

TARGETING COMMUNITY-LED TOTAL SANITATION (CLTS) TO FAVORABLE CONTEXTS: FACTORS CONTRIBUTING TO THE SUCCESS OF CLTS IN GHANA

Study Findings

- CLTS is not uniformly successful. Of 2,038 villages from three CLTS programs across Ghana, only 49% had achieved open defecation free (ODF) status.
- Implementers should focus CLTS programs in areas where local contexts are best suited for the approach. Favorable areas can be determined by leveraging the information they collect on program villages as well as publicly-available data on local contexts.
- We identified three factors that influence CLTS performance in Ghana. Communities were more likely to achieve ODF status if they had fewer households, lower literacy levels, or lower population density.
- Communities with less than approximately 40 households, 280 people per square kilometer, 57% women’s literacy, or 35% men’s literacy were significantly more likely to achieve ODF than communities not meeting these criteria.

Study Overview

The USAID Water, Sanitation and Hygiene Partnerships and Learning for Sustainability (WASHPaLS) project examined CLTS datasets in four countries to quantify the extent to which environmental, demographic, accessibility, and socioeconomic factors affect ODF achievement. In Ghana, we examined CLTS performance data from the UNICEF/Government of Ghana program (1,051 communities), the WASH for Health program delivered by Global Communities (GC) (656 communities), and the Resiliency in Northern Ghana program also delivered by GC (331 communities). The resulting dataset (2,038 communities) covered the period 2014-2019 and included communities from 72 districts (the smallest division of local government) out of 216 nationally (Figure 1).

Approach

We assessed CLTS performance based on whether a community had received ODF certification (“ODF achievement”) according to the databases of program implementers.

We examined the influence of 14 contextual factors listed in Table 1 and identified those that were closely associated with ODF achievement. We expressed model results as Odds Ratios (ORs) where values greater than 1 indicated a positive association between contextual factors and ODF achievement. P-values up to 0.1 can offer insight on general trends, but we deemed p-values greater than 0.05 statistically insignificant. To aid implementers in identifying areas favorable for CLTS, we determined two “split points” delineating three regimes of CLTS favorability (most favorable, somewhat favorable, and least favorable) for each key contextual factor. The first split point identified was the value that maximized the homogeneity of ODF achievement on one side and non-achievement on the other side. The algorithm then used the same methodology to find the second-best split point. We note that these “split points” should not be interpreted as strict thresholds; communities with values just above and below splits are expected to respond similarly. Implementers can use this information to identify areas most favorable for CLTS and adapt their program accordingly. Detailed methods and limitations are described in a journal publication.¹

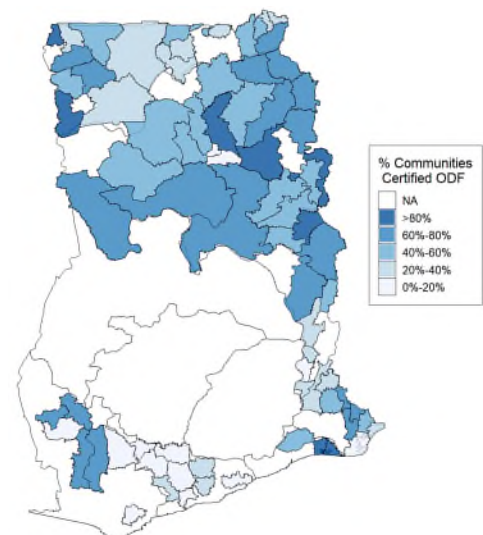


Figure 1. Percent ODF achievement among program communities per district. Overall, 49% of study communities were certified ODF.

CLTS performance metric

ODF achievement: has the community been certified ODF? (binary)

National ODF Guidelines: No signs of OD, 80% latrine coverage with handwashing facilities, remaining households using shared latrines.

Table 1. Contextual factors examined in this study with data source and resolution.

VARIABLE	PROXY	SOURCE	RESOLUTION
Community size	# of households	GC, GoG/UNICEF	Community
Literacy	% literacy among men	Statistical interpolation from DHS survey ²	1 km x 1 km
	% literacy among women		
Forest coverage	% coverage of forest per unit area	Satellite imagery ³	5km x 5km
Shrubland coverage	% coverage of shrubland per unit area	Satellite imagery ⁴	300m x 300m
Water supply	% of population with access to improved water	Statistical interpolation from DHS survey ²	30m x 30m
	Rural water systems coverage in the district	Census ⁵	District
Remoteness of community	Time to cities	Satellite imagery ⁶	1 km x 1 km
	Distance to main roads	Crowd-sourced GPS tracks ⁷	Community
Population density	# people per square kilometer	Satellite imagery + census ⁸	100m x 100m
	Average population per square kilometer in the district		District
Water scarcity	Water use divided by water availability	Hydrological model ³	60km x 60km
Waterborne disease burden	Cholera predicted incidence	Statistical interpolation of incidence data ⁴	20km x 20km
Distance to waterbodies	Distance to major inland waterways (lakes, rivers)	Satellite imagery ⁶	Community

Findings

We identified three statistically significant contextual determinants of ODF achievement in Ghana (Figure 2): communities were more likely to achieve ODF status if they had fewer households, lower literacy levels (both among men and women), or lower population density.

Higher CLTS success in communities with a smaller population: Smaller communities were more likely to achieve ODF status (Figure 2). A number of reasons may explain this trend. Communities with fewer households are easier for implementers to engage with during triggering events and follow-up.⁹ These communities may experience higher social cohesion and stronger local leadership.^{10,11} Stronger relationships between households may also facilitate information transfers about latrine design and available construction materials. Finally, fewer households translates to fewer latrines to be constructed to reach ODF certification benchmarks.

While a smaller community size was consistently more favorable, we found that communities with fewer than 40 households were most favorable, achieving ODF status in 61% of cases, compared to 30% in communities with 40-79 households, and only 10% of communities with larger population (Figure 3).

ODF achievement was higher in communities with low population density (Figure 2)

Communities with low population density are less likely to encounter space constraints or land tenure issues which could stymie latrine construction.¹² These communities are also typically more remote and tend to have stronger social cohesion, higher socioeconomic homogeneity, and have been exposed to fewer subsidy-driven sanitation programs in the past, which are reportedly favorable conditions for CLTS.¹¹ Our implementing partners have also observed that urbanized, denser communities can be more difficult to trigger because households have less time to attend mobilization events and also have less space for building latrines.¹³ The most favorable

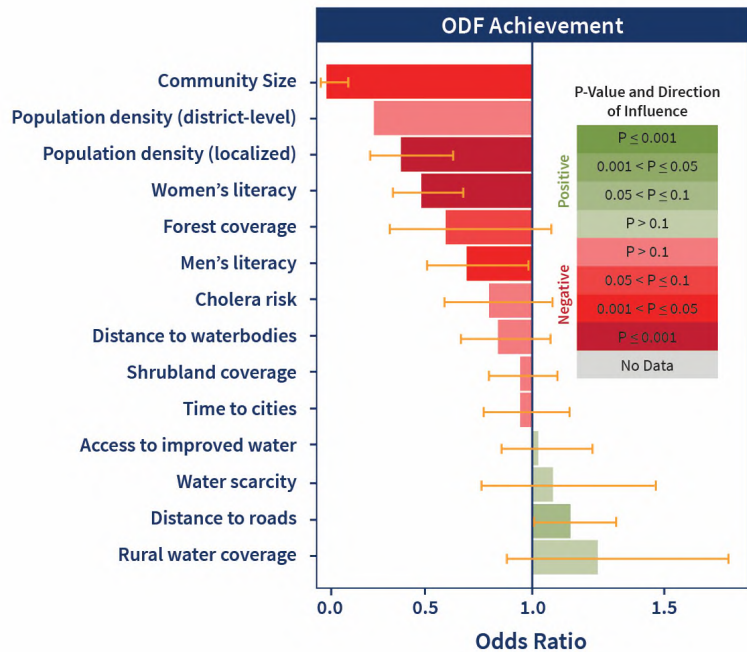


Figure 2. Outputs of logistic regression models in terms of odds ratios (OR). Each bar represents the output of a specific multivariate model, derived for the contextual factor of interest (rows). Results are displayed as Odds Ratios (length of the bar), p-values (shade, darker=more significant, lighter=less significant), and direction of impact (color, green=positive, red=negative), and 95% confidence intervals (in gold). Confidence intervals for area-wide population density exceeded the plot boundaries and were removed for clarity (0.03-2.93).

context was communities with less than 280 people per square kilometer (57% ODF achievement), followed by moderately dense communities with 280-1100 people per square kilometer (32% ODF achievement) (Figure 3).

Communities with lower literacy were more favorable for ODF achievement (Figure 2)

For example, communities with less than approximately 57% literacy among women and less than approximately 35% literacy among men had substantially higher ODF achievement than those with higher literacy levels (Figure 3). Communities with even lower literacy rates (<40% among women and <27% among men) achieved ODF even more frequently, approximately two-thirds of cases (Figure 3). Combined with the rest of our results, this finding is consistent with prior research in Ghana, which has reported that remote, poorer areas (i.e., less educated areas) were more receptive to the CLTS approach, potentially because they had received fewer WASH programs in the past.^{14,15}

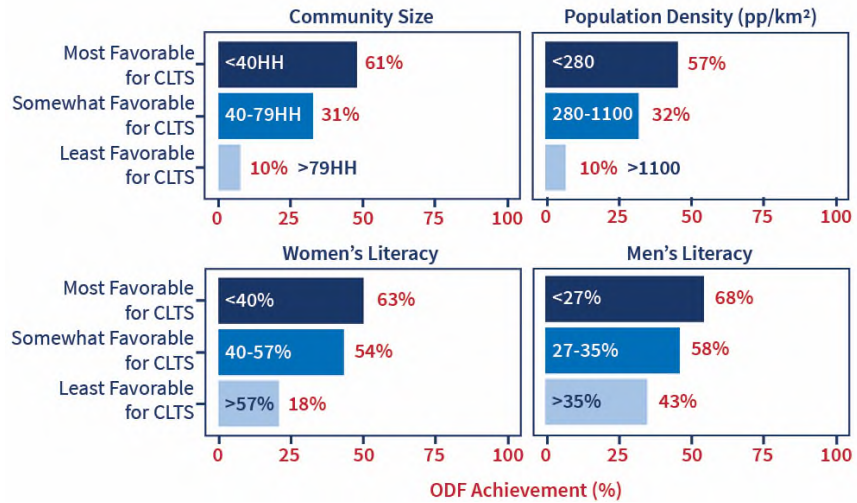


Figure 3. Favorability regimes for ODF achievement. While the split points are the values of the contextual factor corresponding to the largest possible differences in ODF achievement across regimes, they should be interpreted as guidelines rather than strict thresholds.

Achieving a higher probability of ODF achievement by considering multiple factors: Using the three significant contextual factors (community size, population density, and women/men literacy), we identified a type of community with at least 70% probability of ODF achievement: communities with 17-40 households, less than 57% women literacy, and less than 130 people per square kilometer achieved ODF in 72% of cases, which is substantially more than the overall program (49%). Targeting communities with a higher probability of success could help improve the cost-effectiveness of CLTS programs.

Data limitations may have affected our results. Specifically, we excluded 3,000 communities from this analysis because we did not have their GPS coordinates and could not identify their contextual characteristics (a process that required matching a community location with publicly-available spatial datasets).

Implications

This study demonstrated that it is possible to gain insights on the contexts most favorable for the CLTS approach by leveraging publicly available, high-resolution datasets on accessibility and socioeconomic factors. While extensive literature has documented how the quality of CLTS implementation can improve outcomes,^{10,16} our results indicate that implementers should equally focus on targeting geographic areas most suitable for the approach. CLTS programs in Ghana perform better in smaller communities with lower literacy levels and/or lower population density. CLTS implementers would thus benefit from recognizing these influences and incorporating them into their planning.

The determinants of CLTS performance in Ghana differed from other countries. For example, in Cambodia, ODF achievement was higher in areas with high literacy and high accessibility.¹ This divergence suggests that cultural preferences and co-existing sanitation interventions can affect the “performance envelope” of CLTS. In locations like rural Ghana where rudimentary pit latrines made with wood and mud are still widely accepted, remote areas with low economic status are actually more receptive to CLTS due to stronger social cohesion and fewer prior experiences with sanitation subsidies. In contrast, in locations like Cambodia, intensive sanitation marketing interventions have popularized pour-flush toilets made with durable construction materials such as concrete and ceramic.¹⁷ In these areas, rural sanitation programs, including CLTS, are more successful in accessible areas with higher economic status.¹ Implementers should examine the data at their disposal (through their own data collection or public datasets) to understand the determinants of CLTS performance in their specific program areas and identify favorable and unfavorable areas for this approach.

We do not suggest that implementers should avoid difficult areas altogether. In fact, the gradual shift to area-wide programming will require that Ghanaian implementers address all communities within a given jurisdiction. Implementers

can leverage information on favorability to strategically prioritize timing of implementation and evaluate if CLTS should be combined with, or replaced by, other approaches. These types of data-informed decisions could help improve the cost-effectiveness of CLTS interventions.

Finally, we encourage implementers to more systematically collect GPS coordinates of program communities, and continue to collect M&E data post-ODF to further investigate the drivers of ODF sustainability.

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Contacts

Morris Israel	Jesse Shapiro
Project Director	Environmental Health Team Lead
USAID/WASHPaLS	United States Agency for International Development
morris.israel@WASHPaLS.org	jeshapiro@usaid.gov

About USAID/WASHPaLS

The USAID Water, Sanitation and Hygiene Partnerships and Learning for Sustainability Project (USAID/WASHPaLS) is a five-year task order funded by the Bureau for Global Health that identifies and shares best practices for achieving sustainability, scale, and impact of evidence-based environmental health and WASH interventions. Through extensive desk reviews, key informant interviews, and field-based implementation research, USAID/WASHPaLS works with implementing partners to broaden the evidence base on the use and effectiveness of sanitation interventions, including Community-Led Total Sanitation (CLTS), market-based sanitation (MBS), and hygienic environments for infants and young children. For further information about this and other aspects of the project, as well as to access our knowledge products, please visit globalwaters.org/washpals.