introductory Questions:

2. What are the best things about your village?
    a. Probe: Physical structures like temples, qualities like cleanliness, traits, like people's attitudes, etc.
3. Are there things that should change in your village to make this a better place to live?
    a. Probe: If so, what are they?
    b. Probe: What parts of the village do you NOT like? Why?
    c. Probe: What parts of the village could be BETTER?

Transition Questions:

4. Are you aware of some of the latrine promotion-related events taking place in your village?
    a. Probe: What do you think it was about?
    b. Probe: Why was it conducted?
    c. Probe: For whom it was conducted?
        i. Was it for some special section of the village, this event was being held?
5. Which activities did you attend or see?
    a. Probe: Palla performance, transect walk, community meetings, community wall painting, mother's groups, household visit/demonstration/positive deviant HH banner

[guide continues on next page]

For questions 6-11, skip activities that no one in the group has heard about.	6. Palla	7. Transect Walk	8. Community Meeting *Explain what this meeting was if there is confusion	9. Mothers Groups	10. Household visits/ Positive Deviant Banner	11. Wall Painting
How did you find out about the activity?				Probe: Who was invited? How were they invited?	Tell me about the household visit.	
Why did you decide to attend or not attend?						
Where was it held?						
Who else was there? Why?	Probe: Ages, genders, castes	Probe: Ages, genders, castes	Probe: Ages, genders, castes	Probe: Older women, younger women	Who in your household attended?	How many people do you think have seen it?
How long did you stay? (If left early, ask why.)					How long did it last? Should it have been shorter or longer?	
Did anything surprise you?						
Were there any problems?						
What did you think of the activity?						
Individual activity questions	What skit did you like the best? What did you think about the length? Which age group enjoyed it the most?	How did it make you feel? Do you think it is appropriate to use holi powder on feces? Why or why not?	Who made comments in the meeting? What did they say? Did you make comments? Why or why not? How feasible do you think the action plan is?	How did the potty distribution go? Did everyone get a potty who should have gotten one? Did anyone get a potty who shouldn't have gotten one?	What kind of poster did you receive? What did you do with it? How do you feel about the poster?	

12. Which activity did you like the most?
    a. Probe: Why?
13. How could the activities be made better?
    a. Probe: Number of activities/type of activities
    b. Probe: Timing/length of activities
    c. Probe: Location of activities
    d. Probe: Distributions
    e. Probe: Targeting certain groups of people
14. Have these events brought a change in people's behavior in this village, especially in latrine use?
    a. Probe: Who uses latrines the most?
        i. Has this changed? How?
    b. Probe: How often do people use latrines?
        i. Has this changed? How?
    c. Probe: Do people use latrines for any other purposes?
        i. Storage?
        ii. Has this changed?
    d. Probe: Has the events brought about any other changes, aside from latrine use?
        i. Such as reduce or increase family conflicts?
        ii. Community identity?
15. Did these events change how people in this village think about using latrines?
    a. Probe: How important is using a latrine in this village?
        i. Has this changed since the latrine events?
        ii. How?
16. Is there any time that a person who has a latrine CANNOT use it?
    a. Probe: Who, when, and why?
17. Is there any time that a person who has a latrine SHOULDN'T use it?
    a. Probe: Who, when, and why?
18. Is there a penalty for people who open defecate?
    a. IF YES:
        i. What is the penalty?
        ii. How is it enforced?
        iii. Do you think it is good or bad? Why?
    b. IF NO:
        i. Do you think there should be a penalty? Why or why not?
        ii. If so, what should it be?
        iii. How should it be enforced?

Ending Questions

19. Given everything that was said here, would you say that overall the program had any impact/results on people?
20. What do you think should be done, so that people adopt these latrines and start using it?
    a. Probe: more awareness, more latrines, etc?
21. Is there anything else that wasn't covered in this discussion that you'd like to say about the program?

Thank you for your time!

Appendix F - Control FGD guide

Control Village Focus Group Discussion Guide

Opening Question: (Encourage discussion, break the ice)

1. Let's go around the circle and tell everyone your name and favorite food.

   [If given consent to record, start recorder after this question. then start recorder, if "no" then say, "That's fine, we will just take notes."]

Introductory Questions:

2. What are the good things about your village?
   a. Probe: Physical structures like temples, qualities like cleanliness, traits, like people's attitudes, etc.
3. Are there things that should change in your village to make this a better place to live?
   a. Probe: If so, what are they?
   b. Probe: What parts of the village do you NOT like? Why?
   c. Probe: What parts of the village could be BETTER?

Transition Questions:

4. Have you heard about the recent sanitation events in [neighboring village]?
   a. [If limited or NO response]: Skip to HISTORY OF SANITATION IN VILLAGE section
   b. Probe: How did you hear about it?
   c. Probe: What were the different components/activities?
   d. Probe: Why was it conducted?
   e. Probe: Did anyone present here attend any of those events in the neighboring village?
   f. About how many people in this village know about these events?

[Guide continues on next page]

For questions 6-11, skip activities that no one in the group has heard about.	**6. Palla**	**7. Transect Walk**	**8. Community Meeting *Explain what this meeting was if there is confusion**	**9. Mothers Groups**	**10. Household visits/ Positive Deviant Banner**	**11. Wall Painting**
What did you hear about your activity?				Probe: Who was invited? How were they invited?	Tell me about the household visit.	
How did you find out about the activity?						
Where was it held?						
Who was it for?	Probe: Ages, genders, castes	Probe: Ages, genders, castes	Probe: Ages, genders, castes	Probe: Older women, younger women	Who in your household attended?	How many people do you think have seen it?
Did anything surprise you?						
Were there any problems?						
What did you think of the activity?						
Individual activity questions	What skit did you like the best? What did you think about the length? Which age group enjoyed it the most?	How did it make you feel? Do you think it is appropriate to use holi powder on feces? Why or why not?		How did the potty distribution go? Did everyone get a potty who should have gotten one? Did anyone get a potty who shouldn't have gotten one?	Have you seen the poster? What do you think about it?	

12. How have these events changed how people in your village use the latrine?
    a. Probe: Who uses latrines the most in your village?
        i. Has this changed? How?
    b. Probe: How often do people use latrines in your village?
        i. Has this changed? How?
    c. Probe: Do people dispose of children's feces in latrines?
        i. Has this changed? How?
    d. Probe: Do people use latrines for any other purposes?
        i. Storage?
        ii. Has this changed? How?
13. What do people in this village think about using latrines?
    a. Probe: How important is using a latrine in this village?
        iii. Has this changed since the sanitation events?
        iv. How?
14. Given everything that was said here, would you say that overall the program was good or bad?
    a. Probe: What went well?
    b. Probe: What could be improved?
    c. Probe: What should be removed?
    d. Probe: If it was good, good for whom? How? Why?
15. Are these events something you would like to see in this village?
    a. Probe: Why or why not?
    b. What aspects of the events/programming would you like to see or not see?

History of Sanitation in the Village

16. What do people in this village know about sanitation?
    a. Where did they learn what they know?
17. How many households in this village have latrines?
    a. Probe: numbers and percentages
18. When did people in this village get latrines?
    a. Who paid for them?
    b. Who maintains them?
    c. How many of the latrines work?
19. Has there ever been sanitation promotion events in this village?
    a. What were they?
    b. When were they?
    c. Who sponsored them?
    d. What impact did it have on the village?
    e. How did you find out about them?
    f. What were the main messages in the events?
    g. Do you think these events were good? Why or why not?
20. If NGOs or government organizations have worked in this village, how was your relationship with them?
    a. What was the village's relationship (*treatment of community by organization*) with the organization like BEFORE the work? (Planning, initial meetings, assessments, etc – how did they go?)
    b. What was the village's relationship with the organization like DURING the work? (treatment of people, satisfaction with work)

   c. What was the village's relationship with the organization like AFTER the work? (follow-up, communication, etc)
   d. Overall, were you happy with the work done in your village? How could it have been better?
21. What is your village's experience with Swachh Bharat mission?
22. What are your biggest sanitation problems?
   a. Probe: Latrines
   b. Probe: Tube wells
   c. Anything else?

Ending Questions:

23. Is there a penalty for people who open defecate in this village?
   a. If YES:
      i. What is the penalty? How is it enforced?
      ii. Do you think this penalty is good or bad? Why?
   b. If NO:
      i. Should there be a penalty? Why or why not?
      ii. If there should be a penalty, what should it be? How would it be enforced?
24. What would you like to see happen in your village, regarding sanitation?
   a. Suggest ONLY IF they have a hard time thinking of things on their own: Government support, promotional messages, water access, etc.
   b. Probe for details on each thing that they suggest.

25. Is there anything else that wasn't covered in this discussion that you'd like to say about the sanitation events?

Thank you for your time!

Appendix G – Codebook

#	Code	Subcode	Definition	Inclusion/exclusion criteria	Example quotes
1	Outlook on change		Inductive code - Comments about how village improvement can or can't happen; why change will or will not happen		"If five of them take the initiative to create a garden, then there are five others who will oppose that plan."
2	Communication/Harmony		Inductive code - Comments about the level of cooperation, agreement, harmony or communication in a village.	Do not include comments about disagreements with people outside the village UNLESS that village is also part of the study. For example, no comments about disagreements with the government but include comments about not agreeing with a nearby intervention or control village.	"No, we don't have good terms with them, so, we don't know what happened or not, in that village." "There is love and affection among people. Suppose someone is ill, then others in the village take care."

3	Village sanitation history, latrine coverage info		Past sanitation interventions, discussions of latrine coverage when most people built their latrines, latrines in the context of village divisions, environment		"Not 50, may be 40 had built latrines at that time. People had constructed them as per their convenience." "People are not able to build on their own, so when these NGO people came and offered to build the latrine, people gave their consent to them and then they start the construction."
4	Overall Intervention		Comments and opinions about the intervention as a whole	Include suggestions for intervention improvement, and aspects of the program desired by control villages	I: How the activities can be designed more properly, if we have to do it once more? P: No activities are needed, we have now learnt from palla; Belling also does the same thing. I: What else? P: A demo could have been better
4.1	Overall Intervention	Attendance	Comments about who attended and didn't attend the activities. Comments about why an individual did or did not attend.	Include discussions of recruitment methods and motivations to attend	I: Why did you attend the palla, what thoughts were there regarding attending the palla? P: Just wanted to know and see what they are going to present.

4.2	Overall Intervention	Palla	Anything pertaining to the palla activity: descriptions, opinions, suggestions, questions		I: In the palla, did you hear anything new that surprised you? P: No, nothing new. We knew these stories. We had read about those stories.
4.3	Overall Intervention	Transect Walk	Anything pertaining to the transect walk, holi powder, opinions, suggestions, descriptions, questions		"Yes, some joined the walk. They explained many things. Few understood and few didn't. From among those attended, few appreciated, and some criticized. Those who liked the walk have changed their habit and using the latrine, but the ones who criticized, came up with excuses for not using the latrine like there is no latrine, there is no water, all these."
4.4	Overall Intervention	Community Meeting	Anything pertaining to the community meeting, descriptions, opinions, suggestions, questions		"One of my nephews had organized a meeting in our village and I checked with him what the meeting was all about. He had explained that it was being done to aware people on the environment and sanitation, but, I don't know what were discussed."

4.5	Overall Intervention	Mother's Meeting	Anything pertaining to the Mother's Meeting, potty distribution, opinions, descriptions, suggestions, questions		"A sir was sitting in the car, similar to this sir here. He read out the names of the mothers, and then each mother was given a potty."
4.6	Overall Intervention	Household visit/Posters	Anything pertaining to the household visit or poster distribution		"One of the points in the poster is not to store firewood in the latrines."
4.7	Overall Intervention	Positive Deviant Posters	Comments about the positive deviant posters	Exclude comments about the other poster from the household visit, use code 4.6	I: What kind of poster was given to you? P: Most of our villagers are positive deviants households. Every household has a latrine, and tubewells.
4.8	Overall Intervention	Wall Painting	Anything pertaining to the community wall painting		I: Do you know about the wall painting? P: Yes, sir told me. I: Where is the site of wall painting? P: Prashant shop's wall.

4.9	Overall Intervention	Learning from intervention	Anything participants say they learned from the intervention		"They had talked about many issues like the pollution of our surroundings, about mothers' health and also about how flies and mosquitoes act as a cause of our illness..."
4.10	Overall Intervention	Perceived change (intervention)	Whether or not participants believed that things had changed in their village as a result of the intervention, and what they thought the change was		"All was good. People are not defecating in the open and using the latrines. They have slowly changed. So, all good."
5	Latrine Use		Comments about how latrines are or are not used in the household, including barriers and motivators (double-coded as subcode barriers/motivators)	EXCLUDE child feces, use code 6	I-Grandma, what do you do? Do you have a latrine at home? P4-Yes... I-Are you using it now? P4-Yes...Earlier, we used to go out into the fields..

5.1	Latrine Use	Barriers/Motivators	Comments about latrine use barriers, complaints, about latrines in the village: poor construction, dysfunction, any other issues Anything that enables or encourages latrine use		"If someone is already inside the latrine, and the other person has the urge and cannot control then, he has to go outside. If that man has gone to the field, and there he has the urge, then, he will defecate there." "Earlier, when defecating outside, one has to stand up and down many a times. But in the latrine, you can close the door, and there is no one to see, this is more convenient."
6	Child Feces		Discussion of child feces disposal: training of child, feces clean-up, use of latrine, potty, or anything else, child's bathing routine, any mention of child feces		"Our kids are very small. Therefor we don't take them anywhere. In our house, we make them defecate on a paper or cloth and then throw it or wash it..."
7	Water		Water issues in the village: lack of water, lack of clean water, lack of water for drinking, lack of water for washing, lack of water for latrines	Double-code with barriers/motivators if applicable	"We don't have any water facilities. See the condition of the pond water? There are many difficulties because of the water."
8	Guilt/Shame		Instances where the participant described feeling guilt, shame, ashamed, etc.		"How can we feel good? Outsiders came and showed us to sprinkle holi powder. Is that not shameful?"

9	Dirty/Clean		Inductive code: Descriptions of things that are either dirty or clean, the act of cleaning or making dirty	Include concepts of sanitation (primarily asked in control villages) - may often be double-coded with perceived benefits/risks	"If some people take up the responsibility to clean the village for at least one to two hours in the morning, then obviously the village can be kept clean."
10	Perceived health risks/benefits		Any instance of a participant describing a negative or positive health outcome as a result of an action, situation, or substance		"Feces are wastes. They are excreted from our stomach. As it is waste, so it must be...If it is not cleaned, then it will result in pus which is harmful."
11	Penalty System		Comments about whether or not a penalty system for open defecators would be appropriate, descriptions of what that penalty would be		"We will just tell the open defecators that, 'your name is listed, and your photo has been taken and will be informed to the higher authorities.' This message will make them afraid and then they will stop defecating outside."

12	Discontent/Content		Discontent: Frustration with the government, frustration with the project, frustration with us Contentment: Anything participants mention that they are pleased with. Can be double-coded with intervention aspects, or other things	Exclude all comments about internal disagreements, cooperation, and optimism or pessimism about change. Use Code 1: Outlook on change and Code 2: Communication/ Harmony	"No, we are not happy with the construction. The pan should have been installed at a higher level and more rings should have been put for the pit. They just did it as was convenient to them." "I liked it, made me happy. Because, people just defecate next to my house, and we can see them clearly right from my home. Since that day, it has totally stopped, no one is going there."