



**USAID**  
FROM THE AMERICAN PEOPLE

# RESEARCH ON THE IMPACT OF TARGETED SUBSIDIES WITHIN OPEN DEFECATION FREE (ODF) COMMUNITIES

## INCEPTION REPORT



Tetra Tech

**JANUARY 2019**

This document was produced for review by the United States Agency for International Development. It was prepared by The Aquaya Institute under subcontract to Tetra Tech.

# RESEARCH ON THE IMPACT OF TARGETED SUBSIDIES WITHIN OPEN DEFECATION FREE (ODF) COMMUNITIES

Inception Report

JANUARY 2019

## **DISCLAIMER**

The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

# TABLE OF CONTENTS

<b>TABLE OF CONTENTS</b> .....	<b>I</b>
<b>ACRONYM LIST</b> .....	<b>II</b>
<b>1.0 MOTIVATION AND OBJECTIVES</b> .....	<b>I</b>
1.1 THE CASE FOR COMBINING CLTS AND TARGETED SUBSIDIES.....	1
1.2 RESEARCH QUESTIONS.....	3
<b>2.0 LITERATURE REVIEW</b> .....	<b>4</b>
2.1 EXISTING EVIDENCE ON SUBSIDIES IN RURAL SANITATION .....	4
2.2 SECTOR RECOMMENDATIONS FOR FINANCIAL SUPPORT IN CLTS.....	5
2.3 SUBSIDY TYPE .....	6
2.4 PRO-POOR TARGETING METHOD.....	8
2.5 SUBSIDY COVERAGE .....	11
2.6 TIMING OF DISCLOSURE.....	11
2.7 SUBSIDY AMOUNT .....	12
<b>3.0 STUDY COUNTRY: GHANA</b> .....	<b>14</b>
3.1 RATIONALE FOR SELECTING GHANA.....	14
3.2 LEAP: NATIONAL POVERTY IDENTIFICATION TOOL .....	15
3.3 UNICEF’S PROGRAM.....	15
a) Social Fund pilot.....	15
b) Social Fund scale-up.....	16
c) SanMark program .....	18
d) Revolving Fund for household loans .....	18
3.4 FINDINGS FROM FORMATIVE HOUSEHOLD SURVEY.....	18
3.5 COMMUNITY WATER AND SANITATION AGENCY (CWSA) .....	20
<b>4.0 STUDY PROTOCOL</b> .....	<b>22</b>
4.1 STUDY LOCATIONS .....	22
4.2 STUDY DESIGN .....	22
4.3 SUBSIDY ELIGIBILITY CRITERIA .....	23
4.4 SUBSIDY IMPLEMENTATION PROTOCOL.....	24
4.5 OUTCOME METRICS AND DATA COLLECTION.....	26
a) Quantitative data .....	26
b) Qualitative data.....	27
c) Cost data .....	28
4.6 SAMPLE SIZE.....	28
4.7 FIELDWORK MANAGEMENT .....	29
4.8 QA/QC PLAN.....	29
4.9 DATA ANALYSIS .....	30
4.10 RISKS	30
<b>5.0 ENGAGEMENT, LEARNING, AND DISSEMINATION</b> .....	<b>31</b>
1. DISSEMINATION STRATEGY .....	31
2. RESEARCH ON CWSA’S INTERVENTION.....	32
3. LEARNING FORUM.....	32
<b>6.0 TENTATIVE TIMELINE</b> .....	<b>34</b>
<b>7.0 REFERENCES</b> .....	<b>36</b>

# ACRONYM LIST

ACF	Action Contre la Faim (Action against Hunger)
BPL	Below Poverty Line
CLTS	Community-Led Total Sanitation
CHOBA	Community Hygiene Output-Based Aid
cRCT	Cluster Randomized Controlled Trial
CRS	Catholic Relief Services
CTV	Community Technical Volunteers
CWSA	Community Water and Sanitation Agency
GPS	Global Positioning System
GSF	Global Sanitation Fund
iDE	International Development Enterprise
IMC	International Medical Corps
ITT	Intention To Treat
JMP	Joint Monitoring Programme
LEAP	Livelihood Empowerment Against Poverty
MBS	Market-Based Sanitation
MOU	Memorandum Of Understanding
NLLAP	National Level Learning Alliance Platform
OD	Open Defecation
ODF	Open Defecation Free
PHAST	Participatory Hygiene and Sanitation Transformation
PP	Percentage Points
QA/QC	Quality Assurance/Quality Control
RBP	Results Based Payment
RCT	Randomized Controlled Trial
RICCS	Regional Intra-Coordination Committee
SanMark	Sanitation Marketing
TSC	Total Sanitation Campaign
UNC	University of North Carolina
UNICEF	United Nations International Children's Emergency Fund
USAID	United States Agency for International Development
USD	United States Dollar
WASH	Water, Sanitation and Hygiene
WASHPaLS	Water, Sanitation, and Hygiene Partnerships and Learning for Sustainability

# 1.0 MOTIVATION AND OBJECTIVES

## 1.1 THE CASE FOR COMBINING CLTS AND TARGETED SUBSIDIES

**There is growing evidence that the poor do not benefit equally from Community-Led Total Sanitation (CLTS) programs**, as indicated by the fact that they tend to construct lower-quality latrines (House et al., 2017; Mukherjee, 2011; Singh and Balfour, 2015) and are more likely to revert back to open defecation (Crocker et al., 2017a; Kullmann et al., 2011; Odagiri et al., 2017; Robinson and Gnilo, 2016a; USAID, 2017). Additionally, there are reports that the poor may face disproportionate social pressures to build latrines (Bartram et al., 2012), leading them to sell assets or go into debt to do so (House et al., 2017). Beyond the ethical concerns that such inequity raises, it also creates a potential public health problem: as reductions in enteric diseases and growth faltering from sanitation improvements may well be driven by herd protection (Fuller et al., 2016; Fuller and Eisenberg, 2016; Harris et al., 2017; Jung et al., 2017a, 2017b), allowing the poorest fraction to revert back to open defecation (OD) can limit health benefits for the entire community.

**Combining targeted subsidies and CLTS is not straightforward because CLTS is at its core a no-subsidy approach** (Kar and Chambers, 2008). In fact, CLTS was conceived as an alternative to top-down hardware subsidy programs that had generally failed to change sanitation behaviors in rural areas of Africa and South-East Asia. By contrast, CLTS is based on the premise that behavior change must come from *within* a community through psycho-social mechanisms and collective action. There are therefore widespread concerns that *external* financial support, by creating expectations, will deter self-help. These concerns are justified at least in part, as CLTS has been found to be more effective in areas with no prior history of WASH subsidies (Crocker et al., 2016; Harvey, 2011; Sah and Negussie, 2009; Venkataramanan, 2016).

**In recognition of equity concerns, the sanitation sector's aversion to subsidies may be easing, and several CLTS programs in East and South Asia have explored targeted subsidies** (Table 1). Vernon and Bongartz (2016) write that while subsidies have long been a source of controversy within the CLTS community, "it is becoming increasingly evident that the poorest and most marginalized people will not necessarily be able to access sustained improved sanitation and climb the sanitation ladder without some form of external assistance." Robinson and Gnilo (2016b) have observed that attaining open defecation free (ODF) communities often is linked to some form of pro-poor support – financial or in-kind.

**Robust evidence on the impact of targeted subsidies on CLTS outcomes is still limited.** One randomized controlled trial (RCT) in Bangladesh demonstrated the benefits of adding a targeted subsidy to a CLTS program, in this case discount vouchers (Guiteras et al., 2015). A second RCT in Lao is testing the effect of a different type of targeted subsidy (household rebates) on CLTS outcomes (see Section 2.1 and Table 2). Additional evidence on targeted subsidies comes from Market-Based Sanitation (MBS), an approach that seeks to strengthen the provision of sanitation goods and services through the private sector. Studies of three MBS programs in Southeast Asia (Table 3) have shown that different types of targeted subsidies (discount vouchers, household rebates, results-based payments) can increase access to improved sanitation among the very poor. However, *no study on targeted subsidies for toilets has been conducted in Africa.*

**Table 1. Prior programs combining CLTS with targeted subsidies**

Country	Program	Type of targeted subsidy	Reported outcomes	References
Bangladesh	Dishari (Gov. and NGOs)	Upfront donation of construction materials (corresponding to 42% of total costs) to the 7% poorest households, identified through a community participatory process (with eligibility and exclusion criteria) + financial reward to ODF sub-districts.	70% increase in latrine coverage, mostly sustained. High leverage ratio <sup>(2)</sup> (2.3)	Trémolet et al., 2010
Bangladesh	BRAC	Vouchers to poor households covering part of the material costs to build a latrine.	Not available	Robinson and Gnilo, 2016a
Cambodia	SNV	Discount vouchers (with supplier results-based payment) for pour-flush latrine targeted at IDPoor <sup>(1)</sup> 1 (71% subsidy) and IDPoor 2 (57% subsidy) households. The subsidy is introduced when 80% of the village is ODF (but village chiefs know from the start).	38% of eligible households redeemed the voucher. High leverage ratio <sup>(2)</sup> (6-7).	ISF and SNV, 2017; Myers and Gnilo, 2017
Cambodia	Plan	Upfront cash transfer (through microfinance institution) to IDPoor 1 and 2 households who have dug a pit and committed to applying behavior change messages. The cash transfer is supposed to cover material costs, corresponding to ~50% of construction costs.	61% of targeted households have built latrines	Myers and Gnilo, 2017
Ghana	Global Communities	Full sub-structure subsidy (direct provision of Digni-Loo) for the most vulnerable households in ODF communities, designated through community consultation.	Not available	WASHPaLS formative research report, 2018 (Unpublished)
Ghana	UNICEF	Full sub-structure subsidy (voucher with supplier results-based payment) for poorest households in flood-prone areas. Households were identified through the national Livelihood Empowerment Against Poverty (LEAP) program and community consultation.	Not available	WASHPaLS Ghana scoping trip report, 2018 (Unpublished)
India (Maharashtra)	TSC <sup>(3)</sup> (Gov. of India)	22% rebate to “below poverty line” (BPL) households after the village is ODF. ODF villages also received a financial reward to be spent on sanitation.	38% increase in coverage, though with some slippage. Very high leverage ratio <sup>(2)</sup> (10.3)	Trémolet et al., 2010
India (Orissa)	TSC <sup>(3)</sup> (Gov. of India)	85% upfront discount on latrines for BPL households.	29% increase in latrine coverage (34% for BPL households)	Pattanayak et al., 2009

Nepal	GSF <sup>(4)</sup> /Gov. of Nepal	Ultra-poor households are eligible for a local government subsidy when 90% of a community is ODF. Beneficiary households are identified by village committees and local government.	Not available	House et al., 2017
Philippines	PHAST <sup>(5)</sup> (UNICEF)	The phased approach can include subsidies, financial incentives, or community rewards. For example, ACF <sup>(6)</sup> uses vouchers, IMC <sup>(7)</sup> uses post-ODF targeted subsidies, Samaritan Purse uses post-ODF microfinance and vouchers.	Not available	Robinson and Gnilo, 2016b
Timor-Leste	WaterAid	Discount vouchers of 9.5 USD for sanitation products such as toilet pans to poor households identified through a proxy means test followed by a community meeting. Only ODF villages were eligible. Vouchers could be redeemed if the beneficiary spent at least 6 USD in sanitation products.	76% redemption rate. 94% had started installing 2 months later. Spillover effects were noted on non-beneficiaries.	WaterAid, 2017

<sup>(1)</sup> ID Poor is the Government of Cambodia's poverty screening system, which identifies poor (IDPoor 2) and extremely poor (IDPoor 1) households.

<sup>(2)</sup> The leverage ratio is the amount invested by beneficiary household divided by the subsidy amount.

<sup>(3)</sup> Total Sanitation Campaign

<sup>(4)</sup> Global Sanitation Fund

<sup>(5)</sup> Participatory Hygiene and Sanitation Transformation

<sup>(6)</sup> ACF: Action Contre la Faim (Action Against Hunger)

<sup>(7)</sup> IMC: International Medical Corps

## 1.2 RESEARCH QUESTIONS

USAID's Water, Sanitation, and Hygiene Partnerships and Learning for Sustainability (USAID/WASHPaLS) project is undertaking research to investigate whether targeted subsidies are an effective way to help sustain the gains achieved by CLTS. Specifically, we aim to answer the following three research questions:

1. To what extent do targeted subsidies within ODF communities result in sustained latrine coverage, quality, and use among the most vulnerable households?
2. To what extent do these benefits spill over to the rest of the community?
3. What are the costs and challenges of implementing a post-ODF targeted subsidy program?

Our hypothesis for the first question is that targeted sanitation subsidies in ODF communities will increase and help sustain latrine coverage, quality, and use amongst the targeted households.

Our hypothesis for the second question is that increased latrine coverage, quality, and use among targeted households encourage the rest of the community to make similar improvements.

## 2.0 LITERATURE REVIEW

### 2.1 EXISTING EVIDENCE ON SUBSIDIES IN RURAL SANITATION

Based on our global literature review, *An Examination of CLTS's Contributions toward Universal Sanitation* (USAID, 2018a), there are two RCTs investigating the effect of adding a targeted subsidy to a CLTS intervention: the first one took place in Bangladesh in 2011-2013; the second is ongoing in Lao (Table 2).

The Bangladesh RCT tested the impact of offering 75% discount vouchers to households in the bottom 75% of the wealth distribution (Table 2). Compared to CLTS-only villages, the targeted subsidy increased overall latrine coverage village-wide by 9.4 percentage points (pp) and hygienic<sup>1</sup> latrine coverage by 12.4 pp, while decreasing open defecation by 6.9 pp. The increase in latrine *ownership* was 4.8 pp higher than the increase in latrine *access*, indicating that the subsidy also moved households who were previously sharing sanitation facilities into individual ownership. Most notably, the subsidy produced positive spillover effects: i) subsidy beneficiaries were more likely to use their voucher to build a latrine when the subsidy coverage was high (i.e., targeting more than 50% of the poor, i.e., over 37% of the population), and ii) non-beneficiaries were also more likely to build a latrine when subsidy coverage was high in the village (Guiteras et al., 2015).

The Lao RCT, co-funded by USAID/WASHPaLS, is testing the impact of offering rebates to vulnerable households as part of an integrated program of CLTS and market-based measures. The study began in 2016 and preliminary findings were presented at the 2018 UNC Water and Health Conference; full experimental results are expected to be published in 2019.

**Table 2. Subsidy characteristics in the two CLTS + subsidy RCTs**

Country	Subsidy type	Targeting method	Subsidy amount	Timing
Bangladesh (Guiteras et al., 2015)	Voucher for any of three latrine models	Random selection of 25%, 50%, or 75% of households amongst the 75% poorest (based on landholdings).	16-36 USD, corresponding to 75% of hardware costs (~50% of total costs when including installation)	Lottery conducted during CLTS triggering
Lao (ongoing East Meets West/ Thrive trial)	Rebate if latrine is built, used, and has handwashing station*	The poorest 30% of households are identified through a score card (proxy-means test)	20 USD, corresponding to 25-35% of hardware costs	Concept is introduced at the end of the CLTS triggering event

\* Field-level CLTS facilitators (village motivators, district/province staff) also get a 2-3 USD reward for each eligible household who has built a latrine

Research on targeted sanitation subsidies combined with MBS programs provides additional evidence on the benefits of using targeted subsidies in rural sanitation programs. The results of three studies in Southeast Asia using discount vouchers, results-based payments, and household rebates, respectively, are summarized in Table 3.

<sup>1</sup> “hygienic” = intact slab, sealed pit, and intact water seal



**Table 3. Evidence from studies of targeted sanitation subsidies in MBS programs**

Country	Targeting method	Subsidy type	Results	References
Cambodia (iDE)	IDPoor households (categories 1 and 2) (~40% poorest)	45% and 22% discount voucher (for EZ latrine) to IDPoor 1 and 2, respectively*	Toilet sales to IDPoor households multiplied 5x, leading to a 14.3 pp increase in latrine coverage for this population. There were no significant changes for the non-poor. Overall, costs per latrine built were lower due to decreased requirements for sales and marketing.	Nicoletti et al., 2017
Cambodia (East Meets West/Thrive)	IDPoor households (~40% poorest)	Household discount combined with results-based payments to suppliers: eligible households received an upfront 33% discount and the supplier was only compensated if the latrine was installed**	The subsidy program increased latrine coverage by 21 pp for the poorest (and by 10 pp overall), with no negative spill-over detected.	Rivera et al., 2016
Vietnam (East Meets West/Thrive)	Poor, Near-Poor and Economic Hardship households (government categories, corresponding to the (~40% poorest)	20 USD (9%) rebate to poor households that built a hygienic latrine within 6-9 months***	The program increased private septic tank ownership by 17 pp among the two lowest income quintiles.	Nguyen et al., 2016

\* In addition, all households (poor and non-poor) could take out microloans

\*\* In addition, village promoters received a 2 USD reward for every IDPoor household building a latrine

\*\*\* In addition, local governments received conditional cash transfers for community-wide sanitation coverage improvements

## 2.2 SECTOR RECOMMENDATIONS FOR FINANCIAL SUPPORT IN CLTS

With the increasing interest in support to the poor, practitioners in the rural sanitation sector has formulated several recommendations on how to design and implement targeted subsidies.

First, Myers and Gnilo (2017) point out that **building in equity and inclusiveness in CLTS requires more than financial support**: it necessitates modifying several aspects of the CLTS process to include a deliberate focus on the poor. For example, the authors recommend engaging with very poor households during the pre-triggering phase to make sure that they attend the triggering event, to provide toilet options for the poorest, and to do more intense follow-ups with the most vulnerable households. The implementation of the subsidy itself should include specific steps to ensure that the most vulnerable can benefit; for example, implementers in Timor-Leste and Cambodia have recommended long voucher redemption periods (as the very poor may need more time to make

financial investment decisions), support in prioritizing household expenses (as the very poor have many competing priorities), and household visits during the targeting process (as some marginalized households may not attend community meetings) (ISF and SNV, 2017; WaterAid, 2017).

Second, several authors caution that **a subsidy program is only useful if it can be scaled up and sustained with public funds** (Myers and Gnilo, 2017; Trémolet et al., 2010; USAID, 2018b).

Therefore, attention should be given to scalability when selecting the subsidy type, coverage, amount, and the targeting method, as discussed in the following sections.

Finally, practitioners argue that **targeted subsidies should be designed so as not to interfere with the CLTS process itself**, out of concern that even a targeted subsidy may undermine collective action by creating expectations, causing broader community resentment, and/or disengaging non-targeted households. These risks should be considered when designing subsidy programs, particularly the subsidy type, targeting method, and timing.

### 2.3 SUBSIDY TYPE

Historically, sanitation subsidies referred to the *direct provision* of latrines or construction materials to low-income communities. This supply-driven approach has failed to produce long-lasting impacts because it did not generate demand for sanitation, and it was not sustainable or replicable at scale (Jenkins and Sugden, 2006). Therefore, this study does not focus on direct-provision subsidies, but rather on “smart” subsidies that are both designed to respond to consumer demand and targeted at the most-in-need households.

At least five types of targeted subsidies have been employed in rural sanitation programs:

- A. **Discount voucher** to purchase a specific product available in the market (e.g., WaterAid in Timor-Leste and iDE in Cambodia; Tables 1 and 3)
- B. **Discount voucher with supplier results-based payment (“Voucher+RBP”)** where households pay a discounted price to suppliers, and suppliers are only reimbursed after toilet construction has been verified (e.g., SNV and CHOPA in Cambodia, Tables 1 and 3)
- C. **Cash rebate to the household** after toilet construction has been verified (TSC in Maharashtra and East Meets West in Lao and Vietnam, Tables 1-3)
- D. **Upfront cash transfer** to the household (e.g., Plan in Cambodia; Table 1)
- E. **Subsidized microloan** through a microfinance institution, whereby households can take a sanitation loan with preferential terms.

Subsidy types A, B, and C are considered for this research and discussed in more detail below. We have ruled out upfront cash transfers and microloans for several reasons. Microloans usually exclude the very poor (Lestikow, 2017; Myers and Gnilo, 2017; Trémolet et al., 2010). Robinson and Gnilo (2016a) write that “few previous microfinance programs for sanitation have successfully reached the poorest.” They also are complex to implement and manage. Meanwhile, upfront cash subsidies present more risk of diversion (Abdi, 2016; Myers and Gnilo, 2017; USAID, 2018b) compared to demand-driven approaches (vouchers and rebates), and are typically implemented in emergency response and recovery situations.

The subsidy type should be selected based on feasibility, but also based on the primary bottlenecks preventing the very poor from acquiring a latrine (Myers and Gnilo, 2017). Table 4 presents the logistical considerations associated with each of these types of subsidies, as well as advantages and limitations of each.

**Table 4. Description of three demand-driven subsidy types**

	<b>A. Discount vouchers</b>	<b>B. Discount voucher with supplier results-based payment (“voucher + RBP”)</b>	<b>C. Cash rebate to the household (“household rebate”)</b>
Description	Eligible households receive a voucher for redemption at specific retailers, providing a discount on a toilet product (e.g., latrine slab) or construction materials (e.g., cement bag).	Same as the voucher, except that the retailer is only reimbursed after construction of a latrine meeting criteria has been verified.	Eligible households receive a rebate (partial or full) upon construction of a latrine meeting criteria.
Logistics	Multiple retailers are enrolled and stocked with the subsidized product(s). When a voucher is redeemed, the retailer is reimbursed for the difference between the market price and the voucher price.	This approach combines the logistical requirements of administering vouchers and rebates (because household-level verification is needed before disbursing the RBP).	Latrine eligibility criteria must be clearly disseminated. In addition, this approach requires a household-level verification cycle (or several, as different households may build at different times).
Advantages	<ul style="list-style-type: none"> <li>- The subsidy is upfront, so the household doesn't have to advance (all) the costs.</li> <li>- This approach doesn't require a household-level verification cycle</li> </ul>	<ul style="list-style-type: none"> <li>- Households don't have to advance all the costs.</li> <li>- This approach guarantees that subsidized latrines are built.</li> <li>- Retailers bear the financial risks, and are, thereby, incentivized to verify the eligibility of households and to ensure that latrines are built, e.g., by bundling installation services.</li> </ul>	<ul style="list-style-type: none"> <li>- This approach guarantees that subsidized latrines are built.</li> <li>- It does not require management of retail stocks.</li> </ul>
Limitations	<ul style="list-style-type: none"> <li>- There are risks of subsidy “leakage” if the retailers cannot confirm household eligibility.</li> <li>- There is no guarantee that the household will build a latrine</li> </ul>	Retailers may not be willing or able to bear the financial risk.	The household advances all the costs, which can disadvantage the poor.*

\* This limitation of household rebate programs has been observed in Bihar, India (USAID, 2018b) and in Vietnam (Jenkins et al., 2011)

Any targeted subsidy program should be driven by local government to ensure legitimacy and a pathway to scale. For example, East Meets West/Thrive recommends involving local government in the verification process, both to bestow legitimacy on the intervention as well as to think ahead to program scale-up (conversation with East Meets West Lao in Oct 2018). This may involve financial incentives to local government staff involved in the verification.

Whatever the subsidy type (voucher or rebate), Robinson and Gnilo (2016a) emphasized the importance of *providing choice* to households, in terms of toilet options, toilet location, product suppliers, and/or installation timing, hypothesizing that choice will improve feelings of ownership and increase the likelihood of sustained behavior change.

### **Community rewards**

In addition to the household-level subsidy options presented above, several rural sanitation programs have offered financial rewards to communities achieving ODF status (see the Bangladesh and Maharashtra examples in Table 1), with mixed results (Myers and Gnilo, 2017). Myers and Gnilo (2017) proposed that where community rewards are successful, prestige, rather than the financial value of the reward, may be the primary driver for change. In any case, community rewards are consistent with the CLTS emphasis on collective action and are recommended by Robinson and Gnilo (2016a). However, no study to our knowledge has investigated whether community-reward programs foster a social stigma against households who cannot install latrines.

The ongoing East Meets West/Thrive trial in Lao (Table 2) is testing the individual and combined effects of household subsidies and community rewards in a CLTS program, as does a third-party evaluation of East Meets West's CHOPA program in Vietnam (Nguyen et al., 2016), in which communities received awards for commune-wide sanitation coverage increases.

## **2.4 PRO-POOR TARGETING METHOD**

There are several established methods to identify poor households (Table 5). The simplest methods are categorical, geographic, and self-selection targeting. **Categorical targeting** identifies households based on simple characteristics, such as having a single-parent or a disabled member. This method is easy to implement but only is effective if the characteristics chosen are good proxies for poverty (Dershem et al., 2013). **Geographic targeting** identifies entire areas that are deemed poorer than average. This method is straightforward to execute but may overlook disparities in poverty within the targeted geography. **Self-selection** identifies specific population segments based on their abilities to pay for a product or service. Typically, the approach provides a subsidy for a lower-cost product that would only appeal to the poorest households who cannot afford another option (Trémolet et al., 2010). This method does not require prior household information, but its effectiveness can be limited.

Community-based targeting and means-tested targeting are more complex. **Community-based (or participatory) targeting** relies on the input of community members to identify the poorest households (Trémolet et al., 2010). Some forms of this method provide the community with a list of inclusion/exclusion criteria; others request that the community generates its own wealth rankings; and others still rely on the use of maps and cards to sort households into wealth categories (Hargreaves et al., 2007; Trémolet et al., 2010). Community-based targeting is generally thought of as reliable because community members have a more nuanced view of poverty levels than outsiders (e.g., they know which households do not receive any external support) and a better sense of short-term versus long-term poverty (Dershem et al., 2013). It is better suited for smaller communities that are more tight-knit and is difficult to apply at scale; it also is susceptible to subversion by influential community members with ulterior motives (Dershem et al., 2013). Finally, this approach makes it challenging to compare poverty levels across communities and may lack external validity (Aryeetey et al., 2010; Dershem et al., 2013).

**Means-tested targeting** relies on household financial information or proxies thereof (Trémolet et al., 2010). There are three types of means-tested targeting, utilizing different types of data. **Verified means-tested targeting** uses specific financial information reported by the household, such as income reported to the Internal Revenue Service in the United States (Bitrán and Muñoz, 2000). Although these are often accurate data sources that enable comparisons among households, they may be difficult to obtain and are often non-existent in developing countries (Aryeetey et al., 2010). **Simple means-tested targeting** uses one indicator (often reported income) to represent household wealth, which is then confirmed qualitatively by observing the dwelling (Bitrán and Muñoz, 2000). Although it is simple to execute, reported data are often inaccurate or, again, non-existent in developing countries (Bitrán and Muñoz, 2000).

**Table 5. Summary of pro-poor targeting methods**

Type	Definition	Pros	Cons	Example
Categorical targeting	Targeting households based on a set of simple characteristics (Dershem et al., 2013).	<ul style="list-style-type: none"> <li>Easily understood (Dershem et al., 2013).</li> <li>Easily determined (people know if they fall into the category) (Dershem et al., 2013)</li> <li>Requires minimal time and resources.</li> </ul>	<ul style="list-style-type: none"> <li>High errors of exclusion and inclusion</li> <li>Category selection could be weakly correlated with poverty (Dershem et al., 2013)</li> </ul>	Targeting single-headed households, the elderly, households with a disabled member, etc.
Geographic targeting	Targeting an entire geographic area known to be poorer than average through national surveys (Trémolet et al., 2010).	<ul style="list-style-type: none"> <li>Easily implemented.</li> <li>Can increase effectiveness of program due to focused area of outreach and coverage (Dershem et al., 2013).</li> </ul>	<ul style="list-style-type: none"> <li>Limits study area and options for reaching poor populations in other areas.</li> <li>Can overlook disparities in poverty within the targeted geography</li> </ul>	<i>Ecuador:</i> A sanitation study was implemented in one geographic area (which was predominantly poor), in which all households could receive a subsidy (Trémolet et al., 2010).
Self-selection	Targeting a specific population segment based on ability to pay, by offering a lower-cost product or service that would only appeal to the poorest households (Trémolet et al., 2010).	<ul style="list-style-type: none"> <li>Easily implemented since it doesn't require collecting household information.</li> </ul>	<ul style="list-style-type: none"> <li>Product or service is often of lower quality (Robinson, 2012).</li> <li>Can exclude households who do not have the means to learn about the program (Dershem et al., 2013).</li> <li>The non-poor can easily engage if they are interested (Dershem et al., 2013).</li> </ul>	<i>Kenya:</i> A sanitation study offered a plastic latrine slab that would only appeal to households unable to purchase slabs perceived as 'fancier' (such as ceramic and concrete) (Ronoh et al., 2018).
Community-based targeting	Targeting a subset of a community based on the input of community members (Dershem et al., 2013).	<ul style="list-style-type: none"> <li>Higher accuracy since community members are familiar with household assets and external support mechanisms (Dershem et al., 2013).</li> <li>Poverty levels within a community are better defined (rather than within a larger geographical area) (Dershem et al., 2013).</li> <li>Can capture both long-term and transitional poverty (Dershem et al., 2013).</li> <li>Requires minimal resources (Souares et al., 2010).</li> </ul>	<ul style="list-style-type: none"> <li>Indifference or conflict can inhibit the process (Dershem et al., 2013).</li> <li>Influential leaders can jeopardize the process to their own interest (Dershem et al., 2013).</li> <li>Requires a small, close-knit community for accuracy (Dershem et al., 2013; Souares et al., 2010).</li> <li>Can be time-consuming (Dershem et al., 2013)</li> <li>Hard to compare across communities (Aryeetey et al., 2010).</li> <li>Possible reinforcement of social stigma towards the poorest</li> <li>Difficult to scale.</li> </ul>	<p><i>Bangladesh:</i> Village members prepared lists of households in extreme poverty (Trémolet et al., 2010).</p> <p><i>South Africa:</i> Community members drew maps of households, then categorized households into 'very poor', 'poor, but a bit better off', and 'doing OK' (Hargreaves et al., 2007).</p> <p><i>Ghana:</i> Community groups created five wealth categories (represented by different colors), with indicators for each. Group members placed households into each color category (Aryeetey et al., 2010).</p>

Type	Definition	Pros	Cons	Example
Means-tested targeting	Targeting a specific population segment based on wealth-related household characteristics (Trémolet et al., 2010).			
Means-tested targeting: <i>verified</i>	Targeting a specific population segment based on a verifiable income (Bitrán and Muñoz, 2000).	<ul style="list-style-type: none"> <li>• Relatively accurate as a verified absolute measure that can be compared to the poverty line in a national census</li> </ul>	<ul style="list-style-type: none"> <li>• Data often doesn't exist in developing countries.</li> <li>• Expensive to execute (Aryeetey et al., 2010).</li> <li>• Difficult to administer (Aryeetey et al., 2010).</li> </ul>	<i>United States:</i> Medicaid targets poorer households using reported income (Bitrán and Muñoz, 2000).
Means-tested targeting: <i>simple</i>	Targeting a specific population segment based on a reported household indicator, sometimes with qualitative confirmation (Bitrán and Muñoz, 2000).	<ul style="list-style-type: none"> <li>• Simple to execute (Bitrán and Muñoz, 2000).</li> </ul>	<ul style="list-style-type: none"> <li>• Reported indicator data are often not available in developing countries.</li> <li>• Low levels of accuracy (Bitrán and Muñoz, 2000)</li> </ul>	<i>Thailand:</i> Health services were provided based on reported household income; doctors would visually verify with patient appearance (Bitrán and Muñoz, 2000).
Means-tested targeting: <i>proxy</i>	Targeting a specific population segment by calculating a poverty score based on a set of household characteristics as proxy indicators of wealth (Bitrán and Muñoz, 2000).	<ul style="list-style-type: none"> <li>• Data can be observed and verified (Dershem et al., 2013).</li> <li>• Data is objective and uniformly calculated (Bitrán and Muñoz, 2000).</li> <li>• Considers permanent income rather than seasonal income (Bitrán and Muñoz, 2000).</li> </ul>	<ul style="list-style-type: none"> <li>• Can be expensive to implement (Trémolet et al., 2010).</li> <li>• Time-consuming and thus hard to capture households moving in and out of poverty (Trémolet et al., 2010).</li> <li>• Hard to detect unique household situations (Bitrán and Muñoz, 2000).</li> </ul>	<p><i>Cambodia:</i> Surveys used to ask each household 10 questions related to assets, land, housing conditions, income source, etc. to calculate and assign a poverty score (Trémolet et al., 2010).</p> <p><i>Kazakhstan:</i> Conditional Cash Transfer program relies on 52 variables to assign a poverty score (Dershem et al., 2013).</p> <p><i>Uganda:</i> Quick Poverty Score uses 10 questions related to housing conditions, fuel, lighting, sanitation, and assets to determine a poverty score (USAID, 2008).</p>
Mixed Approach	Combine two or more of the targeting approaches.	<ul style="list-style-type: none"> <li>• Can account for local context or needed study/implementation factors.</li> </ul>	<ul style="list-style-type: none"> <li>• Can require more time to develop and implement (Dershem et al., 2013).</li> </ul>	<i>India:</i> A water supply project used geographic targeting to select poor communities and used means-tested targeting to identify households within the communities using India's 'white ration card' system (Mandri-Perrot, 2008).

**Proxy means-tested targeting** is the most common type in developing countries. It involves calculating a poverty score using a variety of wealth-related indicators (dwelling type, assets, fuel, water access, etc.) (Bitrán and Muñoz, 2000). These indicators are objective and can be quantified through household surveys. However, this approach can be time-consuming and expensive, and it fails to capture households moving in and out of poverty (as well as other circumstances, such as households receiving support from other family members or gendered differences in land/asset ownership) (Bitrán and Muñoz, 2000; Dershem et al., 2013; Trémolet et al., 2010). Several countries use proxy means-testing nationwide to establish standard poverty levels. In Cambodia, the IDPoor system places households into three categories based on their score in a national questionnaire that covers dwelling characteristics, assets, type of income-generating activity, and food availability: Poverty Level 1, Poverty Level 2, and Non-Poor (Kingdom of Cambodia, 2011). In India, the Below Poverty Line (BPL) system uses five indicators (dwelling type, land ownership, household income, farming assets, and consumer assets) to determine if a household was ‘visibly poor’ or ‘visibly non-poor’. In Ghana, the national social welfare program (Livelihood Empowerment Against Poverty (LEAP)) uses a wealth ranking system from a national census to identify eligible households (Republic of Ghana, 2017).

The most appropriate targeting method should be selected based on context, feasibility, and scalability. It also is important to consider whether a **national poverty identification system** (such as IDPoor in Cambodia) exists, and if so, it may be preferable to use it as a starting point to guarantee alignment with established targeting systems (Myers and Gnilo, 2017; Robinson and Gnilo, 2016a).

Finally, **mixed targeting methods** can be developed based on context, such as combining proxy-means tested targeting (whether from a national poverty identification system or from a customized tool) with community consultation to verify and promote community buy-in. In addition, elements of self-selection can be built into any targeting method: Robinson and Gnilo (2016a) recommend subsidizing the least expensive acceptable toilet option to reduce the risk of diversion (or “leakage”) to non-poor households.

## 2.5 SUBSIDY COVERAGE

The coverage of a subsidy is the fraction of the population eligible to receive it. In past programs, it has varied from 7% in the Dishari program in Bangladesh (Table 1) to 40% in the East Meets West/Thrive programs in Cambodia and Vietnam (Table 3) and 19-56% in the RCT in Bangladesh (Table 2). The subsidy coverage should be determined based on context, affordability of latrines to target populations, and scalability by government. It also is important to note that a high coverage may amplify the impact of a subsidy program: positive spillover effects (i.e., increases in latrine coverage amongst non-beneficiaries) have been observed at high subsidy coverage (greater than 37% of community population) (Guiteras et al., 2015).

Not all targeting methods allow controlling the subsidy coverage and consistency across communities. For example, national poverty targeting systems or community-based targeting can yield different proportions of eligible households in each community.

## 2.6 TIMING OF DISCLOSURE

CLTS practitioners have not reached consensus on the best time to disclose the existence of a subsidy to a community. On one hand, disclosing the subsidy too early (e.g., during the triggering event) risks undermining the emergence of community-driven solutions and the commitment to use local resources, which is a key emphasis of CLTS (Myers and Gnilo, 2017). This is why many CLTS programs that include targeted subsidies wait until a community is 100% ODF (or close to it, e.g., 80%) before disclosing the subsidy, including those executed by SNV in Cambodia; by local governments in Nepal; as part of the

PHAST approach in the Philippines; and by WaterAid in Timor-Leste (Table 1). In this scenario, the subsidy can serve to upgrade latrines if eligible households already built one, or to help eligible households build their first latrines in countries where ODF status does not require full latrine coverage. Robinson and Gnilo (2016b) write in favor of this approach.

On the other hand, there also may be disadvantages in disclosing the subsidy too late. Many practitioners are concerned that waiting until ODF status to upgrade latrines may be a “missed opportunity” to move larger numbers of households up the sanitation ladder (USAID, 2018a). In addition, delaying the disclosure can raise an ethical concern: in Nepal, ultra-poor households face unacceptable pressure and sometimes have to go into debt to build latrines, only to learn later that they were eligible for a subsidy (House et al., 2017). A recent report by the Global Sanitation Fund (GSF) strongly questions the late timing of the subsidy disclosure in Nepal (House et al., 2017). Additionally, it is worth noting that introducing a subsidy in an ODF community may lead to neighboring non-ODF communities hearing about it. Therefore, guaranteeing late disclosure is difficult in practice.

## 2.7 SUBSIDY AMOUNT

The subsidy amount should be determined based on the cost of available latrine options and the resources of targeted households. In prior examples, the subsidy amount has varied from 22% to 85% of hardware costs (see Tables 1-3).

It may also be beneficial to **vary the subsidy amount** to derive a demand curve and to identify the subsidy amount with the highest “leverage” (i.e., for which the ratio of household funds spent to subsidy provided is the highest) to facilitate scale-up. However, this approach has limitations:

- It would only provide information on willingness-to-pay among the poor, whereas willingness-to-pay among *the general population* may be more relevant from a market perspective
- It can be difficult to obtain support for varying the subsidy amount due to perceptions regarding increased tensions and inequities.

In summary, **every subsidy characteristic (type, targeting, coverage, timing, and amount) is a strategic decision that can only be made with the implementing partner for a specific context.** Table 6 summarizes what is at stake when making these choices.

**Table 6. Consideration for determining subsidy characteristics**

	<b>Non- interference with collective action</b>	<b>Scalability</b>	<b>Effectiveness</b>	<b>Ethics</b>
Subsidy type	Community rewards may be more consistent with collective action than subsidies to individual households.	Rebates and supplier results-based payment may be more difficult to scale due to the need for verification and local government involvement.	Rebates can fail to reach the poorest if they cannot advance construction costs.	Community rewards may be diverted by leaders and decision makers.
Targeting method	Community-led targeting may be more consistent with collective action than external identification.	Using the national poverty identification program or community-led targeting are	Community-led targeting is likely the most effective at identifying the least-able households.	All targeting methods, and especially community-led targeting, could inadvertently



	<b>Non- interference with collective action</b>	<b>Scalability</b>	<b>Effectiveness</b>	<b>Ethics</b>
		less resource-intensive and easier to scale than developing a proxy means-test.	National poverty identification systems are likely the most inaccurate.	reinforce social stigma towards marginalized households.
Subsidy coverage		A subsidy program is only useful if it can be sustained with public funds.	A high subsidy coverage can yield positive spillovers.	
Timing of disclosure	Disclosing the subsidy early (e.g., during triggering) risks undermining pro-active action in the community.		Providing late-stage subsidies (e.g., after ODF) can result in a missed opportunity, if eligible households have built a sub-standard latrine.	Late-stage subsidy can lead to unacceptable amounts of pressure on the most disadvantaged who may face community sanctions
Subsidy amount	Amount will likely correlate with interest among market segments	Optimally, subsidy programs can be sustained with public funds.	The amount should be determined with consideration to the resources of targeted households.	To ensure full coverage, it may be appropriate to have different subsidy levels for different categories of poverty.

## 3.0 STUDY COUNTRY: GHANA

### 3.1 RATIONALE FOR SELECTING GHANA

We investigated partnership opportunities with CLTS implementing organizations in three African countries: Ghana (Global Communities and UNICEF), Senegal (USAID/CRS), and Malawi (GSF/Plan). Global Communities in Ghana and GSF/Plan in Malawi did not have sufficient funding for further CLTS implementation at the time we approached them. USAID/CRS in Senegal did not express interest in the study. Meanwhile, results from two scoping visits revealed that Ghana met all our selection criteria, with UNICEF as a promising research partner (Table 7). We thus selected Ghana, and specifically a partnership with UNICEF, for this study and signed a Memorandum of Understanding (MOU) with UNICEF Ghana on October 5, 2018.

**Table 7. Country selection criteria and corresponding information on Ghana**

Country selection criteria	Information on Ghana
1. CLTS has experienced large-scale success.	Since the introduction of CLTS in Ghana in 2006, over 3,500 communities have been triggered. Although ODF conversion rates were very low (<10%) until 2016, CLTS in Ghana is now showing promising results with at least 1300 ODF communities, especially since Global Communities started its program (2015) and UNICEF revised its implementation approach (2016). In general, CLTS is recognized to be more successful in the Northern region (which has a poorer population, fewer prior WASH programs, and reported highly motivated district staff).
2. There are concerns regarding the quality and sustainability of latrines, especially for the poorest.	UNICEF has anecdotal evidence of latrine collapse and slippage in ODF communities, especially in flood-prone areas. Latrine ownership for the poorest is generally a concern, especially as ODF status only requires 80% latrine coverage in a community.
3. Pro-poor subsidies are permitted by the national sanitation strategy.	In Ghana, the Ministry of Sanitation and Water Resources recently endorsed and launched national guidelines for pro-poor support in CLTS.
4. Implementing partner is willing to engage in experimental research (and to use its own funds for CLTS implementation).	UNICEF is interested in collaborating with WASHPaLS to conduct an RCT in the Northern region. UNICEF has funding to implement a targeted subsidy in ODF communities.
5. There is an opportunity for our study to influence decision-making (i.e., the government, CLTS implementers, and donors are receptive).	Targeted subsidies currently have a lot of traction in Ghana, with all main CLTS implementers (CWSA, UNICEF, Global Communities) planning to implement some form of pro-poor support. The Director of Sanitation at the Ministry of Sanitation and Water Resources and CWSA's Extension Services Coordinator gave verbal support for the study and requested regular updates.

Sections 3.2 through 3.5 present the Ghanaian context in more detail, including information on the national poverty identification tool (LEAP), Community Water and Sanitation Agency (CWSA's) rural sanitation program, UNICEF's rural sanitation program, and findings from our formative research in September-October 2018.

### 3.2 LEAP: NATIONAL POVERTY IDENTIFICATION TOOL

The Livelihood Empowerment Against Poverty (LEAP) program is a social cash transfer program administered by the Government of Ghana since 2008. The program targets households meeting two criteria: i) they should be extremely poor according to a national proxy-means test; and ii) have a vulnerable member (older than 65, person with disability, orphan or “vulnerable”<sup>2</sup> child) (Ministry of Employment and Social Welfare, 2012). LEAP is regarded as an effective poverty targeting tool: the latest evaluation of the LEAP program found that 91% of beneficiaries are under the poverty line, and 67% are under the extreme poverty line (defined as a consumption per adult equivalent of 268 USD and 162 USD per year, respectively) (Ministry of Gender, Children and Social Protection, 2016).

Registering beneficiaries in the LEAP program requires, first, a community consultation to pre-screen households meeting vulnerability criteria, followed by a survey of pre-selected households to conduct a proxy-means test (Ministry of Employment and Social Welfare, 2012). This process is time-intensive and to date not all communities have undergone the LEAP registration process. In some districts the proportion of LEAP-enrolled communities is less than 50% (e.g., in Tatale and Kpandai, two of the prospective study districts). Within enrolled communities, the coverage of LEAP is variable: according to our formative research in the Northern region, it ranges between 5% and 61% of households (33% on average).

Because LEAP does not yet cover all communities in our study region, we cannot use it as our sole tool to identify beneficiaries for the study. However, if our study results are to inform nationally scalable programs, we will need to use selection criteria that align with those of LEAP. Section 4.3 describes how we will use LEAP-consistent criteria for targeting the subsidy.

### 3.3 UNICEF’S PROGRAM

In Ghana, UNICEF has been implementing CLTS through District Assembly staff since 2011. UNICEF’s support covers 50 districts in five regions (out of a total of 216 districts and 10 regions). In collaboration with the Ministry of Sanitation and Water Resources, UNICEF has developed a sanitation-financing framework that includes a “Social Fund”, the aim of which is to provide “poor and vulnerable households with financial and non-financial support to acquire household latrines.” The Social Fund is, in effect, a targeted subsidy and forms the basis of the intervention for this research. UNICEF’s financing framework also includes a revolving loan fund for households and village savings groups, and a revolving loan fund for sanitation entrepreneurs, though these are not the focus of this research.

#### ***a) Social Fund pilot***

Elements of the Social Fund concept were piloted in 2017 in flood-prone areas of the country, where the poorest households were eligible for subsidized latrine sub-structures through a “voucher + supplier results-based payment” program (subsidy type B in section 2.3). The pilot targeted 500 households in 53 ODF communities across 16 Northern districts. A local NGO (ProNet North) was sub-contracted to recruit artisans and manage the funds. For eligible households, the program built flood-proof sub-structures consisting of precast concrete rings for pit lining, elevated slab and ventilation pipe. Beneficiaries did not contribute any cash but were responsible for digging the pit (many received help from family members or neighbors) and for building the superstructure with local materials. ProNet North received payments upon building the sub-structure, but without verifying that the latrine superstructure had been completed. UNICEF disbursed approximately 100 USD per latrine. We

---

<sup>2</sup> A vulnerable child is defined as disabled, or chronically ill, or with a missing parent, or member of a household with a head who is under 18 years old or chronically ill.

conducted case studies in five pilot communities during the formative research. Our main findings are as follows:

❖ Targeting process:

- Where communities drove the selection process, it was understood by everyone and perceived as fair because it was based on inability to build or pay. In contrast, use of LEAP alone led to the perception that selection was somewhat arbitrary and too top-down.
- In other instances, despite consulting with chiefs/elders, some community members did not feel that the selection process had been transparent and fair. To avoid these shortcomings, community engagement during the selection process can be improved by: 1) involving all members (including women), not just chiefs/elders; and 2) giving clear instructions to guide the selection process (e.g., so that they cannot select everyone in the community, which would result in the facilitator using LEAP in a top-down fashion to further narrow-down).
- Many beneficiaries already had latrines, but most of them were not flood-proof (i.e., did not have lined pit or concrete slab).

❖ Construction process:

- District Assembly staff expressed regret that the pilot program had not directly employed trained artisans from the district, but rather an external contractor.
- Beneficiaries received help from the rest of the community to dig the pit and build the superstructure. Receiving such help does not appear to have been a challenge.

❖ Superstructures:

- The majority of superstructures had been completed.
- Superstructures are generally “traditional,” with thatched roof and mud walls, and not very durable (at times less durable than the associated house or the previous latrine)
- Some beneficiaries were expecting external help for the superstructure despite assurances to the contrary.

❖ Latrine use:

- Unless the superstructure has been damaged, beneficiaries reported using their subsidized latrines.
- Beneficiaries may revert to OD if the superstructure is destroyed.
- Beneficiaries generally appreciated the robustness of their subsidized sub-structure, (e.g., they were confident that it would not collapse).

❖ Non-beneficiaries:

- Non-beneficiaries are aware that their own latrines do not have durable sub-structures, and they believe that their “turn will come” to receive support as well.
- Households ineligible for the subsidy were not presented with any information for upgrading their latrines; for example, they were not linked with trained artisans. As a result, there appear to have been no positive spillover effects as have been observed in Bangladesh and Cambodia.

### **b) Social Fund scale-up**

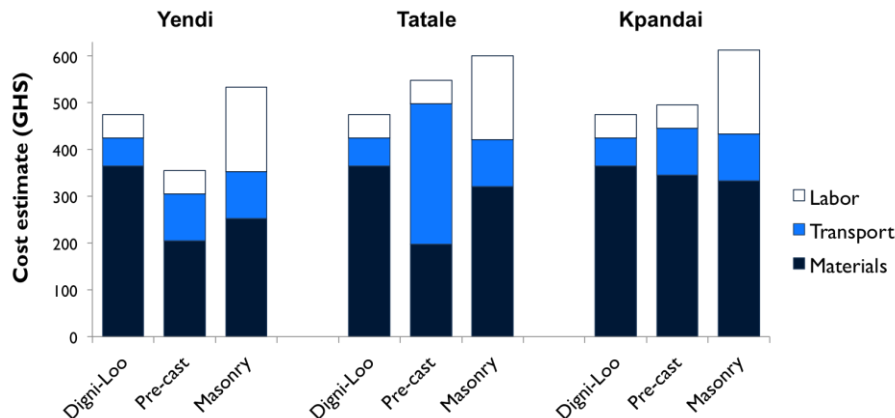
UNICEF has a grant of approximately 250,000 USD to scale up the Social Fund in 13 districts in the Northern region. The grant ends in June 2019 and UNICEF plans to start spending the funds in early 2019. UNICEF has decided on subsidy characteristics that are consistent with Ghana’s National Pro-Poor Guidelines (Table 8). Since WASHPaLS is not funding implementation directly, we have limited control over the design of the subsidy intervention. However, WASHPaLS’ recommendations were taken into account to determine the conditions for the results-based payment, as well as some aspects of implementation (Section 4.6).

**Table 8. Comparison of UNICEF's subsidy characteristics with National Pro-Poor Guidelines**

	<b>UNICEF's targeted subsidy</b>	<b>National Pro-Poor Guidelines</b>
<b>Subsidy type</b>	Voucher with artisan results-based payment (upon verification of sub-structure and superstructure by UNICEF staff).	Not specified.
<b>Timing</b>	When a community has verified "ODF status" (minimum 80% latrine coverage).	When a community reaches "ODF Basic" status (no visible feces).
<b>Targeting method</b>	Community consultation based on criteria consistent with LEAP and National Pro-Poor Guidelines (see Section 4.3).	<ul style="list-style-type: none"> <li>- LEAP beneficiaries.</li> <li>- Other vulnerable households (female-headed, widow(er), outcast groups, terminally ill, unemployed) without support.</li> <li>- Entire community if difficult terrain.</li> </ul>
<b>Subsidy coverage</b>	Expect LEAP-like households to be ~33% of the total but can vary substantially between communities.	Not specified.
<b>Latrine technology</b>	Three dry, lined pit latrine options (Figure 1): 1) Digni-Loo 2) Pre-cast rings and slab 3) Mozambique slab + masonry lining	<ul style="list-style-type: none"> <li>- Improved pit latrine</li> <li>- Digni-Loo</li> <li>- Pour-flush latrine</li> <li>- Aqua-privy latrine</li> <li>- Biodigester</li> </ul>
<b>Subsidy amount</b>	Full subsidy on sub-structure (slab, partial pit lining, ventilation pipe): - 75-130 USD depending on latrine option, district, and distance to town (Figure 2). - Beneficiary contribution: excavation and superstructure (although artisans will likely help build the latter).	Not specified. Guidelines are flexible on what the subsidy can cover (materials for sub-structure and/or superstructure, labor, latrine products, tools).
<b>Implementation process</b>	Overall plan (details in section 4.4): - Community meeting to sensitize on importance of durable sub-structures. - Beneficiary identification by District Assemblies in consultation with the community. Beneficiaries receive a voucher that can be redeemed with identified artisans/suppliers. - UNICEF verifies toilet construction. - Rural bank(s) pay artisans (for labor and transport) and suppliers (for materials).	<ul style="list-style-type: none"> <li>- Beneficiary identification by District Assemblies in consultation with the community.</li> <li>- User education on sustainability of sanitary facilities:</li> <li>- Involve Natural Leaders.</li> <li>- Combine targeted subsidy with post-ODF action plan.</li> </ul>



**Figure 1: latrine options offered in the subsidy intervention: 1) Digni-Loo, 2) pre-cast concrete rings and slab, 3) Mozambique slab and masonry pit lining.**



**Figure 2: Cost estimates for the three latrine options in our three prospective study districts** (based on data collected from artisans and material suppliers; assumes 2 feet of pit lining and 10-km distance between community and materials suppliers; 1 USD = 4.90 GHS)

### c) SanMark program

UNICEF has a sanitation marketing (SanMark) program in most districts in the Northern region. In the Fall of 2017, this program trained approximately 30 artisans and roughly 100 Community Technical Volunteers (CTV) per district in latrine construction and business and marketing. During our formative research, we met with 50 trained artisans in three districts. We found that:

- The trained artisans have low to moderate levels of activity: 26% had built more than 20 latrines in the past year, while 59% had built less than 10.
- They have little cash flow
- They are quite “social-minded”: they seem committed to improving sanitation conditions and adapt their prices to a customer’s ability to pay
- They use social events and District Assembly community visits to do their marketing

### d) Revolving Fund for household loans

UNICEF is planning to rollout an intervention offering household sanitation loans in selected districts. These loans will be disbursed through rural financial institutions, which UNICEF is currently recruiting. To implement the Social Fund intervention and manage payments, it will be logistically beneficial to leverage agreements with the same financial institutions. The specifics of these loans have not been shared with WASHPaLS.

## 3.4 FINDINGS FROM FORMATIVE HOUSEHOLD SURVEY

### Box 1: DEFINITIONS

- ❖ **Latrine:** a pit with some form of superstructure (can be any height, number of walls, materials, as long as there is an attempt to ensure some level of privacy)
- ❖ **Functional latrine:** a latrine that can be used, i.e., whose pit is not collapsed and not full. The superstructure requirements are the same as for a latrine (see above).
- ❖ **Durable sub-structure:** presence of concrete or plastic slab and pit lining with plastic, rocks, bricks, or concrete. Such sub-structures are not likely to collapse or be damaged during floods. Nevertheless, latrines with durable sub-structures are not necessarily functional (e.g., the pit can be full). A durable sub-structure is not required for a latrine to be “safely-managed” as per the JMP definition, given that compact mud slabs can be considered “improved”.
- ❖ **Full superstructure:** with roof and four walls (or circular walls), of any type.
- ❖ **Ownership:** in the Northern region of Ghana, it is common for several households belonging to the same family to share a compound and a latrine. In this case, all sharing households “co-own” the latrine.

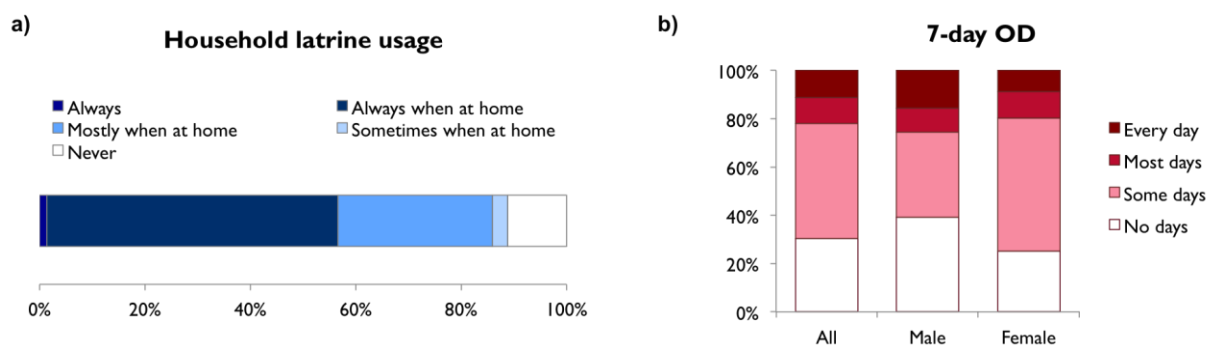
As part of our formative research, we conducted a small household survey in the districts of Mion and Zabzugu, which neighbor our prospective study districts. We surveyed a total of 143 households in eight communities that were certified ODF between October 2016 and May 2018. This survey provided us with a better understanding of latrine coverage, quality and usage in the ODF communities in our study region. The results are as follows:

❖ **Latrine coverage and quality:**

- 87% of households owned a functional latrine
  - 61% owned a non-shared functional latrine
  - 54% owned a non-shared functional latrine with full superstructure (roof and walls)
  - 1% owned a non-shared functional latrine with full superstructure and durable sub-structure
- 29% of latrines were shared by several households, usually in the same family that also shared a compound.
- The vast majority of latrines were “traditional”, with packed mud flooring (87%), packed mud walls (80%), thatch roof (73%), no pit lining (94%), and no ventilation pipe (82%).
- 79% of respondents declared being somewhat or very unsatisfied with the latrine they owned or were using. Specifically, 51% were unsatisfied with the walls, 47% with the roof, 24% with the door, 14% reported a lack of comfort, and 14% feared that the slab would collapse.
- 50% of toilet owners have had to rebuild their toilet in the past.

❖ **Open defecation:**

- 13% of households reported using “the bush” as their primary defecation facility.
- 43% of households reported not always using a latrine to defecate when at home (Figure 3a). This proportion increases to 45% if we add households whose latrine is visibly not used.
- 16% of households had feces present in the immediate environment.
- 18% of respondents reported not having used a latrine in the past 48 hours. Use was higher amongst men compared to women ( $p=0.02$ )
- 69% of respondents reported having defecated in the open in the past 7 days (Figure 3b). There was no significant difference between male and female respondents ( $p=0.14$ ).



**Figure 3: Open defecation in ODF communities (household survey results)**

❖ **Factors associated with open defecation:**

Tables 9 a-d are contingency tables; they present how the proportion of households practicing OD varies between different categories.

- Households without a functional latrine were more likely to defecate in the open; 79% of households without a functional latrine practiced open defecation as their primary behavior, compared to 2% of households with a functional latrine ( $p < 0.001$ ) (Table 9a).
- However, owning a functional latrine does not seem sufficient to eradicate all OD: among households owning a functional latrine, a substantial 36% sometimes practice OD when at home (Table 9b).
- By contrast, all households that were satisfied with their latrines reported using the latrine as their primary defecation facility (Table 9c), and only 4% of these households reported sometimes practicing OD when at home (Table 9d).

Both ownership of a functional latrine and satisfaction with one's latrine appear to be important drivers for eradicating OD. As mentioned above, our data indicate that the primary reasons for being unsatisfied were related to the superstructure (walls, roofs, door) or a fear that the slab would collapse. Together, these results suggest that an intervention aiming at improving both sub- and superstructures has the potential to decrease OD.

**Table 9: Contingency tables from formative household survey** (Fisher exact test  $p$ -values were all  $\leq 0.001$ )

a)		Uses latrine as primary defecation facility			b)		Practices OD when at home		
		No	Yes	Total			Sometimes	Never	Total
Owns functional latrine	No	15 (79%)	4 (21%)	19	Owns functional latrine	No	17 (89%)	2 (11%)	19
	Yes	3 (2%)	121 (98%)	124		Yes	45 (36%)	79 (64%)	124
Total		18	125	143	Total		62	81	143

c)		Uses latrine as primary defecation facility			d)		Practices OD when at home		
		No	Yes	Total			Sometimes	Never	Total
Satisfied with latrine	No	16 (14%)	97 (86%)	113	Satisfied with latrine	No	59 (52%)	54 (48%)	113
	Yes	0 (0%)	28 (100%)	28		Yes	1 (4%)	27 (96%)	28
Total		16	125	141	Total		60	81	141

### 3.5 COMMUNITY WATER AND SANITATION AGENCY (CWSA)

CWSA is a government organization under the Ministry of Sanitation and Water Resources. Since 2010, CWSA has been implementing CLTS in six regions with funding from the World Bank. During the first phase of funding (75 million USD over 5.5 years), only 50 communities became ODF out of the 500 projected. With the second phase of funding (46 million USD over 2 years), CWSA plans to introduce subsidies in its program communities. We met with the Extension Services Coordinator in October 2018, who indicated that the overall subsidy intervention would start in November 2018, but the specific timeline for the Northern region was uncertain due to logistical issues. The subsidy characteristics as follows:



- **Timing:** a community will be eligible when it reaches “ODF Basic” status, which requires that feces are no longer visible in the community (note that “ODF Basic” status does not require a specific latrine coverage).
- **Targeting method:**
  - Sub-structure: no targeting; all households will be eligible.
  - Superstructure: targeted at the most vulnerable, as defined by LEAP.
- **Technology:**
  - Sub-structure: Digni-Loo (CWSA has ordered 20,000 Digni-Loos from Duraplast, which would allow covering an average of 40 households in 500 communities).
  - Superstructure: unclear.
- **Subsidy amount:** full subsidy on the sub-structure (as well as on the superstructure for the most vulnerable).
- **Subsidy type:** unclear; there was no mention of vouchers or rebates, so CWSA may be planning to deliver the products directly to communities.

Partnering with CWSA for our experimental study was not possible because they have already selected their target communities, providing no opportunity to randomize the intervention. In addition, it is important to note that CWSA’s subsidy has many elements of top-down direct provision subsidy approaches, which are not the focus of this research. Nevertheless, CWSA expressed interest in our study and requested that we share regular updates with them and the Ministry. We also are considering conducting a case study of CWSA’s intervention in 3-5 communities. CWSA expressed interest in this opportunity but indicated that this may not be possible in the Northern region where they are facing challenges with the implementation of the intervention (though they didn’t provide specific details). Instead, there may be future opportunities to conduct such case studies in the Brong Ahafo region (but this would require expanding field work outside of our study region, which is currently not a research priority).

In summary, meetings with CWSA and the Ministry of Sanitation and Water Resources allowed us to obtain verbal support from these two government institutions for the study. Notably, the Director of Sanitation emphasized the importance of building the evidence base underlying pro-poor sanitation policies in Ghana. We will give both organizations regular updates and will engage them at our stakeholder meetings. Details on our engagement strategy are given in Section 5.

## 4.0 STUDY PROTOCOL

### 4.1 STUDY LOCATIONS

UNICEF has thirteen CLTS Social Fund program districts (shown in green on Figure 4). As noted above, it will be logistically beneficial to operate our study in districts in which UNICEF is already developing agreements with financial institutions as part of the Revolving Fund program. These comprise seven potential districts (outlined in orange in Figure 4), but UNICEF is currently finalizing this list. Of the six districts that are targeted for both UNICEF's Social Fund and Revolving Fund, three have been selected for CWSA's subsidy intervention, which, as noted in Section 3, differs from the UNICEF program in that the intervention may not be targeted, communities are eligible as soon as they reach ODF Basic, (i.e., no visible feces), and the subsidy also covers superstructure construction. To avoid contamination of our research, we recommend excluding these districts from our geographic selection (CWSA has already selected their communities).

These requirements yield three prospective study districts: Kpandai, Tatale, and Yendi (pending confirmation by UNICEF), which collectively had 243 ODF-verified communities by June 2018 and provide a reasonable sample frame (with sample size parameters listed in section 4.2). During the formative research, we confirmed the three districts to be viable options (with a motivated district assembly as well as the presence of trained artisans and materials suppliers). Only one of these districts (Yendi) has a Digni-Loo retailer, but discussions with Global Communities and UNICEF have indicated that establishing Digni-Loo distributors in Tatale and Kpandai should be possible.

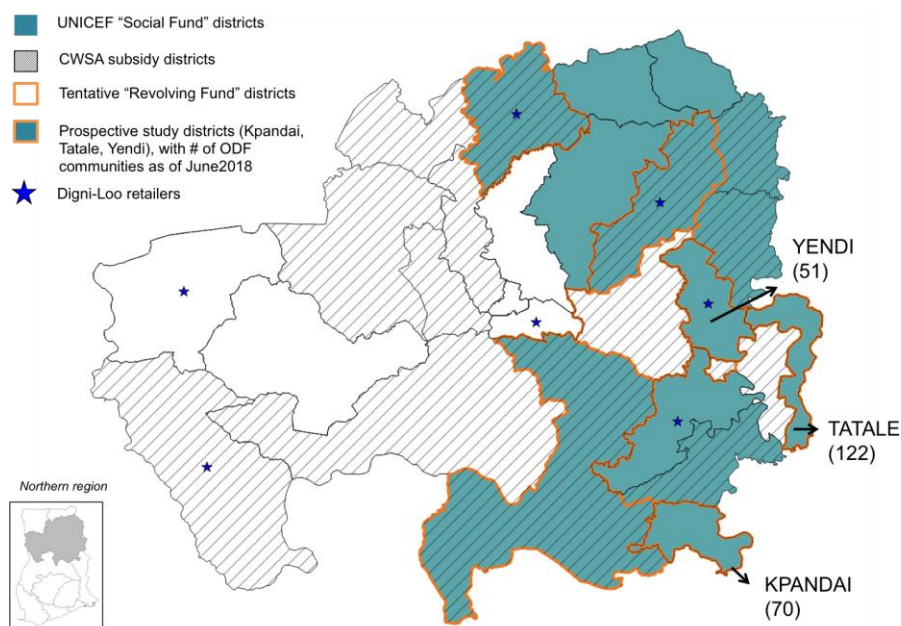


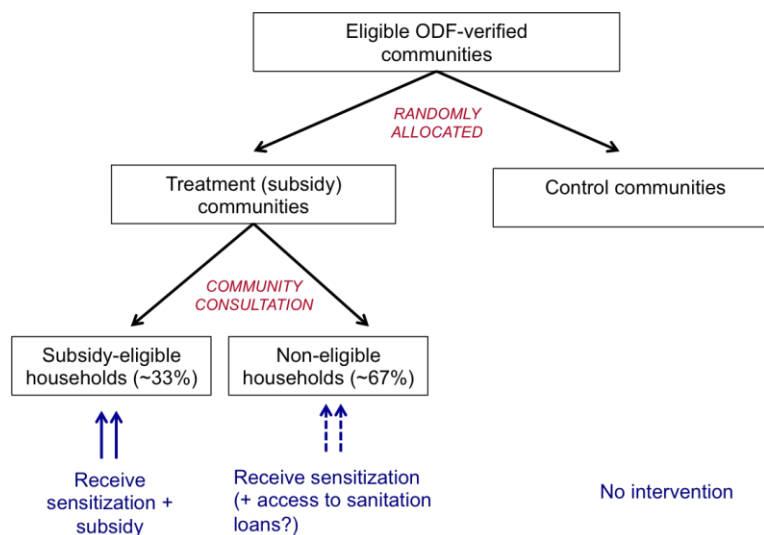
Figure 4. Map of prospective study districts in the Northern region

### 4.2 STUDY DESIGN

We will conduct a cluster randomized controlled trial (cRCT) in which we will randomly assign ODF-verified communities having more than 15 and less than 150 households to the treatment (targeted subsidy as described in Table 8, Section 3.3) or control (no targeted subsidy) groups (Figure 5). Control communities will benefit from the subsidy intervention at the end of the study.

The median size of eligible communities in the three study districts is 29 households (min: 15, max: 146, average: 38). Eligible communities have received comparable CLTS interventions implemented through District Assembly staff in 2012-2018 and were verified ODF between October 2016 and October 2018. We will not exclude communities based on their ODF achievement date, as this variability is characteristic of real-life situations. Randomizing should equate the distribution of dates (and any other potential confounder) between the control and treatment arms, thus not biasing the results.

To avoid treatment contamination of control communities, we will try to ensure a 2-km buffer distance between control and treatment communities. We cannot embed this buffer distance in the randomization process because GPS information is not available for all eligible communities. Instead, we will collect GPS information during the baseline survey. If we find that a control community is located within 2-km of a treatment community, we will replace the former with a randomly selected community from a control back-up list.



**Figure 5. Proposed study design**

The primary study population are households eligible for the subsidy (criteria described in Section 4.3). Based on our formative research, we expect the proportion of beneficiaries to be approximately 33%, but this will vary between communities. Because the study also is interested in spillover effects, we will also survey non-eligible households in study communities.

### 4.3 SUBSIDY ELIGIBILITY CRITERIA

Subsidy beneficiaries will have to meet three eligibility criteria:

- (i) Be extremely poor: We plan to use community consultation to identify households in extreme poverty because LEAP’s proxy-means test data are not public. The district’s Social Welfare officer will provide context-specific criteria to guide communities in identifying these households (note that the National Pro-Poor Guidelines also provide guidance on how to identify the very poor, Table 8)
- (ii) Be vulnerable: Similar to the LEAP process, we will apply community consultation to identify households with member(s) meeting the LEAP vulnerability criteria (elderly > 65, person with disability, orphan or vulnerable child). Note that the National Pro-Poor Guidelines provide for

the inclusion of other vulnerability criteria, such as female head of household, widow(er), terminally-ill persons, unemployed, and outcast groups; we also will consider whether we should expand our vulnerability criteria to include these groups.

(iii) Lack a functional, private (non-shared) latrine with durable sub-structure. As defined in Box I (Section 3.4), a latrine is “functional” if the pit is not full or collapsed; and a “durable” sub-structure requires both a slab (concrete or plastic) and pit lining (with bricks, rocks, concrete, or plastic). This criterion will be verified through visual inspection and interviewing the household. It is important to note that owning a functional non-shared latrine will not disqualify a household if this latrine doesn’t have a durable sub-structure. Based on our formative research, we estimate that up to 60% of voucher beneficiaries will own a functional non-shared latrine; the goal of the subsidy will thus be to help them acquire a new latrine with durable sub-structure.

#### 4.4 SUBSIDY IMPLEMENTATION PROTOCOL

Based on lessons learned from the formative research, we have collaborated with UNICEF to establish the implementation protocol presented in Table 10. The protocol is subject to minor changes after implementation starts, in response to challenges or feedback from field staff.

**Table 10. Subsidy implementation protocol**

STEP	ACTION ITEMS
<p><b>STEP 0:</b> <i>Preparation</i></p>	<ul style="list-style-type: none"> <li>• <b>UNICEF defines superstructure standards</b> <ul style="list-style-type: none"> <li>• Guidance to make traditional superstructures durable.</li> </ul> </li> <li>• <b>UNICEF enrolls artisans</b> <ul style="list-style-type: none"> <li>• Create register of trained artisans in each district, specifying the electoral area (administrative unit) in which they operate.</li> <li>• Negotiate tariffs with artisans for transport &amp; labor, based on i) latrine option, and ii) distance.</li> <li>• Explain subsidy program and superstructure standards.</li> <li>• Explain that it will be important for artisans to attend community meetings and follow up with beneficiaries.</li> <li>• Sensitize artisans on the need for accessibility adjustments (e.g., handrails for the blind, stool for the elderly), although this won’t be mandatory.</li> </ul> </li> <li>• <b>UNICEF enrolls material suppliers</b> <ul style="list-style-type: none"> <li>• This requires establishing a Digni-Loo distributor in districts that do not have one.</li> </ul> </li> </ul>
<p><b>STEP 1:</b> <i>Community meeting</i></p>	<ul style="list-style-type: none"> <li>• <b>District Assembly staff convene community meeting</b> <ul style="list-style-type: none"> <li>• Notify registered artisans in electoral area. Ideally, one or two artisans join.</li> <li>• Ensure that community meeting is inclusive (women, households with vulnerable individuals, etc.).</li> <li>• Explain importance of upgrading latrines to entire community.</li> <li>• Explain targeted subsidy program: toilet options, superstructure requirement.</li> <li>• Explain that community will have to help beneficiaries dig pits and build superstructures.</li> <li>• Coordinate beneficiary identification by community. Consider consulting with women and vulnerable individuals separately, as they may not be comfortable contributing in the large community consultation.</li> <li>• Hand out vouchers to selected beneficiaries (head-of-household)</li> <li>• Provide contact information for registered artisans.</li> <li>• Record contact information of beneficiaries.</li> </ul> </li> </ul>

STEP	ACTION ITEMS
	<ul style="list-style-type: none"> <li>• Non-beneficiaries: sensitize them to the fact that “their turn will not come” but that they can also contact the artisans if they want. Present Revolving Fund opportunity if it is available in the study districts.</li> </ul>
<b>STEP 2:</b> <b>Beneficiary</b> <b>contacts artisan</b>	<ul style="list-style-type: none"> <li>• <b>The beneficiary calls the artisan</b> <ul style="list-style-type: none"> <li>• Beneficiary indicates which of the options on the voucher (s)he wants.</li> </ul> </li> <li>• <b>The artisan visits the beneficiary to:</b> <ol style="list-style-type: none"> <li>1) Verify that beneficiary is “ready” to dig the pit and (help) build superstructure.</li> <li>2) Identify the construction site and give instructions on pit excavation (beneficiary can start digging after this).</li> <li>3) Collect the voucher (household keeps a detachable segment for accountability).</li> </ol> </li> </ul>
<b>STEP 3: Artisan</b> <b>visits materials</b> <b>supplier</b>	<ul style="list-style-type: none"> <li>• <b>The artisan visits the supplier to get materials</b> <ul style="list-style-type: none"> <li>• Artisan gives voucher to supplier.</li> <li>• The supplier gives corresponding quantity of materials to the artisan for free because he knows he is going to be paid soon, as per the arrangement with UNICEF/financial institution (e.g., within 2 weeks).</li> <li>• Every two weeks, supplier gives all collected vouchers to financial institution, and financial institution pays the supplier the corresponding amount</li> </ul> </li> </ul>
<b>STEP 4: Artisan</b> <b>builds latrine</b>	<ul style="list-style-type: none"> <li>• <b>The artisan coordinates materials transport to the community, constructs the latrine and, if necessary, helps build the superstructure</b> according to UNICEF’s standards. <ul style="list-style-type: none"> <li>• When he is done, he notifies the District Assembly and UNICEF’s District Resource Person.</li> <li>• They confirm this by calling or sending SMS to beneficiary (or relative/chief).</li> </ul> </li> </ul>
<b>STEP 5:</b> <b>Verification and</b> <b>payment</b>	<ul style="list-style-type: none"> <li>• <b>One or two weeks later, UNICEF’s District Resource Person visits the beneficiary</b> to verify that the toilet has been constructed according to requirements <ul style="list-style-type: none"> <li>• Checks that the latrine type corresponds to the model selected by the household (as shown on detachable segment of the voucher). Controls that the artisan did not charge the household for his labor.</li> <li>• When appropriate, (s)he gives recommendations on how to increase accessibility (e.g., handrail with rope for the blind, adjustable stool for elderly).</li> <li>• After verification, UNICEF’s District Resource Person gives the artisan a stamped certificate.</li> <li>• The artisan visits the financial institution to redeem his certificate and receive his payment.</li> </ul> </li> </ul>

We have identified three main risks to this implementation protocol:

(1) The beneficiary doesn’t call the artisan to redeem his/her voucher, either because (s)he doesn’t have a phone, because (s)he doesn’t prioritize building a new latrine with durable sub-structure (especially as (s)he may already have a latrine), or because there are gender barriers at play.

- To mitigate this risk, it will be important during the community meeting (Step 1) to connect each beneficiary with someone who has a phone (e.g., relative, chief). In addition, UNICEF will encourage the District Assembly as well as the artisans to follow up with beneficiaries. We will work with District Assembly staff to identify possible gender dynamics that could act as a barrier, and we will discuss strategies to address these risks.

(2) The artisan disappears with the materials after collecting them from the supplier and never builds a latrine for the beneficiary.

- This risk is small because (1) the perspective of the results-based payment is a good incentive for the artisans who don’t have many business opportunities; (2) the preliminary visit to the beneficiary (Step 2) helps confirm the artisan’s commitment; and (3) the District Assembly has a good relationship with, and oversight on the trained artisans. Nevertheless,

it will be important to establish sanctions for artisans who misbehave: e.g., exclusion from the register and the program.

- Even if the artisan doesn't disappear, he may build using lower quality concrete or decrease the pit lining depth to keep some of the materials for himself. To identify this behavior, the verification process should include questions to the beneficiary, who may be able to report on this, as well as visual observations. However, it is important to note that it will be difficult to control this risk, even with a good verification process.

(3) Repayment cycles are too long, and artisans are not able to respond to new requests from beneficiaries.

- It will be important to ensure that UNICEF's District Resource Person and the financial institution are responsive (Step 5) to limit the repayment time to no more than 2-3 weeks.

It would be ideal to pilot this protocol before launching the study. We are, therefore, trying to coordinate with UNICEF to stagger implementation and start in non-study districts, so that lessons and protocol adaptations can be incorporated in the study. However, this may not be feasible due to logistical and time constraints on UNICEF's side.

## 4.5 OUTCOME METRICS AND DATA COLLECTION

### a) Quantitative data

We will conduct household-level data collection at two time points (or three if budget is available): (i) baseline (before distributing vouchers, i.e., ideally before Step 1), (ii) midline (9 months after distributing vouchers), and potentially, (iii) endline (18 months after distributing vouchers). We will collect information on latrine infrastructure, defecation practices, hygiene behaviors (handwashing, disposal of child feces), water usage for sanitation, and latrine construction expenses (including in-kind contributions). We have pre-tested and refined our survey instrument as part of the formative research in September-October 2018.

We will measure the following outcomes of interest at each time point (see summary of definitions in Box 1):

- **Latrine coverage:** We will examine latrine coverage, operationally defined as the proportion of households with non-shared functional (i.e., whose pit is not collapsed and not full) latrines within a community, measured through a combination of self-report and observation.
- **Latrine quality:** We will examine the proportion of households owning a latrine i) with full superstructure (presence of roof and four walls), and ii) with durable sub-structure (presence of concrete or plastic slab and pit lining with bricks, rocks, concrete or plastic). We also will survey respondent-reported satisfaction as a proxy for latrine quality.
- **Latrine use:** to examine latrine use, we will quantify the opposite behavior –open defecation– with two different metrics: i) proportion of households reporting using the bush (open defecation) as their primary defecation location; ii) proportion of households who report not always using a latrine to defecate when at home. For the second metric, we also will use latrine observations (e.g., whether the path to the latrine is walked on or anal cleansing material is present) to confirm that the latrine is regularly used.

Because latrine use and perceptions of latrine quality may vary by gender, we will include questions about both men's and women's defecation behaviors and perceptions. However, we have learned in the formative research that it is not always possible to speak with women when the male head-of-household is present.

At baseline, we also will collect community-level information on potential confounders: village size, soil

conditions, flooding frequency, water table depth, proximity of water bodies and dense vegetation, presence of trained CTVs and masons, LEAP enrollment, attitude of the chief with respect to sanitation, time since ODF, time since triggering, pre-triggering latrine coverage, and access to drinking water.

### **b) Qualitative data**

Rural sanitation interventions are highly dependent on the quality of facilitation and community mobilization. To better understand the drivers of success/failure of this program, a member of our local research team will attend and observe the community mobilization event (Step 1 in Table 10) in 5-10 communities. We will investigate the following questions:

- How does the District Assembly staff present the program and facilitate the selection of beneficiaries?
- Who is present during the community meeting and who participates in the selection of beneficiaries? Who doesn't?
- What concerns do community members express?
- Which household member receives the voucher?
- How does the District Assembly staff mobilize non-beneficiaries, both to help beneficiaries with pit excavation but also to upgrade their own latrines?

To answer our third research question on challenges, we also will collect, at midline, qualitative information from:

- **Treatment communities:** In 10 randomly-selected treatment communities, we will conduct semi-structured interviews with the chief and approximately three households (beneficiaries and non-beneficiaries). We will investigate the following questions:
  - What is the perspective of different community members on the subsidy program, and in particular on the targeting process? What changes would they recommend?
  - Did the chief play a role in encouraging beneficiaries to redeem their vouchers?
  - What were the successes and challenges that beneficiaries faced in redeeming the vouchers?
  - Who in the household received the voucher and who decided how to act on it? Did the voucher cause any intra-household conflict?
  - What barriers do non-beneficiaries face to upgrade their latrines?
- **Data from artisans:** In each study district, we will conduct semi-structured interviews with 2-3 artisans enrolled in the rebate program. We will investigate the following questions:
  - How many latrines did they build over the study period (subsidized and non-subsidized)? How many of these were in subsidy-targeted communities?
  - How was their business impacted by the subsidy intervention?
  - What successes and challenges did they face during the intervention and what changes would they recommend?
- **Data from materials suppliers:** In each study district, we will conduct semi-structured interviews with the 2-3 materials suppliers enrolled in the program. We will investigate the following questions:
  - What successes and challenges did they face during the program and what changes would they recommend?
  - How was their business impacted by the program (if at all)?
- **Data from UNICEF's implementing partners:** In each study district, we will conduct semi-structured interviews with District Assembly staff, the financial institution involved in the subsidy program, and UNICEF's District Resource Persons). We will investigate the following questions:
  - What successes and challenges did they face in implementing the targeted subsidies?

- Did they follow-up with households who had received a voucher? How often? Was it effective?
- Were there any unexpected results or consequences?
- Has the subsidy program impacted neighboring communities or other programs? If so, how?

### c) Cost data

Also, to answer our third research question, we will collect information on intervention costs: facilitation (training, facilitation, verification) and hardware (subsidized latrines). To conduct this analysis, we will use the bottom-up costing approach proposed by Crocker et al., (2017b).

UNICEF has verbally agreed to share cost data with us, with the goal of assessing the scalability of the intervention.

## 4.6 SAMPLE SIZE

For sample size calculation, our primary outcome is the proportion of eligible households owning a non-shared, functional latrine with full superstructure (Table 11). A sample size of 100 communities allows us to detect a minimum of a 15 pp increase in this proportion (corresponding to a 30% reduction in the proportion of households without such a latrine) when comparing the treatment to the control group. This calculation assumes 50% coverage in the control and approximately nine subsidy-eligible households per community, based on data from our formative research (Table 11). For all our calculations, we assumed a 20% loss-to-follow-up, 90% power and 5% significance.

This sample size will allow us to detect the following minimum changes in our secondary outcomes (Table 11):

- A 30% reduction (or 13 pp) in the proportion of **eligible households** sometimes practicing OD when at home
- A 21% reduction (or 9 pp) in the proportion of **all households** sometimes practicing OD when at home
- A 365% increase (or 4 pp) in the proportion of **all households** owning a non-shared, functional latrine with full superstructure and durable sub-structure
- A 36% increase (or 7 pp) in the proportion of **all households** satisfied with their latrine

These minimum detectable changes are reasonable in light of the changes observed in prior studies: the meta-analysis by Garn et al. (2016) found that latrine coverage increased by an average of 14 pp in sanitation interventions. Programs combining CLTS and subsidies have reported attributable increases in improved latrine coverage of 14-18 pp (Guiteras et al., 2015; Patil et al., 2014). Reported changes in latrine use are typically in the same range: 13 pp on average according to Garn et al. (2016).

**Table 11: Sample size and power calculations**

Outcomes	p*	ICC**	m***	Minimum detectable difference between treatment and control	Total required sample size
<b>Primary outcome: Latrine coverage</b>					
% <b>eligible households</b> owning a non-shared, functional latrine with full superstructure.	0.50	0.08	9	+15 pp, or -30% in those without	100 communities
<b>Secondary outcomes: Latrine use</b>					
% <b>eligible households</b> reporting not always using	0.43	0.03	9	30% reduction (-13 pp)	100 communities, as



latrine to defecate when at home.					<i>defined by primary outcome</i>
% <b>all households</b> reporting not always using latrine to defecate when at home.	0.43	0.03	28	21% reduction (-9 pp)	100 communities, as defined by <i>primary outcome</i>
<b>Secondary outcomes: Latrine quality</b>					
% <b>all households</b> owning a non-shared, functional latrine with full superstructure and durable sub-structure.	0.01	0.06	28	365% increase (+4 pp)	100 communities, as defined by <i>primary outcome</i>
% <b>all households</b> reporting being satisfied with the latrine they use.	0.20	0.02	28	36% increase (+7 pp)	100 communities, as defined by <i>primary outcome</i>

\* Expected baseline proportion. Calculated from formative household survey results

\*\* Intra-cluster correlation coefficient. Calculated from formative household survey results

\*\*\* Cluster size. 28 is the median size of eligible communities in our study districts according to UNICEF's dataset, and 9 is 33% of 28, the expected target for the subsidy intervention.

## 4.7 FIELDWORK MANAGEMENT

For the household survey, we plan to have two data collection teams, each comprised of 5 enumerators and one supervisor. Based on our formative research, we estimate that enumerators can conduct up to 7 surveys per day. Given the size of the communities in our sampling frame, it will take on average 1 day to survey a community. Enumerators will collect data on Android phones using the survey app CommCare. The supervisor will be in charge of team logistics, community entry, spot checks, and collecting community-level information. WASHPaLS staff will collect qualitative and cost data directly, assisted by an interpreter when necessary.

We will recruit and train local enumerators fluent in Dagbani, Kokomba/Lekpapa and Twi (the primary languages in our study districts). As we did for the formative research, we will use i) online job alerts through the site JobsInGhana, and ii) iDE in Tamale, who has a roster of enumerators. If these strategies don't suffice, other options to recruit enumerators include the University of Development Studies and the firm EDS in Tamale, both of which came recommended by an EAWAG researcher. If they are still available, we will retain the three enumerators that worked with us during the formative research and promote two of them to supervisors.

## 4.8 QA/QC PLAN

The QA/QC approach will rely on the following aspects:

- Limiting the size of the data collection team to approximately 10 enumerators.
- Piloting survey instruments before each data collection round.
- Embedding data consistency checks and non-falsifiable questions (e.g., GPS) within the data collection platform (CommCare).
- Reviewing incoming data daily during surveys.
- Conducting back-checks or spot checks in ~10% of households through field supervisors.
- Stationing a full-time research staff member in the field for the duration of each data collection round to provide oversight and ensure quality control.

## 4.9 DATA ANALYSIS

Data analysis will consist of statistical comparisons between treatment and control. We will use multivariate models controlling for household-level confounders (such as household size, wealth category, gender and marital status of household head) and community-level confounders (such as distance to town, soil type, community latrine coverage). We plan to conduct an intention-to-treat (ITT) analysis (i.e., comparing treatment and control groups regardless of intervention implementation fidelity).

## 4.10 RISKS

This study is highly dependent on UNICEF's constraints. In chronological order, the main risks are:

- Delayed ethical review board approvals.
- Inability to pilot implementation protocol in non-study districts due to UNICEF's logistical and time constraints.
- Delays in the identification of beneficiaries and distribution of vouchers.
- Inaccurate targeting of the most vulnerable if powerful individuals jeopardize the community consultation process and/or representatives of the vulnerable are not included (or not vocal) in the deliberations.
- Challenges related to the implementation protocol (three main challenges discussed in Section 4.4).
- Insufficient time for all beneficiaries to redeem vouchers and for artisans to respond (implementation is supposed to start in March and UNICEF funding must be spent before the end of June 2019).
- Seasonality: beginning of the farming season in May-June could make people less available to help dig pits and build superstructures. In addition, thatch grass (to make roofs) may not be widely available in March-June.
- Possibility that UNICEF will want to change the subsidy type if no latrines are built (e.g., lifting the superstructure condition).
- Major changes in the implementation protocol during the study.
- Failure to maintain the integrity of intervention and control arms due to insufficient coordination with implementation partners.
- Within intervention arm, subsidy "leakage" to non-targeted households due to poor coordination between implementing partners or poor enforcement of the protocol

To minimize some of these risks, a WASHPaLS staff will be stationed in the field from February through June to observe the subsidy implementation process and react promptly where substantial deviations to the protocol occur.

## 5.0 ENGAGEMENT, LEARNING, AND DISSEMINATION

The recent launch of the Pro-Poor Guidelines in Ghana opened up a space to discuss the most effective ways to use targeted subsidies toward universal and durable sanitation. The present study is part of this discussion, and we will seek to stimulate learning through the following activities:

- 1) **Dissemination** of study objectives and results through presentations, research briefs, and in-person meetings with stakeholders.
- 2) **Research on CWSA’s subsidy intervention** through 3-5 in-depth case studies, and debriefing meetings with government stakeholders.
- 3) Encourage UNICEF and USAID to work with the Ministry of Sanitation and Water Resources to convene a **Learning Forum on Pro-Poor Support**, inviting all sector stakeholders to present lessons learned from their programs.

### I. DISSEMINATION STRATEGY

Our dissemination materials will include:

- 2-page study overview
- Launch presentation
- Trial registration
- Mid-study presentation
- Peer-reviewed publication
- Research brief summarizing country-level findings
- Final presentation

Entry points for the dissemination of study outputs are listed in Table 12.

**Table 12: Entry points for the dissemination of study materials**

INSTITUTION	OUR PRIMARY CONTACTS
Ministry of Sanitation and Water Resources	<ul style="list-style-type: none"> <li>• Ing. Anthony Mensah (Director of Sanitation)</li> <li>• Tony Tsekpetse (National CLTS Coordinator)</li> </ul>
CWSA	<ul style="list-style-type: none"> <li>• Theodora Adomako Adjei (Extension Services Coordinator)</li> </ul>
UNICEF	<ul style="list-style-type: none"> <li>• David Duncan (Head of WASH)</li> <li>• Niall Boot (WASH Specialist)</li> <li>• Lorretta Roberts (WASH Specialist)</li> </ul>
USAID mission	<ul style="list-style-type: none"> <li>• Emmanuel Odotei (WASH Management Specialist)</li> </ul>
Global Communities	<ul style="list-style-type: none"> <li>• Alberto Wilde (Country Director)</li> <li>• Dominic Dapaah (WASH Program Coordinator, Northern Region)</li> </ul>

Engagement activities will include:

- Start of study
  - We will host a stakeholder meeting in partnership with CWSA and the Ministry of Sanitation and Water Resources in February 2019 to present the study to sector stakeholders.
  - If recommended by UNICEF, we will convene a regional-level stakeholder meeting in February 2019 to ensure the cooperation of all CLTS implementers and of the Regional Intra-Coordination Committee (RICCS) in the Northern region.

- Dissemination of a 2-page study overview to present the study objectives and design. We will share this two-pagers with the “entry-point” persons (Table 12), and with the CLTS Knowledge Hub website.
- Mid-study
  - Presentation of preliminary findings to national and regional stakeholders
- End of study
  - Dissemination meeting to discuss final results with Ministry and CWSA
  - Dissemination meeting to discuss final results to other sector stakeholders
  - Dissemination of a peer reviewed publication
  - Dissemination of a research brief summarizing findings for implementers. We will disseminate this through our Ghana “entry-point” persons (Table 12) and through the CLTS Knowledge Hub website.

## **2. RESEARCH ON CWSA’S INTERVENTION**

We propose to select 3-5 program communities and conduct the following activities:

- i) Baseline household survey to measure latrine coverage, quality, and use in the five selected communities
- ii) Key informant interviews with CWSA’s regional staff and district assemblies to understand the subsidy implementation details (how are communities and beneficiaries selected? what is the subsidy amount? How do beneficiaries access the subsidized product?)
- iii) If applicable/possible, qualitative observations of facilitation (e.g., community mobilization event) in the five selected communities
- iv) Endline household survey to measure latrine coverage, quality, and use in the five selected communities
- v) Endline qualitative interviews with chiefs and ~3 households in the five selected communities to get a deeper understanding of the strength and weaknesses of the intervention

This research would provide opportunities to directly engage with government stakeholders on learning. Specifically, we would organize 2-3 debriefing meetings with the Ministry and CWSA to present and discuss lessons from the field. The primary output would be a Power Presentation of findings.

This plan is contingent upon CWSA’s collaboration. Although Theodora Adomako-Adkei from CWSA has provided verbal buy-in for CWSA to participate in case study research, we do not have a formal agreement with CWSA. The next steps are to approach CWSA with this proposed plan and determine if and where this case study would be possible. Our preference would be to do this in the Northern Region, where our research staff will be based and where we will have trained enumerators and interpreters. However, we understand that CWSA may not want us to do this in the Northern Region, where they seem to be facing challenges with the implementation of their intervention. They may therefore direct us to another region, e.g., Brong Ahafo region, which would increase cost and complexity (e.g., staff travel and time, and requiring the recruitment and training of local enumerators).

## **3. LEARNING FORUM**

In Ghana, sanitation stakeholders meet on a regular basis through:

- National Level Learning Alliance Platform (NLLAP) meetings; there is no pre-determined schedule but NLLAP members can convene meetings at any time. UNICEF is a member.
- Annual national CLTS Stocktaking Forum

One of these platforms could be leveraged to convene a stakeholder meeting dedicated to a “Learning Forum on Pro-Poor Support”, allowing all organizations to share lessons learned in their programs. We will encourage UNICEF and/or USAID to organize such a forum after midline/endline data collection.

## 6.0 TENTATIVE TIMELINE

	Y3												Y4												Y5													
	2018			2019									2020									2021																
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep		
Finalize inception report	█	█	█																																			
Develop data collection tools		█	█																																			
National and international ethical approval		█	█																																			
Recruit enumerator team		█	█																																			
Training, piloting, community selection, planning logistics				█	█																																	
National launch workshop with Ministry and CWSA				█																																		
Baseline data collection					█	█	█																															
Intervention (targeted)						█	█	█																														



## 7.0 REFERENCES

- Abdi, R., 2016. Open Defecation Free Sustainability Study in East Timor 2015-2016.
- Aryeetey, G., Jehu-Appiah, C., Spaan, E., D'Exelle, B., Agyepong, I., Baltussen, R., 2010. Identification of poor households for premium exemptions in Ghana's National Health Insurance Scheme: empirical analysis of three strategies. *Trop. Med. Int. Heal.* 15, 1544–1552.
- Bartram, J., Charles, K., Evans, B.E., O'Hanlon, L., Pedley, S., 2012. Commentary on community-led total sanitation and human rights: should the right to community-wide health be won at the cost of individual rights? *J. Water Health* 10, 499. <https://doi.org/10.2166/wh.2012.205>
- Bitrán, R., Muñoz, C., 2000. Targeting Methodologies: Conceptual Approach and Analysis of Experiences, Partnerships for Health Reform (PHR).
- Crocker, J., Abodoo, E., Asamani, D., Domapielle, W., Gyapong, B., Bartram, J., 2016. Impact Evaluation of Training Natural Leaders during a Community-Led Total Sanitation Intervention: A Cluster-Randomized Field Trial in Ghana. *Environ. Sci. Technol.* 50, 8867–8875. <https://doi.org/10.1021/acs.est.6b01557>
- Crocker, J., Saywell, D., Bartram, J., 2017a. Sustainability of community-led total sanitation outcomes: Evidence from Ethiopia and Ghana. *Int. J. Hyg. Environ. Health* 220, 551–557. <https://doi.org/10.1016/j.ijheh.2017.02.011>
- Crocker, J., Saywell, D., Shields, K.F., Kolsky, P., Bartram, J., 2017b. The true costs of participatory sanitation: Evidence from community-led total sanitation studies in Ghana and Ethiopia. *Sci. Total Environ.* 601–602, 1075–1083. <https://doi.org/10.1016/j.scitotenv.2017.05.279>
- Dershem, L., Saidulloev, F., Nadareishvili, M., Arnold, C., Rittmann, J., 2013. Using a Proxy Means Test for Targeting in a Conditional Cash Transfer Program.
- Fuller, J.A., Eisenberg, J.N.S., 2016. Herd Protection from Drinking Water, Sanitation, and Hygiene Interventions. *Am. J. Trop. Med. Hyg.* 95, 1201–1210. <https://doi.org/10.4269/ajtmh.15-0677>
- Fuller, J.A., Villamor, E., Cevallos, W., Trostle, J., Eisenberg, J.N.S., 2016. I get height with a little help from my friends: herd protection from sanitation on child growth in rural Ecuador. *Int. J. Epidemiol.* 45, 460–469. <https://doi.org/10.1093/ije/dyv368>
- Garn, J. V., Sclar, G.D., Freeman, M.C., Penakalapati, G., Alexander, K.T., Brooks, P., Rehfuess, E.A., Boisson, S., Medlicott, K.O., Clasen, T.F., 2016. The impact of sanitation interventions on latrine coverage and latrine use: A systematic review and meta-analysis. *Int. J. Hyg. Environ. Health* 220, 329–340. <https://doi.org/10.1016/j.IJHEH.2016.10.001>
- Guiteras, R.P., Levinsohn, J., Mobarak, A.M., 2015. Encouraging sanitation investment in the developing world: A cluster-randomized trial. *Science (80-. )*. 348, 903–906. <https://doi.org/10.1126/science.aaa5727>
- Hargreaves, J.R., Morison, L.A., Gear, J.S.S., Kim, J.C., Makhubele, M.B., Porter, J.D.H., Watts, C., Pronyk, P.M., 2007. Assessing household wealth in health studies in developing countries: A comparison of participatory wealth ranking and survey techniques from rural South Africa. *Emerg. Themes Epidemiol.* 4. <https://doi.org/10.1186/1742-7622-4-4>
- Harris, M., Alzua, M.L., Osbert, N., Pickering, A.J., 2017. Community-level sanitation coverage is more strongly associated with child growth and household drinking water quality than access to a private toilet in rural Mali. *Environ. Sci. Technol.* 21, 7219–7227. <https://doi.org/10.1021/acs.est.7b00178>
- Harvey, P.A., 2011. Zero subsidy strategies for accelerating access to rural water and sanitation services. *Water Sci. Technol.* 63, 1037–1043. <https://doi.org/10.2166/wst.2011.287>
- House, S., Ferron, S., Cavill, S., 2017. Scoping and Diagnosis of the Global Sanitation Fund's Approach to Equality and Non-Discrimination (EQND).
- ISF, SNV, 2017. Learning Brief: Piloting pro-poor support strategies in Banteay Meas district.
- Jenkins, M., Hien, V., Canada, H., Brown, J., Sobsey, M., 2011. Household participation, satisfaction, usage and investment in an OBA sanitation program to increase uptake of hygienic facilities among the



- rural poor in Central Vietnam.
- Jenkins, M.W., Sugden, S., 2006. Rethinking Sanitation : Lessons and Innovation for Sustainability and Success in the New Millennium.
- Jung, Y.T., Hum, R.J., Lou, W., Cheng, Y.-L., 2017a. Effects of neighbourhood and household sanitation conditions on diarrhea morbidity: Systematic review and meta-analysis. *PLoS One* 12, e0173808. <https://doi.org/10.1371/journal.pone.0173808>
- Jung, Y.T., Lou, W., Cheng, Y.-L., 2017b. Exposure-response relationship of neighbourhood sanitation and children's diarrhoea. *Trop. Med. Int. Heal.* 22, 857–865. <https://doi.org/10.1111/tmi.12886>
- Kar, K., Chambers, R., 2008. Handbook on Community-Led Total Sanitation. Plan International, Brighton, UK.
- Kingdom of Cambodia, M. of P., 2011. Identification of Poor Households: Results from Data Collection Rounds 4 (2010) and 5 (2011).
- Kullmann, C., Ahmed, R., Hanchett, S., Krieger, L., Kahn, M.H., 2011. Long-Term Sustainability of Improved Sanitation in Rural Bangladesh. *WSP Res. Br.*
- Lestikow, G., 2017. Using smart subsidies to increase coverage: Evidence from a rigorous evaluation in Cambodia.
- Mandri-Perrot, C., 2008. Output-Based Aid in India : Community Water Project in Andhra Pradesh. OBA Approaches; Note No. 21. Washington, DC.
- Ministry of Employment and Social Welfare, 2012. Livelihood Empowerment Against Poverty Program (LEAP): Operations Manual.
- Ministry of Gender Children and Social Protection, 2016. Ghana LEAP 1000 Programme: Baseline Evaluation Report.
- Mukherjee, N., 2011. Factors Associated with Achieving and Sustaining Open Defecation Free Communities: Learning from East Java. *WSP Res. Br.*
- Myers, J., Gnilo, M., 2017. Supporting the Poorest and Most Vulnerable in CLTS Programmes.
- Nguyen, C.C., Nguyen, C.C., Phung, T., Nguyen, H., Ljung, P., Westbrook, D., Albert, J., 2016. Smart Subsidies Help the Rural Poor Climb the Sanitation Ladder, in: WASH Futures Water Sanitation and Hygiene Conference. Brisbane, Australia.
- Nicoletti, C., Macaranas, R., Lestikow, G., Hudner, D., 2017. A less expensive toilet: the impact of targeted subsidies on latrine purchases in Cambodia, in: 40th WEDC International Conference, Loughborough, UK.
- Odagiri, M., Muhammad, Z., Cronin, A., Gnilo, M., Mardikanto, A., Umam, K., Asamou, Y., 2017. Enabling Factors for Sustaining Open Defecation-Free Communities in Rural Indonesia: A Cross-Sectional Study. *Int. J. Environ. Res. Public Health* 14, 1572. <https://doi.org/10.3390/ijerph14121572>
- Patil, S.R., Arnold, B.F., Salvatore, A.L., Briceño, B., Ganguly, S., Colford, J.M., Gertler, P.J., 2014. The Effect of India's Total Sanitation Campaign on Defecation Behaviors and Child Health in Rural Madhya Pradesh: A Cluster Randomized Controlled Trial. *PLoS Med.* 11, e1001709. <https://doi.org/10.1371/journal.pmed.1001709>
- Pattanayak, S.K., Yang, J.-C., Dickinson, K.L., Poulos, C., Patil, S.R., Mallick, R.K., Blitstein, J.L., Praharaj, P., 2009. Shame or subsidy revisited: social mobilization for sanitation in Orissa, India. *Bull. World Health Organ.* 87, 580–587. <https://doi.org/10.2471/BLT.08.057422>
- Republic of Ghana, 2017. Livelihood Empowerment Against Poverty Programme [WWW Document].
- Rivera, R., Joseph, G., Smets, S., Chan, V., Ljung, P., Um, S., Nguyen, H., Albert, J., 2016. The effect of OBA subsidies combined with sanitation marketing (SanMark) on latrine uptake among rural populations in Cambodia, in: WASH Futures Water Sanitation and Hygiene Conference. East Meets West; Thrive Networks; World Bank; Water and Sanitation Program, Brisbane, Australia, p. 15.
- Robinson, A., 2012. Sanitation Finance in Rural Cambodia.
- Robinson, A., Gnilo, M., 2016a. CHAPTER 14: Promoting choice: smart finance for rural sanitation development, in: Bongartz, P., Vernon, N., Fox, J. (Eds.), *Sustainable Sanitation for All. Practical*

- Action Publishing, pp. 223–244. <https://doi.org/10.3362/9781780449272.014>
- Robinson, A., Gnilo, M., 2016b. CHAPTER 9: Beyond ODF a phased approach to rural sanitation development, in: Bongartz, P., Vernon, N., Fox, J. (Eds.), *Sustainable Sanitation for All*. Practical Action Publishing, pp. 153–166. <https://doi.org/10.3362/9781780449272.009>
- Ronoh, P., Kones, J., MacLeod, C., Delaire, C., Peletz, R., Kisiangani, J., Luoto, J., Khush, R., 2018. Demand for plastic latrine slabs in rural Kenya and Tanzania 1–6.
- Sah, S., Negussie, A., 2009. Community led total sanitation (CLTS): Addressing the challenges of scale and sustainability in rural Africa. *Desalination* 248, 666–672. <https://doi.org/10.1016/j.desal.2008.05.117>
- Singh, S., Balfour, N., 2015. Sustainability of ODF Practices in Kenya, WASH Field Note. Nairobi, Kenya.
- Souares, A., Savadogo, G., Dong, H., Parmar, D., Sié, A., Sauerborn, R., 2010. Using community wealth ranking to identify the poor for subsidies: a case study of community-based health insurance in Nouna, Burkina Faso. *Health Soc. Care Community* 18, 363–368.
- Trémolet, S., Kolsky, P., Perez, E.A., 2010. *Financing On-Site Sanitation for the Poor: a Six Country Comparative Review and Analysis*. Washington DC.
- USAID, 2018a. *An Examination of CLTS's Contributions Toward Universal Sanitation*. Washington, DC. USAID Water, Sanitation and Hygiene Partnerships and Learning for Sustainability (WASHPaLS) project.
- USAID, 2018b. *Scaling Market Based Sanitation: Desk Review on Market-Based Rural Sanitation Developing Programs*. Washington, DC. USAID Water, Sanitation and Hygiene Partnerships and Learning for Sustainability (WASHPaLS) project.
- USAID, 2017. *Evaluation Report: Madagascar Rural Access to New Opportunities for Health and Prosperity (RANO-HP) Sustainability Evaluation*. Washington, DC.
- USAID, M.E., 2008. *Quick Poverty Score Toolkit: User's Guide*, Uganda.
- Venkataramanan, V., 2016. *Testing CLTS Approaches for Scalability CLTS Learning Series: Lessons from CLTS Implementation in Seven Countries*.
- Vernon, N., Bongartz, P., 2016. CHAPTER 1: Going beyond open defecation free, in: Bongartz, P., Vernon, N., Fox, J. (Eds.), *Sustainable Sanitation for All*. Practical Action Publishing, pp. 1–28. <https://doi.org/10.3362/9781780449272.001>
- WaterAid, 2017. *Learning Report: Sanitation Smart Subsidy Trial for Vulnerable Households in Timor-Leste*.



**U.S. Agency for International Development**

1300 Pennsylvania Avenue, NW

Washington, DC 20523

Tel: (202) 712-0000

Fax: (202) 216-3524

[www.usaid.gov](http://www.usaid.gov)