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LIBERIA SANITATION MARKET ASSESSMENT FINDINGS

FINAL REPORT

DECEMBER 2021

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ACRONYMS AND ABBREVIATIONS

3Si	Supporting Sustainable Sanitation Improvements (intervention in India)
BSS	Basic Sanitation Service
CLTS	Community-Led Total Sanitation
DIY	Do-It-Yourself
EA	Enumeration Area
FGD	Focus Group Discussion
GoL	Government of Liberia
HH	Household
JMP	Joint Monitoring Programme
LDHS	Liberia Demographic and Health Survey
MBS	Market-Based Sanitation
MFI	Microfinance Institution
NGO	Nongovernmental Organization
OD	Open Defecation
ODF	Open Defecation Free
SMA	Sanitation Market Assessment
USAID	United States Agency for International Development
USHA	USAID Uganda Sanitation for Health Activity
VC	Value Chain
WASH	Water, Sanitation, and Hygiene
WASHPaLS	Water, Sanitation, and Hygiene Partnerships and Learning for Sustainability

GLOSSARY OF TERMS

TERM	DEFINITION
Basic sanitation service	Sanitation facilities designed to separate excreta hygienically from human contact, and which are used by a single household
Delivery model	The process and mechanism through which products, services, and information reach the customer during the toilet-buying process
Demand activation	Direct sales and marketing activities carried out to raise awareness and interest in improved sanitation products and services locally available and to persuade customers to convert product awareness and interest into a purchasing decision
Enterprise	A business that facilitates exchanges of products and services between entrepreneurs and customers
Implementer	Local or international nongovernmental organizations (NGOs), community-based organizations (CBOs), and local governments that oversee the design and implementation of MBS interventions
Interface	The floor structure, its surface and any fecal capture components (e.g., sanitary platform, pour flush pan and connective features, mud flooring, raised footrests, or seat) that the user interacts with while using a toilet, separating the substructure from the user
Latent demand	Households that have an interest in purchasing a toilet, but have not purchased one yet
Limited sanitation services	Improved basic toilets shared by two or more households
Market-based sanitation (MBS)	An interrelated series of activities to develop and sustain a sanitation market in which the user makes a full or partial monetary contribution (with savings and/or cash equivalents) toward the purchase, construction, upgrade, and/or maintenance of a toilet from the private sector
Sanitation entrepreneur	Value chain actors that play some focal-point role by aggregating materials, services, and/or information on behalf of the customer
Sanitation market	Arrangements involving the exchange of sanitation-related goods or services among buyers, sellers, and sanitation enterprises
Substructure	The below-ground containment components of a toilet (e.g., on-set/off-set pit, lining, cover, septic tank, vent piping)

Superstructure	The walls, roof, and door components of a toilet
Trace-backs	A trace-back starts with a qualitative interview with a household that constructed an improved toilet in the past few years, followed by qualitative interviews, using a snowballing approach, with all the VC actors that had provided materials or services toward the construction of that toilet, including upstream actors such as the supplier to the hardware store
Unit margin	The profit margin (%) per unit (e.g., per toilet)
Value chain	The process and activities that are carried out to construct a toilet for a customer. These activities are implemented by actors within the value chain (value chain actors) and include manufacture, distribution, wholesale, and retail supply of construction materials (e.g., hardware stores, sand miners), and provision of construction-related services (e.g., masons, transporters)

EXECUTIVE SUMMARY

Low sanitation coverage is an ongoing challenge for Liberia. The prevalence of open defecation (OD) in the country remains high at 35 percent (GoL, 2019), when compared to other countries in sub-Saharan Africa at 20 percent (WHO/UNICEF, 2017). Currently 1.8 million people in Liberia practice OD.

In light of the prevailing conditions in the country, USAID/Liberia aims to support the Government of Liberia (GoL) in ending OD sustainably, and enabling households to gain access to a basic sanitation service (BSS) level. USAID/Liberia tasked Water, Sanitation, and Hygiene Partnerships and Learning for Sustainability (WASHPaLS), a five-year USAID-funded project, to undertake a Sanitation Market Assessment (SMA). The objective of the SMA is to understand the drivers and barriers toward the adoption of basic sanitation; using market-based approaches to accelerate this adoption.

For purposes of this assessment, five target counties (out of Liberia's 15 counties) of Bong, Grand Bassa, Lofa, Montserrado, and Nimba were selected. These five counties account for 65 percent of the Liberian population that practices OD, and represent 70 percent of Liberia's total population.

Community-Led Total Sanitation (CLTS) efforts initiated by the government and its partners have attempted to reduce the prevalence of OD, but some of the hard-earned progress has been lost. Forty-three percent of communities that were once certified as open defecation free (ODF) have reverted to OD (GoL, 2019) owing to a multiplicity of factors—a key factor is the breakdown of toilets due to the use of non-durable materials.

This assessment details the six major findings on the drivers and barriers to adoption of improved toilets by households in the country.

1. Awareness-building programs (e.g., CLTS) appear to have had an impact, as **most households are aware of the health and non-health benefits of toilets**; however, some households still find OD convenient, or hold unfavorable beliefs.
2. **Lack of affordability is a key challenge** for households, as only 43 percent can afford to purchase a US$200 toilet, which would be insufficient in the current, underdeveloped market to obtain a desired toilet that meets their preferences. Others may require soft loans or subsidies to afford building an improved toilet.
3. The current product options available to the households are either expensive, or undesirable for a large proportion of households. While **relatively affordable product components** such as plastic pans and cement commodes do **exist in the market**, they are not commonly found in hardware stores (especially in rural areas). Cement commodes are also not made by most cement pre-fabricators due to a **lack of demand**.
4. There are no sanitation entrepreneurs in the market, despite high unit margins, possibly because **sanitation is unviable as a standalone business** for many value chain actors. This results in a **cumbersome Do-It-Yourself (DIY) delivery model** for households, who have to interact with six to nine value chain actors to construct an improved toilet.
5. While there is **high access to financiers**, and several households have taken a loan in the past, **very few have taken a loan for sanitation**. This is because households prioritize taking loans for only business or emergency consumption (e.g., payment of school fees or medical expenses). Households also expressed concerns around repayment of loans taken to construct an improved toilet.

6. Rural households, and households located further away from Monrovia face issues with limited local access to, and increased transportation costs for materials such as cement, because of **poorly penetrated associated supply chains**.

The findings indicate that the sanitation market in Liberia is ripe with potential for investing in market-based sanitation (MBS) activities, but will require focused interventions to address barriers related to the product offering, delivery model, sales and marketing, and entrepreneur availability. The following recommendations have been identified for potentially unlocking a market of LRD 20 billion (US$ 100 million), by targeting customers through MBS interventions.

Funding innovation to develop, design, and test affordable, context-appropriate toilet product designs, associated delivery models, and direct sales and marketing activities are important first steps for investing in an MBS intervention to increase basic access. **Investing in the enhancement of availability and viability of sanitation enterprises** is also critical in the Liberian context. **Providing customer finance** in the form of loans for sanitation will help some households to overcome liquidity barriers. **Shaping market rules to create favorable regulations/policies** that encourage private participation in sanitation markets, and in the associated service or product ecosystem, will make it easier for customers and entrepreneurs alike, to build toilets.

These findings and recommendations seek to serve as an impetus to innovate and design context-appropriate MBS interventions for Liberia, to increase and sustain adoption of BSS in the country.

1.0 INTRODUCTION

Liberia contends with low sanitation coverage across all service levels (i.e., unimproved, limited, and basic). Even as household sanitation continues to be an important development priority for the Government of Liberia (GoL), the country has not been able to sustain the achievements made in eliminating open defecation (OD). Given this context, USAID/Liberia aims to support the GoL in ending OD sustainably in five counties, and moving households to a basic sanitation service (BSS) level[1], with the guidance and participation of the GoL, the donor and non-profit community, and the private sector.

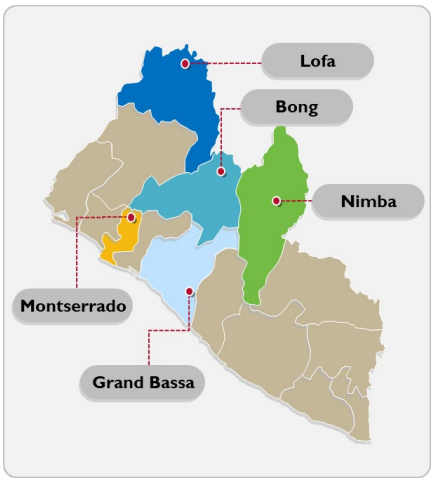
The purpose of Liberia Sanitation Market Assessment (SMA) is to generate an evidence base in the five target counties of Bong, Grand Bassa, Lofa, Montserrado, and Nimba (which represent 65 percent of the population practicing OD in Liberia) to guide investment, and to support the GoL and other sanitation actors and implementers in the development of context-specific sanitation programs. The Liberia SMA is based on formative research and analysis conducted by USAID's Water, Sanitation, and Hygiene Partnerships and Learning for Sustainability (WASHPaLS) from December 2020 to November 2021.

The SMA reveals that the sanitation market in Liberia has considerable untapped potential Research suggests that in the five target counties, nearly half a million households lacking basic sanitation facilities may be able to afford a US$200 toilet either through savings, with customer financing (in the form of a soft loan), or partial subsidy. Targeting these half a million households, through MBS interventions, represents a potential market of LRD 20 billion (US $100 million).

As part of the SMA, WASHPaLS collected and analyzed data from primary and secondary sources, which included qualitative and quantitative interviews with household customers, sanitation value chain (VC) actors (e.g., masons, hardware stores, transporters, cement pre-fabricators, and financiers), as well as key government, donor, and private sector informants.

A total of 3,068 households were interviewed to understand their sanitation context; toilet purchasing process (if relevant); and their beliefs, needs, and preferences toward sanitation. About100 households were part of focus group discussions (FGD) to validate learnings from the household interviews. The assessment team conducted 13 trace-backs[2]to map the sanitation VC, through which 133 qualitative interviews were conducted with VC actors to understand prevalent business models, drivers, and barriers; and their outlook toward sanitation. This was supplemented by 134 quantitative interviews with select VC actors. Thirteen key informant interviews and 24 literature reviews further informed the understanding of the sanitation landscape.

Figure 1: SMA Research coverage



[1] Basic sanitation service is defined as access to an improved toilet that is not shared with other households. See Glossary of Terms.

[2] A trace-back starts with a qualitative interview with a household that constructed an improved toilet in the past few years, followed by qualitative interviews, using a snowballing approach, with all the VC actors that had provided materials or services toward the construction of that toilet, including upstream actors such as the supplier to the hardware store.

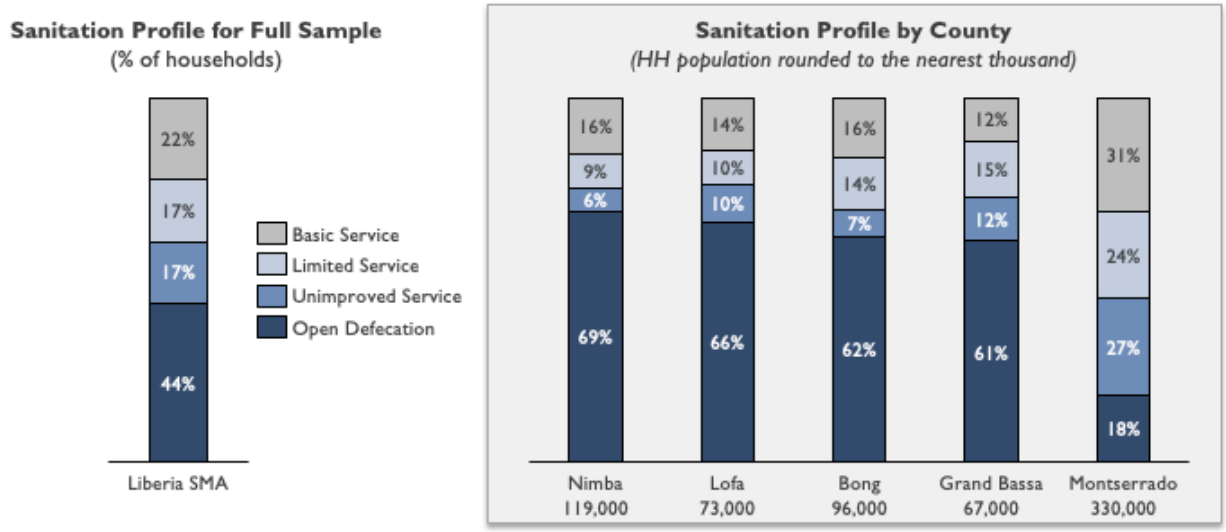
2.0 SANITATION MARKET CONTEXT IN LIBERIA

2.1 SANITATION PROFILE

The SMA revealed that only 22 percent of households in the five target counties currently have access to a basic facility, while 44 percent practice OD, as illustrated in Figure 2 below. The prevalence of OD is particularly significant in Bong, Grand Bassa, Lofa, and Nimba, where more than 60 percent of households practice OD. Only Montserrado has a relatively lower OD rate of 18 percent.

In terms of wealth quintiles, the correlation is stark; the population practicing OD is concentrated in the bottom two wealth quintiles. There is a 94 percent prevalence of OD among the poorest.

Figure 2: Distribution of Households by Sanitation Service Level



Source: Household Population Data drawn from LISGIS. (August 2017). "Household Income and Expenditure Survey 2016."

While efforts have been underway to make these five counties free of OD, the SMA findings highlight that successes could not be sustained. There has been a 13-percentage point (pp) increase in the proportion of households practicing OD across the counties, when compared to the Liberia Demographic and Health Survey (LDHS) 2019. Nimba and Lofa experienced an increase in the OD rate of 32 pp and 17 pp respectively, while Montserrado witnessed the lowest reversion with an increase of 5 pp.

To understand the reasons behind the reversion, the SMA team revisited communities in Bong, Lofa, and Nimba, where they observed a higher prevalence of OD compared to the LDHS. For surveys in Montserrado and Grand Bassa, additional questions to understand the rationale for reversion to OD were included. Based on the responses, the following four factors have contributed to this reversion:

1. **Breakdown of toilets constructed under the Community-Led Total Sanitation (CLTS) initiative:** Several toilets constructed under the CLTS initiative used non-durable materials, and have either collapsed or sustained damage over time without being replaced. Thirty-nine percent of households that reverted to OD reported that they stopped using their toilet due to structural damage. An evaluation of CLTS by the Liberia civil society organization (CSO) Water, Sanitation, and Hygiene (WASH) Working Group highlights that communities

experienced challenges with the use of organic locally sourced materials, such as toilet collapse due to termites, or after heavy rains.

2. **Internal migration:** There has been significant internal migration from urban to rural areas in response to job losses in urban areas, or between various rural areas. Allocation of farm land to corporate plantations has accelerated internal migration (GoL, 2019). As a direct consequence of migration and shifting homes, 42 percent of households that reverted to OD have lost access to toilet facilities that they previously used.

3. **Reduction in donor funding for facility upkeep:** A high dependence on donor-funded community/public toilets coupled with recent reduction in funding allocation for maintenance (since 2018) has also resulted in households reverting to OD. SMA findings show that 57 percent of households in Montserrado and Grand Bassa that reverted to OD previously used a shared or public toilet. Such community or public toilets are commonly constructed by NGOs/donors (PSI, 2014). With no community stake in these facilities built by NGOs or donors, oversight and mismanagement are common.

4. **Economic slowdown and high inflation:** The economic slowdown and rising inflation driven by the 2014-2016 Ebola outbreak and COVID-19 pandemic have compounded the impact of other factors, reducing households' ability to rebuild/replace damaged or filled toilets. SMA findings show that 59 percent of households that reverted to OD did so between 2019 and 2021, coinciding with a period of drastic economic headwinds that eroded households' purchasing power. Households that depend on a daily wage mentioned that they cannot afford to rebuild/replace filled or damaged toilets, and have had to resort to OD.

2.2 PRODUCTS

Households in Liberia that have some access to toilets can be broadly categorized as those with **unimproved** toilets and **improved** toilets. Seventy-six percent of households with unimproved toilets had pit latrines without a slab. Of these, about one-fifth have toilets with wood and/or mud interfaces, while the rest are pit latrines with interfaces made of cement, and slabs that had gaps/holes, which may be easily repaired. This underscores the potential to move these households toward basic sanitation, with relatively minor investments to upgrade the toilet's interface.

On the other hand, 46 percent of the households that use improved toilets commonly have a flush/pour flush toilet. Such toilets are perceived as more hygienic by households, as they can use water for anal cleansing, and to wash feces away. FGD indicated that, agnostic of religion, more affluent households preferred using toilet paper; while less affluent households preferred cleaning with water as they would otherwise have to use leaves or sand to clean after themselves. Further, 79 percent of households with improved toilets built a seated commode, and 19 percent built a squat platform/footrests.

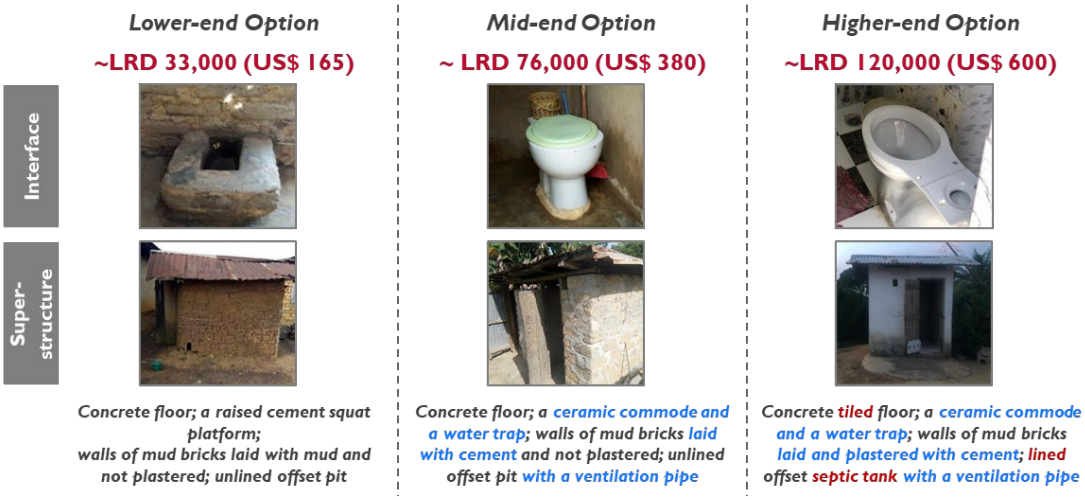
While households with improved toilets have demonstrated a preference for the kind of toilets they want, there are no standardized offerings for improved toilets available in the market. As well, costs vary significantly based on materials used, quality of construction, and add-on features of the toilet. As seen in Figure 3 below, multiple improved toilet products exist in the price range of LRD 33,000 (US $165) to LRD 120,000 (US $600)[3].

The features that households tend to opt for while building their toilets include a pour flush, an offset lined pit with a ventilation pipe, seated commodes or cement squat platforms, and a superstructure made of durable materials such as cement, tiles, and bricks, with wooden doors, and roofs with metal

[3] These costs are for toilets when households have paid for all materials and services. Further data available in Annex C on Toilet Costing.

sheets. Most of these households prefer offset pits, because they feel this would protect them from heat emanating from the pit, keep the smell and flies away, and help prevent one from directly looking at feces. Lined pits reduce the likelihood of structural collapse, while a superstructure made of durable materials provides better privacy. Seated options are desired by households, as they find squatting uncomfortable.

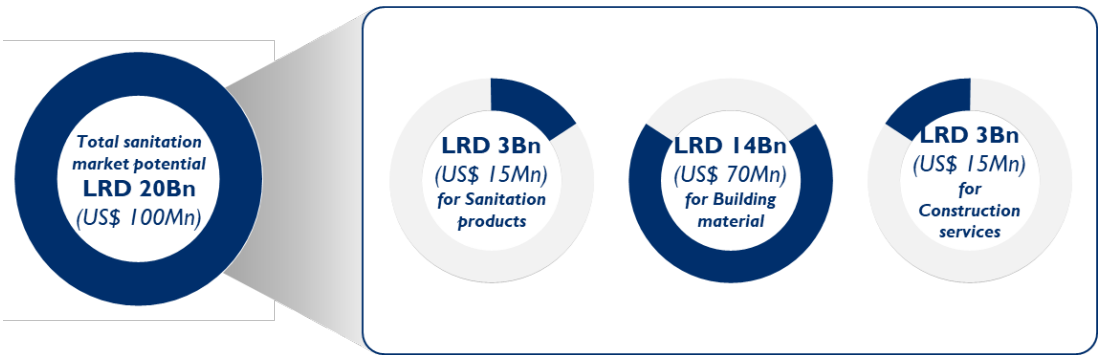
Figure 3: Prevalent Improved Toilets



2.3 MARKET OPPORTUNITY

In the five target counties alone, there are about half a million households that do not have access to basic sanitation, but may be able to invest as much as LRD 40,000 (US $200) on an improved toilet either of their own accord, or with some customer financing in the form of a soft loan or partial subsidy. Thus, there is potential to unlock a market of LRD 20 billion (US $100 million), as seen in Figure 4, by targeting these households through MBS interventions.

Figure 4: The Case for Markets



Based on prevailing costs and the estimated proportion of materials and services to the total toilet cost, sanitation products and construction services each account for about 15 percent of the market, and the remainder is for building materials. Sanitation products allude to the range of fixtures and items used in the building of a toilet such as commodes/seats (ceramic, cement, and plastic), and toilet pans. Building materials for toilet construction and maintenance include cement, timber, sand, iron, and other metal items (i.e., for roofs, doors). Construction services include those offered by masons, pit diggers, carpenters, and plumbers. Of these services, the potential for masonry, plumbing, and carpentry accounts for 60 percent of LRD 3 billion, while pit digging constitutes 40 percent.

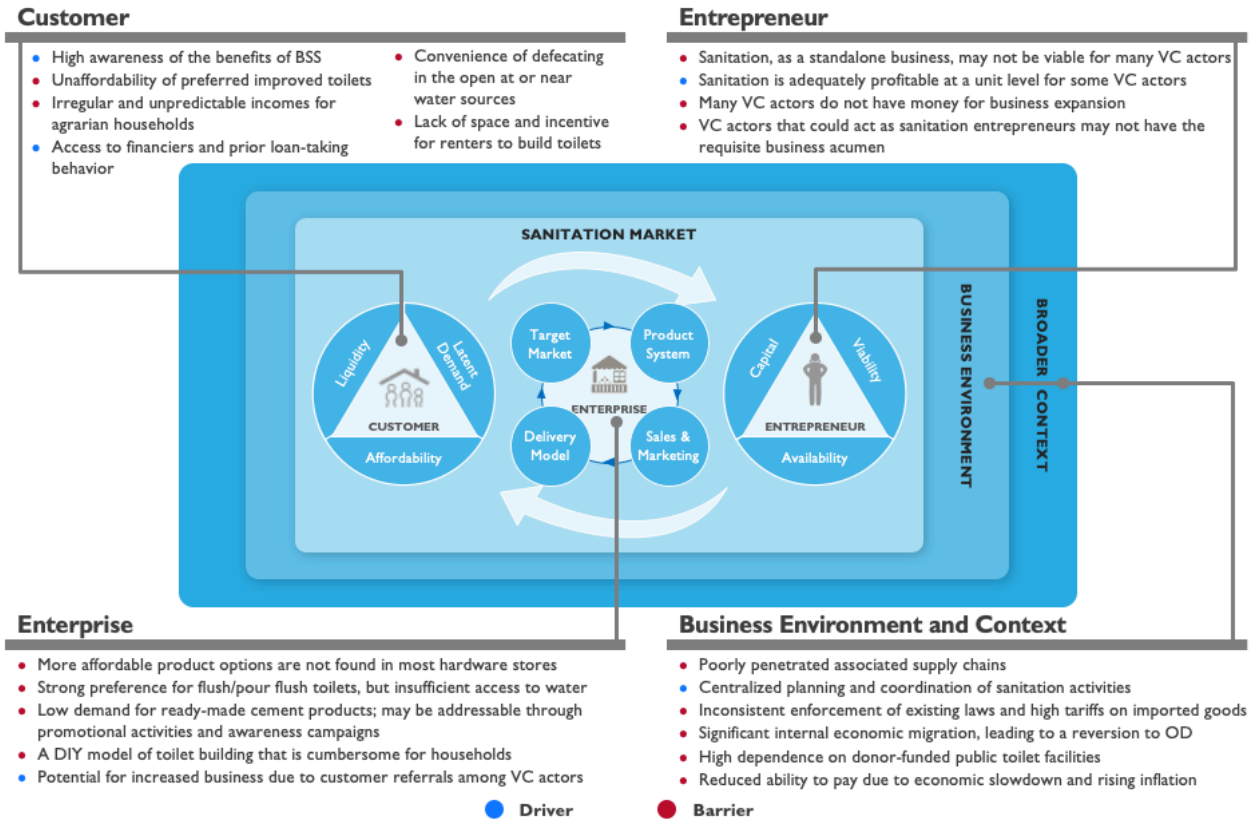
3.0 KEY BARRIERS AND DRIVERS TO MARKET-BASED SANITATION IN LIBERIA

Barriers in the Liberian sanitation market can impede the adoption of sanitation best practices, but these coexist with drivers that encourage and strengthen the engagement of households and VC actors. The USAID WASHPaLS MBS Framework (USAID, 2018) supports the identification and categorization of barriers and drivers unique to different geographies. The framework delineates the following focal areas:

1. **Core Sanitation Market:** The core sphere of activity for sanitation—comprising customers, entrepreneurs, and enterprises—that large-scale interventions can address.
2. **Business Environment and Broader Context:** The factors influencing the sanitation markets, such as government policy or the availability of raw materials and financial services; and factors like social norms, economic environment, and geographic conditions.

Figure 5 summarizes the sanitation market, and business environment barriers and drivers unique to the five target counties in Liberia.

Figure 5: Key Drivers & Barriers to MBS in Liberia



3.1. SANITATION MARKET DRIVERS AND BARRIERS

3.1.1 CUSTOMER

Awareness of the benefits of improved toilets is a key lever to increase the adoption of basic sanitation. Awareness-building programs (e.g., CLTS) have reaped sustained gains, as 90 percent of households were aware of the health and hygiene benefits (e.g., reduction in disease), and nearly all are knowledgeable about the privacy, safety, and convenience benefits of toilets.

> *Having your own toilet will give you respect, keep you safe from contracting illnesses from the public toilet, and give you privacy.*
>
> **– Household using an unimproved toilet in Nimba**

Nevertheless, some households still hold unfavorable beliefs related to toilets, creating a **latent demand** barrier for MBS—i.e., households may have the affordability and willingness to buy a toilet, but do not make a purchase for a range of other reasons (USAID, 2018). Twenty-four percent of households believe it is taboo to live near a toilet. FGD responses suggested that, for a few, cleanliness of the toilet was a concern, while for others this taboo persisted regardless of having clean/well-maintained toilets. Twenty-one percent of households have also suggested that pregnant women should not use toilets, as they feel that they would be exposed to diseases/infections. Some households may opt not to construct a toilet, since they find it more convenient and cleaner to defecate in/at water bodies. While they found it embarrassing to be seen visiting a toilet, there was an absence of judgement or embarrassment in walking into bushes or defecating and cleaning near water bodies.

> *Living near a toilet is akin to sleeping with your feces.*
>
> **– Household with limited sanitation service in Montserrado**

Even for households that prioritize constructing an improved toilet, affording one with features that most households consider ideal may be untenable, based on what is available in the market. Table 1 provides an overview of the stated product functionalities and features that households prefer. The table highlights how these preferences align with what is available in the market, at various price points.

Table 1: Household Data on Desired Toilet Features

TOP FIVE DESIRED PRODUCT FUNCTIONALITIES	DESIRED FEATURES CORRESPONDING TO EACH FUNCTIONALITY	PREFERENCES MET → US $165 TOILET	US $200 TOILET	US $380 TOILET	US $600 TOILET
Ability to clean with water	Cement or tiled floor	✓	✓	✓	
Comfort	Seated commode[4]		✓	✓	
Unlikely to collapse	Offset pit	✓	✓	✓	
	Pit lining				
Privacy	Brick walls laid with cement			✓	✓
Lack of smell/ well ventilated	Ventilation pipe			✓	✓
	Offset pit	✓	✓	✓	
	In-built water trap		✓	✓	

Note: There are factors such as build quality, materials used, and features like a septic tank, pit depth that differ between the varied price ranges of the toilets mentioned

[4] Higher-end variants uses a commode made of ceramic, while the US $200 variant uses a cement commode.

Most households cited that their ideal toilet is a pour flush with a ceramic commode, superstructure made of cement/brick walls, a lined offset pit, and a ventilation pipe, which aligns with the most commonly cited desired product functionalities. Their preferences are based on what is readily available and accessible in the market, and what they know to be clean and sanitary. These preferred functionalities and features are available for a cost of about LRD 120,000 (US $600). But none of the households in the target counties can afford this, and only 29 percent can pay for one with a soft loan[5]. Even a toilet that only partially meets customer preferences and costs (about LRD 40,000 [US $200]) is affordable to just 43 percent of the sample households. Most reside in urban areas, and are largely concentrated in the national capital of Monrovia.

> *I would only like to build a flush toilet with a commode - the same type that my sister has in Monrovia. All the toilet construction materials are expensive, so there is no such thing as a cheaper toilet.*
>
> **– Household practicing OD in Grand Bassa**

Households in Liberia have access to local financiers, and around 40 percent of respondents have taken a loan in the past, though not for sanitation. Those that have taken loans mostly do so to generate income or to pay higher priority expenses like school fees or medical expenses, but not to build toilets. Forty percent of households mentioned taking loans for business or agriculture purposes, and financiers like savings and loan groups cited that 43 percent of loans were given for payment of school fees. Two-thirds of the savings and loan groups already provide non-business loans/consumption loans, 42 percent of which can provide up to LRD 40,000 in loan—an amount that would be sufficient for households to construct an improved toilet. However, a majority of households did not take/consider taking a loan to construct an improved toilet, often because they feared not being able to repay the loan, and did not think one should take a loan for toilet construction. FGD suggested that the fear of loan repayment existed due to prevailing interest rates that were perceived as high, and loan repayment periods as being short.

> *I have taken a loan in the past for my children's school fees. But I am not comfortable taking one for a toilet, because I may not be able to repay it.*
>
> **– Household in Bong**

While affordability, liquidity, and latent demand barriers prevent households from investing in an improved toilet, not every driver and barrier affects all households uniformly. Households in Liberia that lack access to basic sanitation may differ in their preferences and beliefs around sanitation, because of factors such as affluence, setting, and cultural norms. For example, some customers better understand the health, safety and privacy benefits of toilets, and are consequently willing to pay a higher amount for BSS, while others are less willing. Given these differences among households, marketing should be tailored to different segments of households without basic sanitation to develop effective interventions to target them. The SMA segmented the households based on their (potential) toilet-buying process into 12 segments, as detailed below in Box 1.

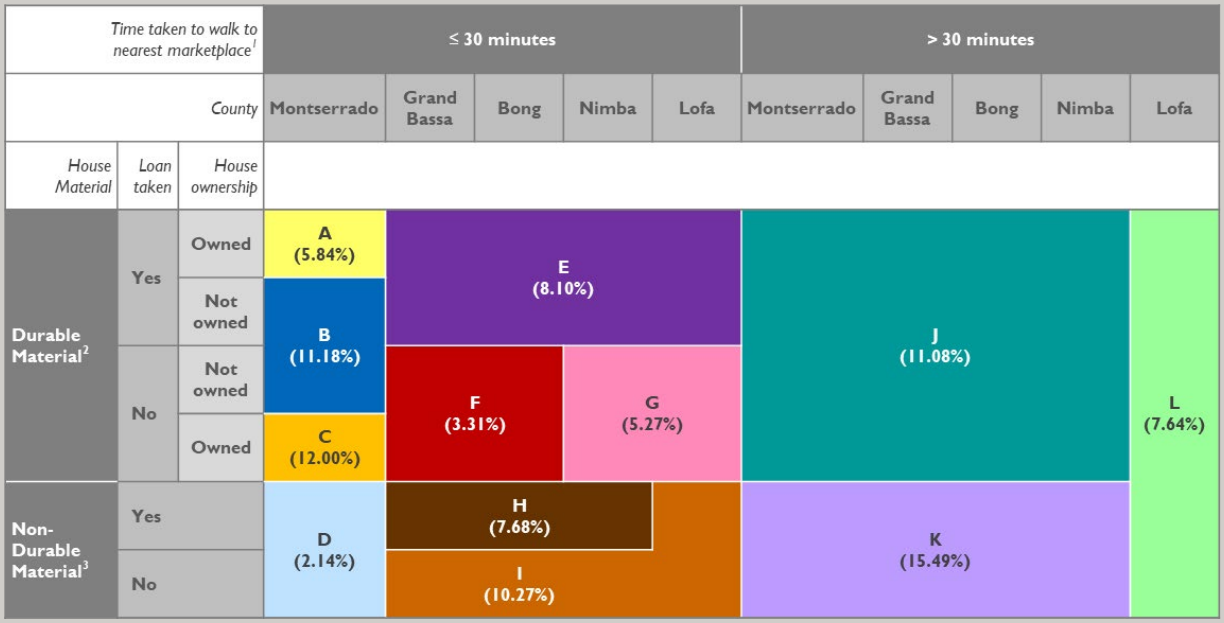
[5] A loan with a below-market interest rate that sometimes includes other concessions to borrowers, such as long repayment periods or interest holidays

Box 1: Segmentation of Household Customers in Liberia

To create this segmentation, the SMA team identified variables that are most likely to predict significant statistical differences in household behavior against key drivers of improved toilet purchase.

Ultimately, the team selected five segmentation variables that most significantly predicted differences in drivers of improved toilet purchase: county of residence, material used for home construction, prior loan-taking behavior, house ownership, and access to marketplaces.

As seen below, these variables were used to meaningfully divide the population that lacks access to basic sanitation (78 percent of the population in the five counties) into 12 identifiable segments that are internally homogenous and externally heterogeneous with respect to their toilet purchase behavior and attitudes and beliefs toward sanitation.



Note: Percentages in parentheses indicate the proportion of HHs that are in each segment out of the total population of HHs without basic sanitation service in the five counties
1. Marketplaces are open-air stalls that operate periodically (e.g., once a week); they differ from permanent stores/businesses, colloquially known as "big market", that operate from the same location on all working days; 2. At least two components among the roof, floor, and walls of the house are primarily made of durable materials (e.g., cement, tiles, zinc sheets); 3. One or fewer components between the roof, floor, and walls of the house are primarily made of durable material; 4. Refer to the section on "Segment Profiles" for detailed profiles of each of the 12 segments mentioned here

Segments on the top left of the segmentation frame (Segments A, B) are among the most affluent, and well connected to markets making them more amenable to MBS. The three segments on the right-hand side of the frame (Segments J, K, and L) are furthest away from open-air and permanent markets, thus making it more challenging for markets to intervene.

In terms of ability to pay, Segments A, B, C, F and J are among those that can afford to pay LRD 40,000 for a toilet, without requiring any form of customer financing. In fact, 69 percent of households from segments A & B that build an improved toilet spent at least LRD 40,000. Segments E and G may need a soft loan of approximately LRD 10,000-20,000 to purchase a toilet at that price.

Segments H and I may require a subsidy of about LRD 10,000, in addition to a soft loan of up to LRD 20,000, and Segments L, K, D may need a nearly full subsidy for a toilet costing around LRD 40,000.

3.1.2 ENTREPRENEUR

Sanitation entrepreneurs are currently not available in the market. This means that households must aggregate sanitation-related materials and seek service providers independently.

SMA research further highlights that VC actors do not aggregate materials used in toilet construction. For example, 93 percent of transporters interviewed do not stock-to-sell materials they transport to customers, while 96 percent of cement pre-fabricators do not retail the materials (cement, sand) that they already use to make readymade products.

VC actors that can play the role of sanitation entrepreneurs are either not available, particularly in rural areas, or if present they may not have the requisite business acumen or the means to take on this role. In particular, most cement pre-fabricators cluster around urban areas, and are not always available to households in rural areas. Furthermore, most hardware stores, masons, and transporters interviewed rely on referrals and word-of-mouth recommendations from friends/neighbors, and do not market their business actively to customers. For example, only 27 percent of hardware stores, and none of the masons or transporters interviewed, stated that their customers hear about them from advertisements.

> *I get new projects either from people who have seen my work and liked it, or from people who have heard about me from my past customers. I do not know how to advertise my business*
>
> **– Mason in Lofa**

Although the availability of entrepreneurs is a challenge, sanitation is **profitable at a unit level**[6] for some VC actors. The SMA research revealed that masons and cement pre-fabricators earn more than 50 percent-unit gross margin on sanitation jobs, while carpenters can earn gross margins of up to 78 percent. In fact, there is a gross profit retention of 38 percent (cumulatively, by all VC actors involved) in a US $380 improved toilet with a ceramic commode, unlined offset-pit, and brick and cement walls.

In spite of this, sanitation **is not viable as a standalone business** for many VC actors, primarily because of monsoon-driven seasonality of income. More than half of the cement pre-fabricators and masons interviewed indicated that their businesses do badly in the period from June to September, which sees the heaviest rainfall in Liberia across the year. Most VC actors tend to have multiple sources of income to sustain themselves. Only 44 percent of the cement pre-fabricators interviewed earned all or most of their income from making prefabricated cement products. Another concern for VC actors is high competition, with 89 percent of masons citing it as one of their key business challenges. Defaults in payments by customers put additional pressure on the viability of their businesses; this is especially a challenge in case of credit-provision. Fifty-two percent of masons stated that customers delaying or not making payments was a key business challenge.

> *I have many plans to expand my business – creating more shelter to dry our bricks in the monsoon, buying a vehicle to transport cement, and buying more land to make/store bricks. But I do not have the money needed for this.*
>
> **– Cement pre-fabricator in Bong**

VC actors mentioned that even when they want to expand their sanitation activities and services, they often **lack the requisite capital**. In particular, 74 percent of masons, and 60 percent of transporters stated that lack of money was the reason why they did not take up activities to expand their business. However, financiers (e.g., savings and loan groups) are often located in close physical proximity to VC actors, and provide business loans regularly. In fact, they typically do not require collateral to disburse business loans to members. The SMA reveals that 69 percent of savings and loan groups suggested that they did not require collateral to provide business loans to members.

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[6] Refers to the gross margin or gross profit after considering material, costs of hired labor (this excludes the business owners own labor as a cost), and transportation. However, it does not include overheads—managerial capacity, capital cost, etc.

3.1.3 ENTERPRISE

The absence of sanitation entrepreneurs and aggregation of materials by VC actors in the Liberian sanitation market has resulted in a cumbersome **DIY delivery model** for toilet construction. The SMA trace-backs indicate that households need to interact with six to nine VC actors (and in some cases as many as eleven VC actors) to source materials and services. Households may find this process inconvenient, and may be discouraged from constructing an improved toilet.

Within the existing DIY model, VC actors that build toilets for customers (e.g., masons, plumbers) usually do not purchase materials on their behalf. Seventy-two percent of households with BSS stated that VC actors did not purchase any materials while building an improved toilet. However, a large proportion of VC **actors refer their customers to other allied VC actors**, which provides them with additional business opportunities/leads. For example, 56 percent of masons interviewed referred customers that were building toilets to hardware stores, and 56 percent of cement pre-fabricators referred customers to masons. This makes a case for an existing VC actor to serve as a focal point for households, and coordinate among a range of actors involved in toilet construction.

> *I do not purchase construction material on behalf of my customers. The materials are usually bought by my customers from shops or vendors that are located out of town, and very far away.*
>
> **– Mason in Nimba**

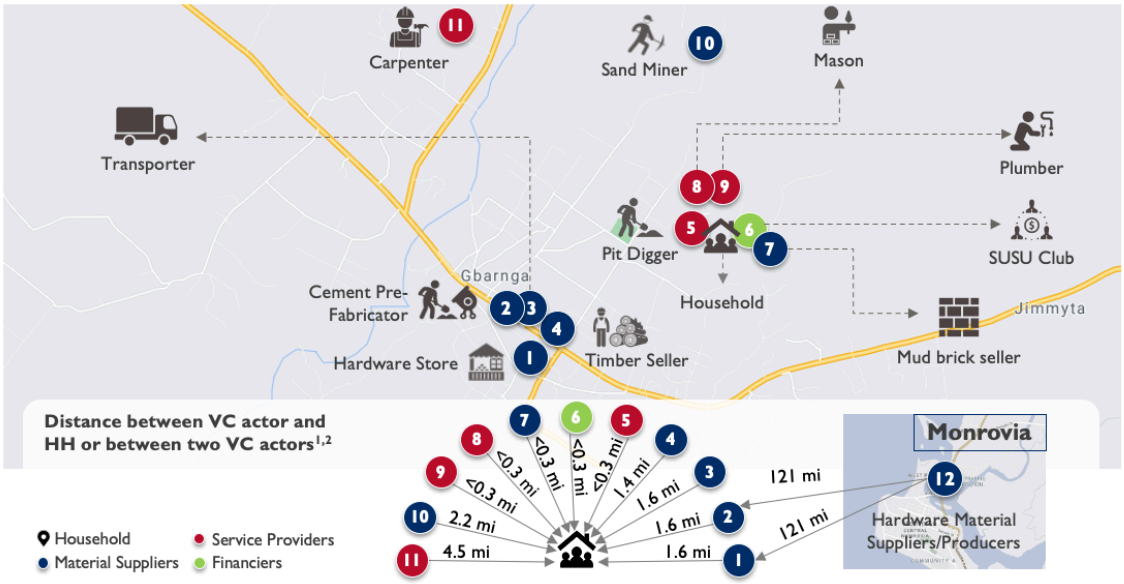
With regard to available products, options such as plastic pans and cement commodes can allow households to construct improved toilets more affordably. In particular, ceramic pans are approximately 1.4 times more expensive than plastic pans. Although 52 percent of hardware store owners interviewed were aware of plastic pans, they are not commonly available in hardware stores, especially in rural areas. In fact, only a few stores in urban areas like Monrovia, Gbarnga, and Buchanan sold them. This underscores the need for wider availability of more affordable sanitation products.

> *I only sell about 3 cement commodes per month, because not many people in the community are aware of the product. I am currently taking up other jobs because business is slow*
>
> **– Cement pre-fabricator trained by an NGO in Nimba**

Similarly, ceramic commodes are about 2.4 times more expensive than cement commodes. Yet only 32 percent of cement pre-fabricators make and sell cement commodes. Most cement pre-fabricators cited that **low demand** was the primary reason for not manufacturing and selling sanitation products.

Additionally, households prefer flush/pour and flush toilets, but may not be able to fulfil the water requirements for these toilets. Pour flush toilets require a significant amount of non-drinking water—up to 48 liters, every day. However, 65 percent of respondents without access to BSS stated that the amount of water currently available is sometimes or often insufficient.

Figure 6: Trace-backs - Distance between VC Actor and Households, or Between two VC Actors



Source: Trace-back for an urban household in Bong county, FSG analysis
1. Distances have been estimated based on the shortest distance suggested by Google Maps. Actual distance traveled may vary, if alternate routes are used
2. The HH sourced aggregate on their own, and did not buy it from an aggregate seller; they also purchased cement from a hardware store and not a cement wholesaler

3.2. BUSINESS ENVIRONMENT AND CONTEXT BARRIERS

Poorly penetrated associated supply chains make the process of building an improved toilet more expensive and difficult for households in rural areas. Rural households typically have to travel four times as far as urban households to buy certain construction materials from a hardware store.

> *We bought materials from the building material store in Compound #3, which is located 3 miles away. It was costly to transport the material from the store to the house. We had to make 5 trips on motorcycle.*
>
> **– Household in Grand Bassa**

Additionally, they may end up paying significantly more for materials like cement as they live further away from Monrovia. For example, a bag of cement when purchased from Monrovia costs approximately LRD 1,250. After accounting for storage, labor, taxes, and transportation costs, and mark-ups from distributors and hardware stores, the same bag of cement in Grand Bassa, Bong, and Nimba is 15-18 percent more expensive and costs LRD 200-225 more. In Lofa, which is even further away from Monrovia, the same bag of cement costs LRD 500 more (38 percent higher than Monrovia).

> *We have plans to improve the sanitation conditions by monitoring and evaluating communities to ensure that they meet sanitation standards, but there is no funding. The public health law is also not being properly enforced due to a lack of logistical support.*
>
> **– County Environment Health Coordinator**

The 1976 National Public Health Law (Liberia) states that all dwelling places and public buildings should have adequate toilet facilities, and that households that fail to meet these standards are liable to a fine and/or imprisonment. **Budgetary constraints** at the county and district levels impede the enforcement of this law. Interviews with county and district health teams suggest that lack of funding is a roadblock in conducting routine community evaluations of prevailing sanitation standards.

For VC actors providing sanitation-related product and services, **inconsistent enforcement of existing laws and tax rates**, along with high tariffs on imported goods (plastic products; raw materials used to manufacture cement such as limestone, clinker, and

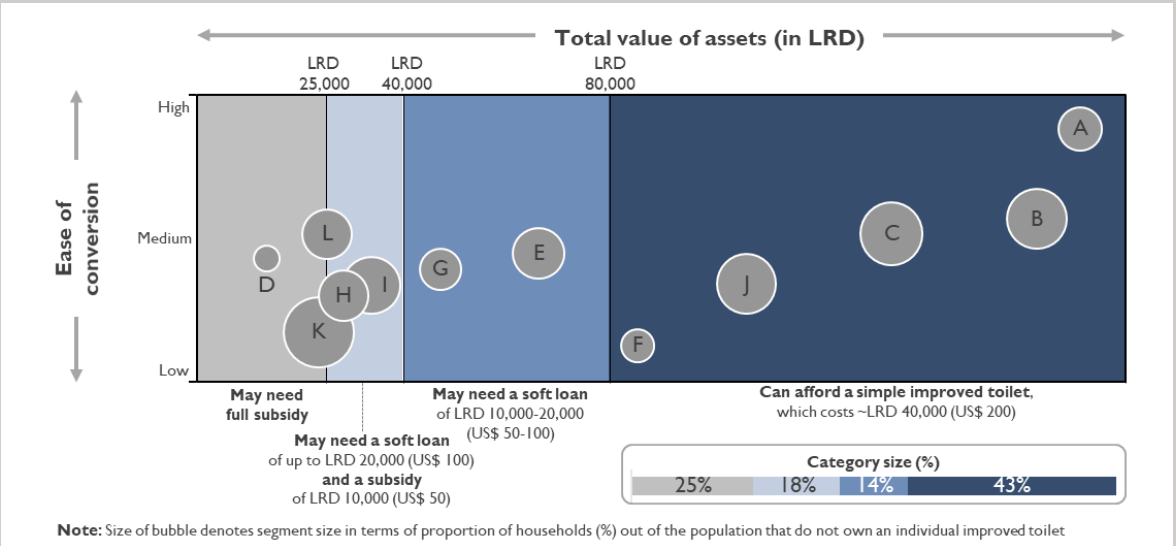
gypsum), affect their ability to expand their business. According to the International Trade Administration's Liberia Country Commercial Guide, customs duties, tax rates, and other statutory fees are not fully centralized and in turn present challenges to Liberian businesses. Government tariffs on imported materials used in the sector, and the absence of pricing regulations in some regions are also hurdles in the growth of Liberia's sanitation market.

Other factors identified in the market context section also serve as barriers to the adoption of improved toilets. Reversion to OD is accelerating because of the use of non-durable materials; internal economic migration; reduction in funding from donors for building, improvement, and maintenance of public toilets; and reduction in people's purchasing power due to the economic slowdown and rising inflation, which has ranged from 17-27 percent between 2018 and 2020 (World Bank, 2020).

While it is evident that investments are needed to address these barriers, support does exist in the form of a National WASH Commission in Liberia that works on central planning and coordination of sanitation activities. The commission helps organize service delivery, as WASH activities in Liberia span multiple ministries/agencies, including the Ministry of Public Works, Liberia Water and Sewage Corporation, Ministry of Education, and Ministry of Health (World Bank, 2019a).

A cohesive set of interventions are needed to make desirable improved toilets affordable and accessible. As seen in Box 2 below, to help design market-led interventions, the 12 customer segments have been divided into 4 categories based on their ability to pay approximately LRD 40,000 for an improved toilet.

Box 2: Planning Implementation – Categorization of Customer Segments for Market-Led Interventions



Note: Size of bubble denotes segment size in terms of proportion of households (%) out of the population that do not own an individual improved toilet

As highlighted above in Section 3.1, Segments A, B, C, F, and J are part of the first category, which can afford to pay LRD 40,000 for a toilet, without any kind of customer financing support.

Segments E and G could benefit from soft loan of LRD 10,000-20,000 to purchase a toilet at that price.

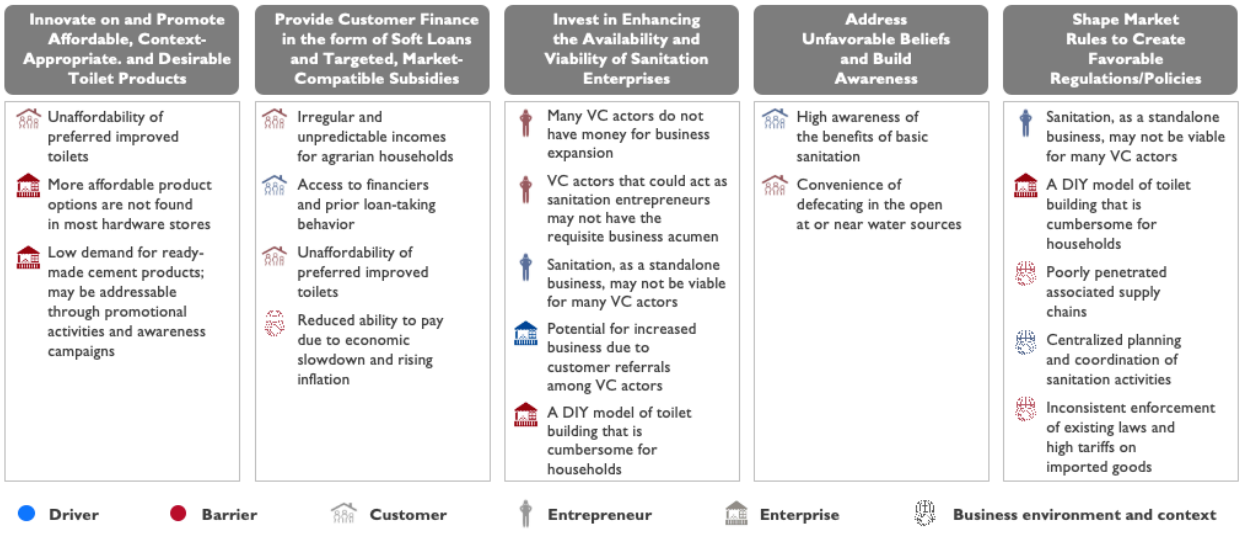
Segments H and I may require a subsidy of LRD 10,000, in addition to a soft loan up to LRD 20,000, and Segments L, K, D may need a nearly full subsidy for a toilet costing LRD 40,000.

This showcases the need for innovation in product designs, so that households in each segment have options that are affordable and desirable for them.

4.0 KEY RECOMMENDATIONS

In light of the drivers and barriers toward the adoption of basic sanitation services (by households) mentioned above, this section details a range of associated recommendations. Figure 7 below is a snapshot of the key recommendations mapped in line with the drivers and barriers listed in the previous section.

Figure 7: Key Recommendations



4.1 INNOVATE ON AND PROMOTE AFFORDABLE, CONTEXT-APPROPRIATE, AND DESIRABLE TOILET PRODUCTS

Although affordable sanitation products, namely cement commodes and plastic pans, exist in Liberia, they are not easily available, especially in rural areas. Funding is needed to promote affordable toilet product designs that customers desire, and consequently increase the availability of these products.

4.1.1 KEY CONSIDERATIONS FOR THIS RECOMMENDATION

1. BALANCE HOUSEHOLD PREFERENCES AND AFFORDABILITY LEVELS

Households in the five counties indicated a greater preference for certain features in a toilet (based on current awareness and availability), and as a result, may wait to construct their ideal toilet. However, improved toilets aligned with current customer preferences come at an increased cost.

Product innovation is required for households to better balance their product preferences, affordability, and other contextual constraints (e.g., insufficient water availability). This can be done through the following:

- *Product development*. Identifying and testing designs, components, materials, and fabrication methods that best address desired functionalities, while being cost-effective and accessible, is key. This is best done in coordination with existing supply chains and operational businesses. The product portfolio should be standardized, which can reduce up-front investment costs, improve and augment production efficiency, all while creating a design signature across products (UNICEF, 2021).
- *Product reengineering*. Reduce input material quantities or replace existing materials with lower-cost alternatives, while maintaining structural integrity. For example, the SMA research uncovered that cement accounts for approximately 20 percent of the total material cost for a US $200 toilet. This is

because masons often use as many as four 50-kilogram bags of cement to construct a single-compartment concrete slab. In contrast, an optimized single-compartment concrete slab designed by the Uganda Sanitation for Health Activity (USHA) requires one 50-kilogram bag (USHA, 2019).

- *Self- installation*. Enable customers to install toilet products more easily and affordably. This may involve providing customers with ready-to-install products, and/or information guides that detail the material procurement process, the overall construction process, and construction techniques/best practices. For example, iDE's "Easy Latrine" in Cambodia included a ready-to-install latrine core package (e.g., a pour flush ceramic pan, PVC pipe), home delivery, and a DIY toilet installation guide to encourage self-installation.

2. ACTIVATE DEMAND FOR PRODUCTS

As seen with cement commodes, designing an affordable product is not sufficient in generating sales. Many households are unaware of more affordable product options, which is addressable by effective demand activation.

Research on global MBS interventions suggests that one-on-one discussions with households, and/or small village group meetings may be more effective than passive mass-marketing methods (e.g., posters, radio) that may not address the broad range of customer concerns. As seen in Box 3 below, independent sales agents are often used to conduct door-to-door household visits, as sanitation enterprises appear reluctant to invest in marketing themselves actively (USAID, 2018).

Box 3: Planning Implementation - Demand Activation Model from Cambodia (USAID, 2018)

In the WaterSHED and iDE interventions in Cambodia, independent sales agents affiliated with local sanitation enterprises are paid to conduct village meetings and door-to-door household visits. During village meetings, agents discuss the risks of unhygienic sanitation, and the benefits and features of using toilets. Agents utilize one-on-one household visits to have conversations with potential customers about their individual sanitation-related challenges (e.g., privacy, health), and propose appropriate solutions.

In the Liberian context, this role can be performed by nongovernmental organizations (NGOs) or community health workers because they are viewed as reliable sources of information within the community. For example, across customer segments, approximately 51 percent of households that sought information on toilet construction relied on NGOs/community health workers.

In the same vein, sales agents also need to be financially incentivized to play this role and equipped with visual communications materials that contain marketing messages tailored to each customer segment. As seen in Annex F, customer segments have different product preferences, attitudes, and beliefs related to sanitation; customized messages may need to capture these unique aspects to persuade target households to construct improved toilets.

4.2. PROVIDE CUSTOMER FINANCE IN THE FORM OF SOFT LOANS AND TARGETED, MARKET-COMPATIBLE SUBSIDIES

Many households in the five target counties cannot afford to purchase their preferred improved toilets. To address the existing affordability and liquidity barriers, access to customer financing needs to be improved.

4.2.1 KEY CONSIDERATIONS FOR THIS RECOMMENDATION

SOFT LOANS

1. IDENTIFY AND SUPPORT APPROPRIATE FINANCIERS

Though several financiers exist in Liberia, savings and loan groups may be best suited to provide sanitation loans, as rural households have easy access to them. More than half (58 percent) of respondents who had taken a loan before had used savings and loan groups; households are more likely to take a loan from savings and loan groups as compared to other sources. Savings and loan groups are able to shoulder greater risks and serve more remote areas due to their close relationship with communities and local entrepreneurs. They also can ensure high repayment due to social pressure. These informal saving and loan groups may offer higher flexibility as well. However, these groups often have insufficient lending capital and limited capacity to develop new loan products, and may therefore require default guarantees and soft capital to ensure that they can provide sanitation loans to target households (USAID, 2018).

2. POPULARIZE LOAN PRODUCTS AMONG HOUSEHOLDS

Promoting loan products may help households overcome misconceptions around financing that may be currently limiting them from taking loans for toilet construction. Fifty-seven percent of households without BSS in the five target counties would not consider taking a loan to construct an improved toilet, primarily because they feared not being able to repay the loan. Sales and marketing channels (e.g., door-to-door household visits) could be leveraged to increase awareness and generate demand for these loan products.

Below is a case study (Box 4) that highlights how customer financing interventions can be planned and implemented to encourage and support households to take sanitation loans.

Box 4: Planning Implementation – Customer Financing Intervention in 3Si, Bihar, India (USAID, 2018)

In rural Bihar, most customers did not have sufficient funds available upfront to buy a toilet, due to income seasonality borne by the agricultural cycle. However, credit providers (microfinance providers) were not willing to provide sanitation loans because they considered consumption loans risky in comparison to income-generating loans. To address household liquidity constraints, the 3Si intervention incentivized microfinance institutions (MFIs) to offer sanitation loans by setting up a revolving fund[7] and underwriting part of the default risk. The reduction in risk served as a catalyst for MFIs to extend loans for sanitation, eventually leading to a disbursement of 32,000 sanitation loans as of 2017, and nearly a 100 percent repayment rate.

[7] Refers to a loan fund in which the loans, when repaid, are disbursed again as loans.

SUBSIDIES

1. DESIGN MARKET-COMPATIBLE SUBSIDIES

Subsidies need to be market-compatible and well targeted to ensure they do not dampen willingness-to-pay for households that are able and willing to pay for improved toilets, and do not crowd out other sources of financing such as credit. The following dimensions need to be considered when designing subsidies:

- *Amount*: Subsidies can vary based on customer segment, with higher subsidies going to poorer segments. The SMA research suggests that 18 percent of households need a partial subsidy of approximately LRD 10,000 to afford a LRD 40,000 toilet, while 25 percent need a full subsidy.
- *Channel*: Subsidies can be directly provided either to the household or to an entrepreneur. In Liberia, only households may be applicable/suitable, due to the absence of sanitation entrepreneurs in the market.
- *Form and timing*: Voucher-based subsidies can be provided prior to toilet purchase or post purchase/installation, and in-kind subsidies through provision of hardware or raw materials, especially to households that may be very far from markets (e.g., Segment L). Voucher-based subsidies that are conditional on toilet installation may be more suitable for the Liberian context to address challenges related to preexisting household expectations for free toilet construction (based on familiarity with in-kind subsidies provided by donors in the past).

2. DEPLOY SUBSIDIES IN A TARGETED MANNER

Well-targeted subsidies allocate limited funds more efficiently by focusing on the poorer households. The following methods can be employed to develop well-targeted subsidies:

- *Geographic targeting:* Regions where the majority of households are poor are made eligible for subsidies; these may be accessible to both intended recipients and wealthier households. In the Liberian context, geographic targeting could be done based on the customer segments delineated in Box 1. For example, Segment L is one of the least affluent segments, and occupies the entirety of rural Lofa.
- *Self-selection*: Households that need subsidies are required to claim them by themselves; it is assumed that only poorer households will claim subsidies for lower-cost toilets that are unlikely to include all desired features (USAID, 2018).

Other methods include community-based testing and means-tested targeting, but neither may be well-suited to Liberia in the current context. Community-based testing refers to communities receiving a financial reward after achieving an open defecation free (ODF) status; this may not guarantee that households construct long-lasting improved toilets, given Liberia's recent history of community reversion to OD. Means-tested targeting refers to households being targeted based on their affluence levels. However, this requires a comprehensive national poverty identification system, which is not present in Liberia.

4.3. INVEST IN ENHANCING THE AVAILABILITY AND VIABILITY OF SANITATION ENTERPRISES

The absence of sanitation entrepreneurs in the five target counties of Liberia makes toilet construction cumbersome for households, as they must aggregate all materials and services by themselves. While there are VC actors in the market who can be primed for the role of sanitation entrepreneurs, it is currently not a viable standalone business for them. This calls attention to the need for new, appropriate delivery models that have to be identified based on existing challenges faced by customers, and their willingness to pay for different levels of aggregation of materials and services.

4.3.1 KEY CONSIDERATIONS FOR THIS RECOMMENDATION

1. IDENTIFY THE RIGHT SANITATION ENTREPRENEUR IN THE MARKET

VC actors who can take on the role of sanitation entrepreneurs would require some, if not all of the following capabilities, assets, and attributes based on their role within the delivery model:

- *Production and infrastructure:* Demonstrate the ability to identify the various products in the market, procure construction materials, manufacture toilet components (e.g., cement commodes), and conduct inventory management and quality control. In terms of infrastructure, they should have access to physical assets like production facilities, and tools such as molds to manufacture toilet components.
- *Entrepreneurial skills and management:* Possess the requisite business acumen; be knowledgeable in tasks like book-keeping, stock management, costing, and price setting; in addition to having sales and marketing skills to manage their day-to-day operations, grow their business, and remain viable.
- *Capital*: Have access to capital to meet the upfront costs involved in stocking inventory or aggregating materials/services on behalf of customers.
- *Commitment to the sanitation business:* View sanitation as an attractive additional business stream, with related businesses.
- *Access to households*: Be easily accessible to households in the target market.

In the absence of a sanitation entrepreneur, none of the VC actors currently possess all the preferred attributes. However, with requisite support, some of them could take on a more involved role toward aggregating materials/services. For example, cement pre-fabricators have the capabilities and infrastructure to manufacture ready-made cement sanitation products and obtain an average unit margin of 56 percent. But they are primarily present in urban areas, rendering them inaccessible to customers in rural areas, and would need support to penetrate these markets.

2. SUPPORT THE IDENTIFIED CANDIDATE IN TARGETED AREAS

Depending on the chosen delivery model and the VC actor's role within the model, the following kinds of support and training may be extended to sanitation entrepreneur candidates:

- *Technical training*: This may involve training on different toilet designs and related specifications, how to manufacture and/or install toilet components, and how to instruct pit diggers on pit dimensions and shape.
- *Business training*: actors may require training on managing customers, basic book-keeping and numeracy skills, and sales and marketing skills.
- *Provision of enterprise finance*: financiers (e.g., savings and loan groups) in Liberia have limited collateral requirements for business loans; actors should be linked to local financiers and be

sensitized on their business loan terms. Additionally, financiers can be provided with capital to enable them to provide actors with low interest rate loans.

4.4. ADDRESS UNFAVORABLE BELIEFS AND BUILD AWARENESS

Although most households in the five counties are aware of the health and non-health benefits of toilets (e.g., safety, privacy), a few households still hold on to unfavorable beliefs related to them (e.g., it is taboo to live near toilets). Context-specific interventions, awareness programs, and social marketing campaigns are required to address these barriers.

4.4.1 KEY CONSIDERATION FOR THIS RECOMMENDATION

1. HIGHLIGHT THE RISKS OF UNIMPROVED AND THE BENEFITS OF IMPROVED TOILETS

CLTS initiatives usually focus on ensuring that households end their OD practices without specifying the type of toilet that households should construct. As a result, households in Liberia tend to construct toilets built with poor quality non-durable materials that collapse or get damaged over time, leading communities to revert to OD.

These initiatives could instead highlight the benefits of constructing improved toilets, as well as the risks of constructing an unimproved toilet. This may include their proneness to collapse, lack of hygiene, greater exposure to diseases, difficulty to clean, and lack of prestige. For example, 39 percent of households that have reverted to OD in Montserrado and Grand Bassa reported that they stopped using their toilets due to structural damage, owing to factors like rain. Formulation of relevant messaging on the benefits of improved toilets could include references to durable materials that can withstand rough weather or termite infestations.

These initiatives can also allow sanitation entrepreneurs and VC actors (e.g., masons) to market their improved toilet construction services to households. This ensures that demand activation begins immediately, and initial momentum around toilet purchase is not lost, increasing the possible adoption of improved toilets.

Participation of local leaders (village chiefs/local government officials), religious leaders, NGO workers, community health workers, and teachers in the CLTS model can enhance trust and persuasion, hold communities accountable to their ODF goals, and influence the adoption of new behaviors.

4.5. SHAPE MARKET RULES, TO CREATE FAVORABLE REGULATIONS/POLICIES

Households located outside of Monrovia face issues with increased transportation costs and limited access to materials such as cement, because of poorly penetrated associated supply chains. Market rules (e.g., import tariff on plastic sanitation products) can be used to reduce the costs of key toilet materials/components, and incentivize households to construct improved toilets.

4.5.1 KEY CONSIDERATIONS FOR THIS RECOMMENDATION

1. IMPROVE CUSTOMER ACCESSIBILITY TO CONSTRUCTION MATERIALS BY ADDRESSING FISCAL BARRIERS

Existing policy levers tend to impact costs for manufacturers and suppliers, as well as the retail price for customers. These need modification to make toilet construction materials more affordable for households. Tariff rates on certain construction materials can be reduced to bring down overall material costs in the form of tariff rebates to material suppliers. For example, an Emerging Markets Consulting study in Lao PDR, suggests that imports procured for officially approved sanitation programs were exempt from import duties (EMC/World Bank, 2014). Reductions in tariff rates can further improve the

overall unit profitability of suppliers, and reduce the final material prices paid by customers. Further, tax holidays, in the form of a reduction in sales tax on certain products/materials, can reduce the final toilet prices paid by customers.

2. STRENGTHEN ENFORCEMENT OF EXISTING LAWS (E.G., NATIONAL PUBLIC HEALTH LAW)

The 1976 National Public Health Law requires public buildings and dwellings to have hygienic toilets, and holds households that fail to meet these standards liable to a fine and/or imprisonment. However, a lack of logistical and budgetary support is limiting enforcement at the local government level.

Consistent enforcement of these laws may incentivize households to purchase toilets to avoid legal ramifications. In other geographies, building codes or bylaws that require properties to have toilets (supplemented with penalties in the form of fines or denial of service) have also been utilized to bolster the uptake of improved toilets. For example, in Ghana, bylaws in the municipalities of Greater Accra West and Kumasi penalize landlords who do not provide their tenants with toilets (The Aquaya Institute, 2019) by fining them or summoning them to court. Similarly, water supply boards in Honduras only provide new water connections to households with functioning toilets (USAID, 2018). This is especially pertinent for households in Segment B, who live in rented houses, and who may not be able to construct toilets without the involvement of their landlords.

However, enforcement of these laws needs to consider the households and landlords' ability to pay. Punitive enforcement without considering factors like ability to pay may result in the unintended consequence of households constructing makeshift unimproved toilets to meet the bare minimum of legal requirements. This would be a missed opportunity to trigger investment in a more appropriate product. For these households, as mentioned in Sections 4.1 and 4.2, affordable product options, and well-targeted subsidies may need to be extended.

ANNEX A: DEFINITION OF TOILET TYPES

Joint Monitoring Programme (JMP) definitions (WHO/UNICEF, 2019) with minor modifications were used to classify toilet types as they are consistent with the Demographic and Health Survey, which were used to understand the change in sanitation profiles over time.

Figure 8: Improved Toilet Types

TOILET TYPE	DEFINITION
 **Flush/Pour Flush Toilet** • *To Septic Tank* • *To Piped Sewer System* • *To Pit Latrine*	• A pour flush toilet contains a water seal below the seat/squatting hole that prevents the passage of smell/flies; it allows for excreta to be flushed by manually pouring water by hand • A flush toilet uses a cistern/holding tank for flushing water and has a water seal • Both variants flush the excreta into pit latrines, septic tanks, or piped sewer systems
 **Pit Latrine with Slab**	• A dry pit latrine where the pit is fully covered by a durable slab or platform (made of durable material, such as concrete, or cement. The slab or platform should adequately cover the pit so that fecal matter is not exposed
 **Ventilated Improved Pit Latrine**	• A dry pit latrine with slab, ventilated with a pipe extending above the latrines roof. The vent pipe is covered with gauze mesh or fly-proof netting
 **Composting Toilet**	• A dry toilet in which excreta and carbon-rich material are combined (vegetable wastes, straw, grass, sawdust, ash) in special conditions to produce compost

Figure 9: Unimproved Toilet Types

TOILET TYPE	DEFINITION
 **Pit Latrine without Slab**	• A latrine without a slab/platform for squatting or a seated commode. This includes an open pit, where there is a rudimentary hole in the ground where excreta is collected, or a latrine where the slab/platform is made of non-durable material (e.g., logs with earth or mud), or where the slab/platform has gaps and does not adequately cover the pit, leaving fecal matter exposed
 **Hanging Latrine**	• A toilet built over a body of water (e.g., a sea, or river), allowing excreta to drop directly into the water
 **Bucket Latrine**	• A bucket or similar container that is used to capture and retain excreta
Flush/Pour Flush Toilet • *To somewhere else*	• A flush/pour flush toilet where excreta is deposited in or around the dwelling unit – This must be a location other than a sewer, septic tank, or pit. For example, excreta may be flushed to the street, yard/plot, drainage ditch or other location

ANNEX B: DETAILED RESEARCH METHODOLOGY

Quantitative research was conducted in 120 enumeration areas (EAs) across the five counties, and households were selected using a two-stage stratified sampling approach; value chain (VC) trace-backs were initiated in EAs not selected for the quantitative research.

The sampling frame for selecting the households to interview is based on the 2008 National Population and Housing Census,[8] conducted by the Liberia Institute of Statistics and Geo-Information Services (LISGIS). This sampling frame is used by both the 2016 Liberia Malaria Indicator Survey and the Liberia Demographic and Health Survey (LDHS) 2019-2020.

A two-stage stratified sampling approach for selecting households from this sampling frame was followed:

- **Stage** 1: 24 EAs were selected in each of the five counties, in proportion to the county's rural/urban split.
- **Stage 2:** 30 Households were selected for profile interviews from each EA using systematic random sampling.

For the detailed interviews, households from profile interviews in proportion to the distribution of households by sanitation facility type in each county[9] (LDHS, 2019) were selected. Both the qualitative and quantitative VC interviews were split in a 1:2 ratio across urban and rural areas in all counties except Montserrado, where the ratio was 2:1.

Focus group discussions (FGDs) were conducted with approximately 100 households. These groups were representative of the various customer segments identified.

Quantitative profiles and detailed interviews were conducted with 3,608 and 659 households respectively, across 120 EAs in the five counties[10], along with qualitative interviews with 77 households. Table 2 is a tabulated version on the sample sizes for household interviews:

Table 2: Sample Size for Household Interviews

COUNTY	NUMBER OF EAS	NUMBER OF PROFILE INTERVIEWS	NUMBER OF DETAILED INTERVIEWS	NUMBER OF QUALITATIVE INTERVIEWS
Bong	24	725	132	3
Grand Bassa	24	734	125	25
Lofa	24	706	140	3
Montserrado	24	721	125	23
Nimba	24	722	137	23
Total	**120**	**3,608**	**659**	**77**

[8] The sampling frame for the 2008 census was used as the Liberia 2020 Population and Housing Census is not publicly available yet.

[9] Data on distribution of households by toilet facility type is not available at a lower administrative level than county.

[10] The number of profile and detailed interviews refer to the useable number of interviews – i.e., after cleaning the data to remove for errors made by enumerators and the survey software.

One hundred and thirty-three qualitative interviews were conducted with VC actors, of which 82 were conducted over 13 VC trace-backs[11], in addition to 134 quantitative VC actor interviews. VC actor quantitative interviews were focused on EAs not selected for the household profile interviews, where possible, to avoid overlapping interviews.

Table 3 captures some of the key highlights.

Table 3: Sample Size for VC Interviews

COUNTY	# OF QUALITATIVE VC INTERVIEWS	# OF VC TRACEBACKS
Bong	20	3
Grand Bassa	33	2
Lofa	18	3
Montserrado	27	2
Nimba	35	3
	133	**13**
VALUE CHAIN ACTOR		# OF QUANTITATIVE INTERVIEWS
Cement pre-fabricator		25
Hardware store		27
Mason		27
Savings and loan group		28
Transporter		27
		134

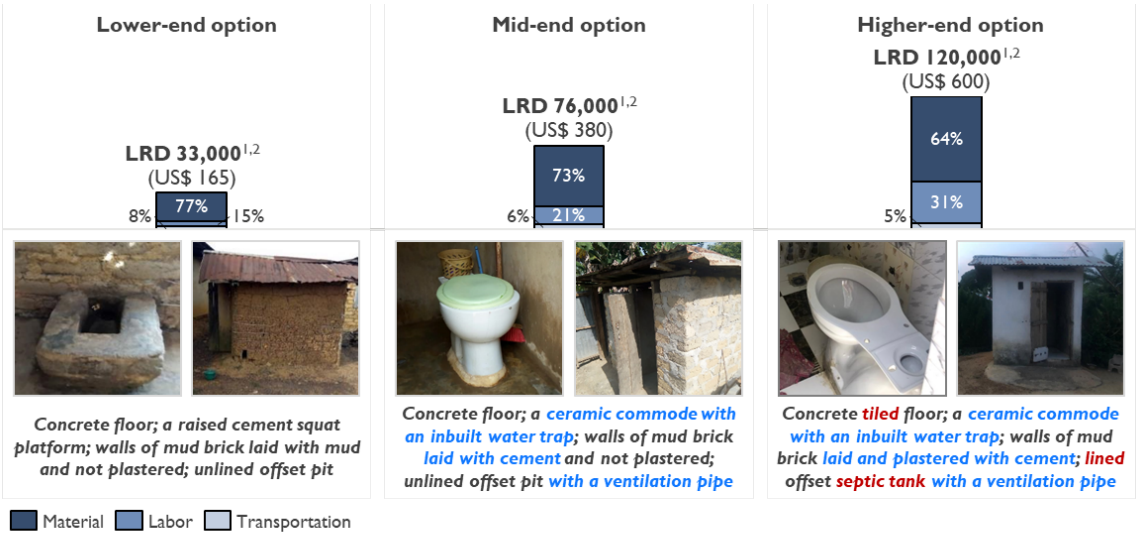
Travel restrictions due to the COVID-19 pandemic limited the ability of some research team members from participating in qualitative interviews. It also inhibited the research team's ability to establish contact with and gain insights from a sufficient number of upstream VC actors (e.g., hardware material wholesalers, plastic importers).

[11] A value chain trace-back starts with a qualitative interview with a household that constructed an improved toilet in the past few years, followed by qualitative interviews with all the VC actors that had provided materials or services toward the construction of that toilet, including upstream actors like the supplier for the hardware store.

ANNEX C: TOILET COSTING

As the quality of construction, materials used, and additional features of the toilet are improved/upgraded, the labor cost as a proportion of the total cost of the toilet increases significantly. Figure highlights improved toilet options within three price ranges.

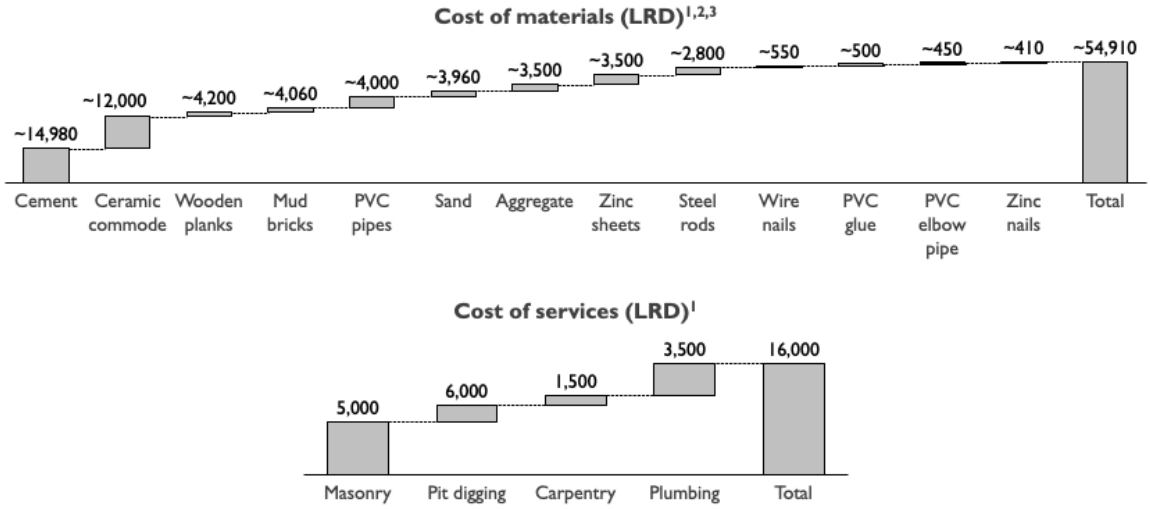
Figure 10: Cost of an Improved Toilet



Source: Qualitative interviews, FSG analysis; **Image Source:** Captured with permission during HH interviews
1. Assuming that the customer pays for all the materials and services required, and does not self-source any of the materials or provide labor for any construction activities
2. Toilet costs differ based on county, urban vs. rural, and other factors. However, for simplicity, we have taken the average cost across all factors for this cost analysis

Figure 11 showcases the cost build-up of a mid-end improved toilet. The cost of masonry and pit digging make up 69 percent of the total labor cost, while the cost of cement and a ceramic commode comprises 49 percent of the total cost of materials needed to build a mid-end improved toilet.

Figure 11: Cost Build-Up of a Mid-End Improved Toilet



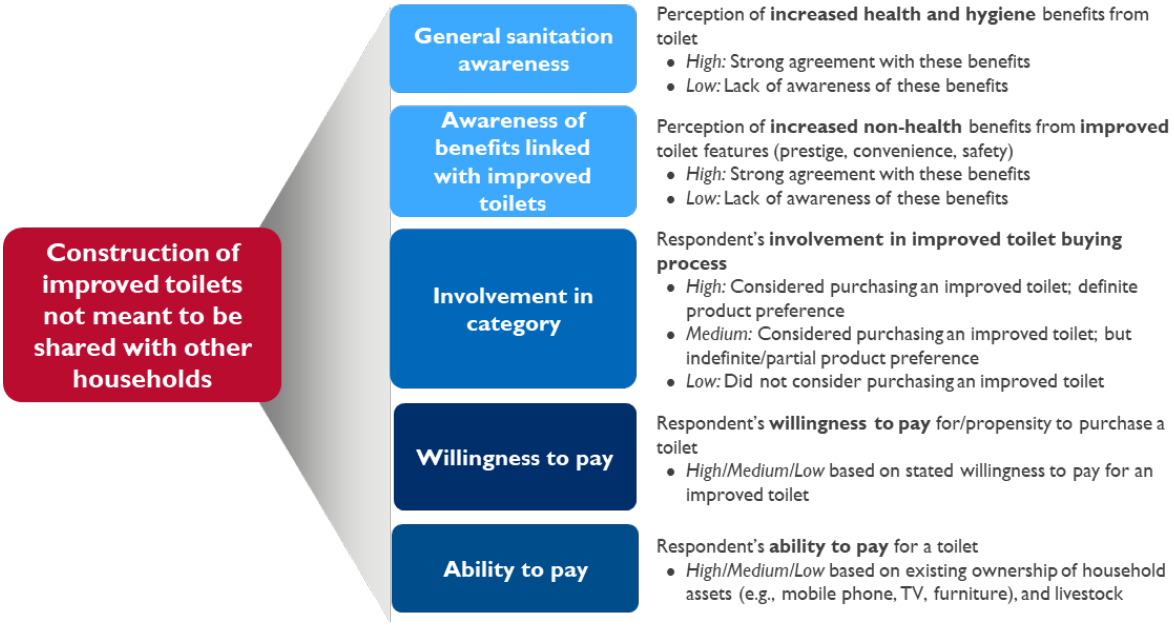
Source: Qualitative interviews, FSG analysis
1. Toilet costs differ based on county, urban vs. rural, and other factors. However, for simplicity, we have taken the average cost across all factors for this cost analysis; 2. This cost analysis accounts for materials that make up a significant portion of the total cost, but may not include materials like floor drains that are not used consistently across contexts and do not affect the overall cost significantly; 3. This analysis also does not include the gross margin for PVC glue, due to the unavailability of data

ANNEX D: CUSTOMER SEGMENTATION PROCESS

Household customers differ in their preferences and beliefs around sanitation, creating a need to segment the population of households without basic sanitation service (BSS).

To segment the population, five appropriateness tests were run across all the hypothesized segmentation variables, to see which variables predicted differences in the key drivers of propensity to purchase an improved toilet. Figure illustrates the approach adopted for this SMA.

Figure 12: Approach



Average ability to pay (out-of-pocket) was estimated to be 50 percent of the average total asset value for each customer segment. Average total asset value for households within a segment was calculated by gathering information on assets owned by the household (e.g., furniture, mobile phone, vehicles, livestock) and estimating the value of the asset depending on whether the household purchased a new or used asset.

ADDITIONAL CONSIDERATIONS IN SEGMENTATION ANALYSIS

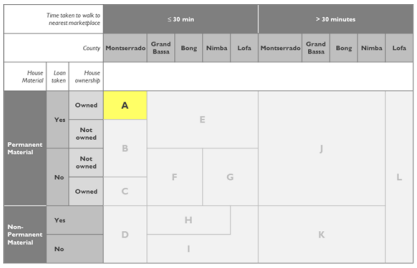
The purpose and limitations of the segmentation process bear consideration. Segmentation allows for the prioritization of customer profiles that are more amenable to MBS solutions, and understanding of the leverage points and the potential activation efforts for each priority segment. Segmentation allows for the design of interventions based on the specific attitudes, preferences, and behavior of priority segments.

However, segmentation-related insights are grounded in stated, and not demonstrated, customer behavior (e.g., a customer's description of their product preferences based on what is currently known to the customer, not a demonstration of it). The data from segmentation analysis should be used directionally, and any planning based on these findings should incorporate qualitative insights from the market.

ANNEX E: DETAILED PROFILES OF CUSTOMER SEGMENTS

SEGMENT A

Key Demographic Statistics



Segment size	
% of potential market	6%
# of households	31K

Sanitation profile	
Limited sanitation service	41%
Unimproved toilet	46%
No toilet	13%

Demographics	
Family size (Avg.)	9
Gender of HH Head	
• Male	41%
• Female	59%
HH Head education[1]	
• No education	25%
• Up to Junior High	24%
• Senior High or above	51%

Income & occupation	
Nature of income	
• Regular	83%
• Seasonal	17%
Primary occupation[2]	
• Petty Trading	54%
• Unskilled Labor	13%
• Skilled Labor	11%
• Shop owner	7%

Affluence indicators	
Total monthly expenditure	
High (>LRD 40K)	61%
Medium (LRD 20K-40K)	35%
Low (≤LRD 20K)	4%
Total asset value (avg.)	171k
Total asset value (spread)	
High (> LRD 120K)	71%
Medium (LRD 75K-120K)	7%
Low (LRD 35K-75K)	0%
Very low (< LRD 35K)	22%

Assets and other indicators	
Mobile phone	96%
Computer	4%
Television	51%
Chair	80%
Agricultural land	20%
Any mode of transport	14%
Home improvement	66%
Loan group member	65%
Mobile money user	61%

Access indicators	
Distance to nearest market[4,5]	
<30 minutes	66%
30 minutes to 1 hour	18%
Not walking distance	15%
Access to electricity	58%
Non-drinking water source[4]	
Surface water	3%
Other unprotected sources	25%
Hand pump, tube well or borehole	39%
Other protected sources	32%

Attitudes & beliefs[3]	
Believe that community cleanliness is important	93%
Believe it is embarrassing to be seen practicing OD	93%
Willing to pay for products that bring prestige	58%
Believe it is taboo to live near a toilet	38%

1. Indicates highest level of education attended; 2. Top four occupations for each segment are shown; 3. Respondents were asked if they 'strongly disagreed', 'disagreed', 'agreed', or 'strongly agreed' to statements related to their attitudes and beliefs. Here the combined percentage of those who 'strongly agreed' or 'agreed' with a statement is reported, barring willingness to pay for prestige products, for which only 'strongly agreed' is shown; 4. Total % ≠100 as it is rounded off; 5. Refers to a permanent market with stores; **Source:** HH interviews (Profile n=122; Detailed n=21), FSG analysis

Customer Persona

Setting

- **Location:** Urban Montserrado, typically within or near Monrovia
- **Typical family size:** 9 people, with 3 children and no elderly[1]
- **Type of house:** Live in their own house, made predominantly of permanent materials
- **Income and occupation:** Typically have regular income, however nearly a fifth of this segment have seasonal income; petty trading is the most dominant occupation
- **Mobile phone and mobile money:** Almost all HHs in this segment have a mobile phone, and mobile money is used by more than half the HHs in this segment
- **Total value of assets:** HHs are affluent; the average total asset value per HH is LRD ~171,000
- **Loan groups:** Two thirds of HHs are loan group members
- **Loans:** All HHs in this segment have taken loans in the past, primarily for business or school fees; loans are typically taken from savings/loan groups

Mental Model

- **Strongly desire respect** from people in their community
- **Value products that make their life more convenient**, and that are **prestigious**
- **Conformity is not particularly important** to this group, as nearly two thirds disagree or strongly disagree that one shouldn't do things 'differently' from their neighbors
- **Place high value on ownership of a toilet**. The majority strongly believe owning a toilet is a sign of prestige, and that it is irresponsible to not have a toilet
  - Majority are **well aware of the health, safety, and privacy benefits** of a toilet, and equate owning a toilet to being modern
    - **Community cleanliness is a priority**, and to witness OD or be seen practicing OD is highly embarrassing
      - **Slightly over a third of the segment may have concerns about using or living near a toilet**

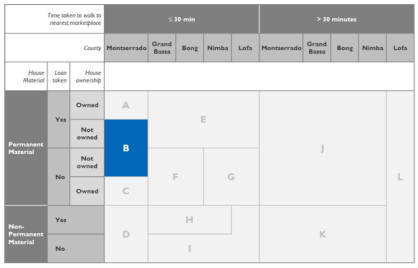
- **Current product and usage:** Improved shared toilet facilities and unimproved toilets
- **Desired product:** A toilet that is easy to clean with water, provides privacy, is comfortable, and has the following functionalities:
  - ***Toilet type***: Flush/pour flush toilet to ensure feces are flushed away and do not attract unwanted organisms
  - ***Substructure***: Offset pit to limit exposure to pit heat and flies, greater than 6ft deep, lined with concrete blocks
  - ***Interface:*** Tiled floor, ceramic commode to provide seated comfort
  - ***Superstructure***: Zinc sheet roof, cement walls, wooden door
- **Estimated cost and ability to pay:** Estimated cost of desired toilet - LRD 96,000; average ability to pay (out-of-pocket) - LRD 86,000
- **Financing:** Only one fifth of the segment would consider taking a loan, with most opting for banks or credit unions; the biggest reason for not taking a loan is a fear of the inability to pay back the loan

The Ask

Source: HH interviews (Profile n=122; Detailed n=21), FSG analysis; 1. Children are individuals who are 0-14 years old, elderly members are individuals who are >64 years old

SEGMENT B

Key Demographic Statistics



Segment size	
% of potential market	11%
# of households	59K

Sanitation profile	
Limited sanitation service	43%
Unimproved toilet	42%
No toilet	15%

Demographics	
Family size (Avg.)	6
Gender of HH Head	
• Male	35%
• Female	65%
HH Head education[1]	
• No education	17%
• Up to Junior High	16%
• Senior High or above	67%

Income & occupation	
Nature of income	
• Regular	85%
• Seasonal	15%
Primary occupation[2]	
• Petty Trading	39%
• Skilled Labor	35%
• Unskilled Labor	12%
• Shop owner	5%

Affluence indicators	
Total monthly expenditure	
High (>LRD 40K)	51%
Medium (LRD 20K-40K)	43%
Low (≤LRD 20K)	6%
Total asset value (avg.)	163k
Total asset value (spread)	
High (> LRD 120K)	41%
Medium (LRD 75K-120K)	19%
Low (LRD 35K-75K)	16%
Very low (< LRD 35K)	24%

Assets and other indicators	
Mobile phone	93%
Computer	8%
Television	46%
Chair	75%
Agricultural land	12%
Any mode of transport	12%
Home improvement	61%
Loan group member	36%
Mobile money user	57%

Access indicators	
Distance to nearest market[4]	
<30 minutes	77%
30 minutes to 1 hour	12%
Not walking distance	11%
Access to electricity	57%
Non-drinking water source	
Surface water	0%
Other unprotected sources	21%
Hand pump, tube well or borehole	39%
Other protected sources	40%

Attitudes & beliefs[3]	
Believe that community cleanliness is important	89%
Believe it is embarrassing to be seen practicing OD	81%
Willing to pay for products that bring prestige	63%
Believe it is taboo to live near a toilet	32%

1. Indicates highest level of education attended; 2. Top four occupations for each segment are shown; 3. Respondents were asked if they 'strongly disagreed', 'disagreed', 'agreed', or 'strongly agreed' to statements related to their attitudes and beliefs. Here the combined percentage of those who 'strongly agreed' or 'agreed' with a statement is reported, barring willingness to pay for prestige products, for which only 'strongly agreed' is shown; 4. Refers to a permanent market with stores
Source: HH interviews (Profile n=174; Detailed n=29), FSG analysis

Customer Persona

Setting

- **Location:** Urban Montserrado, typically within or near Monrovia
- **Typical family size:** 6 people, with 2 children and no elderly[1]
- **Type of house:** Live in rented houses, made predominantly of permanent materials, as monthly renters or multi-year lease tenants
- **Income and occupation:** Typically have regular income; petty trading and skilled labor are the most common occupations
- **Mobile phone and mobile money:** Mobile phone usage is widespread, and mobile money is used by more than half the customers in this segment
- **Total value of assets:** HHs are affluent; the average total asset value per HH is LRD ~163,000
- **Loan groups:** A third of the segment are loan group members
- **Loans:** Less than a third of the segment have taken loans in the past; loans are primarily taken for business followed by school fees, and are taken from NGOs or savings/loan groups

Mental Model

- **Strongly desire respect** from people in their community
- **Value products that make their life more convenient**, and that are **prestigious**
- **Conforming to the norm is not particularly important** to this group, with nearly two thirds suggesting that one should do things 'differently' from their neighbors
- **Place high value on ownership of a toilet** - strongly believe owning a toilet is a matter of pride and as important as investing in things such as a television or home improvement
- Majority are **well aware of the health, safety, and privacy benefits of owning a toilet**
  - **Community cleanliness is a priority**, however they are not as embarrassed to witness OD or be seen practicing OD
    - A third of the segment may express concerns about using or living near a toilet, and **most HHs find using someone else's toilet embarrassing**

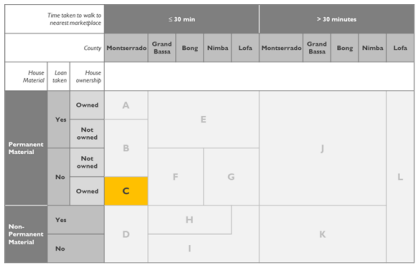
- **Current product and usage:** Improved shared toilet facilities and unimproved toilets
- **Desired product:** A toilet that is easy to clean with water, is comfortable, is well ventilated, and has the following functionalities:
  - ***Toilet type***: Flush/pour flush toilet to ensure feces are flushed away
  - ***Substructure***: Offset pit for better hygiene and safety, depth of >6 ft, lined with concrete blocks
  - ***Interface:*** Tiled floor, with a ceramic commode to provide seated comfort
  - ***Superstructure***: Zinc sheet roof, cement walls, wooden door
- **Estimated cost and ability to pay:** Estimated cost of desired toilet - LRD 78,000; average ability to pay (out-of-pocket) - LRD 81,000
- **Financing:** Less than a fifth of the segment would consider taking a loan, with most opting for banks or NGOs; biggest reason for not taking a loan is the fear of inability to pay back the loan

The Ask

Source: HH interviews (Profile n=174; Detailed n=29), FSG analysis; 1. Children are individuals who are 0-14 years old, elderly members are individuals who are >64 years old

SEGMENT C

Key Demographic Statistics



Segment size	
% of potential market	12%
# of households	64K

Sanitation profile	
Limited sanitation service	33%
Unimproved toilet	44%
No toilet	23%

Demographics	
Family size (Avg.)	8
Gender of HH Head	
• Male	37%
• Female	63%
HH Head education[1]	
• No education	29%
• Up to Junior High	18%
• Senior High or above	53%

Income & occupation	
Nature of income	
• Regular	76%
• Seasonal	24%
Primary occupation[2]	
• Petty Trading	37%
• Skilled Labor	19%
• Unskilled Labor	16%
• Agriculture	7%

Affluence indicators

Total monthly expenditure	
High (>LRD 40K)	47%
Medium (LRD 20K-40K)	43%
Low (≤LRD 20K)	10%
Total asset value (avg.)	135k
Total asset value (spread)[5]	
High (> LRD 120K)	42%
Medium (LRD 75K-120K)	8%
Low (LRD 35K-75K)	19%
Very low (< LRD 35K)	31%

Assets and other indicators	
Mobile phone	93%
Computer	6%
Television	29%
Chair	68%
Agricultural land	27%
Any mode of transport	14%
Home improvement	65%
Loan group member	37%
Mobile money user	57%

Access indicators

Distance to nearest market[4]	
<30 minutes	60%
30 minutes to 1 hour	10%
Not walking distance	31%
Access to electricity	47%
Non-drinking water source[5]	
Surface water	5%
Other unprotected sources	23%
Hand pump, tube well or borehole	39%
Other protected sources	32%

Attitudes & beliefs[3]

Believe that community cleanliness is important	96%
Believe it is embarrassing to be seen practicing OD	100%
Willing to pay for products that bring prestige	66%
Believe it is taboo to live near a toilet	43%

1. Indicates highest level of education attended; 2. Top four occupations for each segment are shown; 3. Respondents were asked if they 'strongly disagreed', 'disagreed', 'agreed', or 'strongly agreed' to statements related to their attitudes and beliefs. Here the combined percentage of those who 'strongly agreed' or 'agreed' with a statement is reported, barring willingness to pay for prestige products, for which only 'strongly agreed' is shown;4. Refers to a permanent market with stores; 5. Total % ≠100 as it is rounded off; **Source:** HH interviews (Profile n=233; Detailed n=33), FSG analysis

Customer Persona

Setting

- **Location:** Urban Montserrado, typically within or near Monrovia **Typical family size:** 8 people, with 3 children and no elderly[1]
- **Type of house:** Live in their own house, made predominantly of permanent materials
- **Income and occupation:** Typically have regular income, however a quarter have seasonal income; petty trading and skilled labor are the most dominant occupations
- **Mobile phone and mobile money:** Mobile phone usage is widespread, and mobile money is used by more than half the customers in this segment
- **Total value of assets:** HHs are affluent; the average total asset value per HH is LRD ~135,000
- **Loan groups:** A third of the segment are loan group members
- **Loans:** No one from this segment had taken a loan previously

Mental Model

- **Strongly desire respect** from people in their community
- **Value products that make their life more convenient**, and that are **prestigious**
- **Conforming to the norm is not important** to this group, with three quarters suggesting that one should do things 'differently' from their neighbors
- **Place high value on ownership of a toilet**. Nearly everyone believes owning a toilet is a sign of prestige, and nearly a third strongly agree that it **is irresponsible to not have a toilet**
- Majority are **well aware of the health, safety, and privacy benefits** of toilets, and equate owning a toilet to being modern
- **Community cleanliness is a priority**, however nearly a quarter of the segment practices OD
- **Strong prevalence of taboo associated with living near or using a toilet**, and with pregnant women using a toilet

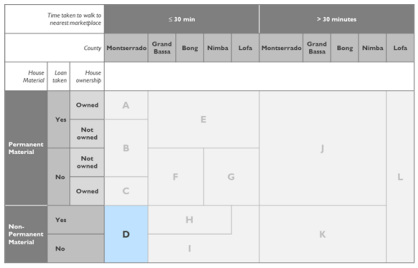
The Ask

- **Current product and usage:** Improved shared toilet facilities and unimproved toilets; nearly a quarter of the segment practices OD
- **Desired product:** A toilet that is easy to clean with water, unlikely to collapse, provides privacy, and has the following functionalities:
  - ***Toilet type***: Flush/pour flush toilet to ensure feces are flushed away and the interface remains clean
  - ***Substructure:*** Offset pit to reduce pit heat and prevent collapse; depth of >12 ft, lined with concrete blocks
  - ***Interface***: Tiled floor, with ceramic commode to provide seated comfort, two compartments (one for the toilet, one for bathing)
  - ***Superstructure***: Zinc sheet roof, cement walls, wooden door
- **Estimated cost and ability to pay:** Estimated cost of desired toilet - LRD 75,000; average ability to pay (out-of-pocket) - LRD 67,000
- **Financing:** Only a fifth of the segment would consider taking a loan, with most opting for savings/loan group or an NGO; biggest reason for not taking a loan is a fear of the inability to pay back the loan

Source: HH interviews (Profile n=233; Detailed n=33), FSG analysis; 1. Children are individuals who are 0-14 years old, elderly members are individuals who are >64 years old

SEGMENT D

Key Demographic Statistics



Segment size	
% of potential market	2%
# of households	11K

Sanitation profile	
Limited sanitation service	8%
Unimproved toilet	23%
No toilet	68%

Demographics	
Family size (Avg.)	7
Gender of HH Head	
• Male	53%
• Female	47%
HH Head education[1]	
• No education	46%
• Up to Junior High	54%
• Senior High or above	0%

Income & occupation	
Nature of income	
• Regular	50%
• Seasonal	50%
Primary occupation[2]	
• Unskilled Labor	46%
• Agriculture	42%
• Petty Trading	8%
• Skilled Labor	4%

Affluence indicators

Total monthly expenditure	
High (>LRD 40K)	31%
Medium (LRD 20K-40K)	54%
Low (≤LRD 20K)	15%
Total asset value (avg.)	14k
Total asset value (spread)	
High (> LRD 120K)	0%
Medium (LRD 75K-120K)	4%
Low (LRD 35K-75K)	0%
Very low (< LRD 35K)	96%

Assets and other indicators	
Mobile phone	53%
Computer	0%
Television	0%
Chair	35%
Agricultural land	81%
Any mode of transport	3%
Home improvement	35%
Loan group member	23%
Mobile money user	12%

Access indicators

Distance to nearest market[4]	
<30 minutes	12%
30 minutes to 1 hour	0%
Not walking distance	88%
Access to electricity	3%
Non-drinking water source[5]	
Surface water	73%
Other unprotected sources	8%
Hand pump, tube well or borehole	12%
Other protected sources	8%

Attitudes & beliefs[3]

Believe that community cleanliness is important	100%
Believe it is embarrassing to be seen practicing OD	100%
Willing to pay for products that bring prestige	72%
Believe it is taboo to live near a toilet	52%

1. Indicates highest level of education attended; 2. Top four occupations for each segment are shown; 3. Respondents were asked if they 'strongly disagreed', 'disagreed', 'agreed', or 'strongly agreed' to statements related to their attitudes and beliefs. Here the combined percentage of those who 'strongly agreed' or 'agreed' with a statement is reported, barring willingness to pay for prestige products, for which only 'strongly agreed' is shown; 4. Refers to a permanent market with stores; 5. Total % ≠100 as it is rounded off; **Source:** HH interviews (Profile n=29; Detailed n=9), FSG analysis

Customer Persona

Setting

- **Location:** Urban Montserrado, typically within or near Monrovia **Typical family size:** 7 people, with 3 children and no elderly[1]
- **Type of house:** Live in their own house, made predominantly of temporary materials
- **Income and occupation:** The segment is split in half between seasonal and regular income; unskilled labor and agriculture are the dominant occupations
- **Mobile phone and mobile money:** Only half the segment own a mobile phone; mobile money is used by only a tenth of the segment
- **Total value of assets:** HHs are not affluent; the average total asset value per HH is LRD ~14,000
- **Loan groups:** Nearly a quarter are loan group members
- **Loans:** Only a fifth of the segment have taken loans in the past, primarily for school fees or business; most borrowed from a friend

Mental Model

- **Strongly desire respect** from their community
- **Value products** that are **prestigious** and make life **convenient**
- **Conforming to the norm is not important** to this group, as more than three quarters suggest that one should do things 'differently' from their neighbors
- **Place high value on ownership of a toilet.** The majority strongly believe owning a toilet is a sign of **prestige**. Majority have some idea of the **health, safety, and privacy benefits** of owning a toilet, and equate owning a toilet to **being modern**
  - **Care about community cleanliness**, and to **witness** or to be seen **practicing OD is considered embarrassing**
    - Agree that it is **irresponsible to not have a toilet**
      - Strongly **prioritize school fees over building a toilet**, relative to other segments
        - **Strong prevalence of taboo associated with living near or using a toilet**

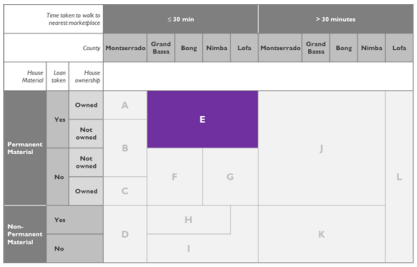
The Ask

- **Current product and usage:** Two thirds of the segment practice OD, and a quarter use unimproved toilets
- **Desired product:** A toilet that is easy to clean with water, is unlikely to collapse and comfortable, is well ventilated, and has the following functionalities:
  - ***Toilet type***: Pour flush toilet to reduce smell
  - ***Substructure***: Offset pit to reduce pit heat; depth of 6-12ft, lined with concrete blocks
  - ***Interface***: Tiled floor, seated ceramic commode to ensure floor is not dirtied, two compartments (one for the toilet, one for bathing)
  - ***Superstructure***: Zinc sheet roof, cement walls, wooden door
- **Estimated cost and ability to pay:** Estimated cost of desired toilet - LRD 57,000; average ability to pay (out-of-pocket) - LRD 7,000
- **Financing:** nearly three quarters of the segment would consider taking a loan, with most opting take one from a bank; biggest reason for not taking a loan is a fear of the inability to pay back the loan

Source: HH interviews (Profile n=29; Detailed n=9), FSG analysis; 1. Children are individuals who are 0-14 years old, elderly members are individuals who are >64 years old

SEGMENT E

Key Demographic Statistics



Segment size	
% of potential market	8%
# of households	43K

Sanitation profile	
Limited sanitation service	27%
Unimproved toilet	13%
No toilet	60%

Demographics	
Family size (Avg.)	9
Gender of HH Head	
• Male	50%
• Female	50%
HH Head education[1]	
• No education	37%
• Up to Junior High	23%
• Senior High or above	40%

Income & occupation	
Nature of income	
• Regular	73%
• Seasonal	27%
Primary occupation[2]	
• Agriculture	39%
• Unskilled Labor	24%
• Petty Trading	19%
• Skilled Labor	9%

Affluence indicators	
Total monthly expenditure	
High (>LRD 40K)	20%
Medium (LRD 20K-40K)	36%
Low (≤LRD 20K)	44%
Total asset value (avg.)	66k
Total asset value (spread)[5]	
High (> LRD 120K)	25%
Medium (LRD 75K-120K)	15%
Low (LRD 35K-75K)	24%
Very low (< LRD 35K)	36%

Assets and other indicators	
Mobile phone	77%
Computer	1%
Television	4%
Chair	57%
Agricultural land	74%
Any mode of transport	15%
Home improvement	29%
Loan group member	66%
Mobile money user	41%

Access indicators	
Distance to nearest market[4]	
<30 minutes	31%
30 minutes to 1 hour	18%
Not walking distance	51%
Access to electricity	17%
Non-drinking water source	
Surface water	29%
Other unprotected sources	24%
Hand pump, tube well or borehole	32%
Other protected sources	15%

Attitudes & beliefs[3]	
Believe that community cleanliness is important	82%
Believe it is embarrassing to be seen practicing OD	94%
Willing to pay for products that bring prestige	36%
Believe it is taboo to live near a toilet	18%

1. Indicates highest level of education attended; 2. Top four occupations for each segment are shown; 3. Respondents were asked if they 'strongly disagreed', 'disagreed', 'agreed', or 'strongly agreed' to statements related to their attitudes and beliefs. Here the combined percentage of those who 'strongly agreed' or 'agreed' with a statement is reported, barring willingness to pay for prestige products, for which only 'strongly agreed' is shown; 4. Refers to a permanent market with stores;
Source: HH interviews (Profile n=390; Detailed n=95), FSG analysis

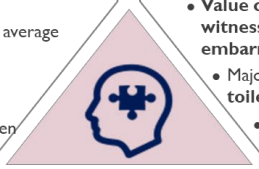
Customer Persona

Setting

- **Location:** Grand Bassa, Nimba, Bong and Lofa
- **Typical family size:** 9 people, with 3 children and no elderly[1]
- **Type of house:** Live in their own house, made predominantly of permanent materials
- **Income and occupation:** Typically have regular income, however a quarter have seasonal income; agriculture is the dominant occupation, followed by unskilled labor
- **Mobile phone and mobile money:** Mobile phone usage is common, and mobile money is used by slightly less than half the customers in this segment
- **Total value of assets:** HHs are relatively affluent; the average total asset value per HH is LRD ~66,000
- **Loan groups:** Two thirds are loan group members
- **Loans:** The entire segment has taken loans in the past, primarily to pay school fees; loans are typically taken from savings/loans groups

Mental Model

- **Strongly desire respect** from their community
- **Value prestigious products** that make life **convenient**
- **Conforming to the norm is not particularly important** to this group, as more than half suggest that one should do things 'differently' from their neighbors
- **Place high value on ownership of a toilet.** The majority believe owning a toilet is a sign of **prestige**. HHs have moderate understanding of the **health, safety, and privacy benefits** of owning a toilet, and equate owning a toilet to **being modern**
  - **Value community cleanliness moderately**, however **witnessing** or be seen **practicing OD is considered embarrassing**
    - Majority agree that it is **irresponsible to not have a toilet**
      - A quarter of the segment **do not prioritize school fees over building a toilet**



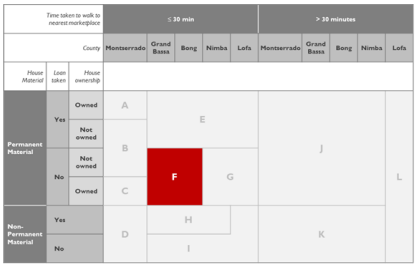
The Ask

- **Current product and usage:** Improved shared toilet facilities and unimproved toilets; more than half the segment practice OD
- **Desired product:** A toilet that is easy to clean with water, provides privacy, is comfortable, and has the following functionalities:
  - ***Toilet type***: Pour flush toilet to ensure feces are flushed away and prevent flies and disease
  - ***Substructure***: Offset pit to reduce pit heat and prevent collapse; depth of >12 ft, lined with concrete blocks
  - ***Interface:*** Cement floor with foot rests/cement squat platform, two compartments
  - ***Superstructure:*** Zinc sheet roof, cement walls, wooden door
- **Estimated cost and ability to pay:** Estimated cost of desired toilet - LRD 57,000; average ability to pay (out-of-pocket) - LRD 33,000
- **Financing:** at least half the segment would consider taking a loan, with most opting for savings/loan group; biggest reason for not taking a loan is a fear of the inability to pay back the loan

Source: HH interviews (Profile n=390; Detailed n=95), FSG analysis; 1. Children are individuals who are 0-14 years old, elderly members are individuals who are >64 years old

SEGMENT F

Key Demographic Statistics



Segment size	
% of potential market	3%
# of households	18K

Sanitation profile	
Limited sanitation service	38%
Unimproved toilet	20%
No toilet	42%

Demographics	
Family size (Avg.)	7
Gender of HH Head	
• Male	45%
• Female	55%
HH Head education[1]	
• No education	28%
• Up to Junior High	34%
• Senior High or above	38%

Income & occupation	
Nature of income	
• Regular	78%
• Seasonal	22%
Primary occupation[2]	
• Petty Trading	30%
• Agriculture	23%
• Unskilled Labor	20%
• Skilled Labor	14%

Affluence indicators

Total monthly expenditure	
High (>LRD 40K)	35%
Medium (LRD 20K-40K)	42%
Low (≤LRD 20K)	23%
Total asset value (avg.)	85k
Total asset value (spread)	
High (> LRD 120K)	37%
Medium (LRD 75K-120K)	34%
Low (LRD 35K-75K)	9%
Very low (< LRD 35K)	20%

Assets and other indicators	
Mobile phone	85%
Computer	1%
Television	6%
Chair	86%
Agricultural land	59%
Any mode of transport	11%
Home improvement	42%
Loan group member	34%
Mobile money user	45%

Access indicators

Distance to nearest market[4]	
<30 minutes	53%
30 minutes to 1 hour	9%
Not walking distance	38%
Access to electricity	29%
Non-drinking water source	
Surface water	22%
Other unprotected sources	28%
Hand pump, tube well or borehole	22%
Other protected sources	28%

Attitudes & beliefs[3]

Believe that community cleanliness is important	70%
Believe it is embarrassing to be seen practicing OD	91%
Willing to pay for products that bring prestige	34%
Believe it is taboo to live near a toilet	26%

1. Indicates highest level of education attended; 2. Top four occupations for each segment are shown; 3. Respondents were asked if they 'strongly disagreed', 'disagreed', 'agreed', or 'strongly agreed' to statements related to their attitudes and beliefs. Here the combined percentage of those who 'strongly agreed' or 'agreed' with a statement is reported, barring willingness to pay for prestige products, for which only 'strongly agreed' is shown; 4. Refers to a permanent market with stores;
Source: HH interviews (Profile n=284; Detailed n=70), FSG analysis

Customer Persona

Setting

- **Location:** Populous urban areas of Grand Bassa, and Bong
- **Typical family size:** 7 people, with 3 children and no elderly[1]
- **Type of house:** Live in their own house, made predominantly of permanent materials
- **Income and occupation:** Typically have regular income, however nearly a fifth have seasonal income; petty trading is the dominant occupation, followed by agriculture
- **Mobile phone and mobile money:** Mobile phone usage is widespread, and mobile money is used by slightly less than half the customers in this segment
- **Total value of assets:** HHs are affluent; the average total asset value per HH is LRD ~85,000
- **Loan groups:** A third are loan group members
- **Loans:** This segment have not taken loans for any purpose

Mental Model

- **Desire respect** from their community
- **Value products** that are **prestigious** and make life **convenient**
- **Conforming to the norm is not particularly important** to this group, as more than half suggest that one should do things 'differently' from their neighbors
- **Place high value on ownership of a toilet.** The majority strongly believe owning a toilet is a sign of **prestige**. Majority are well aware of the **health, safety, and privacy benefits** of owning a toilet, and equate owning a toilet to **being modern**
  - **HHs are not particularly concerned with community cleanliness**, however they disapprove of **witnessing** or **being seen practicing OD**
    - Agree that it is **irresponsible to not have a toilet**
    - **Nearly three quarters prioritize school fees over building a toilet**, relative to other segments

The Ask

- **Current product and usage:** Prevalence of shared toilet facilities and practicing OD
- **Desired product:** A toilet that is easy to clean with water, is comfortable, is well ventilated, and has the following functionalities:
  - ***Toilet type***: Flush/pour flush toilet to reduce odor
  - ***Substructure***: Offset pit to limit pit heat and prevent users from seeing the content's of the pit; depth of 6-12ft, lined with concrete blocks
  - ***Interface:*** Cement floor with a seated ceramic commode
  - ***Superstructure***: Zinc sheet roof, cement walls, wooden door
- **Estimated cost and ability to pay:** Estimated cost of desired toilet - LRD 65,000; average ability to pay (out-of-pocket) - LRD 43,000
- **Financing:** Most of the segment would not take a loan, because they either have enough savings (for those willing to pay up to LRD 40K), or believe that they will be unable to pay back the loan (for those willing to pay LRD 80K-100K or more)

Source: HH interviews (Profile n=284; Detailed n=70), FSG analysis; 1. Children are individuals who are 0-14 years old, elderly members are individuals who are >64 years old

SEGMENT G

Key Demographic Statistics

Segment size	
% of potential market	5%
# of households	28K

Sanitation profile	
Limited sanitation service	24%
Unimproved toilet	14%
No toilet	62%

Demographics	
Family size (Avg.)	10
Gender of HH Head	
• Male	43%
• Female	57%
HH Head education[1]	
• No education	31%
• Up to Junior High	26%
• Senior High or above	44%

Income & occupation	
Nature of income	
• Regular	70%
• Seasonal	30%
Primary occupation[2]	
• Agriculture	51%
• Petty Trading	15%
• Unskilled Labor	15%
• Other	7%

Affluence indicators

Total monthly expenditure	
High (>LRD 40K)	10%
Medium (LRD 20K-40K)	30%
Low (≤LRD 20K)	61%
Total asset value (avg.)	47k
Total asset value (spread)	
High (> LRD 120K)	5%
Medium (LRD 75K-120K)	17%
Low (LRD 35K-75K)	22%
Very low (< LRD 35K)	56%

Assets and other indicators	
Mobile phone	64%
Computer	1%
Television	1%
Chair	51%
Agricultural land	76%
Any mode of transport	9%
Home improvement	20%
Loan group member	47%
Mobile money user	28%

Access indicators

Distance to nearest market[4]	
<30 minutes	36%
30 minutes to 1 hour	17%
Not walking distance	48%
Access to electricity	20%
Non-drinking water source	
Surface water	40%
Other unprotected sources	22%
Hand pump, tube well or borehole	23%
Other protected sources	15%

Attitudes & beliefs[3]

Believe that community cleanliness is important	85%
Believe it is embarrassing to be seen practicing OD	97%
Willing to pay for products that bring prestige	42%
Believe it is taboo to live near a toilet	8%

1. Indicates highest level of education attended; 2. Top four occupations for each segment are shown; 3. Respondents were asked if they 'strongly disagreed', 'disagreed', 'agreed', or 'strongly agreed' to statements related to their attitudes and beliefs. Here the combined percentage of those who 'strongly agreed' or 'agreed' with a statement is reported, barring willingness to pay for prestige products, for which only 'strongly agreed' is shown; 4.Refers to a permanent market with stores;
Source: HH interviews (Profile n=234; Detailed n=57), FSG analysis

Customer Persona

Setting

- **Location:** Populous urban areas of Nimba and Lofa
- **Typical family size:** 10 people, with 3 children and 1 elderly[1]
- **Type of house:** Live in their own house, made predominantly of permanent materials
- **Income and occupation:** Typically have regular income, however slightly less than a third have seasonal income; agriculture is the dominant occupation, practiced by half the segment, followed by petty trading
- **Mobile phone and mobile money:** Two thirds of the segment own mobile phones, and slightly more than a quarter of the segment use mobile money
- **Total value of assets:** HHs are relatively affluent; the average total asset value per HH is LRD ~47,000
- **Loan groups:** Less than half the segment are loan group members
- **Loans:** This segment has no prior loan taking history

Mental Model

- **Strongly desire respect** from their community
- **Value products** that are **prestigious** and make life **convenient**
- **Conforming to the norm is not important** to this group, as more than half suggest that one should do things 'differently' from their neighbors
- **Place high value on ownership of a toilet.** The majority strongly believe owning a toilet is a sign of **prestige**. HHs have some idea of the **health, safety, and privacy benefits** of owning a toilet, and equate owning a toilet to **being modern**
  - **Care about community cleanliness**, and **witnessing** or be seen **practicing OD is considered embarrassing**
    - Agree that it is **irresponsible to not have a toilet**
      - Majority of the segment **prioritize school fees over building a toilet**

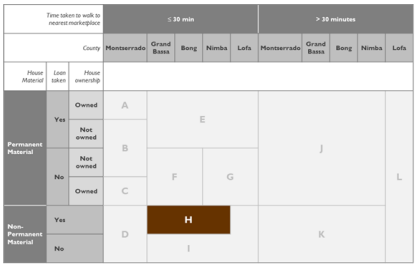
- **Current product and usage:** Improved shared toilet facilities and unimproved toilets; nearly two thirds of the segment practice OD
- **Desired product:** A toilet that is easy to clean with water, provides privacy, is well ventilated, and has the following functionalities:
  - ***Toilet type:*** Flush/pour flush toilet to reduce odor and make it easier to clean
  - ***Substructure:*** Offset pit to reduce pit heat and prevent collapse; Pit depth of >12 ft, lined with concrete blocks
  - ***Interface:*** Cement floor with seated ceramic commode/ foot rests
  - ***Superstructure:*** Zinc sheet roof, mud brick walls, wooden door
- **Estimated cost and ability to pay:** Estimated cost of desired toilet - LRD 62,000; average ability to pay (out-of-pocket) - LRD 24,000
- **Financing:** more than half the segment would consider taking a loan, with most opting for savings/loan group; biggest reason for not taking a loan is a fear of the inability to pay back the loan

The Ask

Source: HH interviews (Profile n=234; Detailed n=57), FSG analysis; 1. Children are individuals who are 0-14 years old, elderly members are individuals who are >64 years old

SEGMENT H

Key Demographic Statistics



Segment size	
% of potential market	8%
# of households	41K

Sanitation profile	
Limited sanitation service	7%
Unimproved toilet	7%
No toilet	87%

Demographics	
Family size (Avg.)	9
Gender of HH Head	
• Male	46%
• Female	54%
HH Head education[1]	
• No education	46%
• Up to Junior High	20%
• Senior High or above	34%

Income & occupation	
Nature of income	
• Regular	72%
• Seasonal	28%
Primary occupation[2]	
• Agriculture	51%
• Unskilled Labor	23%
• Petty Trading	14%
• Skilled Labor	7%

Affluence indicators	
Total monthly expenditure	
High (>LRD 40K)	12%
Medium (LRD 20K-40K)	36%
Low (≤LRD 20K)	51%
Total asset value (avg.)	29k
Total asset value (spread)	
High (> LRD 120K)	3%
Medium (LRD 75K-120K)	14%
Low (LRD 35K-75K)	16%
Very low (< LRD 35K)	67%

Assets and other indicators	
Mobile phone	55%
Computer	0%
Television	0%
Chair	32%
Agricultural land	87%
Any mode of transport	8%
Home improvement	29%
Loan group member	57%
Mobile money user	31%

Access indicators	
Distance to nearest market[4]	
<30 minutes	19%
30 minutes to 1 hour	18%
Not walking distance	63%
Access to electricity	17%
Non-drinking water source[5]	
Surface water	49%
Other unprotected sources	17%
Hand pump, tube well or borehole	27%
Other protected sources	8%

Attitudes & beliefs[3]	
Believe that community cleanliness is important	79%
Believe it is embarrassing to be seen practicing OD	86%
Willing to pay for products that bring prestige	46%
Believe it is taboo to live near a toilet	14%

1. Indicates highest level of education attended; 2. Top four occupations for each segment are shown; 3. Respondents were asked if they 'strongly disagreed', 'disagreed', 'agreed', or 'strongly agreed' to statements related to their attitudes and beliefs. Here the combined percentage of those who 'strongly agreed' or 'agreed' with a statement is reported, barring willingness to pay for prestige products, for which only 'strongly agreed' is shown; 4. Refers to a permanent market with stores ; 5. Total % ≠100 as it is rounded off; **Source:** HH interviews (Profile n=269; Detailed n=48), FSG analysis

Customer Persona

Setting

- **Location:** Populous urban areas of Grand Bassa, Nimba and Bong
- **Typical family size:** 9 people, with 3 children and 1 elderly[1]
- **Type of house:** Live in their own house, made predominantly of temporary materials
- **Income and occupation:** Typically have regular income, however slightly over a quarter have seasonal income; agriculture is the dominant occupation, followed by unskilled labor
- **Mobile phone and mobile money:** Only half the segment have mobile phones, and only a third of the segment uses mobile money
- **Total value of assets:** HHs are relatively less affluent; the average total asset value per HH is LRD ~29,000
- **Loan groups:** More than half are loan group members
- **Loans:** All HH in this segment have taken loans in the past, primarily for school fees; typically loans are taken from savings/loan groups

Mental Model

- **Desire respect** from their community
- **Value products** that are **prestigious** and make life **convenient**
- **Conforming to the norm is not particularly important** to this group, as more than half suggest that one should do things 'differently' from their neighbors
- **Place high value on ownership of a toilet.** The majority strongly believe owning a toilet is a sign of **prestige**. Most HHs have some idea of the **health, safety, and privacy benefits** of owning a toilet, and equate owning a toilet to **being modern**
  - **Community cleanliness is important but not a high priority**, however to **witness** or to be seen **practicing OD is considered embarrassing**
    - Agree that it is **irresponsible to not have a toilet**
      - More than a quarter of the segment disagrees that **school fees is a priority over building a toilet**

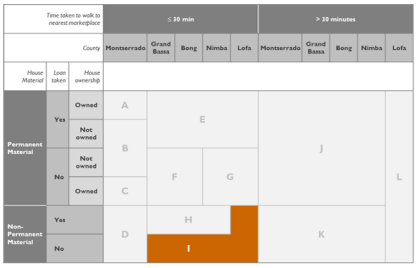
- **Current product and usage:** Most HHs practice OD; Some HHs used improved limited or unimproved toilets
- **Desired product:** A toilet that is easy to clean with water, is comfortable, is well ventilated, and has the following functionalities:
  - ***Toilet type***: Pour flush toilet to ensure feces are flushed away and prevent odor and disease
  - ***Substructure***: offset pit to reduce pit heat; depth of >6 ft, lined with concrete blocks
  - ***Interface:*** Cement floor, with foot rests/cement squat platform
  - ***Superstructure***: Zinc sheet roof, cement/ brick walls, wooden door
- **Estimated cost and ability to pay:** Estimated cost of desired toilet - LRD 63,000; average ability to pay (out-of-pocket) - LRD 14,000
- **Financing:** less than half the segment would consider taking a loan, with most opting for savings/loan group; biggest reason for not taking a loan is a fear of the inability to pay back the loan

The Ask

Source: HH interviews (Profile n=269; Detailed n=48), FSG analysis; 1. Children are individuals who are 0-14 years old, elderly members are individuals who are >64 years old

SEGMENT 1

Key Demographic Statistics



Segment size	
% of potential market	10%
# of households	55K

Sanitation profile	
Limited sanitation service	10%
Unimproved toilet	9%
No toilet	81%

Demographics	
Family size (Avg.)	8
Gender of HH Head	
• Male	49%
• Female	51%
HH Head education[1]	
• No education	50%
• Up to Junior High	25%
• Senior High or above	25%

Income & occupation	
Nature of income	
• Regular	75%
• Seasonal	25%
Primary occupation[2]	
• Agriculture	53%
• Unskilled Labor	20%
• Petty Trading	15%
• Skilled Labor	7%

Affluence indicators

Total monthly expenditure	
High (>LRD 40K)	10%
Medium (LRD 20K-40K)	33%
Low (≤LRD 20K)	57%
Total asset value (avg.)	34k
Total asset value (spread)	
High (> LRD 120K)	2%
Medium (LRD 75K-120K)	18%
Low (LRD 35K-75K)	21%
Very low (< LRD 35K)	59%

Assets and other indicators	
Mobile phone	58%
Computer	0%
Television	1%
Chair	48%
Agricultural land	81%
Any mode of transport	6%
Home improvement	26%
Loan group member	33%
Mobile money user	22%

Access indicators

Distance to nearest market	
<30 minutes	30%
30 minutes to 1 hour	15%
Not walking distance	54%
Access to electricity	10%
Non-drinking water source[4]	
Surface water	47%
Other unprotected sources	18%
Hand pump, tube well or borehole	28%
Other protected sources	8%

Attitudes & beliefs[3]

Believe that community cleanliness is important	80%
Believe it is embarrassing to be seen practicing OD	90%
Willing to pay for products that bring prestige	43%
Believe it is taboo to live near a toilet	26%

1. Indicates highest level of education attended; 2. Top four occupations for each segment are shown; 3. Respondents were asked if they 'strongly disagreed', 'disagreed', 'agreed', or 'strongly agreed' to statements related to their attitudes and beliefs. Here the combined percentage of those who 'strongly agreed' or 'agreed' with a statement is reported, barring willingness to pay for prestige products, for which only 'strongly agreed' is shown; 4. Refers to a permanent market with stores; 4. Total % ≠100 as it is rounded off; **Source:** HH interviews (Profile n=485; Detailed n=83), FSG analysis

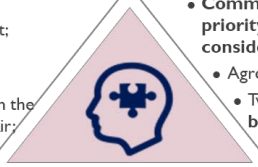
Customer Persona

Setting

- **Location:** Populous areas of Grand Bassa, Nimba, Bong and Lofa
- **Typical family size:** 8 people, with 3 children and no elderly[1]
- **Type of house:** Live in their own house, made predominantly of temporary materials
- **Income and occupation:** Typically have regular income, however a quarter have seasonal income; agriculture is the dominant occupation, followed by unskilled labor
- **Mobile phone and mobile money:** Slightly more than half the segment own mobile phones, and mobile money is used by slightly more than a fifth of the segment
- **Total value of assets:** HHs are relatively less affluent; the average total asset value per HH is LRD ~34,000
- **Loan groups:** A third are loan group members
- **Loans:** Only a tenth of the segment have taken loans in the past, primarily for business or house construction/repair; loans are typically taken from savings/loan groups

Mental Model

- **Desire respect** from their community
- **Value products** that are **prestigious** and make life **convenient**
- **Conforming to the norm is not particularly important** to this group, as more than half suggest that one should do things 'differently' from their neighbors
- **Place high value on ownership of a toilet.** The majority believe owning a toilet is a sign of **prestige**. HHs have some idea of the **health, safety, and privacy benefits** of owning a toilet, and equate owning a toilet to **being modern**
  - **Community cleanliness is important but not a top priority**, however to **witness** or to be seen **practicing OD is considered embarrassing**
    - Agree that it is **irresponsible to not have a toilet**
    - Two thirds of the segment **prioritize school fees over building a toilet**



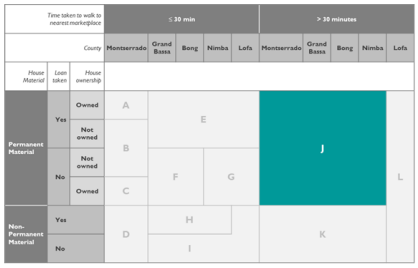
- **Current product and usage:** OD practice is widespread, with traces of Improved shared toilet facilities and unimproved toilets
- **Desired product:** A toilet that is easy to clean with water, provides privacy, is comfortable, and has the following functionalities:
  - ***Toilet type***: Flush/pour flush toilet to reduce odor and prevent flies
  - ***Substructure***: Offset pit to reduce pit heat; depth of >6ft, lined with concrete blocks
  - ***Interface***: Cement floor, with seated ceramic commode
  - ***Superstructure***: Zinc sheet roof, cement/ brick walls, wooden door
- **Estimated cost and ability to pay:** Estimated cost of desired toilet - LRD 73,000; average ability to pay (out-of-pocket) - LRD 17,000
- **Financing:** Half the segment would consider taking a loan, with most opting for savings/loan group; biggest reason for not taking a loan is a fear of the inability to pay back the loan

The Ask

Source: HH interviews (Profile n=485; Detailed n=83), FSG analysis; 1. Children are individuals who are 0-14 years old, elderly members are individuals who are >64 years old

SEGMENT J

Key Demographic Statistics



Segment size	
% of potential market	11%
# of households	59K

Sanitation profile	
Limited sanitation service	25%
Unimproved toilet	24%
No toilet	51%

Demographics	
Family size (Avg.)	8
Gender of HH Head	
• Male	49%
• Female	51%
HH Head education[1]	
• No education	25%
• Up to Junior High	23%
• Senior High or above	52%

Income & occupation	
Nature of income	
• Regular	67%
• Seasonal	33%
Primary occupation[2]	
• Agriculture	31%
• Petty Trading	22%
• Unskilled Labor	20%
• Skilled Labor	11%

Affluence indicators	
Total monthly expenditure	
High (>LRD 40K)	32%
Medium (LRD 20K-40K)	37%
Low (≤LRD 20K)	31%
Total asset value (avg.)	107k
Total asset value (spread)[5]	
High (> LRD 120K)	24%
Medium (LRD 75K-120K)	30%
Low (LRD 35K-75K)	27%
Very low (< LRD 35K)	18%

Assets and other indicators	
Mobile phone	79%
Computer	3%
Television	21%
Chair	73%
Agricultural land	55%
Any mode of transport	18%
Home improvement	47%
Loan group member	41%
Mobile money user	44%

Access indicators	
Distance to nearest market[4]	
<30 minutes	8%
30 minutes to 1 hour	35%
Not walking distance	57%
Access to electricity	30%
Non-drinking water source[5]	
Surface water	35%
Other unprotected sources	9%
Hand pump, tube well or borehole	35%
Other protected sources	20%

Attitudes & beliefs[3]	
Believe that community cleanliness is important	46%
Believe it is embarrassing to be seen practicing OD	85%
Willing to pay for products that bring prestige	43%
Believe it is taboo to live near a toilet	6%

1. Indicates highest level of education attended; 2. Top four occupations for each segment are shown; 3. Respondents were asked if they 'strongly disagreed', 'disagreed', 'agreed', or 'strongly agreed' to statements related to their attitudes and beliefs. Here the combined percentage of those who 'strongly agreed' or 'agreed' with a statement is reported, barring willingness to pay for prestige products, for which only 'strongly agreed' is shown; 4. Refers to a permanent market with stores; 5. Total % ≠100 as it is rounded off; **Source:** HH interviews (Profile n=355; Detailed n=61), FSG analysis

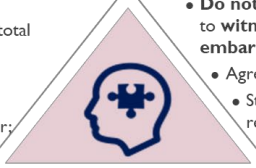
Customer Persona

Setting

- **Location:** Remote areas of Grand Bassa, Nimba, Bong and Lofa
- **Typical family size:** 8 people with 3 children and no elderly[1]
- **Type of house:** Live in their own house, made predominantly of permanent materials
- **Income and occupation:** Typically have regular income, however a third have seasonal income; agriculture is the dominant occupation, followed by petty trading
- **Mobile phone and mobile money:** Mobile phone usage is widespread, and mobile money is used by slightly less than half the customers in this segment
- **Total value of assets:** HHs are affluent; the average total asset value per HH is LRD ~107,000
- **Loan groups:** Less than half are loan group members
- **Loans:** A third of the segment has taken loans in the past primarily for business or house construction/repair; typically loans are taken from savings/loan groups

Mental Model

- **Desire respect** from their community
- **Value products** that are **prestigious** and make life **convenient**
- **Conforming to the norm is not particularly important** to this group, as more than half disagree that one shouldn't do things 'differently' from their neighbors
- **Place high value on ownership of a toilet.** The majority strongly believe owning a toilet is a sign of **prestige**. Majority are well aware of the **health, safety, and privacy benefits** of owning a toilet, and equate owning a toilet to **being modern**
  - **Do not care as much for community cleanliness**, however to **witness** or to be seen **practicing OD is considered embarrassing**
    - Agree that it is **irresponsible to not have a toilet**
    - Strongly **prioritize school fees over building a toilet**, relative to other segments



- **Current product and usage:** Improved shared toilet facilities and unimproved toilets; more than half the segment practice OD
- **Desired product:** A toilet that is easy to clean with water, provides privacy, is well ventilated, and has the following functionalities:
  - ***Toilet type:*** Pour flush toilet to prevent odor/ flies
  - ***Substructure:*** Offset pit to reduce pit heat and prevent users from seeing the contents of the pit; pit depth of 6-12 ft, lined with concrete blocks
  - ***Interface:*** Cement/tiled floor, seated ceramic commode/cement squat platform
  - ***Superstructure:*** Zinc sheet roof, brick/cement walls, wooden door
- **Estimated cost and ability to pay:** Estimated cost of desired toilet - LRD 64,000; average ability to pay (out-of-pocket) - LRD 53,000
- **Financing:** more than half the segment would consider taking a loan, with most opting for savings/loan group; biggest reason for not taking a loan is a fear of the inability to pay back the loan

The Ask

Source: HH interviews (Profile n=355; Detailed n=61), FSG analysis; 1. Children are individuals who are 0-14 years old, elderly members are individuals who are >64 years old

SEGMENT K

Key Demographic Statistics

Segment size	
% of potential market	15%
# of households	82K

Sanitation profile	
Limited sanitation service	9%
Unimproved toilet	6%
No toilet	84%

Demographics	
Family size (Avg.)	7
Gender of HH Head	
• Male	52%
• Female	48%
HH Head education[1]	
• No education	51%
• Up to Junior High	32%
• Senior High or above	17%

Income & occupation	
Nature of income	
• Regular	65%
• Seasonal	35%
Primary occupation[2]	
• Agriculture	49%
• Unskilled Labor	36%
• Petty Trading	8%
• Skilled Labor	3%

Affluence indicators

Total monthly expenditure	
High (>LRD 40K)	13%
Medium (LRD 20K-40K)	40%
Low (≤LRD 20K)	47%
Total asset value (avg.)	24k
Total asset value (spread)	
High (> LRD 120K)	2%
Medium (LRD 75K-120K)	4%
Low (LRD 35K-75K)	16%
Very low (< LRD 35K)	78%

Assets and other indicators	
Mobile phone	54%
Computer	0%
Television	0%
Chair	39%
Agricultural land	83%
Any mode of transport	4%
Home improvement	26%
Loan group member	36%
Mobile money user	18%

Access indicators

Distance to nearest market[4]	
<30 minutes	2%
30 minutes to 1 hour	14%
Not walking distance	84%
Access to electricity	7%
Non-drinking water source	
Surface water	56%
Other unprotected sources	20%
Hand pump, tube well or borehole	22%
Other protected sources	2%

Attitudes & beliefs[3]

Believe that community cleanliness is important	60%
Believe it is embarrassing to be seen practicing OD	89%
Willing to pay for products that bring prestige	21%
Believe it is taboo to live near a toilet	29%

1. Indicates highest level of education attended; 2. Top four occupations for each segment are shown; 3. Respondents were asked if they 'strongly disagreed', 'disagreed', 'agreed', or 'strongly agreed' to statements related to their attitudes and beliefs. Here the combined percentage of those who 'strongly agreed' or 'agreed' with a statement is reported, barring willingness to pay for prestige products, for which only 'strongly agreed' is shown; 4. Refers to a permanent market with stores;
Source: HH interviews (Profile n=630; Detailed n=85), FSG analysis

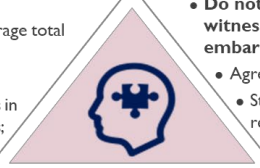
Customer Persona

Setting

- **Location:** Remote areas of Montserrado, Grand Bassa, Nimba, Bong
- **Typical family size:** 7 people, with 3 children and no elderly[1]
- **Type of house:** Live in their own house, made predominantly of temporary materials
- **Income and occupation:** Typically have regular income, however a third have seasonal income; agriculture is the dominant occupation, followed by unskilled labor
- **Mobile phone and mobile money:** Half the segment own a mobile phone, and mobile money is used by nearly a fifth of the customers in this segment
- **Total value of assets:** HHs are not affluent; the average total asset value per HH is LRD ~24,000
- **Loan groups:** A third are loan group members
- **Loans:** Nearly a third of the segment have taken loans in the past, primarily for school fees or medical expenses; loans are typically taken from savings/loan groups

Mental Model

- **Desire respect** from their community
- **Value products** that are **prestigious** and make life **convenient**
- **Conforming to the norm is not particularly important** to this group, as more than half suggest that one should do things 'differently' from their neighbors
- **Place high value on ownership of a toilet.** The majority strongly believe owning a toilet is a sign of **prestige**. Most of the segment have some idea of the **health, safety, and privacy benefits** of owning a toilet, and equate owning a toilet to **being modern**
  - **Do not care as much for community cleanliness**, however **witnessing** or be seen **practicing OD is considered embarrassing**
    - Agree that it is **irresponsible to not have a toilet**
    - Strongly **prioritize school fees over building a toilet**, relative to other segments



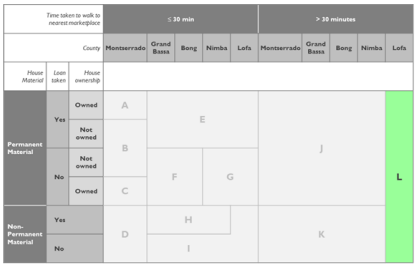
- **Current product and usage:** The majority of this segment practices OD, with some HHs also using improved limited or unimproved toilets
- **Desired product:** A toilet that is easy to clean with water, provides privacy, is well ventilated, and has the following functionalities:
  - ***Toilet type***: Pour flush toilet to flush away feces and reduce odor
  - ***Substructure:*** Offset pit to reduce pit heat and prevent the user from having to see the contents of the pit; Pit depth of >6 ft, lined with concrete blocks
  - ***Interface***: Cement floor, foot rests/cement squat platform
  - ***Superstructure***: Zinc sheet roof, cement walls, wooden door
- **Estimated cost and ability to pay:** Estimated cost of desired toilet - LRD 71,000; average ability to pay (out-of-pocket) - LRD 12,000
- **Financing:** more than half the segment would consider taking a loan, with most opting for savings/loans group; biggest reason for not taking a loan is a fear of the inability to pay back the loan

The Ask

Source: HH interviews (Profile n=630; Detailed n=85), FSG analysis; 1. Children are individuals who are 0-14 years old, elderly members are individuals who are >64 years old

SEGMENT L

Key Demographic Statistics



Segment size	
% of potential market	8%
# of households	41K

Sanitation profile	
Limited sanitation service	6%
Unimproved toilet	10%
No toilet	85%

Demographics	
Family size (Avg.)	8
Gender of HH Head	
• Male	59%
• Female	41%
HH Head education[1]	
• No education	61%
• Up to Junior High	23%
• Senior High or above	16%

Income & occupation	
Nature of income	
• Regular	51%
• Seasonal	49%
Primary occupation[2]	
• Agriculture	66%
• Unskilled Labor	16%
• Petty Trading	4%
• Other	12%

Affluence indicators	
Total monthly expenditure	
High (>LRD 40K)	20%
Medium (LRD 20K-40K)	34%
Low (≤LRD 20K)	47%
Total asset value (avg.)	25k
Total asset value (spread)	
High (> LRD 120K)	6%
Medium (LRD 75K-120K)	2%
Low (LRD 35K-75K)	22%
Very low (< LRD 35K)	70%

Assets and other indicators	
Mobile phone	58%
Computer	1%
Television	0%
Chair	50%
Agricultural land	94%
Any mode of transport	7%
Home improvement	26%
Loan group member	47%
Mobile money user	27%

Access indicators	
Distance to nearest market[4]	
<30 minutes	6%
30 minutes to 1 hour	8%
Not walking distance	86%
Access to electricity	10%
Non-drinking water source	
Surface water	81%
Other unprotected sources	9%
Hand pump, tube well or borehole	10%
Other protected sources	0%

Attitudes & beliefs[3]	
Believe that community cleanliness is important	85%
Believe it is embarrassing to be seen practicing OD	74%
Willing to pay for products that bring prestige	63%
Believe it is taboo to live near a toilet	16%

1. Indicates highest level of education attended; 2. Top four occupations for each segment are shown; 3. Respondents were asked if they 'strongly disagreed', 'disagreed', 'agreed', or 'strongly agreed' to statements related to their attitudes and beliefs. Here the combined percentage of those who 'strongly agreed' or 'agreed' with a statement is reported, barring willingness to pay for prestige products, for which only 'strongly agreed' is shown; 4. Refers to a permanent market with stores;
Source: HH interviews (Profile n=403; Detailed n=68), FSG analysis

Customer Persona

Setting

- **Location:** Remote areas of Lofa
- **Typical family size:** 8 people, with 3 children and 1 elderly[1]
- **Type of house:** Live in their own house, made of permanent or temporary materials
- **Income and occupation:** the segment is evenly split between seasonal and regular income; agriculture is the most dominant occupation, followed by unskilled labor
- **Mobile phone and mobile money:** More than half the segment have mobile phones, and mobile money is used by a little more than a quarter of the HH in this segment
- **Total value of assets:** HHs are not affluent; the average total asset value per HH is LRD ~25,000
- **Loan groups:** Less than half are loan group members
- **Loans:** Half of the segment have taken loans in the past, primarily for agriculture or school loans; loans are typically taken from savings/loan groups

Mental Model

- **Strongly desire respect** from their community
- **Value products** that are **prestigious** and make life **convenient**
- **Conforming to the norm is not particularly important** to this group, as more than half suggest that one should do things 'differently' from their neighbors
- **Place high value on ownership of a toilet.** The majority strongly believe owning a toilet is a sign of **prestige**. Majority are well aware of the **health, safety, and privacy benefits** of owning a toilet, and equate owning a toilet to **being modern**
  - **Care about community cleanliness**, and **witnessing** be seen **practicing OD is considered embarrassing**
    - More than a third of the segment disagree that it is **irresponsible to not have a toilet**
      - Strongly **prioritize school fees over building a toilet**, relative to other segments

The Ask

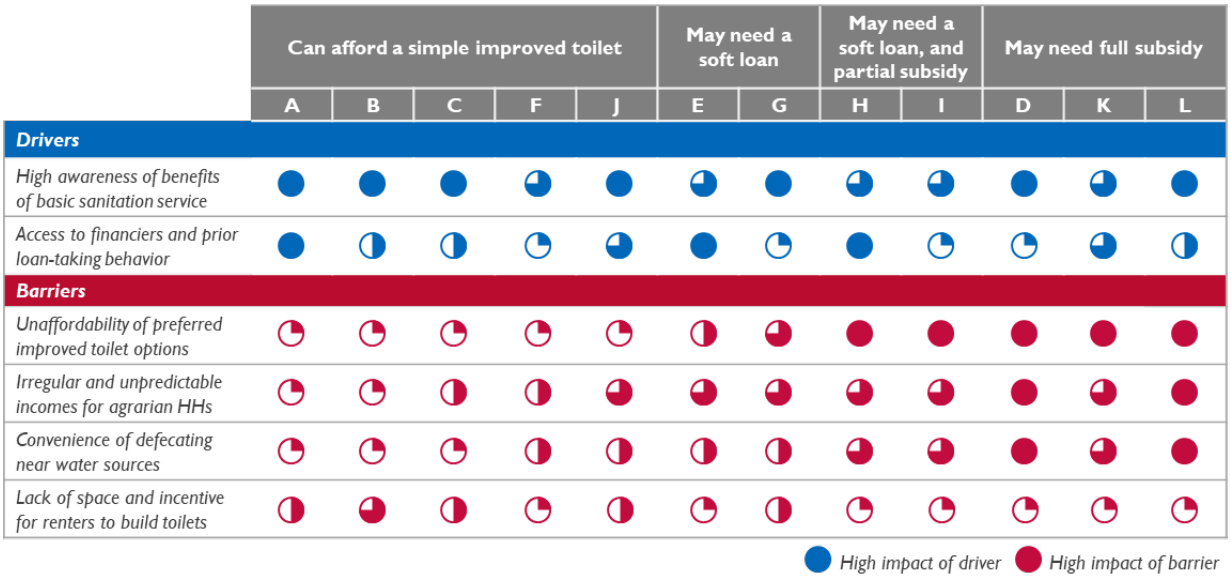
- **Current product and usage:** Most HHs practice OD; some HHs also use improved limited or unimproved toilets
- **Desired product:** A toilet that is easy to clean with water, is comfortable, is well ventilated, and has the following functionalities:
  - ***Toilet type:*** Flush/pour flush toilet to reduce odor and enhance cleanliness
  - ***Substructure:*** offset pit to reduce pit heat, flies, and the risk of collapse; pit depth of >6 ft, lined with concrete blocks
  - ***Interface:*** Cement floor, with ceramic commode/foot rests
  - ***Superstructure:*** Zinc sheet roof, cement/ brick walls, wooden door
- **Estimated cost and ability to pay:** Estimated cost of desired toilet - LRD 58,000; average ability to pay (out-of-pocket) - LRD 13,000
- **Financing:** more than half the segment would consider taking a loan, with most opting for savings/loan group; biggest reason for not taking a loan is a fear of the inability to pay back the loan

Source: HH interviews (Profile n=403; Detailed n=68), FSG analysis; 1. Children are individuals who are 0-14 years old, elderly members are individuals who are >64 years old

ANNEX F: IMPACT OF CUSTOMER DRIVERS & BARRIERS ON THE SEGMENTS

Figure 13 illustrates the impact of the drivers and barriers on each of the 12 customer segments. To determine the impact of the driver/barrier on each segment ("Very low impact," "Low impact," "Moderate impact", "High impact") a four-point relative scale was defined (based on segment-level averages of relevant data points). Data points taken into consideration include awareness of benefits of basic sanitation services (BSS) benefits, ability to pay for a toilet, seasonality of income, openness to financing, reliance on surface water as non-drinking water source, and lack of extra space for construction.

Figure 13: Variation across drivers and barriers



Note: For each driver and barrier, a four point relative scale was defined (based on segment-level averages of relevant data points), to determine the impact of the driver/barrier on each segment; i.e., 'Very low impact', 'Low impact', 'Moderate impact', 'High impact'. Data points considered include awareness of benefits of basic sanitation service, ability to pay for a toilet, seasonality of income, openness to financing, reliance on surface water as non drinking water source, and lack of extra space for construction. Refer to the next section for detailed profiles of the 12 segments within these four categories

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