

Exploring Rural Sanitation Behaviors Among Households and Communities in Nimba & Lofa Counties, Liberia

A Mixed Methods Study

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Acronyms

CLTS	Community led total sanitation
FGD	Focus group discussion
HH	Household
IDI	In-depth interview
KII	Key informant interview
ODF	Open defecation free
PACS	The Partnership for Advancing Community Based Services
SBC	Social and behavior change
USAID	United States Agency for International Development
WASH	Water, sanitation, and hygiene
WASHPaLS	Water, sanitation, and hygiene partnership and learning for sustainability

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Chapter 1: Introduction

Overview of the Breakthrough ACTION Liberia Program

Breakthrough ACTION is a global social and behavior change (SBC) project funded by the United States Agency for International Development (USAID) to lead social and behavior change (SBC) programs around the world. Breakthrough ACTION ignites collective action and encourages people to adopt healthier behaviors—from using modern contraceptive methods to sleeping under bed nets and beyond. The work harnesses the demonstrated power of communication and integrates innovative approaches from marketing science, behavioral economics, and human-centered design. In Liberia, adopting healthy behaviors remains a critical barrier to improved health outcomes. While USAID Liberia has previously invested in community health, social mobilization, and community engagement including outreach activities and facility strengthening, the need for household level change continues, along with strengthened engagement of traditional leadership structures. To address these needs and contribute to USAID/Liberia’s Development Objective 3, Breakthrough ACTION will deliver effective quality SBC activities in Liberia that will result in behavior change across a variety of health sectors, including WASH. Breakthrough ACTION will build on and complement existing knowledge, information and partner efforts where possible, while building capacity of Liberian institutions in SBC.

Background

Partnership for Advancing Community-Based Services (PACS) was 5-year project funded by United States Agency for International Development (USAID). In response to the high rates of open defecation, the Community-Led Total Sanitation (CLTS) initiative was introduced in Liberia in 2010. PACS triggered 1,490 communities supporting community-driven latrine constructions through the use of the CLTS approach with the goal of becoming Open Defecation Free (ODF).¹ In 2019, the PACS Endline quantitative study was implemented to evaluate the project’s progress on key indicators including WASH, iCCM, SBCC and malaria among households with children under five years of age (CU5). The PACS Endline Report found that the percentage of people using an improved sanitation facility has decreased from 35% at baseline to 27% at endline. However, PACS WASH communities saw a significant smaller decline than non-PACS communities. According to the PACS Endline Report, 27.7% of people in Lofa and 29.8% of people in Nimba used an improved sanitation facility.²

According to the 2019-2020 DHS report, 47% of households in Liberia use an improved toilet facility and access to improves sanitation facilities is higher among urban households (66% of households) than for rural households (21% of households).³ In Lofa and Nimba improved sanitation coverage is 27.2% and 41.8% respectively. Both counties open defecation rates are higher than the national average of 34.8%; however, the rate of open defecation is higher in Lofa (49.3%) than in Nimba (37.4%).⁴ Although the

¹ Social Impact Inc. (2019). [USAID/LIBERIA PARTNERSHIP FOR ADVANCING COMMUNITY-BASED SERVICES FINAL EVALUATION](#).

² Partnership for Advancing Community-Based Services (PACS) 2019 Endline Survey Report.

³ Liberia DHS (2021). [Liberia Demographic and Health Survey 2019-2020](#).

⁴ Liberia DHS (2021)

percentage of people using an improved sanitation facility in Lofa is similar in the PACS Endline Report and the 2019 DHS report (27%) this is not the case for Nimba – the 2019 DHS report found higher percentage of access in Nimba than the PACS Endline Report, 41% (DHS) and 29.8% (PACS Endline) respectively. Progress towards increasing household access to basic sanitation services has been stagnant for the past 20 years.⁵ While unimproved and limited services are becoming more common among rural Liberians within the lowest wealth quintiles, sanitation progress among rural Liberians within the highest wealth quintiles is regressing.⁶ Existing evidence suggests that motivating factors for latrine adoption among rural Liberians include understanding that project-related benefits are tied to latrine ownership, the dangers of going to defecate in the open at night, health concerns (diarrhea, illness) and environmental concerns (water, soil contamination).^{7, 8} Other reported risks associated with open defecation include embarrassment when you receive a visitor and inconvenience.⁹ Barriers to latrine adoption include financial constraints, construction quality, a fear of children falling into pits and latrine cleanliness.¹⁰ Open defecation is seen as a shameful act, yet it is practiced by 96% of rural Liberians.¹¹ While a 2010 UNICEF study reported that 89% of rural households perceive benefits to latrine ownership, little data is available on what the perceived benefits are among rural households.¹²

Handwashing with water and soap remains low with only 20% of households observed to have a hand washing station and among those de jour population observed to have a station only 29% had water available and 23% had soap.¹³

While some evidence on certain social and behavioral determinants influencing household and community sanitation practices exist, we could not identify a comprehensive study of behavioral determinants related to sanitation practices in any one location in Liberia. Specifically, little evidence could be found related to how other determinants (household ability to act, norms, availability of products services, social capital, resources, leadership, policies, and environmental conditions) affect individual, household and community sanitation practices. A recent study by The Water, Sanitation, and Hygiene Partnership and Learning for Sustainability (WASHPaLS) project on Community Led Total Sanitation (CLTS) in Liberia found that “villages were more likely to achieve ODF status if they had fewer households, were further from major roadways, had lower access to improved water sources, higher diarrhea prevalence at baseline, higher forest coverage in the immediate vicinity, or lower water scarcity.”¹⁴ Although our study is in the same geographic area, it will provide a deeper understanding of behavioral practices, such as individual and community level motivators and barriers to latrine use.

⁵ WHO & UNICEF (2017). WASH Household Data 2017. Joint Monitoring Programme

⁶ Ibid

⁷ Irish Aid (2020). Link Nutrition Causal Analysis in Grand Bassa, Grand Cape Mount, Rural Montserrado, Rivercess and Sinoe Counties. Final Report.

⁸ Global Communities (2019). Partnership for Advancing Community-based Services KAP Survey: 2019 Endline Survey Report. USAID

⁹ Ntow, Stephen (2010). Assessing WASH Package Interventions in 5 Counties of Liberia. UNICEF

¹⁰ Irish Aid (2020)

¹¹ Ibid

¹² Ntow, Stephen (2010).

¹³ DHS (2021).

¹⁴ https://www.globalwaters.org/sites/default/files/washpals_clts_performance_envelope_liberia_brief_jan_2021_0.pdf

Objectives

The objectives of the rural sanitation study are to:

- Determine the current sanitation and open defecation free (ODF) status among previous USAID-supported communities within Lofa and Nimba counties
- Deepen understanding of the individual, community and political drivers and barriers to household toilet/latrine adoption and sustained use or “slippage” in both rural Liberia (Lofa & Nimba)
- Assess the determinants of “drop outs” of sustained toilet use

Research Questions:

1. What are the current individual, household and community practices related to defecation?
2. What are the social and behavioral determinants to adopting and maintaining toilet/latrine use for individuals (women and men)?
3. What are the relevant community and service determinants that influence household latrine/toilet adoption and community open defecation free (ODF) achievement and sustainment?
4. How do environmental determinants (soil type, access to natural resources for construction) influence household latrine adoption and use?
5. How do the local and political structures influence community (and household) action related to toilet/ latrine adoption and use?
6. Which behavioral determinants are different among sanitation adopter households/communities and non-adopter households/communities?

Chapter 2: Methodology

Study Design

Breakthrough ACTION Liberia used a mixed methods approach for this research study, a cross-sectional descriptive study using household quantitative surveys, household observational survey, in-depth interviews (IDIs), focus group discussions (FGDs) and Key Informant Interviews (KIIs). Data collected from these methods was triangulated to develop a deeper understanding of household practices, preferences, barriers.

Target population and geographical focus

The rural sanitation study took place in two counties (Lofa and Nimba) where USAID had recent sanitation investments aimed at supporting communities to achieve and sustain Open Defecation Free Status through the USAID/PACS project. Although the PACS project implemented sanitation interventions in 816 communities, only one-third of those communities received the entire PACS package of multi-sectoral interventions. Breakthrough ACTION Liberia re-visited the same PACS communities who received the full intervention that were sampled through the project's endline evaluation (n=29). Breakthrough ACTION Liberia assessed the ODF status of all 29 communities. Based on the community ODF status, Breakthrough ACTION Liberia selected 11 communities that achieved and sustained ODF status since the end of the PACS project, along with 10 communities that achieved but did not sustain ODF status since the end of the PACS project. Breakthrough ACTION Liberia also selected 10 communities that never achieved ODF. Within those 33 communities, Breakthrough ACTION Liberia conducted a series of household observations, household questionnaires, focus group discussions, in-depth interviews, and key informant interviews as per the sample table listed below.

TALE 2.1: SAMPLE SIZES BY DATA COLLECTION METHOD

RURAL SANITATION STUDY	# SAMPLE COMMUNITIES	HOUSEHOLD WATER STORAGE AND USE OBSERVATIONS	HH QUESTIONNAIRE	FGDs	IDIs	KIIs
Current ODF Communities (as verified during data collection)	11	400 (40/community)	400 (40/community)	2 (adult men) 2 (adult women)	5 (adult men) 5 (adult women)	3 (WASH district official, informal leader & CHA)
Previously ODF Communities (as verified during data collection)	10	400 (40 /community)	400 (40 community)	2 (adult men) 2 (adult women)	5 adult men (practicing OD) 5 adult men	3 (WASH district official, informal leader & CHA)

					(using latrine 5 adult women (practicing OD 5 adult women (using latrine)	
Never ODF Communities (as verified during data collection)	12	400 (40 /community)	400 (40/community)	2 (adult men) 2 (adult women)	5 adult men (practicing OD) 5 adult men (using latrine 5 adult women (practicing OD 5 adult women (using latrine)	3 (WASH district official, informal leader & CHA)
Government Officials						6
Total Sample Size	30	1200	1200	12	50	15

We have calculated the sample size with $P = 0.5$, based on maximum variance as the open field defecation prevalence is not known. We would like to compare three groups, previous ODF communities, current ODF communities and non ODF communities. Recent PACS sites with villages with ODF status will represent the toilet users, previous PACS sites will represent older ODF communities and a comparable site where there has been no WASH intervention, will be chosen as the site for non-users.

TABLE 2.2: SAMPLE SIZE CALCULATION				
SAMPLE SIZE CALCULATION	ALPHA	POWER	SAMPLE BY GROUPS (3)	Total sample FOR 3 SETTINGS
Maximum variance p = 0.50	0.05	80 %	407 x 3 settings= 1221 rounded to 1200 (400 per group	3 groups = 1200

We calculated the sample size with $P = 0.5$, based maximum variance as the ODF prevalence in the 3 sites is not known. Given a P of 0.50, with an alpha of 0.05 and 80 percent power, the sample size per site is 407 respondents. The sample for 3 sites is 1221 which is rounded to 1200. The total sample for the study is 1200.

Sampling Strategy

Participants for the rural sanitation study consisted of adult men and women older than 18 years of age from rural communities in Nimba and Lofa counties, Liberia. No children or particularly vulnerable populations were included in the study. Systematic multi-stage sampling was used to select respondents for the WASH study. The procedures were the following:

1. The districts in Lofa and Nimba were stratified into 3 groups, PACs with current ODF communities, PACs with previous ODF communities and districts with no PACs communities. One district was randomly selected from each of the three categories.
2. Enumeration areas (EAs) of 150-200 households were identified within each town (rural area).
3. A total of 40 respondents were selected after starting at a random household and then covering the area using a systematic skip based on the sampling fraction.

Inclusion Criteria

- Adults (men and women) ages 18 or older.
- Full time resident of the communities within Lofa and Nimba counties
- Even sample of participants from current ODF, previously ODF, and never ODF communities
- Communities participated in the USAID/PACS project
- Only one participant from each household

Exclusion Criteria

- Children (<18 years old)
- Vulnerable populations (cognitive limitations, education, legal migration status, incarceration, poverty, or some combination of factors)
- Non-full time residents of sampled communities

Enumerators Training, Field Testing of Study Instruments and Household Listings

A local research consulting firm, PERT Consultancy Inc., was recruited through a competitive process to do data collection and initial analysis. The research firm recruited a team of 20 quantitative field researchers and 8 qualitative field researchers and 2 field supervisors. Prior to the enumerators training, the BA Liberia research team held a training of trainers with the PERT Consultancy Lead Researcher, Dana Analyst and Field Supervisors on quality assurance, consent process, and COVID-19 prevention protocols. BA Liberia and PERT Consultancy implemented a 4 day training to review the study tools, ensure data quality, consent process, and to discuss COVID-19 prevention protocols. Upon completion of the enumerators training, the study tools (e.g. households surveys, FDG guide, KII guide etc.) were field tested and some modifications were done to the tools before data collection began.

Prior to conducting research in the selected communities, the research team held community entry meeting with local government and community leaders to explain the goals of the study. The research team explain the study aims and invited potential participants who fulfilled the inclusion criteria to participate at the designated location, using first the recruitment oral script and then the corresponding oral consent script provided. Enumerators clarified that the decision to participate in the study was voluntary and did not in any way affect their eligibility to benefit from any other health service or project. Enumerators were trained to maintain social distancing of at least 6 feet (2m) when doing data collection. All conversations were held outside and enumerators and participants wore face coverings at all times to limit risk to themselves and the potential participants. BA Liberia provided enumerators with personal protective equipment (e.g. face masks, hand sanitizer, disinfectant product etc.) and provided face mask to all respondents. Additionally, respondents were given a “sweet” as a token of appreciation for their time.

Data Analysis

For quantitative data collection, descriptive analyses, bivariate and multivariate analyses were conducted to determine trends in sanitation practices based on household settings and participant-reported behaviors and preferences. Logistic regression analysis was used to identify the determinants of key sanitation behaviors. Comparisons across the three groups of the study (Current ODF villages, previous ODF villages and non-ODF villages) was made on consistent use, intermittent use and dropout rates. The study also assessed the determinants of consistent toilet use through logistic regression analysis. Survey CTO, a mobile data collection platform, was used for quantitative data collection and storage. Tablets were used to collect Household surveys and the data was uploaded to the Survey CTO platform once internet connectivity was available. After data cleaning, bivariate and multivariate analysis of the qualitative data was done using Stata.

For the qualitative data collection methods (FGDs, IDIs, KIIs), related themes were identified with both an inductive and deductive approach, and responses were coded against those themes using Dedoose software.

Chapter 3: Participant Profile

The survey included both women and men selected from 3 groups to enable a comparison of ODF communities versus non ODF communities. We selected a current ODF group which had communities that have been recently declared ODF. The second group included previously ODF communities when the PACS program was under implementation. Finally, the third group is a non ODF group with communities which were never declared as ODF. Each of these groups had a sample of approximately 400 individuals, leading to a total sample size of 1199.

Table 3 provides an overview of household and individual level demographic and behavioral characteristics of individuals surveyed. At first glance, a few patterns emerge across the entire study population, namely that a large proportion of respondents had no formal schooling (46%) and reported making less than 20,000 LRD (74.9%) or earning no income at all (17.4%). Further the data show that handwashing with soap for the entire sample (67.9%) and frequency of daily handwashing (mean of 6.4 days per week) are not optimal.

Regarding balance of the study sample, there is a near equal split between males (52.0%) and females (48.0%), which remains more or less consistent across each ODF subgroup sampled. Religious representation is also consistent across the various ODF subgroups. There was slight heterogeneity across groups in regard to age distribution in the sample, with a slightly larger 55+ population (27.2%) being captured in the Never ODF group, as compared to the current and previously ODF groups.

TABLE 3.1: DEMOGRAPHIC CHARACTERISTICS OF STUDY POPULATION BY ODF STATUS

VARIABLE	CURRENT ODF (N=408) %	PREVIOUSLY ODF (N=387) %	NEVER ODF (N=404) %	TOTAL SAMPLE (N=1199) %
Place of Defecation				
Bush	248 (60.8%)	229 (59.2%)	271 (67.1%)	748 (62.4%)
Toilet	160 (39.2%)	158 (40.8%)	133 (32.9%)	451 (37.6%)
Material Used for Handwashing				
Don't wash hands	7 (1.7%)	9 (2.3%)	10 (2.5%)	26 (2.2%)
Water only	105 (25.7%)	104 (26.9%)	110 (27.2%)	319 (26.6%)
Water and soap	281 (68.9%)	259 (66.9%)	274 (67.8%)	814 (67.9%)
Ashes	14 (3.4%)	15 (3.9%)	9 (2.2%)	38 (3.2%)
Other	1 (0.2%)	0 (0.0%)	1 (0.2%)	2 (0.2%)
Number of Times Handwashing Occurred the past 7 days, mean (SD)	6.6 (3.0)	6.4 (2.3)	6.2 (2.5)	6.4 (2.6)
Ever Attended School (Y/N)				
No	157 (38.5%)	180 (46.5%)	183 (45.3%)	520 (43.4%)

Yes	251 (61.5%)	207 (53.5%)	221 (54.7%)	679 (56.6%)
Respondent Age				
18 – 35	179 (43.9%)	171 (44.3%)	142 (35.2%)	493 (41.1%)
35 – 55	148 (36.3%)	143 (36.9%)	152 (37.6%)	442 (36.9%)
55+	81 (19.8%)	73 (18.8%)	110 (27.2%)	264 (22.0%)
Gender				
Male	209 (51.2%)	203 (52.5%)	212 (52.5%)	624 (52.0%)
Female	199 (48.8%)	184 (47.5%)	192 (47.5%)	575 (48.0%)
Educational Attainment				
No Schooling	63 (42.0%)	56 (40.3%)	80 (55.6%)	199 (46.0%)
Elementary	35 (23.3%)	38 (27.3%)	32 (22.2%)	105 (24.2%)
Junior High	26 (17.3%)	27 (19.4%)	17 (11.8%)	70 (16.2%)
Senior High/Secondary+	26 (17.3%)	18 (12.9%)	15 (10.4%)	59 (13.6%)
Household Size, mean (SD)	5.8 (2.3)	5.8 (2.3)	6.2 (2.5)	6.0 (2.4)
Religion				
Christian	318 (77.9%)	288 (74.4%)	280 (69.3%)	886 (73.9%)
Muslim	74 (18.1%)	74 (19.1%)	89 (22.0%)	237 (19.8%)
Local tradition	15 (3.7%)	18 (4.7%)	28 (6.9%)	61 (5.1%)
Other	1 (0.2%)	7 (1.8%)	7 (1.7%)	15 (1.3%)
Household Monthly Income				
Not working or no source of income	75 (18.4%)	61 (15.8%)	73 (18.1%)	209 (17.4%)
Less than 20,000 Liberian Dollars	301 (73.8%)	296 (76.5%)	301 (74.5%)	898 (74.9%)
Between 20,000 LD to 40,000 LD	32 (7.8%)	30 (7.8%)	30 (7.4%)	92 (7.7%)

Current toilet use was measured by asking respondents where they went for defecation. When comparing toilet use across all subsamples, the previously ODF (39.2%) and currently ODF (40.8%) communities were similar. However, the currently ODF communities were declared ODF before the PACS evaluation in 2019 and the present WASH study data was collected in February 2021. Therefore the “currently ODF communities” have an almost 16-18 months time lapse for the current WASH study. cDue to this reason we see very little difference between the two ODF communities. Comparison between the current and previously ODF groups yields insignificant tests for a difference in toilet use between these two groups ($\chi^2 = 0.21$, $p\text{val} = 0.64$).

Significance testing for differences between the current and previously ODF groups (combined together) compared to the never ODF group does show statistical significance ($\chi^2 = 5.72$, $p\text{val} = 0.02$). When combined with the data from Table 3, these tests provide preliminary indication that there has been

slippage in sustained toilet use even when accounting for the fact that there has been slight increase in toilet use among the current and previously ODF groups, as compared to the never ODF group.

Chapter 4: Overall Toilet Use and Bush Users' Practices

This chapter focuses on bush users' practices and describes the extent of open field defecation in Nimba and Lofa counties . These counties are of specific interest since the PACS program was implemented here from 2016-2020. The chapter begins with data on the overall toilet use in the sample, followed by toilet use and ownership patterns in current bush users. We also describe the level of open field defecation in 3 groups, current ODF communities, previous ODF communities and never ODF communities. In addition, the chapter shares data on bush users' intentions related to toilet ownership.

Figure 4.1 shows the estimate of open field defecation in Liberia by county. Based on the DHS 2019 data, we see that the counties of Nimba and Lofa have 37.4 percent and 49.3 percent open field defecation. River Gee and Maryland counties have the lowest levels of open field defecation and Gbarpolu and Sinoe counties have the highest levels of bush use (Figure 4.1)

Figure 4.1: Percent open field defecation in Liberia by county, DHS, 2019.

Overall Toilet Use

Table 4.1 describes toilet use in the three groups as well as overall toilet use in the sample. The study sample includes 3 groups to enable a comparison of ODF (open defecation free) communities versus non

ODF communities. We selected a current ODF group which had communities that have been declared ODF in 2019 prior to the PACS evaluation. The second group included previously ODF communities when the PACS program was under implementation. And finally, the third group is a non ODF group with communities which were never declared as ODF. Each of these groups has a sample of about 400 respondents and the total sample was 1199.

We want to highlight that both the ODF groups (current and previous) had a time lapse of more than 12-18 months when the current WASH survey was conducted. The findings have to be seen in light of this time lag. Although the three groups have differing program experiences, there is not that much of a difference between them. For example, toilet use is 39% in the currently ODF group, 40% in the previously ODF communities and 33% in the never ODF community (table 4.2). The results in terms of currently ODF and previously ODF communities show a very high level of attrition in toilet use.

TABLE 4.1: CURRENT TOILET USE IN HOUSEHOLD HEADS IN NIMBA AND LOFA COUNTIES, LIBERIA

VARIABLE	CURRENTLY ODF GROUP N = 408 %	PREVIOUSLY ODF GROUP N=387 %	NEVER ODF GROUP N=404 %	TOTAL SAMPLE N=1199 %
Toilet use	39.2	40.8	33.0	37.6
Bush use (lake, river)	60.8	59.2	67.0	62.4

Bush Users' Practices

A little more than half the respondents have to travel a distance of more than 5 minutes to the bush. Although the data indicate that almost 62 percent of the sample are bush users, a very small percentage of bush users state any benefits of bush use. Overwhelmingly, less than 5 percent of the respondents see any benefits of bush use from convenience, health, cleanliness, safety, no smell, access etc. (Table 4.2). Interestingly, the currently and previously ODF groups are very similar in their responses to perceived benefits of the bush and the never ODF groups aren't very different either (Table 4.2). No smell in the toilet was also perceived as a benefit by bush users (4.5%).

TABLE 4.2: BUSH PRACTICES AND PERCEIVED BENEFITS OF USING THE BUSH AMONG BUSH USERS IN NIMBA AND LOFA COUNTIES, LIBERIA

VARIABLE	CURRENTLY ODF GROUP N = 248 %	PREVIOUSLY ODF GROUP N=229 %	NEVER ODF GROUP N=271 %	TOTAL SAMPLE N=748 %
Distance Beyond 5 minutes from home	62.9	62.8	47.9	57.4

Benefits of going to the bush	1.3	3.7	0.4	2.5
Convenience for adults				
Convenience for child	0.4	0	0.4	0.2
Cleanliness	0.4	0.4	1.5	0.7
Health	0.8	0.4	2.9	1.3
Comfort	1.6	1.3	4.8	2.5
Safety	0.4	0	1.8	0.7
No Smell	4.0	3.6	5.9	4.5
Cost effective/cheaper	2.4	4.8	5.5	4.2
Access	3.2	2.1	3.6	2.9
Other benefits*				

*Other benefits include, no choice, “out toilet is full”, etc.

Toilet Ever Use Among Bush Users

Table 4.3 indicates that 73 to 80 percent of the sample have used a toilet before. Infact, about 26-30 percent reported having used toilets frequently. More than half the respondents had used toilets occasionally. These results indicate that a large number of bush users have been previous toilet users but for some reason/s have stopped using the toilet and have reverted back to bush use.

The most common reasons for stopping toilet use are, toilet was full, toilet was difficult to use followed by having a dirty toilet with bad odor (Table 4.3).

TABLE 4.3: TOILET EVER USE AMONG CURRENT BUSH USERS IN NIMBA AND LOFA COUNTIES, LIBERIA

VARIABLE	CURRENTLY ODF GROUP N = 248 %	PREVIOUSLY ODF GROUP N=229 %	NEVER ODF GROUP N=271 %	TOTAL SAMPLE N=748 %
Ever used toilet	80.2	70.7	73.4	
Frequency of ever use of toilet				
Only once	13.5	22.2	21.6	
Occasionally	59.3	46.9	52.2	
Frequently	27.1	30.2	26.1	
Reasons for stopping toilet use				
Smell	9.3	5.2	12.5	
Unclean toilet	8.4	7.8	7.6	
Toilet needed repair	11.0	7.8	10.5	

Toilet was full	33.0	14.4	21.1	
Toilet difficult to use	28.8	50.0	29.8	
Does your household have a toilet? No	97.9	97.0	97.2	
Does anyone in your household know how to construct a toilet? No	69.3	72.1	58.5	

Bush Users' Intention to Own a Toilet

The study assessed the willingness of bush users to procure/build toilets. Overwhelmingly, most bush users wanted to use toilets instead of opting for open field defecation. Toilet ownership was only 2.7% among bush users across the 3 groups (Table 4.5). About 94 percent of the bush users expressed benefits of toilets while only 47 percent respondents who practiced open defecation, stated disadvantages of toilets.

Data indicate that demand for toilets is very high in the respondent group. About 94 percent of current bush users expressed the desire to own a toilet (Table 4.5). The time frame planned for this intention was 6-12 months by 40 percent of the sample. Another 28 percent of the respondents said they would like a toilet within 6 months. About 46% stated that they could get a toilet with Liberian \$10,000 while 28 percent said they could afford something less than Liberian \$ 10,000. Majority of the bush users (86%) preferred to build their own toilets. However only 5 percent stated that they had the resources to build their own toilet and more than two thirds did not have the ability to construct the latrine (Table 4.5).

Table 4.4: Bush users' intention to own a toilet

Variable	Value	Currently ODF Group	Previously ODF Group	Never ODF Group	Total Sample
		Household Heads (N=248) %	Household Heads (N=229) %	Household Heads (N=271) %	Household Heads (N=748) (95 CI)
Latrine ownership among bush users	Yes	2 (0.3, 13.3)	3 (0.7, 11.3)	2.8 (0.7, 10.5)	2.7 (1.1, 6.3)
	No	98 (86.7, 99.7)	97 (88.7, 99.2)	97.2 (89.4, 99.3)	97.3 (93.7, 98.9)
Respondent stated Benefits of toilets	Yes	92.3 (88.3, 95.1)	95.6 (92.1, 97.6)	94.1 (90.6, 96.4)	94 (92.0, 95.5)
Respondent stated Disadvantage of toilets	Yes	44.0 (37.9, 50.2)	50.7 (44.2, 57.1)	48 (42.1, 53.9)	47.5 (43.9, 51.1)

Intention to adopt a toilet	Yes	94.8 (91.2, 96.9)	95.6 (92.1, 97.6)	92.6 (88.8, 95.2)	94.3 (92.3, 95.7)
When would you like to adopt a toilet	Less than 6 months	36.6 (30.7, 42.3)	24.2 (19.0, 30.3)	33.1 (27.5, 39.1)	31.5 (28.2, 35.0)
	Between 6 months and one year	38.3 (32.3, 44.7)	45.2 (38.7, 51.9)	47.4 (41.3, 53.6)	43.7 (40.1, 47.4)
	More than one year	25.1 (20.0, 31.1)	30.6 (24.8, 37.0)	19.5 (15.1, 24.9)	24.8 (21.8, 28.2)
Cost of Latrine adoption	Less than US\$50.00	26.4 (21.1, 32.4)	26 (20.6, 32.3)	31.9 (26.4, 37.9)	28.2 (25.0, 31.7)
	Between US\$50.00 or L\$10,000.00	45.9 (39.7, 52.4)	47 (40.5, 53.7)	45.8 (39.7, 52.4)	46.2 (42.6, 49.9)
	Over L\$20,000.00	27.7 (22.3, 33.7)	26.9 (21.4, 33.2)	22.3 (17.6, 27.9)	25.5 (22.0, 28.9)
Option to buy or built a latrine	Prefer to Purchase Toilet/Latrine	11.9 (8.3, 16.7)	12.8 (9.0, 17.9)	14.7 (10.9, 19.7)	13.1 (10.9, 15.9)
	Prefer to Construct Toilet/Latrine	88.1 (83.3, 91.7)	87.2 (82.1, 91.0)	85.26 (80.3, 89.1)	86.8 (84.1, 89.1)
Resources to build latrine	Yes	8.1 (5.2, 12.3)	3.2 (1.5, 6.6)	4.78 (2.7, 8.2)	5.4 (92.7, 96.1)
Ability to construct latrine	Yes	30.6 (25.1, 36.8)	27.9 (22.3, 34.2)	41.4 (35.5, 47.6)	33.6 (30.2, 37.2)

TABLE 4.4: BUSH USERS' INTENTION TO OWN A TOILET

VARIABLE	VALUE	CURRENTLY ODF GROUP	PREVIOUSLY ODF GROUP	NEVER ODF GROUP	TOTAL SAMPLE
		HOUSEHOLD HEADS (N=248) %	HOUSEHOLD HEADS (N=229) %	HOUSEHOLD HEADS (N=271) %	HOUSEHOLD HEADS (N=748) (95 CI)
Latrine ownership among bush users	Yes	2.0	3.0	2.8	2.7 (1.1, 6.3)
	No	98.0	97.0	97.2	97.3 (93.7, 98.9)
Benefits of toilets	Yes	92.3	95.6	94.1	94.0 (92.0, 95.5)

Disadvantages of toilets	Yes	44.0	50.7	48.0	47.5 (43.9, 51.1)
Intention to adopt a toilet	Yes	94.8	95.6	92.6	94.3 (92.3, 95.7)
When would you like to adopt a toilet	Less than one year	36.6	24.2	33.1	31.5 (28.2, 35.0)
	Between 6 months and one year	38.3	45.2	47.4	43.7 (40.1, 47.4)
	More than one year	25.1	30.6	19.5	24.8 (21.8, 28.2)
Cost of Latrine adoption	Less than US\$50.00	26.4	26.0	31.9	28.2 (25.0, 31.7)
	Between US\$50.00 or L\$10,000.00	45.9	47.0	45.8	46.2 (42.6, 49.9)
	Over L\$20,000.00	27.7	26.9	22.3	25.5 (22.0, 28.9)
Option to buy or built a latrine	Prefer to Purchase Toilet/Latrine	10.6	12.3	14.7	12.6 (10.4, 15.3)
	Prefer to Construct Toilet/Latrine	88.1	87.2	85.26	86.8 (84.1, 89.1)
Resources to build latrine	Yes	8.1	3.2	4.78	5.4 (92.7, 96.1)
Ability to construct latrine	Yes	30.6	27.9	41.4	33.6 (30.2, 37.2)

Bush Users: Perceptions Related to Toilet Ownership

As the data above has demonstrated, most people in communities are at the very least occasional bush users, even in ODF communities. In fact, in many communities, including ODF communities, interviewed participants expressed that most of their community members did not use the toilet consistently. For example, in a FGD in Lofa county, most participants thought that one in every ten persons in their quarter used the toilet every day.

“Due to the toilet condition, 1 out of 10 persons use the toilet every day. One out of 10 persons use the toilet every day because people can use the bush more than the toilet.”
(Lofa County, Bolahun, ODF Community, FGD woman)

Participants in a Nimba County FGD also felt that consistent toilet use was low in their community, with one participant estimating that four in every ten community members used the toilet daily. One explanation given for this was travel distance to the toilet—consistent toilet use was more achievable for those in town than those in rural areas since the toilet was located in the town area.

“In my community, out of 10 persons four persons use the toilet daily. Because when you are in the town, you are force to use the toilet but other people can go on the farm and they can remain there and ease themselves.”
(Nimba County, Saclepea meh Gbanlah, OD, FGD woman)

However, there were a few participants and that felt consistent, daily toilet use was achievable and present in their community. For example, one FGD participant in a non-ODF community stated that she used her toilet on a daily basis.

“I can use my toilet every day since I build it”
(Lofa County Toingehewa, Never ODF, Woman)

As we can see, consistent toilet use is mostly low among participants regardless of their community’s ODF status, even though there were a handful of participants who did feel as though it was possible to use their toilet consistently. However, this low consistency of toilet use is likely not due to low awareness and understanding around the benefits of using a toilet over the bush. In fact, many participants expressed that most community members understood the benefits of using a toilet. Participants understand that bush use can cause pollution and sanitation issues in their community.

“They use to say that those that don’t have toilet are the one that are polluting the community.”
(Nimba County, Sanniquelle Meh District #2 Suakarzu, ODF, IDI, Man)

Additionally, participants noted that clear messaging existed on the disadvantages of using the bush. In fact, one female IDI participant in Nimba county noted that the local authorities in her community

clearly caution them to not use the bush as there are communal and health disadvantages to using the bush.

“We always tell them to try hard to build their own toilet because to toilet in the bush is not good.”

(Nimba County, Saclepeama Gbanlah, OD, IDI, Woman)

Furthermore, participants themselves mentioned potential health disadvantages to using the bush. For example, one female IDI participant in Nimba county expressed that she preferred using the toilet, as bush use could cause food contamination.

“Using the bush is unhealthy and it helps bring flies that will sit on your food. I like using toilet because you cannot get sick and flies cannot leave the toilet to sit on your food.”

(Lofa County Toingehewa, Never ODF, IDI, woman)

While participants provided many reasons for why consistent toilet use—let alone any toilet use— is difficult for communities across Nimba and Lofa county, the two most salient reasons given were lack of household owned latrines and spoiled toilets. Many participants expressed that it was difficult to use a toilet every day if they didn’t own their own toilet.

“Everybody don’t have toilet at their house. So, it causes them to go in the bush because they don’t have it”

(Nimba Country, Sanniquelle Mah District, NODF, Woman)

Many participants felt that private toilets would help reduce the lack of privacy they experienced while using communal toilets. Some of these participants noted that the bush was oftentimes preferred to communal toilets as communal toilets oftentimes had people waiting outside to use the toilet next.

“The only thing you can enjoy is you can sit in the bush for more than 30min or as long as you wish, then when you go to someone’s toilet. Nobody will embarrass you in the bush.”

(Nimba Country, Saclepea Mah District, OD, Man)

Other participants implied that having their own toilet would reduce travel time, making it more likely they will use a toilet rather than the bush.

“I don’t have toilet and when I want to toilet I can go to the bush. The toilet he’s talking about is down there and it’s not here and if I am jam with toilet I can’t go down there I will prefer going to the bush.”

(Lofa Country, Kolahun District, NOD, Man)

The second, and most common, reason participants did not consistently use a toilet everyday and preferred using the bush was due to “spoiled” toilets.

“Most of the toilets in the community has spoiled. Because of this, we can go in the bush and dig hole to toilet in it and cover it after we have finished.”

(Nimba, Sanniquelle Mah District, ODF, Woman)

Further explanation provided by participants made it clear that “spoiled” toilets referred to three issues surrounding used toilets in their community—broken toilets, dirty toilets, and filled toilets. Participants mentioned that some of the toilets built in their community had broken down due to initial construction issues.

“Some of the toilets where not build properly so they broke down so people use the bush.”

(Nimba Country, Sanniquelle Mah District, ODF, Man)

Other participants expressed that their communities’ toilets were difficult to use because they were not clean and therefore unappealing to community members. In fact, participants felt they did not have the necessary materials to clean and maintain the toilets.

“We don’t have things that can maintain toilet here. Sometimes, we can use hand gloves to wash in the toilet.”

(Lofa County, Bolahun District, ODF, Woman)

Finally, many participants thought their toilets were “spoiled” because the pits had been filled, making it difficult to use the toilet.

“The reason I can go in the bush is, my toilet is filled and I can’t sit on it because it will make me sick.”

(Lofa County, Bolahun District, ODF, Woman)

Many participants also stopped using toilets and returned to the bush because they worried that their “spoiled” toilets would give them an infection or cause they to become sick.

“I can use the bush because the toilet is not fine. If I us the toilet I may get sick from using it because it is not clean.”

(Lofa Country, Kolahun District, NOD, Woman)

Overall, the qualitative and quantitative data provided clearly demonstrate attrition in toilet use among most communities. While toilet use was low, it seemed the knowledge and awareness of the benefits of using a toilet were high in most communities. Instead, the main reasons why these communities seemed to prefer the bush was due to unavailability of private, household toilets as well as the issue of “spoiled” toilets in their communities.

Chapter 5: Current Toilet Users

Description of toilet characteristics

Characteristics of the toilets that individuals use, such as accessibility, quality, condition and privacy can influence not only an individual's initial decision to use a toilet, but further their choice to continue toilet use. In this study, we have asked current toilet users to show the toilet that they use for the purpose of creating an inventory of toilet characteristics within each ODF group, as well as the total sample.

Table 5.1 highlights characteristics of toilets within each community, as well as in the total study population. Overall, the observed current users' toilets were in close proximity to their place of residence, with 88.2% of toilets being located with the household's compound or within 30 yards of the individual's place of residence. Further, 81.9% of current users noted that the toilets they use are within 20 meters of their residence. These data indicate that distance, understandably, may very well play a large role in an individual's choice to continue toilet use.

Qualitative data, which is highlighted later in this chapter, notes that the large proportion of toilet sharing (67.4%) has led to a lack of accountability within communities for the cleanliness and maintenance of toilets. An individual's experience of using toilet naturally influences their decision to uptake and continue use. Table 5.1 further support the challenges posed in the qualitative data that shared toilet use may contribute to an unpleasant toilet use experience. Less than a third of toilets were observed to have ventilation or were identified as improved systems. In contrast, 68.5% of toilets were noted to have a mild or strong odor detected when observed. Further, only 34.8% of toilets have a cover, and 25.3 of observed facilities had a container for waste. Suboptimal build quality of toilets and lack of accountability regarding toilet maintenance lead to bad toilet experiences for individuals, pushing them back towards bush use.

TABLE 5.1: CHARACTERISTICS OF OBSERVED TOILETS

VARIABLE	VALUE	CURRENTLY ODF GROUP	PREVIOUSLY ODF GROUP	NEVER ODF GROUP	TOTAL SAMPLE
TOILET CHARACTERISTICS		HOUSEHOLD HEADS (N=160) %	HOUSEHOLD HEADS (N=158) %	HOUSEHOLD HEADS (N=133) %	HOUSEHOLD HEADS (N=451) % (95 CI)
Shared Toilet (Yes)		64.4	72.2	65.4	67.4 (62.9, 71.6)
Location of Household latrine	Within HH compound/yard	50.6	57.0	66.9	57.6 (53.0, 62.1)
	Outside HH compound/yard – within 30 yards	33.1	34.2	23.3	30.6 (26.5, 35.0)

	Outside HH compound/yard – further than 30 meters	10.6	6.3	2.3	6.7 (4.7, 9.4)
	Neighboring HH compound/yard	3.1	2.5	5.3	3.5 (2.2, 5.7)
	A public facility	2.5	0.0	2.3	1.6 (1.0, 3.8)
Type of sanitation facility observed	No toilet facility (open defecation)	0.0	2.6	0.8	1.1 (0.5, 2.7)
	Simple toilet with dirt/wood	12.8	29.3	31.8	24.2 (20.4, 28.4)
	Ventilated pit toilet with dirt/w	16.0	19.1	18.6	17.9 (14.6, 21.7)
	Toilet with cement, plastic	31.4	28.0	23.3	27.8 (23.8, 32.2)
	Ventilated pit toilet with concrete	18.6	10.8	6.2	12.2 (9.5, 15.6)
	Pour flush toilet with brick/zinc	20.5	8.3	17.8	15.4 (12.3, 19.1)
	Septic system (improved)	0.6	1.9	0.8	1.1 (0.5, 2.7)
	Municipal sewer system (improved)	0.0	0.0	0.8	0.2 (0.03, 1.6)
Approximate distance of toilet from Household	20 meters or less	81.4	79.0	86.0	81.9 (78.0, 85.2)
	21 – 50 meters	16.7	18.5	14.0	16.5 (13.3, 20.3)
	More than 50 meters	1.9	2.5	0.0	1.6 (0.7, 3.3)
Foul odor detected	No odor detected	32.0	21.7	42.6	31.5 (27.3, 35.9)
	Yes, a slight odor	52.6	51.0	38.0	47.7 (43.1, 52.4)
	Yes, a strong odor	15.4	27.4	19.4	20.8 (17.3, 24.9)
Latrine hole cover	Yes	37.2	26.8	41.9	34.8 (30.5, 39.4)
	No	62.8	73.2	58.1	65.2 (60.6, 69.5)

Waste container available	Yes	37.8	21.0	15.5	25.3 (21.5, 29.6)
	No	62.2	79.0	84.5	74.7 (70.4, 78.5)
Artificial lighting available	Yes	30.8	24.8	23.3	26.5 (22.6, 30.0)
	No	69.2	75.2	76.7	73.5 (69.2, 77.4)
Handicap Accessible	Yes	60.3	41.4	50.4	50.7 (46.0, 55.3)
	No	39.7	58.6	49.6	49.3 (44.7, 54.0)
Toilet facility wall materials	No Walls	0.6	3.2	6.2	3.2 (1.9, 5.3)
	Mud, dung, grass, zinc	37.2	54.1	47.3	46.2 (41.5, 50.8)
	Sun baked bricks	21.8	19.8	19.4	20.4 (16.8, 24.4)
	Commercial bricks	7.1	5.1	7.8	6.6 (4.6, 9.3)
	Wood	1.3	1.9	5.4	2.7 (1.5, 4.7)
	Cement	31.4	14.7	13.2	20.1 (16.6, 24.1)
	Other	0.6	1.3	0.8	0.9 (0.3, 2.4)
Toilet roof materials	No Roof	5.1	7.0	9.3	7.0 (5.0, 9.8)
	Thatch, Plastic sheet	4.5	9.6	7.0	7.0 (5.0, 9.8)
	Zinc roofing/metal sheets	88.5	80.9	78.3	82.8 (79.0, 86.1)
Toilet floor materials	Concrete slab (cement)	1.3	1.9	5.4	2.7 (1.5, 4.7)
	Wood/planks	0.6	0.6	0.0	0.4 (0.1, 1.8)
Covered entrance /door	Yes	84.6	79.6	86.8	83.5 (79.7, 86.7)

	No	15.4	20.4	13.2	16.5 (13.3, 20.3)
Lock on door	Yes	70.5	50.3	58.9	60.0 (55.3, 64.4)
	No	29.5	49.7	41.1	40.0 (35.6, 44.7)

Benefits and Disadvantages of Toilet Use

While the above information is important in hypothesizing why individuals may or may not uptake and sustain toilet use, knowledge of the perceived benefits and disadvantages of toilet use among communities is essential to understanding what drives demand for toilets.

Table 5.2 highlights perceptions within study communities regarding benefits and disadvantages to toilet use. Overall, we find that there is a high amount of perceived benefits to toilet use across all sub groups, indicating that the demand for toilets is likely high. The most commonly listed benefits of toilet use are health (78.5%) and safety (67.8%), privacy (48.8%), convenience (42.1%), and cleanliness (53.7%). Insights from qualitative data highlight that when toilets are filled and unclean due to lack of proper maintenance and cleaning, individuals express concern for their own health and safety.

When asked about disadvantages to toilet use, individuals surveyed highlighted that structural concerns such as cost (29.5%), smell (57.9%), and distance (8.9%) were the primary disadvantages that they could think of to toilet use. It is important to think about the interconnectedness of these stated disadvantages. Financial barriers to building and maintaining toilets leads to less toilets being built in communities, and further contributing to the prevalence of shared toilets in those same communities. These barriers, according to respondents in FGDs conducted in Nimba and Lofa county, are then often coupled with poor maintenance of shared toilets, which leads individuals to stop using them.

These data support our prior intuition that, while demand for toilets is high, many community members may be reluctant to use toilets for sustained periods of time due to poor build quality and maintenance. Ensuring that individuals feel that toilets are safe, clean, private, and easily accessible is necessary for community demand for toilets to be met.

TABLE 5.2: COMMUNITY PERCEPTIONS OF TOILET USE BENEFITS AND DISADVANTAGES					
VARIABLE	VALUE	CURRENT ODF	PREVIOUSLY ODF	NEVER ODF	TOTAL SAMPLE
		HOUSEHOLD HEADS (N=160) %	HOUSEHOLD HEADS (N=158) %	HOUSEHOLD HEADS (N=133) %	HOUSEHOLD HEADS (N=451) % (95 CI)
Toilet Use Benefits	Health	78.8	81	75.2	78.5 (74.4, 82.1)
	Safety	70.6	65.2	67.7	67.8 (63.4, 72.0)

	Convenience	45.6	49.4	29.3	42.1 (37.6, 46.8)
	Privacy	48.8	47.8	50.4	48.8 (44.2, 53.4)
	Comfort	42.5	34.8	28.6	35.7 (31.4, 40.2)
	Cleanliness	53.1	53.8	54.1	53.7 (49.0, 58.2)
	Environmental Cleanliness	34.4	40.5	27.1	34.4 (30.1, 38.9)
	Popular behavior	3.1	3.2	2.3	2.9 (1.7, 4.9)
	Cheap	0.6	0.0	1.5	0.7 (0.2, 2.1)
Toilet Use Disadvantages	Distance	6.3	10.8	9.8	8.9 (6.6, 11.9)
	Smell	55.0	59.5	59.4	57.9 (53.2, 62.4)
	Cost	29.4	26.0	33.8	29.5 (25.5, 33.9)
	Not traditional	2.5	0.0	6.0	2.7 (1.5, 4.6)

Disadvantages of Bush Use

Just as important to knowing about perceived benefit of toilets is to understand what disadvantages, if any, individuals state for the alternative to toilet use; bush use. When asked about disadvantages of using the bush, near universal agreement was found across communities stating that there was no satisfaction with using the bush.

Table 5.3 shows that when individuals use the bush they are most concerned about personal (51.1%) and environmental (37.5%) health, safety from animals (73.8%) and other individuals (35.1%), and lack of privacy (42.9%). Each of these concerns can be mitigated if individuals have access to well-built and maintained toilets.

These data, when coupled with those found in table 5.2, highlight that individuals perceive numerous benefits to toilet use and generally do not wish to use the bush, but are primarily inhibited by financial barriers and lack of accountability for maintenance for shared toilets.

TABLE 5.3: COMMUNITY PERCEPTIONS OF BUSH USE DISADVANTAGES

VARIABLE	VALUE	CURRENT ODF	PREVIOUSLY ODF	NEVER ODF	TOTAL SAMPLE
		HOUSEHOLD HEADS (N=160) %	HOUSEHOLD HEADS (N=158) %	HOUSEHOLD HEADS (N=133) %	HOUSEHOLD HEADS (N=451) % (95 CI)
Bush Use Disadvantages	Satisfied with bush	1.4	0.0	0.8	0.7 (0.2, 2.2)
	Environmental concerns	31.1	42.6	38.7	37.5 (33.0, 42.2)
	Health concerns	56.1	46.5	50.8	51.1 (46.3, 55.8)
	Safety from animals	77.0	77.4	65.3	73.8 (69.4, 77.8)
	Safety from people	29.7	35.0	41.9	35.1 (30.7, 39.8)
	No privacy	46.0	38.1	45.2	42.9 (38.2, 47.6)
	Not convenient	23.0	19.4	32.3	24.3 (20.5, 28.7)
	Smell	25.0	16.1	21.8	20.8 (17.2, 25.0)
	Embarrassing	7.4	9.7	6.5	8.0 (5.7, 11.0)

Characteristics of Good and Bad Quality Toilets

Demand for toilets has been illuminated through the benefits stated above of toilet use, as well as through the disadvantages that individuals see with using the bush. However, if toilets are to be built, it is also important to understand what features individuals place the most value on. Ensuring that these features are present when individuals use the toilet can greatly increase the probability that individuals will not only begin using toilets, but further that they will continue use of them.

As stated earlier, privacy (47.6%) and safety (46.0%) show up again as important characteristics that individuals consider when naming features of a desirable toilet. Overwhelmingly, individuals hint at the importance of toilet build quality, namely the quality of the roof (84.1%) and walls and floors (76.2%). Individuals also state that they desire to have pour flush functionality (60.1%) in toilets. Painted walls also show up as a characteristic of toilets that are demanded by individuals across each community (47.0%).

Unsurprisingly, individuals overwhelmingly state that leaky roofs (84.7%) and unplastered walls (66.9%) are highly undesirable, again hinting at the importance of toilet structural integrity. In line with stated

preference for privacy in toilets, we find that individuals also state that toilets not having a door as being highly undesirable (80.1%). No concrete slab in the toilet has also been listed as a feature demanded by 57.8% of individuals in the study population.

TABLE 5.4: QUALITIES OF GOOD AND BAD TOILETS					
VARIABLE	VALUE	CURRENT ODF	PREVIOUSLY ODF	NEVER ODF	TOTAL SAMPLE
		HOUSEHOLD HEADS (N=160) %	HOUSEHOLD HEADS (N=158) %	HOUSEHOLD HEADS (N=133) %	HOUSEHOLD HEADS (N=451) % (95 CI)
Good Toilet Qualities	Good roof - zinc	84.6	83.5	84.2	84.1 (82.0, 86.0)
	Wall and floor plaster	77.2	77.0	74.5	76.2 (73.7, 78.6)
	Pour flush	64.0	58.4	57.7	60.1 (57.2, 62.8)
	Painted walls	49.5	49.3	42.3	47.0 (44.2, 49.9)
	Privacy	53.9	47.6	41.3	47.6 (44.8, 50.5)
	Safety	49.8	44.7	43.3	46.0 (43.1, 48.8)
Bad Toilet Qualities	Leaky roof	86.8	82.4	84.9	84.7 (82.3, 86.7)
	Walls not plastered	69.4	67.7	63.6	66.9 (64.2, 69.5)
	No concrete slab	64.5	55.3	53.5	57.8 (55.0, 60.6)
	No door	80.4	82.4	77.5	80.1 (77.8, 82.2)

Community level Toilet Use

A total of 33 communities were included in the survey, 11 each within the 3 groups being studied. Table 5.5 shows how some communities in the current ODF and previously ODF groups managed to retain high toilet use. For example, Nyewahun #2 from the current ODF group, showed 100 percent toilet use indicating that it is an ODF community. Similarly, Barfelleh reported 84% toilet use, Wehyeepa had 64 % respondents using toilets and Ducorgbondo had 50% of its respondents

using toilets. This indicates that 4 out of the 11 communities in the currently ODF group had more than 50% toilet use.

The previously ODF group has 5 communities that have 50% or more toilet use (Table 5.5). These are, Kortuma (80%), Suakarzue (75%), Fofanata (62%), Kondu town (53%) and Karnwee (52%). The never ODF groups had only one community with more than 50% toilet use, Jarmulor (78%). These findings highlight the variation in uptake of toilet use within the 3 groups.

TABLE 5.5: Percent of Bush and Toilet Users in each Community Sampled, by ODF status				
PACS ODF Status	Community	Bush Users N (%)	Toilet Users N (%)	Sample Size
ODF	Barfelleh	2 (15.4)	11 (84.6)	13
	Nyewahun #2	0 (0.0)	10 (100.0)	10
	Bololahun	47 (63.5)	27 (36.5)	74
	Kortulahun	36 (65.5)	19 (34.5)	55
	Tongolahun	19 (95.0)	1 (5.0)	20
	Ducorgbondo	15 (50.0)	15 (50.0)	30
	Manbor	27 (67.5)	13 (32.5)	40
	Beahnlay New Town	31 (77.5)	9 (22.5)	40
	Kpolay	28 (70.0)	12 (30.0)	40
	Wehyeepa	17 (37.0)	29 (63.0)	46
	Zekepa	26 (65.0)	14 (35.0)	40
Previously ODF	Temisadu	19 (76.0)	6 (24.0)	25
	Fofanata	22 (37.3)	37 (62.7)	59

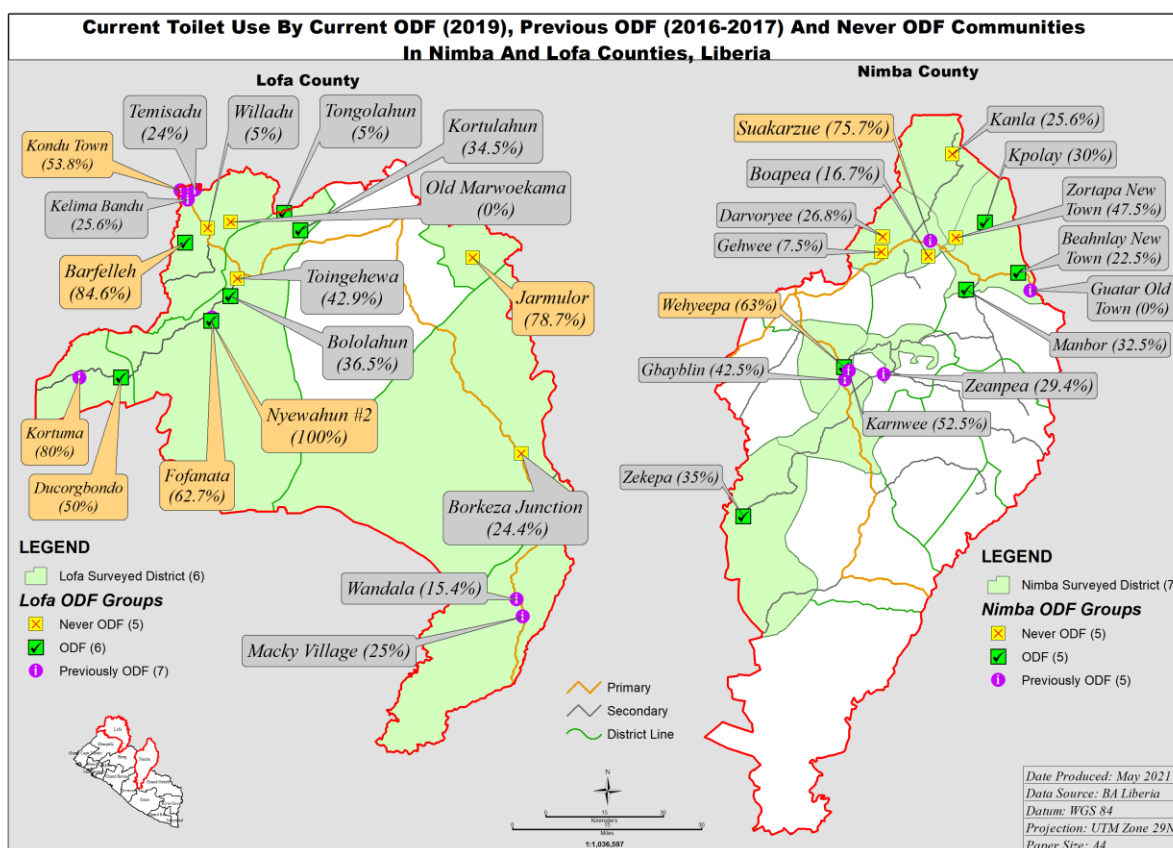
	Macky Village	24 (75.0)	8 (25.0)	32
	Kondu Town	6 (46.2)	7 (53.8)	13
	Kelima Bandu	29 (74.4)	10 (25.6)	39
	Wandala	11 (84.6)	2 (15.4)	13
	Kortuma	3 (20.0)	12 (80.0)	15
	Guatar Old Town	40 (100.0)	0 (0.0)	40
	Suakarzue	9 (24.3)	28 (75.7)	37
	Gbayblin	23 (57.5)	17 (42.5)	40
	Karnwee	19 (47.5)	21 (52.5)	40
	Zeanpea	24 (70.6)	10 (29.4)	34
Never ODF	Old Marwoekama	18 (100.0)	0 (0.0)	18
	Willadu	38 (95.0)	2 (5.0)	40
	Toingehewa	16 (57.1)	12 (42.9)	28
	Jarmulor	16 (21.3)	59 (78.7)	75
	Borkeza Junction	31 (75.6)	10 (24.4)	41
	Zortapa New Town	21 (52.5)	19 (47.5)	40
	Darvoryee	30 (73.2)	11 (26.8)	41
	Gehwee	37 (92.5)	3 (7.5)	40
	Boapea	35 (83.3)	7 (16.7)	42

	Kanla	29 (74.4)	10 (25.6)	39
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Community toilet use and GIS maps

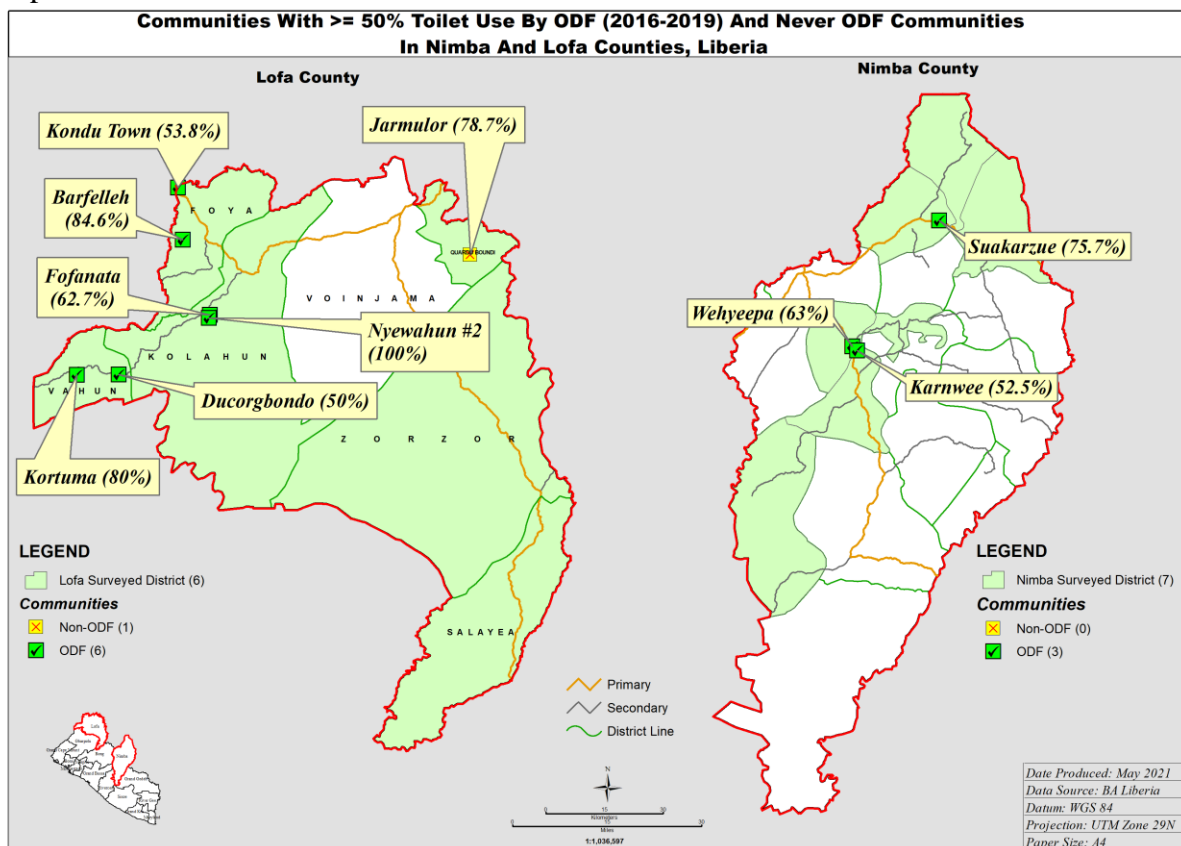
We would like to provide the details of the GIS maps and data related to community level toilet use.

Map # 1



Map #1 shows that Lofa county has 18 study sites and Nimba county has 15 study sites. Of these, 5 communities are never ODF, 6 communities are currently ODF (2019) and 7 communities are previously ODF (2016-2017) are in Lofa county. Meanwhile, Nimba county has 5 never ODF communities, 5 communities are previously ODF (2016-2017) and 5 communities that are never ODF communities. The map shows toilet use data for every community that was sampled in the WASH, 2021 study. Toilet use at each site is displayed on the map. The map shows a mix of high, medium and low toilet use across the sites. However, one site has sustained ODF status (Nyewahun, 100%).

Map #2



We can see in Map #2 this map that the ODF groups have a higher number of communities with toilet use > 50 percent. We have 6 ODF communities in Lofa and 3 ODF communities in Nimba compared with only 1 community in the non ODF community with more than 50 percent toilet use.

Experiences with Toilet Construction

The quantitative and qualitative data seemed to indicate that the amount of toilets per household relative to community status was very low across both Nimba and Lofa counties. For example, one IDI female participant in Nimba county noted that only three households had toilets out of all the households in her neighborhood.

“Only three person have toilet in my neighborhood”

(Nimba County, Sanniquelle, ODF, Woman)

This FGD participant was in an ODF community. In fact, many of the ODF communities noted low numbers of toilets in their and other communities.

“Yes, there are three (3) toilets in Ketougain and there are three (3) household in Zegbain.”

(Nimba County, Darvoryee Community, ODF, Woman)

Other participants in non-ODF communities also mentioned low numbers of toilets in their communities.

“What my son said is the final we have only one toilet here per cluster”

(Lofa County, Temisadu, OD, Man)

“Four houses has toilet in Nanplay. One House has toilet in Zainplay. No house has toilet in Joelay besides the government toilet. Four houses have toilet in Bealay. My recommendation is, we want the people (our partners) to come and give something to us so that we can build out toilet, because the public toilets in this community are not enough.”

(Nimba County, Darvoryee Community, Never ODF, Woman)

As this participant highlighted, most toilets in communities were communal, and there were very few private household latrines. Even private household latrines, however, seemed to eventually become communal due to the low supply of toilets and high demand for toilets in communities.

When asked how communities and individuals obtained their toilet, participants noted one of the three sources for obtaining a toilet: self-bought and self-built, government provision, and NGO support. Some participants noted that they or other people in their community built their own toilets for personal use. For example, a male IDI participant in IDI in Nimba county said that some people in his ODF community built their own toilet for the own usage.

“Some people build their own toilet.”

(Nimba County Sanniquelle Meh District #2, Swakazue, IDI, ODF Community Male)

Participants who built their own toilet oftentimes procured their own materials as well. For example, female FGD participants expressed that they bought the materials for the toilet and built the toilet themselves, and it seemed the main motivator for this was the convenience of having a toilet during the rainy season.

“I bought zinc, fix bricks, and fix the one I am using now because at that time money business was hard so I build this one not to go in the bush during the rainy season.”

(Nimba County Saclepea mah Gbanlah, OD Community, FGD, Female)

Furthermore, another participant noted that the decision to buy and build their own household toilet was a decision made by their whole family, highlighting both the large financial decision of building a toilet as well as the widely understood value of using a toilet.

“Before getting this toilet, we use the bush for latrine, after a long period we sat down as family and discuss about building our own toilet and that was how we build our toilet.”

(Lofa County Fofanata, Never ODF Community, IDI, Female)

Other participants and communities obtained their toilets with the help of local government officials. For example, a female FGD participant in Lofa county stated that the head of their quarter helped with building their toilet, also noting that no non-profit organization had come to help in the community with toilet.

“The head of the quarter is the one that promoted the building of the toilet. If for example, Sidiki Kamara is controlling this community, he will say let us dig a pit for toilet but no NGO has come here to ever do that.”
(Lofa County, Bolahun, ODF Adult, FGD, Female)

Other participants said that non-profit organizations, like the Concerned Christian Community, helped build toilets in their communities.

“An NGO Called Triple C [built our toilet].”
(Nimba County Saclepea Mah Gbanlah, OD Community, FGD, Female)

Overall, most participants had a small number of toilets in their communities, and most toilets were communal toilets. All toilets were either self-bought and self-built, provided by the government, or bought and built by non-profit organizations.

When it comes to the type of toilets, 75% of participants mentioned that their toilets are single pit for Never ODF status in Lofa County as compared to 50% in Nimba County. Subsequently, 25% of participants from OD and ODF communities mentioned double pit toilet. Lastly, only 25% of ODF participants mentioned other type of toilet in Lofa county. However, when participants were asked to describe their toilets, descriptions ranged in terms of type of toilet. For example, a male IDI participant from Nimba county talked about two different types of toilets, a “Chinese toilet” and a “hole”.

“Yes, that is why we called it Chinese toilet, because can easily flush using just a little bit of water.... [For the other toilet], we dig round hole (i.e. septic tank) and cover it.”
(Nimba County, Kpoplay Town, IDI, Man)

Participants mentioned a panoply of materials used to build their toilets. A female FGD participant from Lofa county woman said that her toilet was made out of reef.

“The toilet is made out of reef.”
(Lofa County, Bolahun, ODF Adult Female, FGD)

And many participants mentioned the use of mud in building their toilets.

*"[The toilet is made of] mud to mud."
(Lofa County, Temisadu Town, IDI, Female)*

Overall, single and double pit latrines were the most common toilets across Nimba and Lofa counties. However, the materials used to build the toilets varied greatly.

Maintaining Cleanliness of the Toilet

Participants found it difficult to maintain the cleanliness of their and their communities' toilets. Some participants felt they were unable to maintain the cleanliness of their toilet because they did not have the materials to do so.

*"We are lacking of things that are to be used to sweep or clean in the toilet, we can want to clean in the toilet sometimes but we do not have. Sometimes we can use gloves to hold brooms to sweep in the toilet."
(Lofa County, Bolahun, ODF, FGD, Female)*

Another female FGD participant from Lofa county stated that the chemical needed to clean feces in the toilet to prevent it from smelling was unavailable to them. She also mentioned the need for other materials, like brooms and gloves.

*"Things that can maintain toilet are the chemical to put in the toilet when it fill that it can't smell in the community, things that we can use to sweep in the toilet."
(Lofa County, Bolahun, FGD, ODF Community Female)*

A few other participants felt it was the responsibility of the government or organizations to clean the toilets and felt there was a lack of such support.

*"Yes, we stop using the toilet because it has spoiled completely, or it is not good again... Because the authorities are not taking care of the toilet."
(Nimba Country, Sanniquelle Mah District, NODF, Woman)*

Interestingly, one male FGD participant in Nimba county also mentioned that the government had already put policies in place to incentivize clean yards and related environments, highlighting the potential for similar toilet-related cleanliness policies.

*"Yes, there is a law here to clean your yard and environment. If you clean, you will be paid about 250LD to 500LD."
(Nimba County, Sanniquelle Meh (D#2), Suakarzue Community, ODF, Man)*

Overall, many participants found maintaining the cleanliness of toilets difficult. Some wanted materials that would help them clean the toilet. Others expected the government to be responsible for cleaning the toilets. Since there seems to be environmental and cleanliness policies in some communities, similar toilet-related policies could prove possible and beneficial.

Chapter 6: Handwashing Station, Practices Related to Handwashing with Soap After Defecation

Rural sanitation includes handwashing with soap after defecation in addition to using a toilet. The two behaviors, toilet use followed by handwashing with soap form a continuum of behaviors that are essential if toilets are to yield health benefits. This chapter focuses on the handwashing habits of the respondents, specifically after defecation and cleaning a young child's faeces.

A handwashing station has a water source and soap availability at a specified spot near a toilet or house. Handwashing with soap after defecation is facilitated by the presence of a handwashing station. Therefore, a functional handwashing station is a prerequisite to handwashing with soap after defecation in rural areas.

Only 21% respondents stated that they had a handwashing station within 2 meter of their toilet (Table 6.1). And the previously ODF group had the least number of handwashing stations reported (16%). Of these handwashing stations, about 78 percent had water and only 48 percent had soap available on the day of the survey.

The observation data indicate corroborates the findings related to handwashing stations. Only 16% of the toilets were found to have handwashing stations within 2 meters of the toilet.

TABLE 6.1: HANDWASHING STATION & CURRENT TOILET USERS (N=451)					
HANDWASHING STATION	VALUE	CURRENTLY ODF GROUP	PREVIOUSLY ODF GROUP	NEVER ODF GROUP	TOTAL SAMPLE
		HOUSEHOLD HEAD (N=160)	HOUSEHOLD HEAD (N=158)	HOUSEHOLD HEAD (N=133)	HOUSEHOLD HEAD (N=451) (95 CI)
Is there a handwashing station 2-meter from toilet	Yes	25.0	16.5	24.8	21.9 (18.4, 26.0)
	No	75.0	83.5	75.2	78.1 (74.0, 81.6)
Does hand washing station have water today	Yes	87.5	65.4	78.8	78.8 (69.5, 85.8)

	No	10.0	30.8	21.2	19.2 (12.5, 28.3)
	Don't Know/No Response	2.5	3.8	0.0	2.0 (0.5, 7.8)
Does the hand washing station have soap today	Yes	50.0	38.5	54.5	48.5 (38.7, 58.4)
	No	50.0	57.7	45.5	50.5 (40.6, 60.3)
	Don't Know/No Response	0.0	3.8	0.0	1.0 (0.1, 7.0)

Handwashing with Soap after Defecation

The leaf is the most commonly used material for anal cleansing (Table 6.2). This was followed by the use of water, and paper/tissue (Table 6.2). We used two measures for handwashing with soap after defecation. In the first measure, we asked respondents what they wash their hands with after defecation. Here, about 67 percent of the sample said they use soap and water (Table 6.1). However, we also asked how many times in the past week did people wash their hands with soap and water. From this data, we understand that about one third of the users (32%) do not wash their hands with soap, another 30 percent have low handwashing with soap (<6 times a week) and 37% reported daily handwashing with soap after defecation (7+ times).

TABLE 6.2: HANDWASHING WITH SOAP PRACTICES AMONG HOUSEHOLD HEADS IN NIMBA AND LOFA COUNTIES, LIBERIA

VARIABLE	CURRENTLY ODF GROUP N = 408 %	PREVIOUSLY ODF GROUP N=387 %	NEVER ODF GROUP N= 404% %	TOTAL SAMPLE N=1199 %
Anal cleansing				
Leaf	39.7	46.5	44.0	43.3
Water	30.1	31.0	34.6	31.9
Paper/Tissue	29.9	22.4	20.7	24.4

Handwashing after defecation	1.7	2.3	2.4	2.1
Don't wash hands	25.7	26.8	27.2	26.6
Water only	68.8	66.9	67.8	67.8
Water and soap	3.4	3.8	2.2	0.1
Ash				
Daily handwashing with soap after defecation (7+) Yes	36.1	38.9	35.4	36.8
Soap Location				
Inside the house	58.3	51.7	58.0	56.2
Outside the house	27.7	31.6	25.9	28.4
Both	12.4	12.3	12.0	12.2
Other	1.4	4.2	4.0	3.2

Water Availability

For some communities, there was low availability of water for handwashing for various reasons. A few communities did not have a water pump, making it difficult to obtain water. For example, a female FGD participant in Lofa County stated that the absence of a water pump means that the only means of getting water is by fetching water from a natural water source, which is oftentimes further away and unclear.

*"We do not have pump. We go to the waterside to draw water."
(Lofa County, Bolahun, ODF, FGD, woman)*

However, Peace Wing, Plan Liberia, and other organizations have helped to build pumps in some communities in Nimba and Lofa counties.

*"Yes, we thank God or the water business because peace wing and Plan Liberia help to build pump for us after the war."
(Lofa County, Toingehewa, NODF, Man)*

For those communities that had at least one water pump, some participants noted the seasonal difficulty of using a water pump. For example, a female IDI participant in Lofa county stated that it is during the dry season when water can dry up from the pump. When this happens, the pipe cannot draw water any longer.

*"It is during the dry season the water can finish from the pump because the pipe cannot draw water any longer."
(Lofa County, Toingehewa, NODF, Woman)*

*"We are talking about safe drinking water. Water business can be hard even in the dry and raining seasons because we only have two hand pumps in the town and not everyone here can draw from it. When you go for water sometimes, the pump has been locked."
(Nimba County, Saclepeama Gbanlah, OD, woman)*

Additionally, some participants in communities with pumps said that water was scarce because of the limited number of pumps available for the whole community. With a limited number of pumps, there is oftentimes not enough water for everyone in the community.

"We are facing hard times with our pump. We only have two pumps in this town and the population in this town is big. When people go there first, they can draw all the water, it finished. At the end, we can go at the creek and draw water."
(Nimba County, Kpoplay Town, ODF FGD, Woman)

Overall, it seems that a small number of communities do not have access to water pumps and clean water. For those communities that have water pumps, there were still some issues with water scarcity due to seasonality or low number of pumps, and therefore available clean water, for the community. This limited access to clean water can make it difficult for community members to wash their hands after defecation.

Benefits and Challenges of Handwashing

Another essential component to encouraging handwashing is the existence and accessibility of handwashing stations. Across Nimba and Lofa counties, most participants expressed a lack of handwashing stations. A female FGD participant in Lofa county stated that did not have hand washing station at the two communal toilets in their quarter.

"There is no hand washing station at the two toilets in Fofanata Quarter."
(Bolahun, Lofa, FGD, ODF, Man)

Only a few participants mentioned having handwashing stations. For example, a male IDI participant in Nimba county reported having a water station with soap next to their toilet.

"Yes, there is water station at the toilet with soap."
(Nimba County Sanniquelle Meh District #2 Suakarzue, ODF, IDI, Man)

While handwashing stations seemed scarce among communities in Nimba and Lofa counties, many participants thought there were clear benefits to handwashing after defecation.

"It is important to make yourself clean when you come from toilets because you will be free from the sickness."
(Lofa County, Bolahun District, ODF, Woman)

Since many participants reported little to no handwashing stations for their communities to use after defecation, many participants said they use buckets to bring water to the toilet or bush, and to wash their hands after defecation.

"We do not have water station here, so we use the keto [bucket with water] to wash our hands after using the bush to toilet."
(Lofa County Bolahun, ODF Community, IDI Female)

"I can take water in the bathing bucket and wash my hand."
(Nimba County Darvoryee, Never ODF Community, IDI, Woman)

Generally, while a few participants reporting having handwashing stations to use after defecation, most participants reporting seeing/having little to no such handwashing stations. For those who did not have handwashing stations, many participants reported using a bucket to bring water and clean their hands after defecation.

With regards to using soap for handwashing, most participants felt there were benefits to using soap when handwashing, especially handwashing after defecation. For example, a male IDI participant in Lofa county stated that it was always good to wash one's hands with clean water and soap after using the latrine in order to remove any unpleasant scents.

"Even when you use the water and you do not wash your hand with soap, the latrine scent remain on your hand."

(Lofa County Borkeza Junction, Never ODF, IDI, Man)

However, soap was difficult for many participants to obtain. For those who were unable to obtain or use soap, many of these participants reported using ashes instead to clean their hands.

"Sometime with clear water and clean water with ashes when there is no soap from the advice the health people gave us."

(Saclepeama Gbanlah, Nimba, IDI, OD, Man)

"Yes, sometime when there is no soap we use ashes."

(Nimba County, Suakazu, Sanniquelle Meh District #2, Never ODF, Woman)

Limited water supply and lack of handwashing stations near toilets made it difficult for many participants to practice handwashing after defecation, even though participants felt there were clear benefits to handwashing. Additionally, most participants thought there were clear benefits to using soap while handwashing, especially after defecation. However, some participants did not have soap readily available, and many of these participants would use ashes instead to clean their hands after defecation.

Chapter 7: Couple Communication, Self Efficacy, Social Norms and Community Sanitation Practices

This rural sanitation study has a special focus on behavioral determinants of sanitation practices. The key research question to be answered is, which specific factors influence positive sanitation behaviors in Nimba and Lofa counties. We explored several constructs to get an in-depth understanding of the factors associated with toilet use and handwashing with soap after defecation. These constructs include couple communication, self efficacy and social norms. In addition, we also explored the role of the community in the promotion and maintenance of toilets.

Couple Communication among Bush Users

Couple communication related to sanitation was high in all 3 communities. About 42.5 % bush users replied that they had spoken 40 times or more about sanitation issues with their partners (Table 8.1). In contrast, 92 % toilet owners stated that they had discussed sanitation issues ONLY once in the past 3 months with their partners. Usually household heads (51%) initiated discussions on sanitation with their partners.

We measured how free household heads felt about discussing issues with their partners. Almost 32 percent of the respondents felt they did not feel free to talk with their partners. And about 16 percent stated that they had very high levels of communication interaction with their partners.

TABLE 7.1: PATTERNS OF COUPLE COMMUNICATION AROUND SANITATION TOPICS AMONG BUSH USERS

VARIABLE	VALUE	CURRENTLY ODF GROUP %	PREVIOUSLY ODF GROUP %	NEVER ODF GROUP %	TOTAL SAMPLE
COUPLE COMMUNICATION		HOUSEHOLD HEADS (N=248) %	HOUSEHOLD HEADS (N=229) %	HOUSEHOLD HEADS (N=271) %	HOUSEHOLD HEADS (N=748) (95 CI)
Speak to partner about sanitation	0 (Not at all)	12.8	13.6	13.1	13.2 (11.4, 15.2)
	1-10 (Rarely)	39.2	29.9	37.9	35.7 (33.1, 38.5)
	11-40 (Sometimes)	6.6	9.3	9.9	8.6 (7.1, 10.3)
	40+ (Often)	41.4	47.2	39.1	42.5 (39.7, 45.3)

Who initiates conversation	Myself	45.9	51.7	56.9	51.7 (47.7, 55.7)
	My Partner	24.5	17.6	17.4	19.8 (16.8, 23.3)
	Both	27.6	30.1	23.4	26.8 (23.4, 30.5)
	Other	2.0	0.6	2.3	1.7 (0.9, 3.1)
San30_How freely do you talk to your spouse/partner	0-20 (Not free)	30.7	33.2	34.3	32.8 (11.4, 15.2)
	20-40	8.5	6.1	5.9	6.8 (33.1, 38.5)
	40-60	18.9	18.8	15.9	17.8 (7.1, 10.3)
	60-80	27.0	25.7	24.7	25.8 (39.7, 45.3)
	80-100 (very free)	14.9	16.2	19.2	16.8 (39.7, 45.3)

Social Norms Related to Sanitation

Social norms are a major driver of health behaviors. Social norms refer to the prevalence of informal rules which bind a social group to follow them. Since Liberia is a socially interconnected society, we felt it was important to measure social norms in the context of health behavior change.

The first social norm we measured was around latrine ownership in the neighborhood/cluster. Table 8.2 shows that 75% of the respondents from the two ODF areas said that only 0-3 persons out of 10 use toilets in their community. For the never ODF group, 85 % stated that only 0-3 persons use toilets in their community (Table 8.2). This indicates a low social norm around toilet use.

Similarly, for handwashing with soap after defecation, almost 55% of respondents stated that 0-3 persons out of 10 in their community wash their hands with soap after defecation. This indicates a low social norm for handwashing with soap after defecation (Table 8.2).

The social norm around washing hands with soap after cleaning a young child's faeces is also low. About 56% of the respondents say that only 0-3 persons out of 10 wash their hands with soap after cleaning their child's faeces. Interestingly, the social norms across the three groups are almost same indicating the need to shift social norms towards positive toilet use and handwashing behaviors.

TABLE 7.2: SOCIAL NORMS RELATED TO TOILETS AND HANDWASHING WITH SOAP

VARIABLE	VALUE	CURRENTLY ODF GROUP	PREVIOUSLY ODF GROUP	NEVER ODF GROUP	TOTAL SAMPLE
SOCIAL NORMS		HOUSEHOLD HEADS (N=408)	HOUSEHOLD HEADS (N=387)	HOUSEHOLD HEADS (N=404)	HOUSEHOLD HEADS (N=1,199) (95 CI)
# of households own latrine out of 10	0-3	74.7	75.7	85.9	78.8 (76.4, 81.0)
	4-6	17.9	17.1	8.7	14.5 (12.6, 16.6)
	7-10	7.4	7.2	5.4	6.7 (5.4, 8.2)
# of members using latrine out of 10 households	0-3	68.6	65.9	78.5	71.1 (68.4, 73.6)
	4-6	17.4	18.9	11.9	16.0 (14.0, 18.2)
	7-10	14.0	15.2	9.6	12.9 (11.1, 14.9)
# of households wash hands with soap after bush/toilet out of 10	0-3	53.9	55.0	57.9	55.6 (52.8, 58.4)
	4-6	19.9	20.9	24.5	21.8 (19.5, 24.2)
	7-10	26.2	24.0	17.6	22.6 (20.3, 25.1)
# of households wash hands with soap after child's feces out of 10	0-3	56.1	57.4	60.6	58.0 (55.2, 60.8)
	4-6	21.1	22.2	23.0	22.1 (19.8, 24.5)
	7-10	22.8	20.4	16.3	19.9 (17.7, 22.2)

Self Efficacy

Self efficacy is a person's confidence in being able to perform a task or action. Table 8.3 shows that toilet users 45 percent toilet users were very confident that they would continue using the toilet. The efficacy for toilet use was highest in the previously ODF group and lowest in the never OFD group (Table 8.3).

However, high self efficacy in placing a handwashing station near the toilet was expressed by only 37 percent of the toilet users (Table 8.3). About half the respondents (50%) expressed high self efficacy in washing their hands with soap after defecation.

TABLE 7.3: SELF EFFICACY FOR TOILET USE AND HANDWASHING WITH SOAP IN TOILET USERS					
SELF-EFFICACY	VALUE	CURRENTLY ODF GROUP	PREVIOUSLY ODF GROUP	NEVER ODF GROUP	TOTAL SAMPLE
		HOUSEHOLD HEADS (N=160)	HOUSEHOLD HEADS (N=158)	HOUSEHOLD HEADS (N=133)	HOUSEHOLD HEADS (N=451) (95 CI)
Confidence of continued toilet use	0-20	6.9	11.4	18.8	11.9 (9.3, 15.35)
	20-40	5.0	5.1	3.8	4.7 (3.1, 7.0)
	40-60	12.5	11.4	16.5	13.3 (10.5, 16.8)
	60-80	28.1	20.9	23.3	24.2 (20.4, 28.3)
	80-100	47.5	51.2	37.6	45.9 (41.3, 50.5)
Confident to place hand washing facility near the toilet	0-20	17.5	16.5	19.5	17.7 (14.5, 21.5)
	20-40	5.6	11.4	10.5	9.1 (6.8, 12.1)
	40-60	9.4	12.0	15.8	12.2 (9.5, 15.6)
	60-80	28.8	21.5	21.1	23.9 (20.2, 28.1)
	80-100	38.8	38.6	38.1	37.0 (44.2, 53.4)
Confident to wash hand after defecation	0-20	11.9	10.7	15.0	12.4 (9.7, 15.8)
	20-40	5.0	4.4	7.5	5.5 (3.8, 8.1)
	40-60	6.3	8.9	18.1	10.6 (8.1, 13.8)
	60-80	23.7	20.9	16.5	20.6 (17.1, 24.6)

	80-100	53.1	55.1	42.9	50.8 (46.2, 55.4)
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Community Knowledge and Sanitation Practices

Tantamount to ensuring uptake and sustainability of sanitation practices is robust community engagement in the promotion and implementation healthy behaviors related to sanitation and hygiene. In chapter 5, we saw that lack of accountability within communities has led to a high number of toilets being unclean and filled. It is thus important to understand the degree to which individuals are aware of and engage in community sanitation practices.

Table 7.4 highlights community-level knowledge and engagement in sanitation practices related to toilet use and handwashing. Overall, it seems as though many individuals do not have much awareness of CLTS practices (56.3%), although there is notable difference in knowledge between those in the currently (62.8%) and previously (57.9%) ODF groups as compared to the never ODF group (48.3%), indicating that programs aimed at increasing knowledge of community-led sanitation have likely increased knowledge around the same subject.

While individuals tend to show low levels of awareness of CLTS, when asked whether or not they participate in activities that are part of CLTS, the majority stated that they have partaken in community sanitation practices (78.2%). Levels of engagement also differ quite drastically between the current (88.3%) and previous (79.9%) ODF groups, when compared with the never ODF group (63.1%). These data further indicate that knowledge of community sanitation practices may have a positive impact on actual engagement in activities that promote the uptake and sustained use of toilets and handwashing facilities.

TABLE 7.4: COMMUNITY KNOWLEDGE AND SANITATION PRACTICES FOR TOILET USE AND HANDWASHING WITH SOAP					
VARIABLE	VALUE	CURRENTLY ODF GROUP	PREVIOUSLY ODF GROUP	NEVER ODF GROUP	TOTAL SAMPLE
COMMUNITY KNOWLEDGE/PRACTICE		HOUSEHOLD HEADS (N=408)	HOUSEHOLD HEADS (N=387)	HOUSEHOLD HEADS (N=404)	HOUSEHOLD HEADS (N=1,199) (95 CI)
Individual has knowledge of CLTS	Yes	62.8	57.9	48.3	56.3 (53.5, 59.1)
	No	31.1	35.1	47	37.8 (35.1, 40.6)
	Don't Know/No Response	6.1	7	4.7	5.9 (4.7, 7.4)
Participation in CLTS activities	Yes	88.3	79.9	63.1	78.2 (74.9, 81.2)
	No	8.6	15.2	27.2	16.1 (13.6, 19.1)

Don't Know/No Response	3.1	4.9	9.7	5.6 (4.1, 7.6)
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Community Leadership

While community engagement in sanitation practice and promotion is important, the influence of leaders and community role models should not be undervalued. Strong leaders can push communities into action and promote sustained behaviors by organizing and supporting communities in their efforts to practice healthy behaviors related to sanitation and hygiene.

The first item to explore is the frequency of engagement by leaders with promotion of healthy sanitation practices. Data in table 7.5 show that engagement by community leaders is high across the sample (76.5%), with noted difference across the different ODF groups.

Individuals state that faith leaders, such as pastors (34.9%) and imams (12.8%) influence their decision to participate in community sanitation practices. Overwhelmingly, individuals note that traditional leaders (50.3%) and community role models such as health workers and teachers (48.2%) play the largest roles in affecting individual behavior. Politicians seem to have virtually no influence on individual decision-making. This may be tied to noted perceptions that the government has not supported communities to maintain sanitation facilities.

TABLE 7.5: COMMUNITY LEADERSHIP AND INFLUENCERS

VARIABLE	VALUE	CURRENT ODF	PREVIOUSLY ODF	NEVER ODF	TOTAL SAMPLE
		HOUSEHOLD HEADS (N=408)	HOUSEHOLD HEADS (N=387)	HOUSEHOLD HEADS (N=404)	HOUSEHOLD HEADS (N=451) (95 CI)
Community leader promotion of toilet use (Yes)		82.8	79.1	67.6	76.5 (74.0, 78.8)
Personal influencers of toilet use	Pastor	40.7	33.6	30.5	34.9 (32.3, 37.7)
	Imam	10.5	13.7	14.1	12.8 (11.0, 14.8)
	Traditional leader	53.2	46.0	51.5	50.3 (47.5, 53.1)
	Politician	1.0	1.0	1.5	1.2 (0.7, 2.0)
	Teachers and health workers	48.3	48.8	47.5	48.2 (45.4, 51.0)

Barriers to Building Toilets

Experiences and challenges of building toilets is an integral element in understanding how individuals may or may not get involved in community sanitation practices, and further uptake and maintain healthy behaviors themselves.

Overall, there seems to be some knowledge within communities on how to build toilets (65.4%). This observation, combined with the low toilet ownership noted earlier on in this report seem to further hint at financial barriers likely playing a large role in an individual's decision not to build a toilet or request help for building one.

Table 7.6 also highlights that there is little knowledge among individuals about where they can procure materials for building and maintaining toilets (40.8%). Knowledge of sources of sanitation materials was mismatched with actual availability around individuals, which shows that the majority of individuals have access to at least 2 or more shops (62.6%) that offer materials for sanitation facilities.

Increasing knowledge of local options for sanitation facility building and maintenance material, coupled with increased supply of these materials, is an area where intervention could be considered to increase the number of toilets in each community.

TABLE 7.6: BARRIERS TO BUILDING TOILETS					
VARIABLE	VALUE	CURRENT ODF	PREVIOUSLY ODF	NEVER ODF	TOTAL SAMPLE
		HOUSEHOLD HEADS (N=408)	HOUSEHOLD HEADS (N=387)	HOUSEHOLD HEADS (N=404)	HOUSEHOLD HEADS (N=451) (95 CI)
Individual in community to support building (Yes)		66.9	60.7	68.3	65.4 (62.6, 68.0)
Knowledge of business selling materials (Yes)		40.2	41.1	41.1	40.8 (38.0, 43.6)
Number of nearby businesses selling toilet materials	1 to 2	45.7	25.8	39.8	37.2 (33.0, 41.6)
	2 to 4	42.1	37.1	33.1	37.4 (33.2, 41.8)
	More than 4	11.6	37.1	27.1	25.2 (21.5, 29.2)
	Don't know	0.6	0.0	0.0	0.2 (0.03, 1.4)

Challenges for Building Toilets

Generally, most participants in Lofa and Nimba counties are faced with similar toilet constraints. There is a strong need to build more toilets because of the lack thereof and a rigorous effort is also needed to renovate and maintain existing ones in ODF, OD, and Never ODF communities.

First, it is a pleasure, and what I have to say is that not everybody have the means of building that facility, because is straining and because of the virus, people are not able to really work and get money to build this facility as if others can do. So if there's a means were help will be given to people who may like to do those things thyself should be done, because actually this community is a poor community and people do not have means of doing it as we may have so there a need for assistance so that other people can have the means to better ventilation.

(Nimba County, Sanniquelle Meh District #2 Suakarzue, ODF, IDI, Man)

As this quote clearly highlights, the biggest challenge most participants faced with building toilets is the lack of quality materials available to them due to the high costs of such materials. As such, participants feel they must sparingly use high cost materials such as zinc and cement. A female IDI participant from Lofa county stated that the lack of zinc over the toilet was good for the toilet during rainy season.

Yes, there are problem (s) we are facing with toilet, and the problem for now is rainy season the rain can wet all over in the toilet because the zinc over the toilet is not good.

(Lofa County, Fofanata, IDI, Never ODF Community Female)

Additionally, another female FGD participant reported that her toilet was sinking down because she had little to no cement to fix the toilet.

I do not know what because it to sink down but maybe the cement was not enough that is why it sinks down.

(Nimba County, Saclepea Meh, FGD, OD Community Female)

Overall, the most salient challenge for participants to build and maintain their toilets was the lack of enough materials, especially high-quality materials. Materials were scarce for individuals because they were expensive, making it difficult for participants to afford the materials needed for their toilets.

Chapter 8: Multivariate Modeling of Rural Sanitation Practices

In this chapter, we highlight results from multivariate logistic regression models to determine the influence that demographic, PACS-related, and SBC influencing factors have on both toilet use and daily handwashing. All tables in this section present estimates in 3 ways, first by showing a base model that includes only demographic information. This is followed by a model that adds onto the demographic controls to see if an individual's ODF status is correlated with toilet use. Finally, a full model including demographic, ODF status, and ideational SBC factors is presented to show the estimated effect of each component, controlling for confounding variables. Diagnostics of model fit and notes on how statistical significance is noted have also been added at the bottom of each table for all models presented.

Factors Associated with Toilet Use in Nimba and Lofa Counties

Table 8.1 highlights results (odds ratios) from a multivariate regression of toilet use on demographic and ideational variables of interest. The base model, which includes only demographic controls, highlights that education (OR: 1.41, CI: 1.07–1.86), religion, and having income greater than 20,000 LRD (OR: 2.57, CI 1.52–4.37) are positively associated with the likelihood that an individual will use a toilet. The pseudo R-squared value of 0.06 highlights that around 6% of the variation in toilet use is explained by demographic characteristics of respondents alone.

When ODF status is added to the base model, we find that both current ODF status (OR: 1.37, CI: 1.01–1.86) and previously ODF status (OR: 1.52, CI: 1.12–2.06) are positively associated with increased toilet use, though these do lose significance once individuals and community-level behavioral determinants of toilet use are added to the model. Again, we find similar influence of an individual's income, education, and religion on toilet use in the model. ODF status seems to explain very little variance in toilet use, with an improvement in the pseudo R-squared value of 0.01, indicating that ODF status explains an additional 1% of variance in toilet use.

When examining our full model we find that stated benefit of toilet use (OR: 1.47, CI: 1.10–1.95), knowledge of CLTS (OR: 1.53, CI: 1.12–2.09), comfort in talking with one's partner about sanitation (OR: 2.04, CI: 1.47–2.84), and high perceived norms around toilet ownership (OR: 2.28, CI: 1.05–4.96) and toilet use (OR: 1.95, CI: 1.23–3.09) are significantly correlated with increased likelihood that an individual will use a toilet. A respondent's knowledge of their community's ODF status, as well as high income and religion are also positively associated with the likelihood that they would use a toilet. The full model's pseudo R-squared value of 0.21 indicates that a high level of variance (an additional 14% compared to the previous model) in toilet use is explained when individual and community-level influencing factors are added into the model.

These results highlight that while there has been higher prevalence of toilet use in ODF and previously ODF communities, as compared to never ODF communities (as highlighted earlier in this report), that individual, household, and community level influencing factors hold the largest bearing on an individual's decision to use toilets. Work that is aimed at providing greater financial access to toilets,

highlighting benefits of toilet use, encouraging comfort to converse about sanitation, and bolstering community norms around toilet use and ownership are estimated to have significant impact on toilet use in communities if appropriate interventions are implemented.

TABLE 8.1: RESULTS (ODDS RATIO) OF MULTIVARIATE REGRESSION OF TOILET USE ON SELECTED DEMOGRAPHIC AND IDEATIONAL VARIABLES IN NIMBA AND LOFA COUNTIES, LIBERIA			
VARIABLE	BASE MODEL ^(A)	ODF STATUS MODEL ^(B)	FULL MODEL ^(C)
Ever Attended School (Y/N)			
No (RC)	1.00	1.00	1.00
Yes	1.41 (1.07 – 1.86)*	1.43 (1.08 – 1.89)*	1.23 (0.89 – 1.68)
Respondent Age			
18 – 35 (RC)	1.00	1.00	1.00
35 – 55	1.12 (0.84 – 1.49)	1.15 (0.86 – 1.53)	1.02 (0.74 – 1.41)
55+	1.27 (0.90 – 1.79)	1.34 (0.95 – 1.89)	1.27 (0.86 – 1.88)
Respondent Gender			
Male (RC)	1.00	1.00	1.00
Female	0.83 (0.64 – 1.08)	0.83 (0.64 – 1.08)	0.80 (0.60 – 1.08)
Household Size	1.00 (0.94 – 1.05)	1.00 (0.95 – 1.05)	0.95 (0.89 – 1.01)
Religion			
Christian (RC)	1.00	1.00	1.00
Muslim	3.31 (2.43 – 4.51)***	3.43 (2.51 – 4.70)***	2.35 (1.62 – 3.39)***
Local tradition	0.49 (0.25 – 0.94)*	0.51 (0.26 – 0.98)*	0.45 (0.21 – 0.94)*
Other	0.32 (0.07 – 1.45)	0.34 (0.08 – 1.53)	0.39 (0.08 – 1.96)
Household Monthly Income			
Not Working or No Income (RC)	1.00	1.00	1.00
Less than 20,000 Liberian Dollars	1.35 (0.95 – 1.90)	1.35 (0.95 – 1.91)	1.44 (0.97 – 2.13)
Between 20,000 LD to 40,000 LD	2.57 (1.52 – 4.37)***	2.57 (1.51 – 4.37)***	2.48 (1.38 – 4.47)***
ODF Status			
Never ODF (RC)	-	1.00	1.00
Current ODF	-	1.37 (1.01 – 1.86)*	0.85 (0.60 – 1.20)
Previously ODF	-	1.52 (1.12 – 2.06)**	1.07 (0.75 – 1.51)
Benefits of Using Toilet			
Less than 3 Benefits Named (RC)	-	-	1.00
More than 3 Benefits Named	-	-	1.47 (1.10 – 1.95)**
Respondent Knows CLTS			
No (RC)	-	-	1.00

Yes	-	-	1.53 (1.12 – 2.09)**
Respondent Knows ODF Status			
No (RC)	-	-	1.00
Yes	-	-	1.59 (1.11 – 2.27)*
Couple Communication Frequency			
Low (0 – 33%) (RC)	-	-	1.00
Medium (34 – 66%)	-	-	0.92 (0.46 – 1.84)
High (67 – 100%)	-	-	0.63 (0.32 – 1.25)
Free Couple Communication			
Less than 33% (RC)	-	-	1.00
Greater than 33%	-	-	2.04 (1.47 – 2.84)***
Toilet Ownership Norm			
Low (0 – 33%) (RC)	-	-	1.00
Medium (34 – 66%)	-	-	2.47 (1.51 – 4.03)**
High (67 – 100%)	-	-	2.28 (1.05 – 4.96)*
Toilet Use Norm			
Low (0 – 33%) (RC)	-	-	1.00
Medium (34 – 66%)	-	-	1.95 (1.23 – 3.09)**
High (67 – 100%)	-	-	5.24 (3.00 – 9.16)***

Number of Respondents	1199	1199	1199
Pseudo R-Squared	0.06	0.07	0.21
Akaike Information Criterion (AIC)	1512.88	1509.01	1297.61

RC: Reference Category

(a) Model controlling for respondent demographics

(b) Model of odf status effect on toilet use, controlling for demographics

(c) Full Model with demographics, odf status, and behavioral influencing factors

* P<0.05

** P < 0.01

*** P<0.001

Factors Associated with Daily Handwashing with Soap after Defecation in Nimba and Lofa Counties

The study shows that only 36 percent of respondents reported a daily habit of handwashing with soap.

A. multivariate logistic regression model was run to identify factors associated with daily handwashing with soap after defecation. Table 8.2 present the model building exercise was conducted in 3 parts, (a) a base model looking at how demographic factors are associated with handwashing with soap, (b) the

second model adds the three ODF communities to see their effect on handwashing with soap after controlling for demographics and (c) the final model with the addition of socio-cultural, individual and relational factors (couple communication) associated with handwashing after defecation.

Data indicate that if only demographic variables are used in the model, then respondents in middle the age group (30-55) are more likely to wash their hands daily with soap compared to the younger (18-34 years) and older (55+) age groups. The other factors that were significantly associated with daily handwashing with soap are education, income and household size (Table 8.2). People who have attended school are more likely to wash hands with soap daily compared to those who have never been to school. Respondents who reported higher monthly income were more likely to wash hands daily with soap compared to those who were not working (Table 8.2). Finally large families (10-12 persons) were less likely to use soap daily after defecation compared to smaller size families (1-5 persons). Finally, in term of religion, Muslims were less likely to sue soap daily after defecation than the Christians.

The second model (Table 8.2) indicates that by adding ODF status to the model, there is no statistically significant difference in handwashing practices between the never ODF and the two ODF groups. We can conclude that after controlling for demographic factors, the currently and previously ODF communities were no different than the never ODF community for daily handwashing with soap after defecation.

The third model (Table 8.2) includes socio-cultural, self efficacy, couple communication and other factors known to influence daily handwashing behavior. Despite adding socio-behavioral factors to the model, almost all the demographic variables except education remained significantly associated with daily handwashing with soap (Table 8.2).

Toilet use is significantly associated with daily handwashing with soap even though only 21 percent respondents' state that they had handwashing stations within 2 meters of the toilet.

Two key variables which have important program implications were found to be associated with daily handwashing with soap. These are "free" couple communication and the social norm around handwashing with soap. Couple communication refers to how much and how often do couples discuss daily handwashing with soap after defecation. The data indicate that couples who can freely discuss sanitation issues are significantly more likely to daily wash their hands with soap. The strongest impact on daily handwashing with soap comes from the social norm related to this practice. Respondents who said more than 7 out of 10 people their cluster wash their hands daily with soap, are 2.4 times more likely to adopt the practice of daily handwashing with soap after defecation (Table 8.2).

We have reported the model fitness data at the end of Table 8.2. Another important feature of the 3 models is that we see the pseudo r^2 increase as we add the ideational factors into the third model. This model explains about 7 percent of the variance compared with 1 and 2 percent of the base and ODF models.

TABLE 8.2: FACTORS ASSOCIATED WITH HANDWASHING WITH SOAP AFTER DEFECTION AMONG HOUSEHOLD HEADS IN NIMBA & LOFA COUNTIES, LIBERIA (LOGISTIC REGRESSION ANALYSIS)

VARIABLE	BASE MODEL ^(a)	ODF STATUS MODEL ^(b)	FULL MODEL ^(c)
Respondent Age			

18 – 35 (RC)	1.00	1.00	1.00
35 – 55	1.59 (1.20 – 2.09)***	1.59 (1.20 – 2.10)***	1.49 (1.11 – 1.99)**
55+	1.31 (0.93 – 1.83)	1.22 (0.93 – 1.84)	1.22 (0.86 – 1.74)
Respondent Gender			
Male (RC)	1.00	1.00	1.00
Female	0.97 (0.76 – 1.16)	0.97 (0.72 – 1.31)	1.07 (0.82 – 1.39)
Household Size	0.97 (0.92 – 1.02)	0.97 (0.92 – 1.02)	1.00 (0.90 – 1.00)
Small (1-5)	1.00	1.00	1.00
Medium (6-9)	0.88 (0.67- 1.15)	0.88 (0.67- 1.15)	0.88 (0.67- 1.15)
Large (10-12)	0.55 (0.35- 0.87)*	0.55 (0.35- 0.87)*	0.55 (0.35- 0.87)*
Ever Attended School			
No (RC)	1.00	1.00	1.00
Yes	1.33 (1.02 – 1.75)*	1.32 (1.01 – 0.73)*	1.19 (0.89 – 1.57)
Religion			
Christian (RC)	1.00	1.00	1.00
Muslim	0.85 (0.62 – 1.16)	0.85 (0.62 – 1.17)	0.69 (0.48 – 0.99)*
Local tradition	1.21 (0.71 – 2.08)	1.23 (0.71 – 2.10)	1.45 (0.83 – 2.52)
Other	0.87 (0.29 – 2.58)	0.90 (0.30 – 2.69)	1.34 (0.43 – 4.13)
Household Monthly Income			
Not Working or No Income (RC)	1.00	1.00	1.00
Less than 20,000 Liberian Dollars	1.59 (1.13 – 2.24)**	1.60 (1.14 – 2.25)**	1.61 (1.12 – 2.31)**
Between 20,000 LD to 40,000 LD	2.40 (1.42 – 4.03)***	2.41 (1.43 – 4.05)***	2.13 (1.23 – 3.69)**
ODF Status			
Never ODF (RC)	-	1.00	1.00
Currently ODF	-	1.12 (0.84 – 1.50)	0.99 (0.73 – 1.34)
Previously ODF	-	0.97 (0.72 – 1.31)	0.87 (0.64 – 1.18)
Toilet Use (Y/N)			
No (RC)	-	-	1.00
Yes	-	-	1.40 (1.06 – 1.86)**
Couple Communication Frequency			
Low (0 – 33%) (RC)	-	-	1.00
Medium (34 – 66%)	-	-	0.94 (0.50 – 1.77)
High (67 – 100%)	-	-	1.31 (0.72 – 2.36)
Free Couple Communication			
Less than 33% (RC)	-	-	1.00

Greater than 33%	-	-	1.21 (1.008 – 1.84)*
Handwashing Self-Efficacy			
Low (0 – 33) (RC)	-	-	1.00
Medium (34 – 66)	-	-	0.93 (0.59 – 1.48)
High (67 – 100)	-	-	1.51 (0.99 – 2.44)
Handwashing Facility Building Self-Efficacy			
Low (0 – 33) (RC)	-	-	1.00
Medium (34 – 66)	-	-	1.22 (0.85 – 1.96)
High (67 – 100)	-	-	0.93 (0.62 – 1.40)
Handwashing Social Norm			
Low (0 – 3) (RC)	-	-	1.00
Medium (4 – 6)	-	-	1.20 (0.88 – 1.64)
High (7 – 10)	-	-	2.46 (1.77 – 3.41)***

Number of Respondents	1199	1199	1199
Pseudo R-Squared	0.019	0.02	0.070
Akaike Information Criterion (AIC)	1314	1317	1281

RC: Reference Category

(a) Model controlling for respondent demographics

(b) Model of odf status effect on toilet use, controlling for demographics

(c) Full Model with demographics, odf status, and behavioral influencing factors

* P<0.05

** P < 0.01

*** P<0.001

Chapter 9: Conclusions and Recommendations

The mixed methods study on rural sanitation in Nimba and Lofa counties suggests that although demand for toilets is high, the two ODF communities studied had reverted back to pre ODF status. The conclusions and recommendations draw from this key finding that it is essential for the next level of investments to be made on sustained toilet use and the behavioral challenges that families and individuals face leading to attrition in toilet use and reversal to open field defecation.

The goal of CLTS programs is to build toilets. However the goal of the next investments in the rural sanitation sector in Liberia should be sustained daily toilet use which implies that behavioral inputs need to focus on consistent toilet use and address the barriers to daily toilet use. These barriers have been identified by the study and will be discussed further in this chapter.

The main conclusions of the study are as follows,

1. The 3 groups studied, including two ODF groups indicate that the ODF groups have more communities with high toilet use compared to the never ODF group.
2. Toilet use attrition especially 12-18 months after toilet construction, is high. The main reasons of toilet attrition are lack of cleanliness and maintenance of the toilets since a large number are shared toilets.
3. The primary issue of attrition is related to poor toilet use experience.
4. People are already motivated to use toilets in Nimba and Lofa counties. Therefore, implementing programs for toilet motivation are not necessary. Instead, programs that help maintain toilet cleanliness, reduce attrition and build social norms around consistent toilet use are necessary.
5. Handwashing with soap practices are not optimal with only a third of the sample washing their hands daily with soap after defecation.
6. The toilet filling up and the toilet getting “spoiled” are the two major reasons for returning to the bush for defecation.
7. A large number of the bush users are former toilet users, indicating that a high demand for toilets exists in the 3 communities.
8. However, even the ODF communities have reverted to a large extent to bush use.
9. Therefore, making toilet use a clean and pleasant experience is essential to continued and sustained use.
10. Individuals state that faith leaders, such as pastors (34.9%) and imams (12.8%) influence their decision to participate in community sanitation practices. Overwhelmingly, individuals note that traditional leaders (50.3%) and community role models such as health workers and teachers (48.2%) play the largest roles in affecting individual behavior.

Based on the above conclusions, we offer both program and policy recommendations.

Program Recommendations

1. The goal of new rural sanitation programs needs to be “sustained toilet use on a daily basis, with clean and well maintained toilets”.
2. Rural sanitation programs need to focus on SBC issues that promote consistent toilet use, cleanliness of the toilet, immediate troubleshooting to prevent an unhappy toilet user from being a drop out.
3. There little difference between the 3 communities (currently ODF, Previously ODF and never ODF) in toilet use. The study indicates a high attrition rate of toilet use. This conclusion has been supported by logistical regression modeling which showed no difference between the 3 communities after controlling for background variables and socio-cultural, relational and individual variables.
4. The main reasons of toilet attrition are lack of cleanliness and maintenance of the toilets since two thirds of toilets are shared toilets. Respondents stated that they stopped using “spoiled toilets”. The qualitative data indicates that 3 main issues constituted “spoiled toilets”—broken toilets, dirty toilets, and filled toilets. Programs need to consistently address these issues.
5. Data indicate that almost all the respondents, including current bush users understood the importance and benefits of using toilets. In fact, intention to build their own toilets was 94% among current bush users. Future programming needs to leverage this demand for toilets that already exists in Nimba and Lofa counties.
6. “Shared” toilets emerged as a major barrier to sustained toilet use. Firstly, shared toilets meant that no one was assigned the responsibility of cleaning and keeping the toilet odor free. Infact, a few study participants stated they were completely unaware of which cleaning agents to use to keep the toilet clean. The focus of a new rural sanitation program has to shift from motivation to build toilets, to ensuring that individuals are well equipped to build their own toilets and are trained in the maintenance and cleanliness of these toilets. The new project will have to provide community level support to households for several years to establish a sustainable system around fixing broken toilets, regular cleaning of dirty toilets and management of filled pits.
7. The primary issues of attrition are concerned with poor toilet use experience. Respondents reported that they felt “sick” to use toilets where pits were full or when toilets got clogged with leaves, tissue paper or other materials used for anal cleansing. Our overall assessment from the data is that attrition was a result of “unpleasant toilet use” which included toilets that were dirty, had odor, had broken platforms or structures, were clogged etc. One of the key factors related to toilet use attrition is that using toilets results in an absolutely unpleasant experience. Future programming has to ensure that toilet use is a “pleasant experience”.

8. People are already motivated to use toilets. Therefore, implementing programs for toilet motivation are not necessary. Instead, SBC programs that help maintain toilet cleanliness, reduce attrition and build social norms around consistent toilet use are necessary.
9. Handwashing with soap practices aren't optimal with only a third of the sample reporting that they wash their hands daily with soap after defecation. Multivariate regression data indicate that there is no significant difference among the 3 groups in terms of daily handwashing with soap after defecation. Handwashing with soap needs to be promoted in an integrated manner with sustained toilet use programs.
10. Social and behavioral communication approaches focused on daily toilet use should be enhanced or implemented in communities that have been once triggered during the Community Led Total Sanitation (CLTS) program. Participatory Hygiene and Sanitation Transformation (PHAST) should be implemented in these communities as demand for sanitation facilities such as toilets/latrines has been created by the initial CLTS triggering exercises. This will provide additional incentives to community members to enable them climb the sanitation ladder and eventually attain and maintain open defecation free status.
11. While community engagement in sanitation practice and promotion is important, the influence of leaders and community role models should not be undervalued. Strong leaders can push communities into action and promote sustained behaviors by organizing and supporting communities in their efforts to practice healthy behaviors related to sanitation and hygiene.
12. Toilet programs offer a good opportunity to promote handwashing with soap. We should consider daily toilet use and daily handwashing with soap hereafter as "linked behaviors" that protect the health of individuals and families. Building toilets should include provision for handwashing stations too. Thousands of toilets have been built under CLTS with little or no attention to organizing handwashing stations near the toilets.
13. A demand exists for individual toilets. However, families and households will require support in terms of good quality materials, specific guidelines for pit size, and quick repair of toilets. We recommend that unless these services are put into place, the current scenario may not change.
14. Given the initial demand that has been created in CLTS communities for sanitation services, there should be a market based sanitation program that can link households to sanitation markets where they can either purchase latrine products to upgrade existing toilets/latrines or purchase new toilets/latrines. Such market based sanitation services should be decentralized at district levels to facilitate easy access among communities' members especially in rural remote counties.
15. Routine surveillance and follow up of toilet users is essential to track and prevent attrition. Regular follow up of toilet users by community health agents is required.

Policy Recommendations

1. Considering the numerous structural barriers that have been cited in this study that prevent individuals and households from building their own toilets and procuring supplies for toilet maintenance, incentive programs such as market-based sanitation (MBS), vouchers for toilet and handwashing station building and cleaning materials, or subsidies may aid in increasing actual procurement of toilets and handwashing stations, as demand is high in each area.

Further, there is an opportunity to combine individual incentive with increased economic activity if trainings are offered for a handful of community members to become sanitation experts who can retain a salary through vouchers or subsidies that are given out to community members. These individuals could then have continued employment within the communities to provide repair and upgrade services for toilets and handwashing stations.

2. A major policy recommendation is that the focus of rural sanitation programs in Liberia should shift from motivating people to use a toilet to assisting communities to become self-sufficient in keeping toilets clean and well maintained. Once toilets are individually owned, kept clean and have handwashing stations, then sustainable change can be achieved.
3. The levels of handwashing with soap after defecation are suboptimal. Handwashing with soap and consistent toilet use have to be promoted together. The implications of handwashing with soap after defecation are enormous as is the evidence. For Liberia, where newer infectious diseases like Ebola and Covid-19 require handwashing with soap, it makes sense to promote handwashing with soap as a habit.