



# Sustainability of community-led total sanitation outcomes: Evidence from Ethiopia and Ghana



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## ABSTRACT

We conducted a study to evaluate the sustainability of community-led total sanitation (CLTS) outcomes in Ethiopia and Ghana. Plan International, with local actors, implemented four CLTS interventions from 2012 to 2014: health extension worker-facilitated CLTS and teacher-facilitated CLTS in Ethiopia, and NGO-facilitated CLTS with and without training for natural leaders in Ghana. We previously evaluated these interventions using survey data collected immediately after implementation ended, and concluded that in Ethiopia health extension workers were more effective facilitators than teachers, and that in Ghana training natural leaders improved CLTS outcomes. For this study, we resurveyed 3831 households one year after implementation ended, and analyzed latrine use and quality to assess post-intervention changes in sanitation outcomes, to determine if our original conclusions were robust. In one of four interventions evaluated (health extension worker-facilitated CLTS in Ethiopia), there was an 8 percentage point increase in open defecation in the year after implementation ended, challenging our prior conclusion on their effectiveness. For the other three interventions, the initial decreases in open defecation of 8–24 percentage points were sustained, with no significant changes occurring in the year after implementation. On average, latrines in Ethiopia were lower quality than those in Ghana. In the year following implementation, forty-five percent of households in Ethiopia repaired or rebuilt latrines that had become unusable, while only 6% did in Ghana possibly due to higher latrine quality. Across all four interventions and three survey rounds, most latrines remained unimproved. Regardless of the intervention, households in villages higher latrine use were more likely to have sustained latrine use, which together with the high latrine repair rates indicates a potential social norm. There are few studies that revisit villages after an initial evaluation to assess sustainability of sanitation outcomes. This study provides new evidence that CLTS outcomes can be sustained in the presence of training provided to local actors, and strengthens previous recommendations that CLTS is not appropriate in all settings and should be combined with efforts to address barriers households face to building higher quality latrines.

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## 1. Introduction

Globally, 2.4 billion people lack improved sanitation, and 946 million people practice open defecation (WHO/UNICEF, 2015). The United Nations reaffirmed the importance of sanitation by including it in the Sustainable Development Goals (SDGs), which calls for ending open defecation and universal access to adequate and equitable sanitation (UN General Assembly, 2015). The SDGs also set out the means of implementation as strengthening the participation of local communities and capacity building support for

developing countries. Community-led total sanitation (CLTS) is an approach to addressing open defecation that triggers emotions to generate a collective demand for sanitation within a community. CLTS emerged in the year 2000, and has since spread to over 60 countries, many of which now include it in national policy (Institute of Development Studies, 2016). CLTS has a role to play in addressing the SDGs, as it is participatory, generally includes capacity building, and has shown promise in addressing open defecation (Kar and Chambers, 2008; Pickering et al., 2015). However, it is not always effective (Guiteras et al., 2015), and seems to be most appropriate under certain settings, such as high baseline open defecation (Crocker et al., 2016b) and high social capital (Cameron et al., 2015; Crocker et al., 2016a).

There are no journal-published studies on the sustainability of CLTS outcomes. Three gray literature studies (literature not pub-

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lished in scientific journals) report sanitation outcomes and rates of reversion back to open defecation 2–4 years after CLTS completed (Hanchett et al., 2011; Mukherjee et al., 2012; Tyndale-Biscoe et al., 2013). Another report reviewed gray literature on CLTS sustainability, and while it described a number of methodological challenges to drawing any conclusions across the varied reports, it does include a thorough discussion of factors that enable and constrain the sustainability of CLTS outcomes (Cavill et al., 2014). The review found that CLTS outcomes were reported to be more sustainable where there was a supportive enabling environment (e.g. sufficient follow-up visits were conducted), where communities had market-access to latrine products and materials, and where communities were socially cohesive.

There are very few studies that report on the sustainability of any type of sanitation intervention (Garn et al., 2016), and generating evidence on longer term outcomes of sanitation interventions is a research priority (Waddington et al., 2009). Two studies report longer term latrine use following sanitation interventions: one 5 years after a latrine-provision project in Bangladesh (Hoque et al., 1996), and another 2–9 years after programs across 8 countries that included latrine promotion (Cairncross and Shordt, 2004).

We conducted a study to assess how sanitation outcomes of four CLTS interventions in Ethiopia and Ghana changed one year after the interventions had finished. We previously published evaluations of the four CLTS interventions that were based on surveys conducted before and immediately after the interventions (Crocker et al., 2016a,b). The previously published evaluations focus on the effectiveness of training health workers, teachers, and natural leaders to lead or support CLTS facilitation, and include recommendations on where and how to engage these local actors. In the initial evaluations, we found that open defecation decreased during all four interventions. In Ethiopia, teacher-facilitated CLTS was initially less effective than health extension worker-facilitated CLTS. In Ghana, training natural leaders increased the impact of CLTS. Thus, our second objective in this study was to assess if the conclusions from the original evaluations are still sound given new longer-term survey data. Our third objective was to assess other predictors of sustained latrine use.

## 2. Methods

### 2.1. Program description

Four different CLTS interventions were implemented: in Ethiopia, (1) health extension worker (HEW) and kebele leader-facilitated CLTS, and (2) teacher-facilitated CLTS; and in Ghana, (3) NGO-facilitated CLTS, and (4) NGO-facilitated CLTS, with additional training for natural leaders. A kebele is the lowest administrative unit in Ethiopia, comprising 20–30 villages and approximately 5000 people in rural areas. Kebele leaders and HEWs always worked together in intervention 1, so the impact of each of these actors cannot be separated. Natural leaders are motivated community members who encourage others to construct latrines and change sanitation-related behaviors. Facilitation comprised visits to study villages by facilitators to conduct the three typical stages of CLTS as they are described in the CLTS Handbook (Kar and Chambers, 2008): pre-triggering (or community entry), triggering, and follow-up, which involves monitoring a community's progress and guiding them toward eliminating open defecation. The two interventions in Ethiopia lasted 12 months, and the two in Ghana lasted 18 months. Interventions 1 and 2 in Ethiopia began with training local actors who then led CLTS facilitation. Interventions 3 and 4 in Ghana were facilitated by Plan. Intervention 4 included the addition of training natural leaders after triggering had been completed so they could support facilitation. These four CLTS interventions cover a range

of implementation arrangements and modalities as practiced by other organizations and in other countries (Venkataramanan, 2016, 2012), so the findings are relevant beyond this project. A timeline of implementation activities and ODF certification rates are in the appendix (Tables S1–S3). Detailed implementation narratives are available online (Plan International Ethiopia, 2015; Plan International Ghana, 2015).

There were a range of pre-existing factors that enabled the CLTS interventions, and could contribute to sustainability. In both Ethiopia and Ghana there were supportive national governments that have produced policies or strategies naming CLTS as the preferred rural sanitation approach, national guidelines for CLTS implementation, and CLTS coordinating committees. Moreover, local government is mandated with implementing CLTS (Crocker and Bogle, 2015; Crocker and Rowe, 2015). Plan spent the year preceding the interventions working with government and NGO partners to develop contextually appropriate training manuals that would be used for the interventions (Plan International Ethiopia, 2012; Plan International Ghana, 2013).

### 2.2. Study design

The study in Ethiopia used a quasi-experimental design, in which kebeles (clusters of villages) were prematched on latrine access and population, then manually assigned to receive CLTS facilitated by either HEWs and kebele leaders, or by teachers. The study in Ghana used a cluster-randomized design, in which all project villages received CLTS, and half of the villages were randomly selected to receive natural leader training as an add-on activity. The interventions in Ethiopia took place in the Oromia and Southern Nations, Nationalities, and Peoples (SNNP) regions, and in Ghana in the Central, Upper West, and Volta regions. Further details on the two study designs are in the previous publications.

In Ethiopia, a complete village listing was conducted at baseline, then villages were randomly sampled and all households within sampled villages were surveyed (Table S4 in the appendix). The same households were resurveyed immediately after the interventions (midline) and again one year later (endline). In Ghana, a complete household listing was conducted immediately after the interventions, then households were randomly sampled, surveyed for the midline, and resurveyed a year later for the endline. No baseline survey was used in Ghana. Household surveys covered demographics, sanitation, hygiene, interactions, and recall of CLTS events. Sanitation outcomes were assessed by asking heads-of-households where members of their family primarily defecated and their handwashing practices. Those reporting using a latrine were asked a series of questions to determine if it was private, shared, or communal. Latrine and handwashing station quality and maintenance were then assessed by observation. All data collection was conducted by an independent contractor in each country. Surveys were translated into local languages then independently checked, pretested during surveyor training, and piloted in non-study villages. Surveyors were audited by Plan staff or team leaders resurveying a selection of households. Printed surveys were used in Ethiopia, and SurveyCTO software on Nexus tablets was used in Ghana.

The primary outcome was change in levels of open defecation at the household-level. Open defecation was defined as respondents reporting their family's primary place of defecation as somewhere other than a latrine. Additionally, if a respondent reported using a private latrine but did not allow the surveyor to observe it, their household was categorized as open defecation, as were households whose latrines were observed to be full or have collapsed floors. Baseline surveys were not used in Ghana, so baseline open defecation was estimated using the conservative assumption that decreases in open defecation were equivalent to increases in latrine

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