The Vetiver Latrine

Household toilet preferences in rural western Kenya

Learning Brief 2 of 4 | August 2026

Prepared by Opero Services and Centre for Affordable Water and Sanitation Technology

About this brief

This is the second of four learning briefs developed through a collaboration between Opero Services and the Centre for Affordable Water and Sanitation Technology (CAWST), with CAWST supporting the development of the series and the Kisumu pilot featured in Brief 1. It explores what rural households in western Kenya value in a toilet and how the Vetiver Latrine responds to these preferences. Brief 1 presents findings from the pilot installations, Brief 3 examines the toilet market, and Brief 4 reviews existing sanitation options available to households.

The brief draws together insights from work Opero has carried out over several years rather than from new research. Household preference data comes from the customer discovery study conducted in 2024 under the USAID Western Kenya Sanitation Project, co-implemented by Opero Services and Triangle Environmental. The market context draws on Opero Services' 2025 assessment of decentralised sanitation services, prepared for the World Bank Group's 2030 Water Resources Group, as well as published sources cited throughout the brief.

The findings presented here are drawn from households across four counties in western Kenya and should be understood as indicative insights rather than the results of a representative survey. This brief is not a publication of USAID, of the World Bank Group, or of their implementing partners Their work is referenced as secondary source material, while the interpretations and conclusions presented are those of Opero Services alone.

1 The challenge

Affordable sanitation facilities in rural Kenya, particularly unlined pit latrines, are often constructed without a structured assessment of users' needs and preferences. Among the 44 toilets observed in the customer discovery study conducted under the USAID Western Kenya Sanitation Project in Kisii, Siaya, Migori and Busia , 38 had unlined pits and 12 were judged not structurally safe (Triangle Environmental and Opero Services, 2024).



Unlined pit latrine, Kisumu County, 2024. Photograph: Opero Services

Durability remains a documented challenge across the region. Almost half of the households surveyed for the WASHPaLS market assessment reported that their toilet had collapsed within five years of construction. Only 24 per cent had upgraded an existing facility, as toilets often collapse before households consider making improvements. (USAID, 2021).

Design shortcomings also affect daily use. Among the same 44 households surveyed in the four counties in western Kenya , 21 reported at least a noticeable smell, 36 had no lighting inside the cubicle and 11 had doors that could not be locked. These conditions influence whether every household member uses the

facility consistently—an essential requirement for achieving the intended health benefits.

The market for sanitation upgrades is also substantial but remains poorly understood. Opero Services' assessment of decentralised sanitation services for the World Bank Group's 2030 Water Resources Group estimated that approximately 620,000 households across Kenya have unimproved facilities that could be upgraded, representing a potential market of around USD 100 million. However, the assessment also identified a lack of information about what consumers want from a containment upgrade (Greene, Ngutu and Kruiter, 2025). This brief draws on the evidence available to Opero Services to help address that gap.

2 The typical household toilet

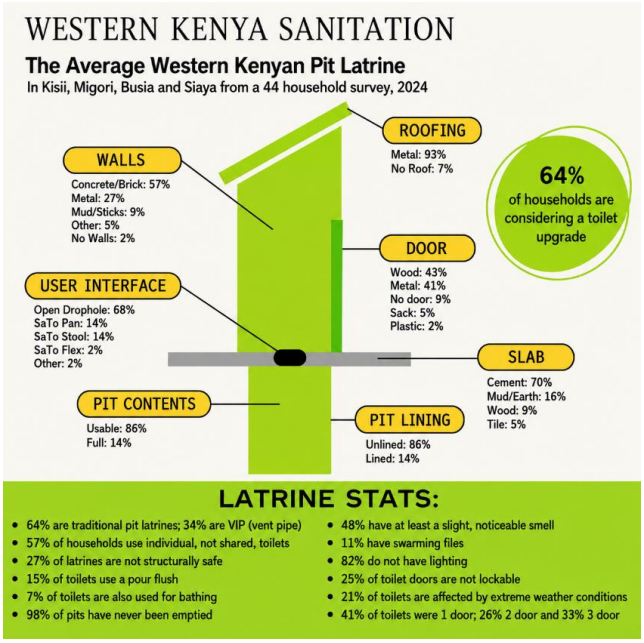


Figure 1. Characteristics of the typical pit latrine recorded across four counties of western Kenya (n=44)
Source: Triangle Environmental and Opero Services (2024), customer discovery study conducted under the USAID Western Kenya Sanitation Project

Observation of the 44 sampled facilities showed the traditional pit latrine to be the prevailing toilet, at 28 of 44, with ventilated improved pits accounting for a further 15 (Triangle Environmental and Opero Services, 2024). The typical facility had a metal roof, concrete or brick walls, a wooden or metal door, a cement slab and an open drop hole over an unlined pit. Most pits were still usable rather than full, at 38 of 44, and all but one had never been emptied.

Two aspects of this household profile have direct implications for product design. Manufactured toilet components are already present in the market: seven of the 44 sampled toilets used a pour-flush system, while 13 were fitted with a plastic pan, stool or flexible unit. Purchased components and water seals are therefore not unfamiliar to these households. By contrast, pit emptying is almost entirely absent, with 43 of the 44 pits having never been emptied. Households consequently have no established emptying practices, service relationships or budgets for desludging. Any containment system requiring regular solids removal will therefore need to introduce and support these practices rather than rely on existing arrangements.

The sample also shows clear interest in improving existing facilities. Of the 44 households surveyed, 28 were considering a toilet upgrade, while 38 had pits that were still usable. This suggests that most upgrade decisions relate to improving a functioning facility rather than replacing one after it collapses, creating an opportunity for products that can be integrated into existing toilets.

3 Reported satisfaction and dissatisfaction

When asked what they valued most about their toilet, respondents most frequently cited its ability to contain faeces and urine, mentioned by 19 of the 44 households (Triangle Environmental and Opero Services, 2024). This was followed by absence of odour, with nine mentions, and affordability, with seven. Cleanliness, suitability for older users and limited flies each received six mentions. Containment was the only preference that clearly stood out. Given the small sample and the similar number of responses for the other features, these should be treated as a group of important preferences rather than ranked in order.

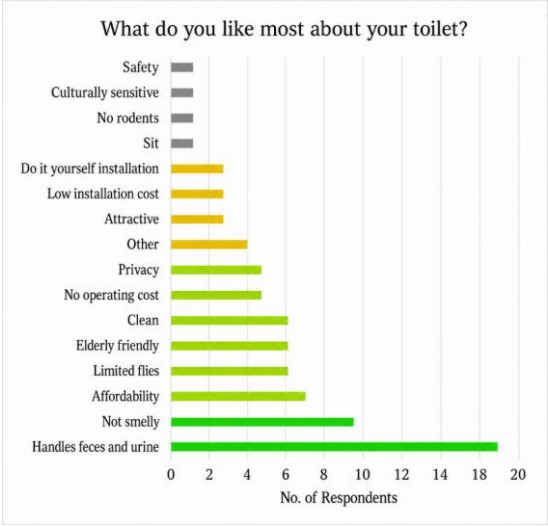


Figure 2. Most valued attributes of the current toilet (n=44, multiple responses permitted)
Source: Triangle Environmental and Opero Services (2024), customer discovery study conducted under the USAID Western Kenya Sanitation Project

Dissatisfaction was distributed more evenly across categories. Flies were mentioned by 10 respondents, odour by 9, and a lack of modern appearance by 8. Frequent maintenance was cited by 7 respondents, while limited privacy and unsuitability for some users received 6 mentions each. Four respondents said there was nothing they disliked about their toilet..

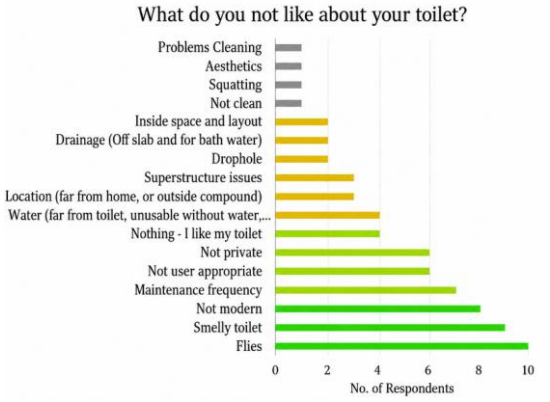


Figure 3. Reported sources of dissatisfaction with the current toilet (n=44, multiple responses permitted)
Source: Triangle Environmental and Opero Services (2024), customer discovery study conducted under the USAID Western Kenya Sanitation Project

Odour appeared among both the most valued and most disliked toilet features, with 21 of the 44 households reporting a noticeable smell. This suggests that households value effective odour control and notice when it is present. However,

because respondents were not asked to rank odour against other features, its relative importance cannot be confirmed from this survey alone.

4 The ideal toilet described in focus groups

Both panels independently described the same facility. Women in Kisii and Siaya and men in Migori and Busia each specified a three door unit comprising a squat plate for adults, a seated unit for children and older persons, and a bathing room, together with ventilation, a lockable door, internal and external lighting, cleaning supplies and a waste bin (Figures 4 and 5; Triangle Environmental and Opero Services, 2024).

Although the groups were consulted separately, both described almost identical layouts and features. This strong agreement provides a credible reference for future toilet design and development.



Figure 4. The ideal toilet described by women (two discussions, 16 participants, Kisii and Siaya)
Source: Triangle Environmental and Opero Services (2024), customer discovery study conducted under the USAID Western Kenya Sanitation Project

Both panels preferred broadly the same facility but emphasized different design features. The women's panel focused on accessibility, privacy, safety and hygiene. They requested non-slip tiled floors, a toilet cover to control odour and prevent items from falling into the pit, a bin for sanitary towels, and a construction period of about one week. The men's panel focused on durability and waste management. They requested brick walls with internal tiling, a vent pipe with an elbow below the roofline, a septic tank, and a pour-flush system rather than a cistern flush to keep running costs low.



Figure 5. The ideal toilet described by men (two discussions, 18 participants, Migori and Busia)
Source: Triangle Environmental and Opero Services (2024), customer discovery study conducted under the USAID Western Kenya Sanitation Project

The differences between the panels should not be interpreted as gender-based because the discussions were conducted in different counties, where local conditions may also have influenced participants' priorities. However, both panels named the same constraints on purchase, namely cost, limited information about available products, and limited local availability.

The wider market assessment reinforces the importance of affordability: the WKSP market sizing assessment found household expenditure to be the only significant determinant of willingness to pay among the socio demographic variables tested, and modelled a 1 per cent increase in price against a loss of roughly 35 per cent of the market (B&M Consult, 2022). That elasticity is a modelled result from what households said they would pay, rather than on actual purchases. It therefore suggests that customers are sensitive to price changes but does not predict exactly how demand will change.

5 Motivations and sources of influence

Both panels reported that advice from trusted people, particularly friends, family members and public health officers, strongly influenced their choice of sanitation products (Triangle Environmental and Opero Services, 2024).The men's panel additionally named shame and family health and wellbeing as motivations for improving a facility. These findings are based on the views of 44 focus group participants rather than their actual purchasing decisions. They therefore suggest which factors may influence household choices but do not show the strength of that influence.

Households may find it difficult to appreciate benefits such as odour control before they use the toilet. Demonstration facilities and recommendations from trusted people, particularly public health officers and existing owners, may therefore be important in encouraging adoption. We are carrying this forward as a working assumption rather than as an established finding, and it can be tested by recording the referral source of early sales.

6 Implications for product design

Households assess a toilet through daily use, weighing cleanliness, safety, privacy, durability and convenience against what they can afford. The requirements below follow from the evidence set out above, with the supporting observation and its source stated alongside each. They apply to any improved sanitation product intended for this market, and not to the Vetiver Latrine alone.

Design requirement	Supporting evidence and source
User experience alongside containment	Containment was the most frequently cited reason for satisfaction (19 of 44 respondents), while flies, odour and a lack of modern appearance were the leading sources of dissatisfaction (10, 9 and 8 mentions, respectively) (Customer Discovery Study, 2024).
Affordability as a binding constraint	Household expenditure was the only significant determinant of willingness to pay, and a 1 per cent price rise was modelled against roughly a 35 per cent market loss (B&M Consult, 2022). Households also overestimate the price of a durable toilet (USAID, 2021).
Inclusive access for all users	Both focus group panels specified a separate seated unit for children and older persons; suitability for older users was named by 6 of 44 in the survey (Customer discovery study, 2024).
Structural durability under local conditions	12 of 44 observed toilets were judged not structurally safe and 9 were affected by extreme weather (customer discovery study, 2024); almost half of WASHPaLS respondents reported collapse within five years (USAID, 2021).
Privacy and security of the cubicle	11 of 44 observed doors could not be locked and 36 of 44 cubicles had no lighting; limited privacy was named by 6 of 44 (Customer discovery study, 2024).
Provision for hygiene and menstrual management	Both panels specified handwashing with running water, cleaning supplies, a covered waste bin and ventilation (Customer discovery study, 2024).
Incremental upgrading of existing facilities	Of the 44 households, 28 were considering an upgrade and 38 had a pit latrine that was still usable, suggesting that most upgrade decisions concerned an existing facility (Customer Discovery Study, 2024).
Provision for the full sanitation service chain	43 of 44 observed pits had never been emptied (Customer discovery study, 2024), and mechanical emptying is concentrated in urban centres at three to five operators per county (USAID Western Kenya Sanitation Project, 2023).

7 Implications for the Vetiver Latrine

Comparing the findings from the two pilot installations in Brief 1 with household preferences shows which user requirements the current design meets and which it does not. Both the design's strengths and its limitations are presented because they are equally important when assessing the technology's suitability.

Points of alignment

- Odour control addresses a common daily frustration. Users at both pilot sites reported no odour. In the household survey, 9 of 44 respondents cited odour as a source of dissatisfaction, while 21 reported a noticeable smell in their current toilet.
- The pour flush interface matches a stated preference. The men's panel specified pour flush over cistern flush on running cost grounds, and 7 of 44 sampled households already use a pour flush arrangement.

- Sealed containment matches what households describe. The men's panel specified a septic tank rather than a pit, which expresses a preference for sealed containment. The Vetiver Latrine shares that principle, although the barrel and planted bed arrangement works differently from a septic tank
- Timing favours market entry. With 28 of 44 sampled households considering an upgrade and most pits still usable, the product is offered into an active rather than a dormant decision.

Points of divergence

- Water availability constrains the tested variant. The pour flush configuration requires water, while households in Opero's Kisii and Kisumu assessment relied primarily on rainwater harvesting (Opero Services, 2024). The Basic Drop variant addresses this and remains untested under monitored conditions.
- Solids management is unresolved and unfamiliar. Brief 1 identifies on site management of accumulated solids as the largest open question, and all but one of the sampled pits had ever been emptied, so no household practice exists to build on.
- Appearance has not been assessed. A toilet that is modern was named by 8 of 44 respondents, and the pilot superstructures have not been evaluated against this preference.
- Scope is narrower than the stated ideal. Both panels described a three door facility including a bathing room, while the current product is a single unit, so a household purchasing it obtains part of the specification it describes.

8 Summary of findings

- Households sampled already own a functioning facility, are considering an upgrade, or are weighing an addition to what they have rather than a replacement.
- Containment is what households value most, while flies, odour and appearance are what they complain about, and odour is the attribute that appears on both lists.
- Women and men in the four counties describe the same three door facility, and cost, product information and local availability were named as the constraints on obtaining it.
- Purchase decisions are shaped by recommendations from friends, family and public health officers, which places demonstration and endorsement at the centre of any route to market.
- The Vetiver Latrine answers the odour and interface preferences directly, and does not yet answer the water, solids management, appearance and facility scope requirements.

For more information about the innovation, contact **edwin@opero-services.com**

9 References

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