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The Sanitation & Hygiene Fund

Sanitation Economy Estimates

UGANDA 2022

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SHF Website **www.shfund.org**

About This Report

Safe sanitation, hygiene and menstrual health are essential to the achievement of health, education, gender equity, economic growth and climate outcomes in Uganda. This report shines a spotlight on why making investments now into a thriving national sanitation economy makes sense for women, entrepreneurs, investors, the environment, climate, social impact and economic growth. These markets focus on products and services, renewable resource flows, and data and information to transform cities, communities and businesses in pursuit of national targets for equitable and sustainable development. In the context of the political, economic, social and technological landscape and the business environment, this report provides insights into the multiple opportunities for existing partners and new investors.

A Note on the Estimates

The estimates presented in this report are anchored in country planning and budgets, and localized pricing. Baseline estimates for 2022 are projected into the future, with the assumption of reaching universal access, to generate a realistic picture of the full market potential and opportunity. Data collection and analysis was carried out between August and December 2022, followed by a review, including a consultation workshop with government and other key experts in early 2023.
All calculations use the conversion rate of US$ 1 equals Uganda Shilling (UGX) 3807.61 as per the exchange rate on 9 October 2022.

About the Sanitation and Hygiene Fund

The Sanitation and Hygiene Fund (SHF) is a UN fund dedicated to achieving universal access to sanitation, hygiene, and menstrual health through market-based approaches. SHF works with Low- and Middle-Income Countries (LMICs) to build robust and climate-resilient sanitation economies and MHH markets. In Uganda, SHF is supporting the government to enhance market ecosystems and identify investible propositions with a view to channeling investments in conjunction with development finance institutions and investors.

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Introduction

> There is a growing recognition that a transformative approach is needed to meet global and national targets on sanitation, hygiene and menstrual health, and any such approach must be grounded in evidence and data. By catalyzing and growing national sanitation economies, we can unlock tangible impacts on health, education, gender equality, livelihoods and climate resilience for governments and for investors.

Dominic O'Neill, Executive Director of the Sanitation and Hygiene Fund

Only seven years to 2030 and not only is progress on many Sustainable Development Goals (SDGs) lagging, but hopes of attaining the multiple benefits of women's social and economic empowerment are under threat. In fact, the sanitation and hygiene target, SDG 6.2 related to safe sanitation, will not be reached until the 22nd century under current conditions.[1] The business of development is not working at the pace and scale needed.

Uganda's development priorities focus on inclusive socio-economic growth and progress towards a people-centered, integrated, resilient and self-sustaining economy. To realize Uganda's development ambition, there is an urgent need to ensure the role of women as leaders, entrepreneurs, employees and consumers in society and the economy. This cannot happen without affordable access to menstrual health and hygiene (MHH) products and services, and a strong sanitation economy that benefits all.

Achieving universal access to sanitation is a huge challenge. Access to safe sanitation is a basic human right. However, nearly half of the global population still does not have access to safely-managed sanitation, meaning they have a dirty or unsafe toilet where the waste is not treated, or there is no toilet at all.[2] Urgent acceleration of the current rate of progress, with increased investments in the sanitation and hygiene sector, is required if national development priorities and the global 2030 SDGs are to be met.

The world requires an urgent shift on how we tackle sanitation, a challenge that underpins several other SDGs linked to climate, livelihoods, economic growth, gender, global health and education. This report shows that the market economy approach can deliver on accelerating progress in the sanitation and hygiene sectors. The findings present an opportunity for stakeholders to accelerate collective progress towards achieving SDG 6.2.

A Note on Market Drivers and Barriers

The development of any new economy or market encounters drivers and barriers. The development of the sanitation economy in Uganda is no different. As the market is shaped through innovations along the value chain, strong and dynamic capabilities are needed. Uganda is committed to working with its partners to tackle the systemic barriers that prevent entrepreneurs and enterprises from taking action. This includes work on improving financial competitiveness, considering incentives in the supply chain, enhancing infrastructure and supporting the building of capability among small and medium-sized enterprises (SMEs), in addition to public acceptance of new approaches, products and costs.

About the Sanitation Economy

The **Sanitation Economy** is the growing economy of sanitation and hygiene products and services for all, including for the poorest and most vulnerable. It includes:

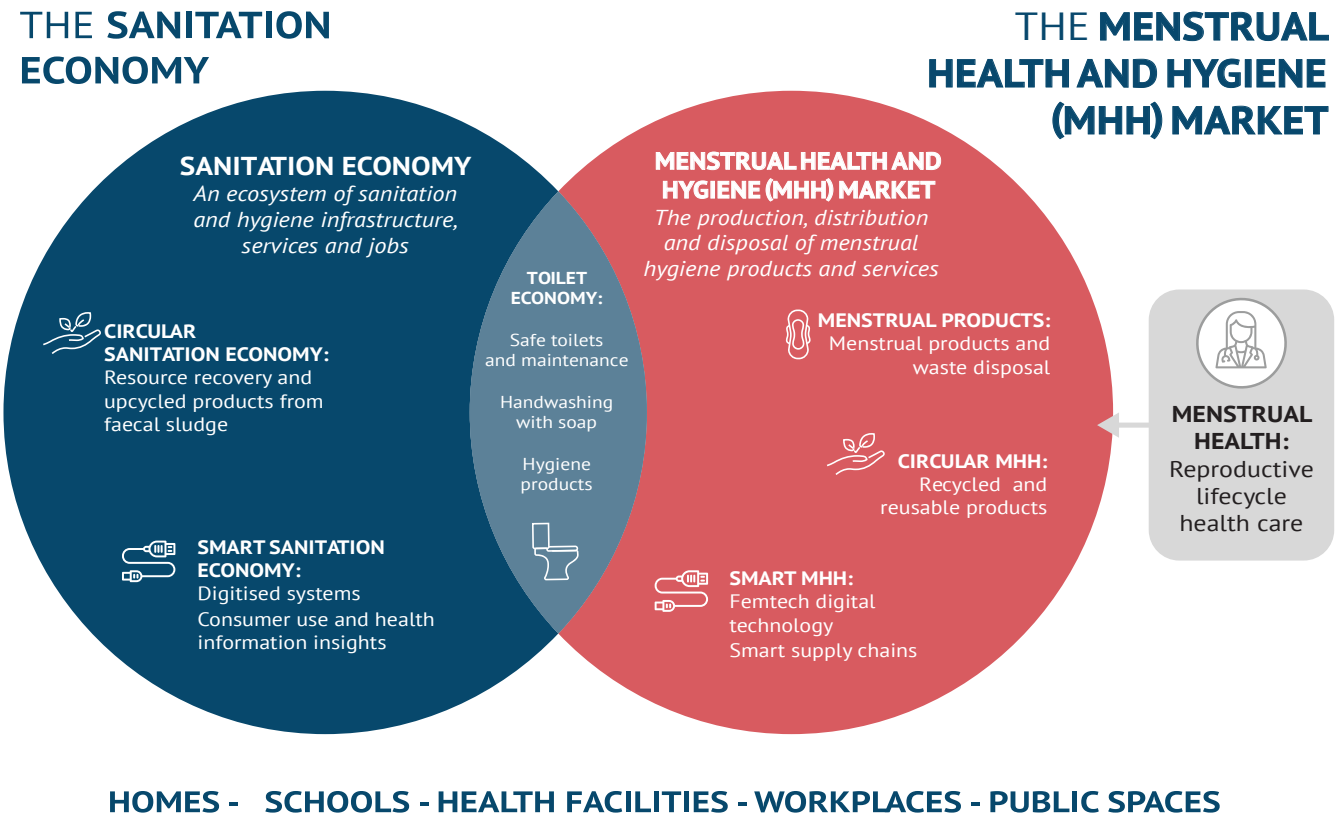
- products and services that provide safe toilet and handwashing access for all, whether public or private (Toilet Economy);
- systems that connect the biocycle, using multiple forms of biological waste, recovering nutrients and water, creating value-adding products such as renewable energy, organic fertilizers, proteins and more (Circular Sanitation Economy); and
- digitized sanitation and hygiene systems that optimize data for operating efficiencies, maintenance, plus consumer use and health information insights (Smart Sanitation Economy).[3]

The **Menstrual Health and Hygiene (MHH) Market** is the marketplace for menstrual hygiene materials, and development of related infrastructure, products and services including disposal and femtech solutions. It includes:

- access to reusable and disposable menstrual materials, as per choice and affordability, gender-responsive facilities and services allowing users to change, clean or dispose of materials safely (Menstrual Products);
- new and innovative technology including recycling and reuse to reduce the impact on the environment (Circular MHH); and
- smart supply chains to extend reach (Smart MHH).

These markets are closely connected as menstruating women and girls require access to safe toilets, handwashing and hygiene products, in addition to MHH.

Figure 1. The Sanitation Economy and Menstrual Health and Hygiene (MHH) Market



Methodology

This report estimates the size of the sanitation economy, its products and services, renewable resource flows, data and information at a country level. The estimates were generated from verified data from published government and other available sources, and cross-validated by interviews with sector experts (see Figure 2). Estimates are provided for a baseline year (2022) and projected into the future on the assumption that universal access will be reached.

Figure 2: Data Sources and Methodology

THE SANITATION ECONOMY POTENTIAL FRAMEWORK					
Objectives	*Methods and Tools*	*Data*			
Country-level Analysis	Desk Research: PEST Analysis	Economic (GDP, Employment)		Social (Population, Gender, Urbanization)	
Market Projection	Desk Research and Calculation: Sanitation Economy Estimates Model	Sanitation Economy (Toilet, Circular Sanitation and Smart Sanitation Economies)			
Market Insights	Interviews, Consultation, and Desk Research: SWOT Analysis	Current Market	Market Drivers	Market Barriers	Market Opportunities
Solutions Showcase	Interviews, Consultation Group, and Desk Research	Investible Sanitation			

PEST = Political, economic, social and technological | **SWOT =** Strengths, weaknesses, opportunities and threats

The country's potential was assessed at both macro and micro levels. Starting at the macro level, the economic, social and technological landscape was examined, using available reports, research and statistics. Each data source was assessed in terms of validity, integrity, precision, reliability and timeliness. Additional market insights were gathered through a series of interviews with key experts in the sanitation and hygiene spaces in the country. Interviewees included key government officials working on sanitation and hygiene, and private sector and civil society representatives. The interview data was triangulated with the secondary information sources.

The sanitation economy estimates were calculated based on the most recent population estimates and growth projections, available macroeconomic data and data on current access to sanitation and hygiene, existing estimates of the market value of products and services, and available data on the national context and consumer behaviors. Data collection and analysis was carried out between August and December 2022, followed by a review, including a consultation workshop with government and other key experts in early 2023. The received feedback and comments were integrated and estimates and narrative were subsequently finalized.

As with all research, the estimates presented in this report are subject to some assumptions and limitations. While care was taken to use only the best and most recent available data and to address data gaps, including through the involvement of experts, some gaps remain and not all expert opinions have been independently verified. The projections assume steady progress towards universal access; however, these emerging markets are subject to long-term political, social and economic trends and developments, and may experience unexpected shocks, which could impact the outcomes.

Country Context

Uganda remains off-track in delivering safely-managed sanitation for all by 2030. In 2021, more than half of the Ugandan population (57.6%) was using unsafe latrines and sanitation facilities.[4] Up to 5% still defecate in the open and only 20% have access to basic facilities.[5] To reach the national sanitation targets by 2030, increased investment in sanitation, including menstrual health, is imperative. The country has significant potential to attract sanitation economy investments:

Growing population: with a population of 45.8 million people spread across four regions and 111 districts, Uganda is considered to be one of the most populous countries in Africa.[6] Up to 74% of this population is in rural areas while only 26% live in urban areas.[7] Estimated to grow annually at 3.4% between 2020 and 2030, Uganda's population could grow by 31% to reach 63.8 million by 2030.[8] In 2025, the number of households is estimated to increase to 11.27 million, and 13.35 million in 2030, of which 40.7% will be urban households. The increasing population implies greater demand, presenting a potential for the sanitation market to grow.

Young and active workforce: the country has a 16.99 million-strong labor force.[9] Youth unemployment (ages 15 to 24) accounts for 4.33% of the population and 700,000 young people join the labor market each year. This marks opportunities to obtain new workforce resources for new businesses.

Booming economy: with a continuously growing GDP of US$ 40.4 billion, Uganda is the third largest economy in the East African Community (EAC) and the 18th economic power in Africa. A structural transformation of the economy was in progress before the COVID-19 pandemic. The economy is dominated by services (46%), while industry (27%) now has an equivalent portion of the GDP to agriculture. In 2013, the vision "to transform Ugandan society from a rural stage to a modern and prosperous economy within 30 years" was articulated in the *Uganda Vision 2040* strategy, aiming for a per capita income of US$ 9,500 in 2040, ten times more than the present rate. According to researchers from the Growth Lab at Harvard University, Uganda is expected to be among the fastest-growing economies by 2030.

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Value of the Sanitation Economy

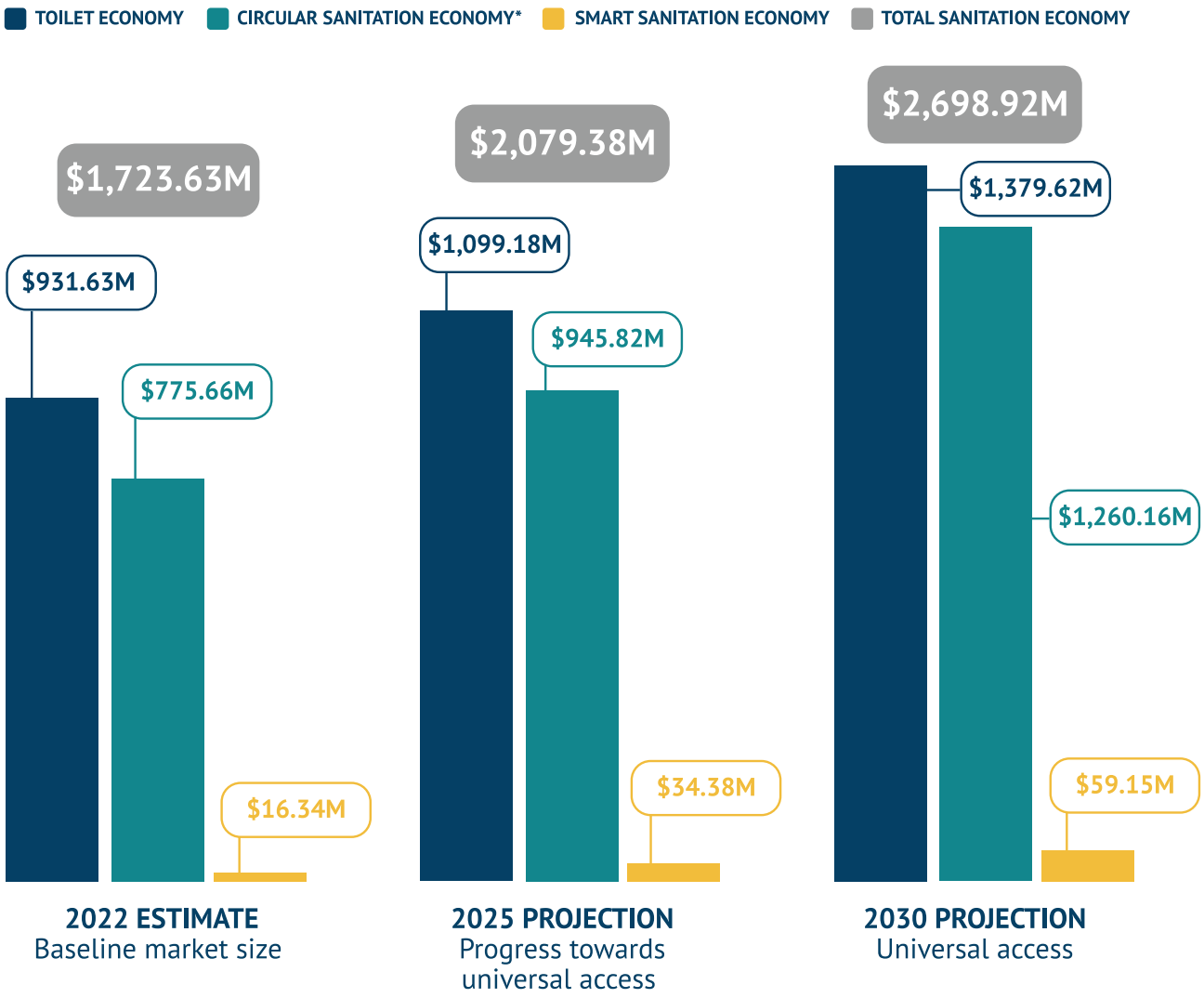
The current total value of the sanitation economy in Uganda is US$ 1.7 billion. Potentially it can reach US$ 2.7 billion, once universal access has been achieved.

KEY POINTS

- At present, the toilet economy accounts for 54% of the total sanitation economy.
- The circular sanitation economy and the smart sanitation economy are expected to grow.
- The potential for economic, environmental, and social return is significant.

When toilet, circular sanitation and smart sanitation economies are thriving, businesses can deliver new and alternative toilet and waste management solutions at a lower cost. They generate revenue and become net producers of valuable resources, such as water, energy, nutrients, proteins, data and information, presenting a new development pathway of opportunities for governments and the business sector to achieve SDG 6.

MARKET ESTIMATE FOR SANITATION ECONOMY (IN US$ MILLION)



*While biogas has the highest financial potential, it breaks the nutrient cycle as the compounds from food consumption are burned rather than returned to the food system. For the overall sanitation economy estimate, and given that only one product can be produced from a volume of waste, Protein Meal product is selected as it promises financial returns while contributing back to the food system.

Toilet Economy

The **toilet economy** has the potential to grow from an estimated value of US$ 931.6 million in 2022 to US$ 1.4 billion, once universal access has been achieved. Within this category, the household toilet market is valued at US$ 826.5 million in 2022 and has the potential to reach US$ 1.2 billion, and the public toilet market is valued at US$ 105.2 million in 2022 and may reach US$ 160.3 million.

MARKET ESTIMATE FOR 2030 TOILET ECONOMY (IN US$ MILLION)

PROJECTION Universal Access

HOUSEHOLDS

RURAL TOILET INSTALLATION, CLEANING, MAINTENANCE AND SOAP

- $42.80M New Toilet Installation
- $176.73M Toilet Cleaning Products
- $328.28M Repair and Maintenance of the Facilities
- $23.67M Soap

TOTAL RURAL $571.52M

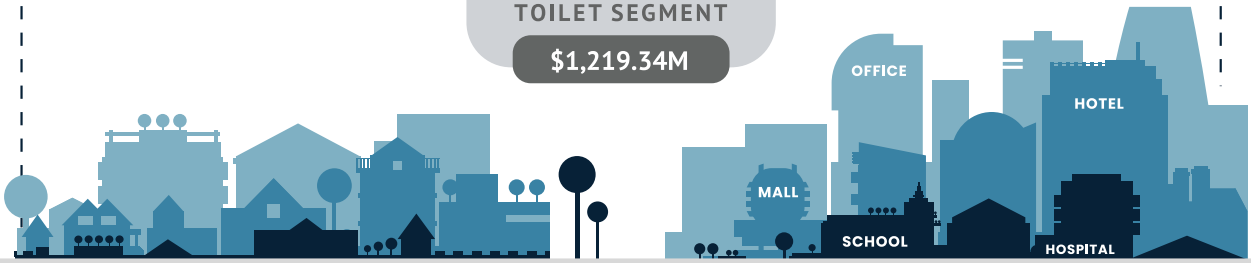
$216.93M Toilet Paper Segment

TOTAL URBAN $430.94M

URBAN TOILET INSTALLATION, CLEANING, MAINTENANCE AND SOAP

- $39.85M New Toilet Installation
- $121.32M Toilet Cleaning Products
- $261.65M Repair and Maintenance of the Facilities
- $8.12M Soap

HOUSEHOLD TOILET SEGMENT $1,219.34M



INSTITUTIONS

SCHOOL
- $56.02M Toilet Cleaning Products
- $27.52M Toilet Cleaner Services

AIRPORT
- $0.008M Toilet Cleaning Products
- $0.016M Toilet Cleaner Services

HOTEL
- $34.64M Toilet Cleaning Products
- $14.06M Toilet Cleaner Services

HOSPITAL
- $14.96M Toilet Cleaning Products
- $4.86M Toilet Cleaner Services

OFFICES
- $2.65M Toilet Cleaning Products
- $5.39M Toilet Cleaner Services

PUBLIC TOILETS
- $0.06M Toilet Cleaning Products
- $0.07M Toilet Cleaner Services

$108.35M Toilet Cleaning Products

$51.93M Toilet Cleaner Services

INSTITUTIONS TOILET SEGMENT $160.27M

Table 1: Uganda Household Toilet Market

MARKET ESTIMATES FOR TOILET ECONOMY - Households (in US$ million)	Baseline: Estimate of 2022 market size	Projection: 2025 progress towards universal access	Projection: Universal access in 2030
Urban			
New Toilet Installation		20.46	39.85
Toilet Cleaning Products	92.62	102.43	121.32
Repair and Maintenance of the Facilities	195.63	218.43	261.65
Soap	2.98	4.38	8.12
Total Urban	**291.23**	**345.61**	**430.94**
Rural			
New Toilet Installation		21.17	42.80
Toilet Cleaning Products	134.92	149.21	176.73
Repair and Maintenance of the Facilities	228.87	263.62	328.28
Soap	8.66	12.76	23.67
Total Rural	**372.45**	**446.77**	**571.48**
Toilet Paper Segment	162.82	185.05	216.93
Household Toilet Segment	**826.48**	**977.43**	**1,219.34**

Table 2: Uganda Institutions Toilet Market

MARKET ESTIMATES FOR TOILET ECONOMY - Institutions (in US$ million)		Baseline: Estimate of 2022 market size	Projection: 2025 progress towards universal access	Projection: Universal access in 2030
School	Toilet Cleaning Products	33.63	39.42	56.02
	Toilet Cleaner Services	15.34	18.66	27.52
Hotel	Toilet Cleaning Products	23.53	27.59	34.64
	Toilet Cleaner Services	10.74	11.87	14.06
Offices	Toilet Cleaning Products	1.81	2.12	2.65
	Toilet Cleaner Services	4.13	4.56	5.39
Airport	Toilet Cleaning Products	0.007	0.008	0.008
	Toilet Cleaner Services	0.013	0.014	0.016
Hospital	Toilet Cleaning Products	11.63	12.94	14.96
	Toilet Cleaner Services	4.24	4.45	4.86
Public Toilets	Toilet Cleaning Products	0.04	0.05	0.06
	Toilet Cleaner Services	0.05	0.06	0.07
Subtotal Toilet Cleaning Products		70.65	82.12	108.35
Subtotal Toilet Cleaner Services		34.51	39.62	51.93
Institutions Toilet Segment		**105.16**	**121.75**	**160.27**

Toilet Economy Market Insights

Current Market Situation

In March 2022, the Ministry of Health issued the **Uganda National Sanitation Market Guidelines (NSMG) for Basic Sanitation** to provide a *"strategic roadmap on how to use market-based sanitation to increase basic on-site sanitation services in Uganda"*.[10] The roadmap, developed in collaboration with USAID, captured many of the barriers and drivers for market-based sanitation in the country and an excerpt is included in the Annex.

1. **Pit latrines dominate market share.** Pit latrines are the most used toilet facilities, accounting for 83% of households.[11] Highest usage was reported in Kigezi (98%) and Ankole (97%) sub-regions.[12] Up to 3% of households use flush toilets, predominantly in Kampala (17%),[13] while close to 7% did not have any toilet facilities, especially in Karamoja sub-region (35%) and severely-affected PRDP districts (35%).[14] More users of VIP latrines were also reported in urban areas (12%) compared to rural areas (4%).[15]

2. **The existing market for toilet care and toilet paper products is huge.** The market for toilet care products[16] reached UGX 13 billion (US$ 3.41 million)[17] in 2021, while the toilet paper market hit UGX 31 billion (US$ 8.34 million) in the same year.[18] Common distribution channels were grocery stores, supermarkets and hypermarkets.[19]

3. **Increased health and hygiene awareness due to COVID-19 pandemic has boosted demand for soaps**. Public handwashing campaigns due to COVID-19 stimulated demand for soaps, reaching UGX 198 billion (US$ 53 million) in 2021.[20] Purchases were higher in urban areas but interest in rural areas also grew.

4. **There is limited participation from the private sector**. Currently, there is little participation from the private sector in the delivery of sanitation services. Most of the districts in Uganda have implemented community-led total sanitation (CLTS) and home improvement campaigns (HIC) in their area.[21] Civil society organizations were also active in the sanitation space, investing UGX 9.72 billion (US$ 2.61 million) in sanitation and hygiene in 2019/2020.[22]

Market Barriers

1. **Limited household income is a top barrier to owning a toilet.** Despite significant improvements over the last 20 years, 42.2% of the population continues to live in poverty, earning UGX 7,996 (US$ 2.15) a day.[23] Average monthly consumption expenditure per household is UGX 339,263 (US$ 91.22). Households in urban areas reported higher expenditure at UGX 466,082 (US$ 125.13) than in rural areas at UGX 285,119 (US$ 76.67).[24]

2. **Sanitation is not a purchasing priority.** Household expenditure is focused on food and non-alcoholic beverages, accounting for 42.9% of expenditure.[25] Budgets for items where sanitation could be included are low: furnishing and household equipment is only at 3.2%, while miscellaneous goods and services only at 2.2%.[26]

3. **Households cited geology, alternative defecation sites and cultural belief as reasons for not owning a toilet.** In the 2019-2020 Uganda National Household Survey, households cited the following reasons for not owning a toilet: (i) low income (25%); (ii) negative attitude (23%); (iii) ignorance (22%); (iv) poor soil type (13%); (v) poor landscape or terrain (8.1%); (vi) tenants (1.4%); and (vii) no land (0.9%). [27]

   In an early study by USAID, presence of alternative defecation sites was also a factor, particularly in rural areas.[28] Defecating outside was seen as an opportunity for some people to "keep their faeces and their scent out of the home." Cultural beliefs also contribute to non-adoption. In some groups and communities, pregnant women are discouraged from using toilets in the belief that the baby will fall into the latrine. Some also considered it "taboo to handle, touch or live in a dwelling unit near a toilet facility."[29]

Market Opportunities

1. **There is a need for holistic sanitation service provision.** Due to small-scale operations of sanitation businesses and entrepreneurs, the sector has become too fragmented. Building a latrine or toilet requires a household's engagement with several private sector players.[30] Fragmentation increases construction costs and discourages households from building or improving their facilities. As this marketplace becomes better organized, there is the opportunity to lower the cost burden and simplify the task for customers.

2. **There is a need for more innovative technologies and approaches.** The country still relies on conventional sanitation technologies. The Ministry of Finance reported in 2016 that implementation of new technologies is hindered by high costs, lack of effective regulatory and financing mechanisms and insufficient private sector participation.[31] Accelerating private sector investment is pivotal to responding to the gaps in innovations within the sector.

3. **Development of best-fit products and services based on consumer preferences and needs is required.** As established by the NSMG, different consumer segments have different sanitation needs and preferences. Product development should consider and balance consumer needs and preferences with their ability to pay.

Circular Sanitation Economy

The **circular sanitation economy** appears to be on a favorable track due to the country's immense need for faecal sludge management services, energy and agricultural products. The surge in the price of agricultural products due to the current Ukraine-Russia conflict has further triggered the demand for locally-produced fertilizers. The market for emptying and transport is relatively strong, with an estimated value of US$ 81.5 million in 2022 and the potential to reach US$ 144.2 million by 2030. In terms of resource recovery, biogas shows the largest potential, with an estimated value of US$ 4.0 billion in 2022 and the potential to grow to 1.6 times this size, eventually reaching US$ 6.4 billion.

MARKET ESTIMATE FOR 2030 CIRCULAR SANITATION ECONOMY* (IN US$ MILLION)

$144.22M Emptying and Transport

$17.54M Biochar

$10.96M Phosphate

$6,400.46M Biogas

$31.89M Compost

$8.75M Potassium

$209.89M Electricity

$12.19M Nitrogen

$1,115.94M Protein meal - Black Soldier Fly Larvae

*Note that this report does not total the estimates in the Circular Sanitation Economy as only one product can be produced from a volume of waste. Stakeholders are encouraged to look not only at the potential revenue of products but also, from a circular economy perspective, at retaining the value of the product. For example, biogas is a significant leader in financial potential, enables greener cooking and produces a liquid fertiliser. For the overall sanitation economy estimate, Protein Meal product is selected as it promises moderate financial returns while also contributing back to the food system.

Table 3: Uganda Circular Sanitation Market

MARKET ESTIMATE FOR CIRCULAR SANITATION ECONOMY (in US$ million)[32]	Baseline: Estimate of 2022 market size	Projection: 2025 progress towards universal access	Projection: Universal access in 2030
Emptying and Transport	81.53	103.09	144.22
Biogas	3,981.16	4,833.46	6,400.46
Electricity	130.56	158.50	209.89
Biochar	10.91	13.24	17.54
Compost created	19.84	24.08	31.89
Total nitrogen	7.58	9.20	12.19
Total phosphate	6.81	8.27	10.96
Total potassium	5.44	6.60	8.75
Protein meal/black soldier fly larvae	694.13	842.73	1,115.94

Circular Sanitation Economy Market Insights

Current Market Situation

1. **There is an underdeveloped market for faecal sludge emptying and transport.** Collection and transportation of faecal sludge in Uganda is still underdeveloped.[33] In Kampala, faecal sludge collection is done by private operators, who are informal and unregulated.[34] Treatment plants are managed by the National Water and Sewerage Corporation. Vacuum truck operators charge at least UGX 76,152 (US$ 20) for 2.5m^3 and UGX 190,380 (US$ 50) for 10m^3 of faecal sludge.[35] Faecal sludge collection and transportation services are mainly provided by private operators, through the Association of Uganda Emptiers Ltd (TAOUEL). Currently, TAOUEL has 356 members, who operate 132 trucks in the country. Almost all operators are based in Kampala.[36]

2. **Faecal sludge management (FSM) solutions are needed in the country.** FSM in Uganda is mostly on-site, with only 2% of the total population connected to a sewerage network, 23% in 17 large towns and 12% of the household toilets in Kampala.[37] Up to 74,000m^3/d of faecal sludge is produced from emptiable toilets.[38] Current treatment capacity of the facilities in rural areas is only 3%.[39]

3. **There is a nascent resource recovery market in the country.** A GIZ study highlighted that a few organizations and businesses in the country already use faecal sludge as soil amendment and briquettes.[40] There is an interest from cement and clay companies in Uganda to use dried faecal sludge as a crushed fuel.[41] Water for People (WFP) also ventured into the production of faecal sludge briquettes and has since uncovered its market potential.[42]

Market Drivers

1. **The government is supportive.** The Ministry of Water and Environment promotes the use of emptiable technologies in households and is preparing a guideline requiring emptiable facilities in schools.[43]

Market Barriers

1. **Less than 5% of pit latrines are emptiable.** The Ministry of Water and Environment reported that less than 5% of pit latrines in Uganda are emptiable.[44] Faecal sludge is usually mixed with solid waste, making emptying and treatment difficult.

2. **The lack of certification is limiting growth of faecal sludge-derived products.** Lack of certification from Uganda National Bureau of Standards (UNBS) on treated faecal sludge products limits business sales of their output products in bigger markets.[45]

Market Opportunities

1. **The establishment of faecal sludge treatment plants (FSTPs) is needed.** Using the country's urban population and estimated waste generation, a simple projection of the required FSTPs in Uganda is carried out.[46]

Estimated FSTPs needed	2022	2025	2030
Kampala	11	30	42
Nansana, Kira, Ssabagabo	17	48	68
Town Class 1 (9 Towns)	0	24	42
Town Class 2 (7 Towns)	0	23	40

2. **The country has a severe need for FSTPs.** There is a 97% market gap for FSTPs in the country, based on current capacity in rural areas. Up to 45 faecal sludge management facilities (FSMFs) are reported, with an average capacity of 50m3/d, but 22 of these facilities are used for sewage, 22 for faecal sludge, and only one treats both. Most faecal sludge treatment plants (FSTPs) are underutilized or overloaded and release untreated or partially-treated effluent into the environment. Investments in FSMFs are greatly needed.[47]

3. **There could be a market for faecal sludge fuel pellets.** EAWAG (2016) reported that dewatered faecal sludge could be turned into fuel pellets, which are homogeneous in size and easy to transport, store and dry.[48]

4. **There could be a market for fuel briquettes.** A GIZ study noted that there is a huge market for briquettes in Uganda, given the increasing pressure to abandon charcoal and firewood.[49] Potential consumers are households, poultry farmers, commercial enterprises and factories that consume energy for heat production, and schools for meal preparations.[50]

5. **Potential FSM market for schools.** Schools have a great potential for the FSM market as the Ministry of Education has been promoting lined pits in schools for over 15 years.[51] Cost is estimated to be UGX 500 (US$ 0.13) per pupil per term, which is generally affordable to the parents.[52]

Smart Sanitation Economy

The **smart sanitation economy** is valued at US$ 16.3 million in 2022. It is, nonetheless, projected to grow significantly, doubling to US$ 34.8 million by 2025 and increasing 3.6 times its initial value by 2030.

MARKET ESTIMATE FOR 2030 SMART SANITATION ECONOMY (IN US$ MILLION)

PROJECTION Universal Access

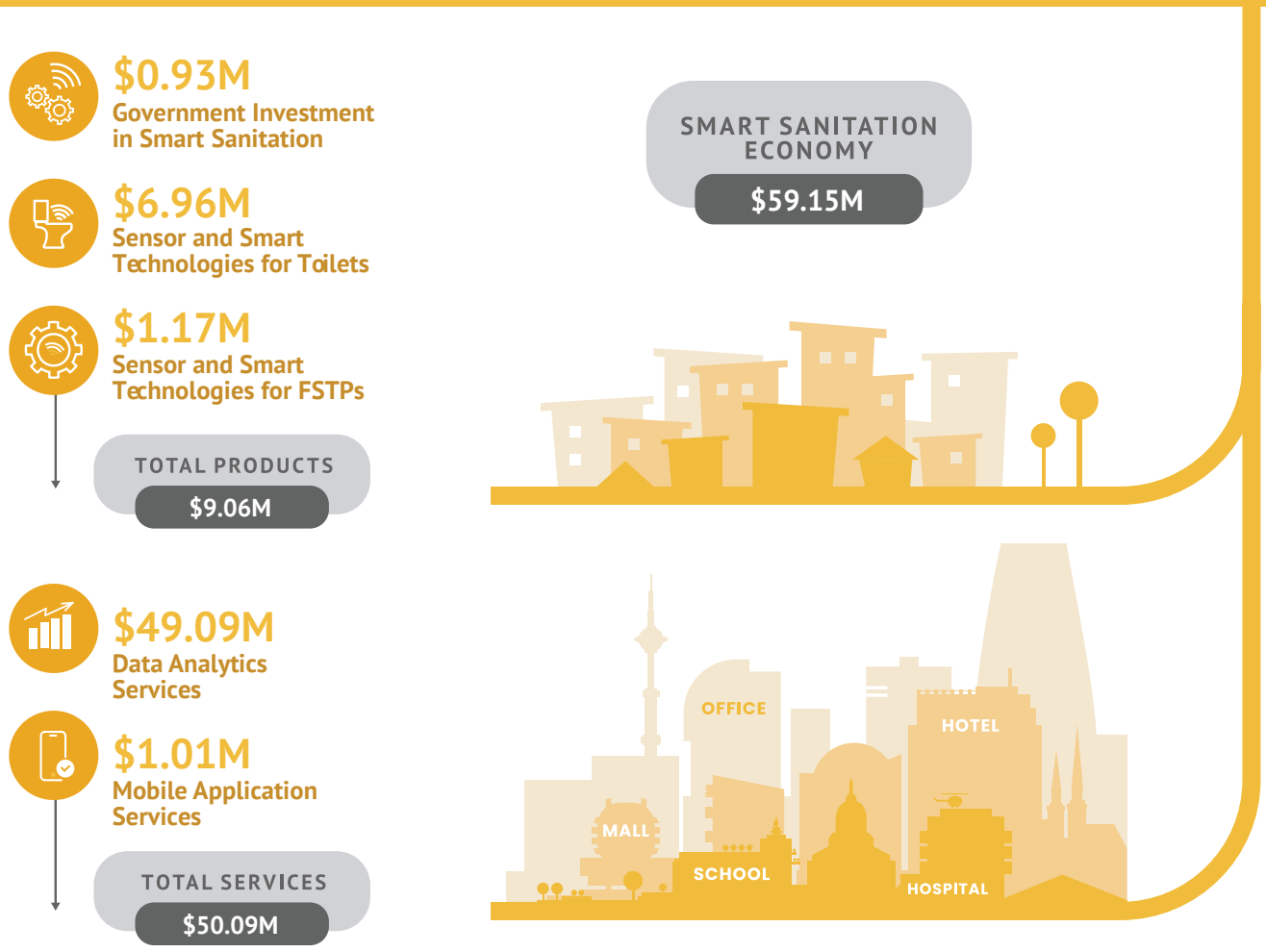


Table 4: Uganda Smart Sanitation Market

MARKET ESTIMATE FOR SMART SANITATION ECONOMY (in US$ million)	Baseline: Estimate of 2022 market size	Projection: 2025 progress towards universal access	Projection: Universal access in 2030
Product			
Government investment in smart sanitation	0.87	0.90	0.93
Sensor and smart technologies for toilets	2.05	4.09	6.96
Sensor and smart technologies for FSTPs	0.17	0.75	1.17
Total Product	**3.09**	**5.74**	**9.06**
Services			
Data Analytics Services	12.80	28.04	49.09
Mobile Application Services	0.45	0.59	1.01
Total Services	**13.25**	**28.63**	**50.09**
Smart Sanitation Economy	**16.34**	**34.38**	**59.15**

Smart Sanitation Economy Market Insights

Current Market Situation

1. **There are existing smart sanitation technologies.** Kampala Capital City Authority (KCCA) launched a geographic information system (GIS)-based mobile application that links pit emptiers with customers.[53] Through this, KCCA receives pit-emptying jobs from customers via its call center, connecting customers with the nearest pit emptier. Pit emptiers submit critical data through the app to KCCA, including customer details, amounts paid, volume emptied, and type and location of the sanitation facility. The app and call center serve as an "ecosystem catalyst" by connecting customers with sanitation services and helping to ensure safe disposal of faecal sludge.

Market Drivers

1. **The Ministry of Water and Environment established the Appropriate Technology Center for Water and Sanitation (ATC).** The ATC was established by the Ministry of Water and Environment to undertake action research, promotion, dissemination of appropriate technologies and approaches for water and sanitation.[54]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Market Barriers

1. **The country's workforce may lack technical skills as most universities do not offer courses on sanitation.** Water and sanitation, for example, are not adequately addressed in Ugandan universities' engineering curricula. An upcoming workforce unaware of sector opportunities would be a challenge to developing the local smart sanitation economy.

Market Opportunities

1. **There is an opportunity for technological solutions that further coordinate the sector.** Following KCCA's call center, innovations that similarly coordinate toilet construction, maintenance and pit emptying could also be explored.

2. **There are opportunities for call centers and mobile transfer stations.** A study found that there is potential for call centers (with scheduled emptying) and mobile transfer stations that effectively optimize emptying services by reducing their costs and improving service delivery.[55]

Showcase

Innovations can drive consumer demand for sanitation, but it is more than just the toilets. The Toilet Board Coalition hosts an accelerator program that scales up essential innovations in toilet design, circular recovery of biological resources, smart digital technologies and menstrual hygiene products to ensure safe and sustainable sanitation for all. This section highlights sanitation solutions from the Coalition's portfolio plus Elphrods Services that are scalable, innovative, replicable, commercially viable and responsive to the needs of emerging markets in Asia and Africa.

Toilet Economy

Company name CleanTeam
Year Founded 2010
Country of Operations Ghana
Solution Portable toilets

Problem that you were trying to solve Inadequate sanitation facilities in low-income communities

Description of the Solution CleanTeam offers portable toilets to low-income users in Kumasi, Ghana. CleanTeam uses a product-as-a-service model and charges monthly fees for toilet servicing, rental and waste collection thrice weekly. Waste collected from the toilet facilities is disposed of at the municipal treatment center.

Impact Over 600 toilets were installed, providing access to improved sanitation to 4,500 people.

Contact Information Abigail Aruna

Company name Elphrods Services LLP
Year Founded 2021
Country of Operations Kenya
Solution Affordable and inclusive WASH credits

Problem that you were trying to solve Inaccessible water and sanitation services in low-income areas

Description of the Solution Elphrods Services LLP offers small credits for small and medium-sized businesses and households wanting to improve their WASH facilities and matchmaking with WASH service providers (i.e. manual pit emptiers, exhausters, plumbers, utilities and master operators). The WASH credits enable them to connect their facilities to water piping networks, access formal pit emptying services and upgrade their pits to meet the required standards.

Impact Over 1,000 households have benefitted from the program since its inauguration.

Contact Information Denish Owiti

Circular Sanitation Economy

Company name Pit Vidura
Year Founded 2016
Country of Operations Rwanda
Solution Faecal sludge emptying and transportation

PIT VIDURA

Problem that you were trying to solve Unsafe and unsustainable faecal sludge emptying and transportation

Description of the Solution Pit Vidura is a sanitation logistics company that targets low-income communities with no access to public sewerage systems. It offers a quick and clean waste management solution to poor households and currently maintains over 960 toilets annually.

Impact Pit latrines are emptied annually (as opposed to every seven years prior to Pit Vidura) at a relatively affordable rate of US$ 8.50 per household annually.

Contact Information Nicolas Kuria

Company name Kaka Cesspool Services
Year Founded 2018
Country of Operations Uganda
Solution Faecal sludge management services

KAKA CESSPOOL SERVICES

Problem that you were trying to solve Inadequate and unsafe faecal sludge emptying services in Uganda

Description of the Solution Kaka Cesspool Services is a faecal sludge emptying and transportation company that serves households in Uganda, including those in congested slums, which were deemed inaccessible. Faecal sludge is safely collected and transported to the treatment plant.

Impact Over 2,262 households were emptied – equivalent to 4,020 m^3 volume - in 2022. Employment opportunities, especially for the young, were also created in their respective communities.

Contact Information Derrick Matovu

Smart Sanitation Economy

Company name Garv Toilets

Year Founded 2017

Country of Operations India, Ghana, Nigeria

Solution Smart portable toilet cabins

Problem that you were trying to solve Lack of sustainable toilets for public use, especially for women and the disabled

Description of the Solution Garv Toilets offers a 'Smart toilet' solution, with self-cleaning and automation, requiring no grid power or sewer lines and less capital to maintain. It is also specifically engineered for women and the disabled population.

Impact Serves 170,000 users daily with over 900 toilets deployed in 68 locations.

Contact Information Mayank Midha

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A Forward Look

> “The world keeps moving further away from achieving the Global Goals. We know how to get back on track. What we need is unity of purpose, effective leadership from all sectors and urgent, ambitious action.”

António Guterres, Secretary-General of the United Nations

The sanitation economy provides sustainable and complementary solutions, monetizing toilet provision, products and services, biological resources, health data and information, to provide benefits across business and society. This report shows the unrealized US$ 1 billion potential that exists in the sanitation economy in Uganda today and how opportunities can grow as these services expand to all Ugandans. The Sanitation & Hygiene Fund (SHF) is committed to realizing this potential and the immense economic, social and environmental benefits.

As we create demand for sanitation and drive gender equality, we call on our development partners, the investment community, philanthropists, the financial sector and private sector to also focus on market-based sanitation, hygiene and menstrual health.

Together we can

1. **Build a dynamic pipeline of bankable projects in the sanitation economy.** These investment propositions will focus on specific elements of the sanitation economy profiled in this report, and will lay out compelling business plans and clearly show the social, environmental and financial returns for investors.

2. **Facilitate flow of investment into the sanitation economy.** Together, we can align commercial investors, impact investors and philanthropists with the right type of investment opportunities. We will work with our partners to design innovative financial instruments to de-risk these investments and maximize the impact of funding from Uganda’s development partners.

3. **Strengthen the enabling environment to attract new and greater investments into the sanitation economy.** We know that the economic potential highlighted in this report will only be realized when barriers to investment are removed and new incentives are put in place. We are putting in place concrete plans on various priority public reforms to address these bottlenecks and we invite all partners to support these crucial actions.

Social impact and financial return can co-exist. We can achieve safe sanitation for all, catalyze economic growth, eradicate poverty and ensure women’s empowerment and job creation. We look forward to your support.

Annex

Uganda National Sanitation Market Guidelines For Basic Sanitation

In March 2022, the Ministry of Health issued the **Uganda National Sanitation Market Guidelines (NSMG) for Basic Sanitation** to provide a "*strategic roadmap on how to use market-based sanitation to increase basic on-site sanitation services in Uganda*." The guidelines thoroughly captured the barriers and drivers for market-based sanitation in the country.

Market Drivers

1. There is a strong preference for Improved Basic Toilets (IBTs)

- Up to 97% of households were reported to recognize the health and hygiene benefits of having improved toilets.
- Up to 94% also preferred improved toilets due to durability, safety and a certain prestige associated with it.

2. For some stakeholders there is adequate unit cost margin for profit on sanitation products/services

- Certain value chain actors showed the ability to earn sufficient income from providing sanitation services.
- Pit diggers and masons earn unit margins of approximately 75% and 45% respectively on the construction of a 2-stance toilet with a bathroom and curtain wall.
- In contrast, hardware stores earn unit margins of 9-10% on plastic toilet pans, and cement pre-fabricators earn 25-34% on a 60 cm by 60 cm slab.

Market Barriers

1. Low household expense priority is accorded to sanitation

- Construction of IBTs is a lower priority for some households than other things, i.e. school fees.

2. Some products and services are unaffordable and even unknown

- The estimated cost of a new 1-stance toilet do-it-yourself (DIY) model (UGX 790,000 i.e. US$ 212.42) costs well above the median household's ability to pay (UGX 570,000 i.e. US$ 152.27).
- For some sanitation-specific products (e.g. plastic pans), a mismatch between the price advertised on the radio and the actual retail selling price can negatively impact sales.
- Furthermore, 78% of masons interviewed were not aware of one or more of the common pan/slab options.

3. Households are challenged by a lack of liquidity

- Some households earn irregular or seasonal incomes, which restrict their ability to make large lump-sum purchases.
- Up to 81% of the households are also reluctant to take loans, for fear of payment default and loss of collateral.

4. There is a lack of financial support for sanitation businesses

- Sanitation businesses are not seen as viable businesses, which limits their access to better financing mechanisms.
- Customer payment defaults are common across the value chain, negatively affecting viability and further reducing entrepreneurs' interest in sanitation.

5. Transportation costs are high

- Rural households must travel 20 km on average to purchase some products and materials (e.g. cement) from hardware stores.
- Transporters that source materials on behalf of customers often travel 35-50 km to supply sand or aggregate to rural households.
- As a result, rural households pay transporters approximately UGX 163,000-210,000 i.e. US$ 43.83-56.47 (11% of the total toilet cost) to source sand, brick and aggregate for the construction of a 2-stance IBT with a bathing area and curtain wall.
- Rising fuel costs in Uganda continue to increase total transportation costs.

Market Opportunities

1. There is specific market potential according to affordability

- Among the 5.6m households that do not currently own IBTs, around 34% (1.9M households) may be able to afford full IBTs at current prices and an additional 54% (3M households) may be able to afford interface-only upgrades or other potentially lower-priced variants.
- The remaining 12% of households are unable to afford upgrades at current prices.

2. There is a need for sanitation entrepreneurs especially in rural areas

- A lot of sanitation services are not available in many areas, particularly the rural parts of the country.
- Value chain actors were revealed to have limited interest in household toilet construction due to perceived low revenue.

3. There is a demand for appropriate sanitation product designs

- Current toilet product systems are not appropriate for some households in Uganda.
- For example, around 21% of pit diggers do not know how to dig circular pits, which are most appropriate for households living in areas with collapsing (loose) soils.
- This opens opportunities for the introduction of suitable products to each household.

4. There is a need for products at a variety of price points and financing options to enable purchase

- Construction of new, improved toilets was deemed unaffordable at an estimated cost of UGX 790,000.
- Toilet upgrades are affordable for most households, but preference was given to waiting for more affordable, better toilets.
- This presents an opportunity for microfinance mechanisms that lower the capital expenditure for toilet ownership.

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