EXPANDING SAFE FECAL SLUDGE MANAGEMENT IN KISUMU, KENYA

AN ANALYSIS OF THE GAP BETWEEN SUPPLY AND DEMAND

OVERVIEW
• Pit latrines are often the most common form of sanitation in urban, low-income areas.
• When pits fill up, informal and unregulated manual emptiers typically remove and dump the fecal waste in the surrounding environment.
• We conducted household surveys and a real-money voucher trial to determine willingness-to-pay for safe pit emptying services in Kisumu, Kenya.
• We found that less than 20% of households were willing to pay market prices for safe emptying services.
• This gap between supply and demand indicates that expanding safe emptying services to low-income areas will require substantial subsidies.

RATIONALE
Improving sanitation conditions in low-income communities is a major challenge for rapidly growing cities of the developing world. Residents of low-income communities generally do not have access to formal, regulated sanitation services such as centralized sewerage networks. Instead, they typically rely on unsafe practices for removing and disposing of fecal sludge, such as connecting pit latrines or septic tanks to drains, or employing informal manual emptiers who remove fecal sludge by hand or buckets and either bury it onsite or dispose of it in nearby waterways. These unsafe practices are inevitably cheaper than formal, safe services, because they avoid the licensing/dumping fees and transportation costs of delivering fecal sludge to designated disposal areas (Chowdhury and Kone, 2012). Previous research indicates that there is insufficient demand for safe sanitation services in low-income areas at current market prices (Balasubramanya et al., 2017b; Chunga et al., 2018; J-PAL, 2012; Simiyu et al., 2017). This study quantified the gap between market prices (supply) and the amount households are willing to pay (demand) for safe emptying services in Kisumu’s low-income areas.

METHODS
We examined household willingness-to-pay (WTP) for two types of safe pit-emptying services: i) Gasia Poa, a formal manual emptying group that deploys emptiers equipped with safety gear to manually transfer waste from pit latrines and septic tanks to large barrels; and ii) Vacuum Truck Operators (VTOs) that use exhauster trucks to suction fecal waste from pit latrines and septic tanks. Both services transport fecal sludge to one of the city’s treatment sites and were licensed by the local authorities. The study took place in eight low-income areas of Kisumu (Bandani, Manyatta A, Manyatta B, Nyabera, Nyalenda A, Nyalenda B, Nyamasaria, and Obunga).

We evaluated WTP through two different methods: household surveys (stated WTP) and a real-money voucher trial (revealed WTP). In the voucher trial, we randomly distributed discounted vouchers for pit-emptying services (i.e., 20%, 40%, 60%, and 80% of full costs) and then tracked voucher redemption rates at each discount level to estimate demand at different price points. Households had two to four months to redeem vouchers before their expiration. Finally, we
estimated the financial requirements for serving the fraction of Kisumu’s population currently lacking safe emptying and transport services, approximately 51,965 households (Furlong and Jouost, 2016); we also estimated the financial requirement assuming a 20% sewer expansion (KIWASCO, 2019), which would reduce the number of people lacking safe emptying and transport services to 35,202 households. For these estimates, we assumed that toilets are shared by an average of six households and require one emptying per year, based on our survey data.

**KEY FINDINGS**

1) **There is a substantial gap between WTP of Kisumu’s low-income residents and current market prices.** We found that stated and revealed demand for safe emptying services was low: less than 20% of households were willing to pay full market prices (Figure 1). More specifically, median stated WTP was approximately 33-50% of market prices for VTO services and approximately 25-43% of market prices for Gasia Poa services.

2) **Large capital investments, in addition to operational costs, are required to expand safe emptying services.** To serve the households in Kisumu that currently need safe emptying and transport services, we calculated that the required capital investment would amount to 84 million KES (840,000 USD); this amount would reduce to 45 million KES (445,000 USD) with the projected sewer expansion to an additional 20% of households (KIWASCO, 2019). In addition, we estimated that operational costs would amount to 53 million KES (530,000 USD) per year (or 36 million KES i.e., 359,000 USD) per year with the projected sewer expansion (Table 1).
3) Universal coverage of safe emptying services will not be achieved in the absence of large subsidies. Based on our WTP data, we estimated that the gap between operational costs and household WTP amounts to approximately 41 million KES (407,000 USD) annually (Table 1). With a 20% sewer expansion (KIWASCO, 2019), this gap would amount to 28 million KES (276,000 USD) per year.

CONCLUSIONS
A substantial fraction of Kisumu’s population will continue to rely on onsite sanitation that requires safe emptying and transport services, even with the projected sewer expansion. Addressing the need for subsidies and capital investments for expanding safe emptying services in Kisumu will likely require substantial coordination, planning, and investment by government and donor agencies. Raising and administering the large subsidies required on an ongoing basis will likely entail a public-private partnership and the development of a city-wide sanitation master plan that specifies investment, management, and regulatory procedures for both sewerage and fecal sludge management. In the absence of government investment and coordination, it is unlikely that the private sector will address safe sanitation needs in low-income areas of Kisumu. Furthermore, it is unlikely that small and fragmented fecal sludge management efforts will achieve substantial impacts, particularly among the poor.

REFERENCES


See the following publication for additional details on study design and findings: