

Global Leaders In Household Container-Based Sanitation Services: A COMPARATIVE ANALYSIS

INTRODUCTION

SOIL, Water and Sanitation for the Urban Poor (WSUP), and x-runner commissioned EY's Enterprise Growth Services (EGS) team to support their respective container-based sanitation (CBS) businesses in better understanding cost drivers and paths to financial sustainability as the global leaders in scaling household-level Container-based Sanitation (CBS). The resulting study is a component of the larger efforts being undertaken by the newly formed CBS Alliance (CBSA) to strengthen, inform and grow the sector through closer collaboration.

CBS AND THE ALLIANCE

CBS consists of an end-to-end sanitation service that hygienically collects waste from waterless toilets built around sealable, removable containers, and transports the waste for safe disposal or treatment and transformation into valuable end products. Though service models vary, in general costs are recovered through subscription service fees in return for access to a CBS toilet and the safe management of waste, and from the sale of waste treatment byproducts such as compost.

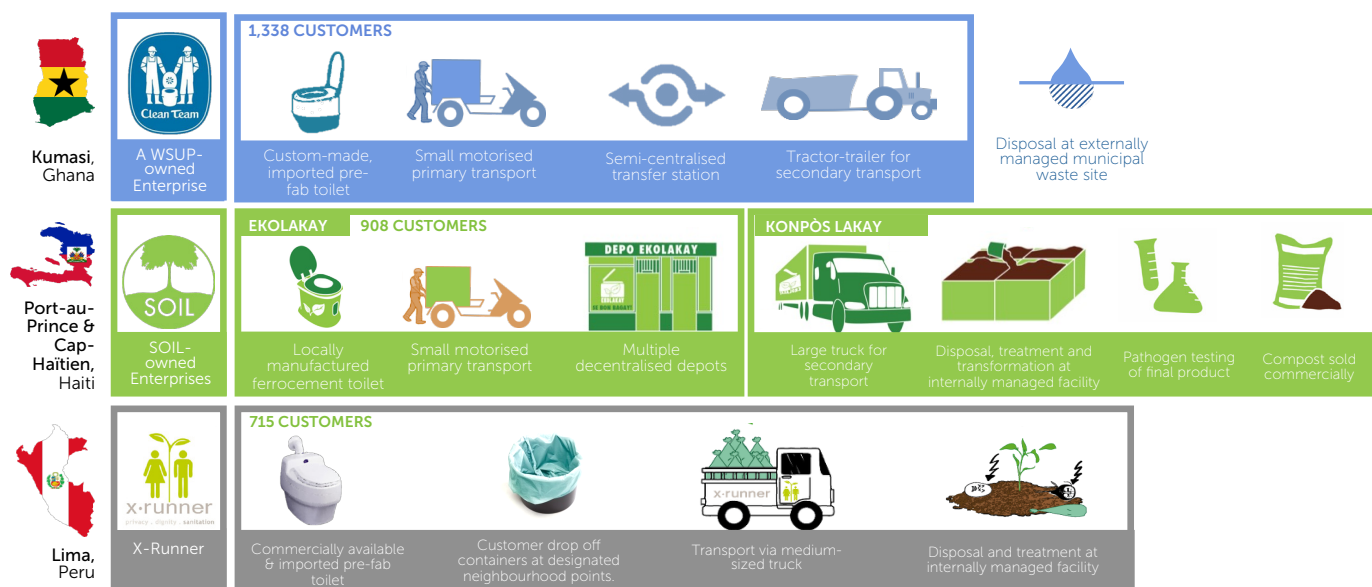
In late 2016, the CBSA was co-founded by Clean Team (WSUP), Loowatt, Sanergy, Sanivation, SOIL and x-runner. Its goals are to formalize CBS as a widely accepted and endorsed approach among municipalities and regulators, help sanitation services reach scale, and achieve sustainable impact in urban areas around the world. The CBSA is a groundbreaking collaborative effort aimed at addressing the challenge of urban sanitation in areas where conventional solutions such as sewers, septic tanks and pit latrines have proven to be either too expensive, undesirable, unsafe for public health or contaminating of the environment. Alliance members currently provide safely managed sanitation services to over 60,000 people daily, with individual service footprints ranging from 100 to 1,500 households or public toilets.

SERVICE MODEL OVERVIEW

The three CBS providers participating in the study have designed relatively similar service models, each adapted to the unique conditions of their service areas. The different aspects of these models are summarized below and in **Figure 1**:

- 1. Toilets and Containers:** Both Clean Team and x-runner have an imported plastic toilet; the former was specifically designed for the business, while the latter is commercially available from a European manufacturer. SOIL opted for and designed a locally manufactured ferrocement toilet. Clean Team and SOIL contain waste in plastic sealable containers which are washed and recirculated after use, while x-runner lines its containers with biobags to facilitate pick up and reduce cleaning needs. All businesses offer locally sourced cover materials (waste from wood mills or agro-processing) used in place of water for flushing, with slightly different strategies to minimize odors.

Figure 1: Comparing the service models of the three businesses



- 2. Transport:** Clean Team and SOIL have adopted a three-stage transport model to address the challenging road infrastructure in their respective dense urban areas. This model can be summarized as: 1) door-to-door collection of containers by small motorized vehicles, 2) use of transfer stations (semi-centralized and decentralized respectively) for temporary storage of containers collected by the small motorized vehicles, and 3) secondary transport of containers to and from the waste treatment facility using larger trucks. In comparison, x-runner has adopted a single-stage, sub-contracted, 'customer drop-off' transport model reflecting customer and access characteristics within their context as well as the need for a special permit for transporting waste.
- 3. Disposal, Treatment and Transformation:** Clean Team disposes of its waste at a centralized, municipal-owned treatment facility managed by a separate waste management enterprise. Clean Team does not engage in treatment or value recovery itself, however they have a 5-year Memorandum of Understanding (MOU) to underpin their use of this treatment facility. X-runner's model is based on treatment and transformation of waste into compost, however during this analysis period they were experiencing some capacity issues at their composting site due to permitting issues which do not allow for the commercial sale of compost from human waste in Peru. X-runner is working to encourage a change in regulations to be more conducive and facilitating of composting fecal waste treatment. Both businesses are investigating the potential to transform the waste into commercially viable by-products. SOIL operates its own treatment facility, transforming waste into compost and selling it locally. Both Clean Team and SOIL have to wash and disinfect their containers after disposing of their waste, before drying them and sending them back to customers with cover material.
- 4. Systems:** All three companies have been developing systems to support and strengthen service delivery, improve customer experience and strengthen cost recovery. Clean Team custom-developed a mobile operations service system (MOSS) to track the logistics and customer payments, while SOIL uses a combination of off-the-shelf solutions: TaroWorks, Salesforce and NetSuite. Both businesses have introduced mobile money to reduce missed payments and the cost of payment collection. X-runner, on the other hand, has developed a payment collection model using bank agents in local shops to collect payments. They combine this model with other customized applications like Salesforce and Formyoula to track customer payments, inventory, and operation schedules.

METHODOLOGY

The study captured a three-month snapshot of the financial and operational data of each of the three service providers and attempted to standardize and harmonize it. This is not necessarily an accurate representation of the overall cost and sustainability potential of the businesses, but rather provided a sufficient illustration of the comparative trends and impact of different approaches on the bottom line.

SNAPSHOT OF RESULTS

Table 1: Snapshot of key indicators of the three businesses

	Units	Clean Team	SOIL	x-runner
Customers	customers	1,338	908	715
Toilet Cost ⁱ	USD	92	46	130
Annualized Toilet Cost ⁱⁱ	USD	18.40	10.45	16.25
Monthly Service Fee	USD	8.58	3.21	12.00
Direct Costs per Toilet	USD	6.67	13.57	19.42
Payment Rate	%	90%	74%	80%
By-Product Revenue per Toilet	USD	0.00	1.66	0.04
Acquisition Cost per New Customer ⁱⁱⁱ	USD	4.79	2.27	6.58
Average No. of Toilets / Waste Collector	toilets/collector	106	175	357
Customer Churn Rate	%	9.8%	25.0%	12.7%

i Landed cost • ii Dependent on depreciation rate of each toilet • iii Excluding sales payroll expenses

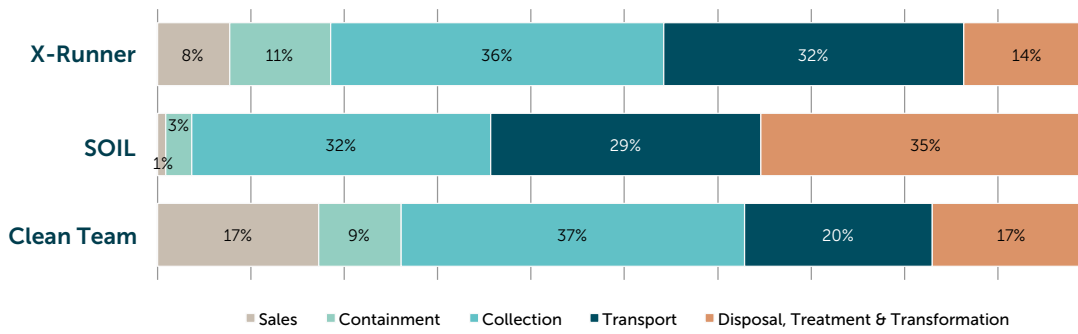
LESSONS LEARNED

Toilet Design and Estimated Asset Life: Comparatively, SOIL's locally manufactured ferrocement toilet had the lowest capital and depreciation costs, with no reported difference in impact on service quality or customer satisfaction. While the capital cost of x-runner's toilet was higher, it had a longer lifespan and thus a lower annualized cost compared to Clean Team's. Clean Team and x-runner have an advantage in production capacity as their toilets can be mass produced and are not constrained by the production capacity of informal local producers. SOIL chose a locally produced model as a means for generating livelihood opportunities in the neighborhoods where they work as well as out of necessity given extreme challenges with importation of externally produced materials.

Setting Service Fees: X-runner was able to charge the highest absolute service fee to its customers at USD 12.00 per month. However, the service fee paid over one year represented only 1.15% of Peru's gross national income (GNI) per person per annum, compared to Clean Team's 2.48% of Ghana's GNI. Clean Team's ability to charge the highest fee compared to GNI is mainly due to Kumasi's context where customers are used to paying (high willingness to pay) for sanitation as they are typically converts from pay-per-use public toilets which are costlier than the household service fee. SOIL, on the other hand, which charged the lowest service fee and operates in a context where paying for sanitation is not common (low willingness to pay), has a relatively competitive service fee at 2.15% of GNI. The impact of service fees and payment collection on the viability of a business is significant; for example, for Clean Team, a 1% increase in the fee or improvement in payment collection results in a 3%-point improvement in the gross margin. Clean Team's competitive margins were due in part to their higher payment rates which were achieved through mobile payments and an intentional push to increase customer satisfaction.

Managing Direct Costs: Clean Team had the lowest direct costs, due primarily to their ability to transfer responsibility of waste disposal to the private operator of the municipal facility at no cost. The latter is an opportunity not available to either SOIL or x-runner resulting in 322% and 133% higher treatment costs respectively. Furthermore, in the case of SOIL, the higher cost is a reflection of the additional strategic investment made in transforming the waste into compost. In regards to transport, SOIL had higher staff and maintenance of transport equipment costs even though it has a lower collection frequency, while the efficiencies gained by x-runner's simplified transport model are neutralized by their need to sub-contract transport to a licensed private operator. X-runner's direct costs were also strongly influenced by the use of expensive biobags to contain the waste.

Figure 2: Comparing the proportion of direct costs of each business



Strategies to Market Growth: Clean Team and x-runner reported similar above-the-line approaches of paper-based marketing (fliers, posters, etc.); the former business however was most effective at driving sales due to significant and strategic investment in coaching of the sales team. SOIL’s approach used a number of different channels (community ambassadors, cash incentives, paper-based marketing, prizes, etc.), which proved to be the leanest approach in terms of acquisition cost per customer. Although these marketing approaches have proved effective to date, it is likely SOIL will need to invest more heavily in marketing as they move towards rapid scaling. In the last year, x-runner has implemented referral mechanisms among their current customers that have helped them increase growth in their current service areas.

Opportunities for Ongoing Collaboration: While this work presents an unprecedented comparison of key financial and performance metrics across CBS services, the report analyzes only three months of operations for businesses that are rapidly evolving. In addition, while EGS did a considerable amount of work to standardize the way costs were assigned along the sanitation value chain and to extract valid and productive insights from their analysis, some key differences in financial and KPI recording practices across the groups limited the utility and validity of direct comparisons. The participants in this study recognize the need for standardization of KPI and accounting practices across the CBSA to better facilitate future analyses and foster continued collaborative innovation in the sector.

CONTEXT-SPECIFIC STRATEGY

Investing in Environmental and Social Externalities: A significant proportion of SOIL’s costs are a result of a decision to address critical environmental and social externalities unique to Haiti. 42.6% of Haiti’s territory is degrading, compared to 21% of Ghana’s, and 15.3% of Peru’s (Bai, et al. 2008). SOIL’s investment in composting waste not only contributes to safely managed sanitation and public health, but also in addressing Haiti’s unique challenge of soil degradation and erosion. In regards to social externalities, Haiti is ranked 130 out of 130 on the FM Global Resilience Index, compared to 80 of 130 for Ghana, and 82 of 130 for Peru (FM Global 2018). To address the chronically low resilience of Haiti’s infrastructure and social systems to the increasing risk of natural disasters and climate change, SOIL actively and strategically invests in building the resilience of its employees (as seen in its high ratio of salaries to GNI), customers, and the wider communities within which it operates.

Figure 3: Comparing service fees to GNI

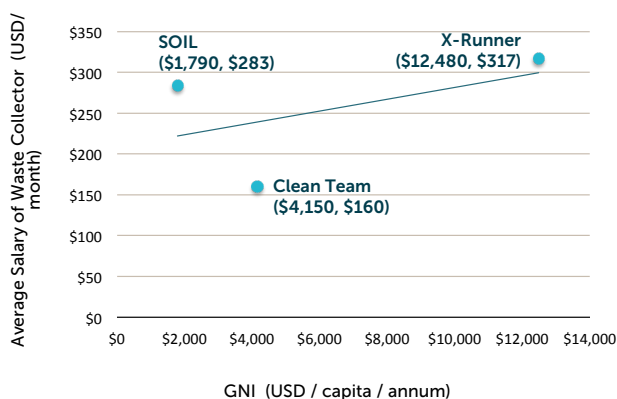
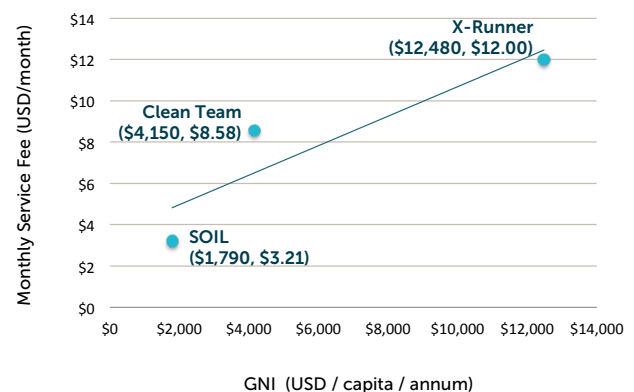


Figure 4: Comparing monthly salaries of waste collectors to GNI



Supporting Green Spaces: X-runner chose to invest in composting waste treatment in order to both support safely managed sanitation and to help address the deficit of green spaces in the city of Lima. According to figures from the World Health Organization, Lima should have at least 79 million square meters of green areas, however, there are currently only 23 million square meters of green areas. This leaves the city with a deficit of 56 million square meters. X-runner's long-term vision is to provide the resulting compost for use in urban areas of the city through agreements and collaborations with local municipalities.

Focusing on Financial Viability: Clean Team's ambition from its inception was to create a scaled, commercially self-sustaining social enterprise; making a significant contribution to address the sanitation crisis in Kumasi's relevant market of c. 260,000 households, and beyond, in the rest of Ghana. Business success lies in competitive pricing, outstanding service, and customer focus. Clean Team has a strong value proposition for customers. It is a cheaper and vastly superior service than public toilets and cheaper than constructing an individual household pit latrine. Similar to the other members of the CBSA, Clean Team reduces barriers to entry for customers via the service-based model and no large recurring costs. Following a start-up phase rich with learning, Clean Team has focused on achieving the gross margins necessary to prove a viable business model. Over the past two years, Clean Team has achieved a +60% swing in gross margin and reduced customer churn rate to less than 1% per month. In this time, it has also increased its customers by 80%. Clean Team's business plan over the next three years focuses on achieving break-even and then positive earnings by tripling its customer base and continuing to improve its unit economics, whilst also providing a safe, dignified, and affordable sanitation to its valued customers.

CONCLUSION

This study has led to significant learning by the three businesses, allowing them to showcase the effectiveness of their unique approaches, highlighting the cost drivers and opportunities yet to be addressed, and informing strategic shifts in their growth trajectories. By publishing this brief report, the sanitation businesses hope to contribute to the CBSA's goal of positively impacting sector growth and sustainability.

CONTACT INFORMATION

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Clean Team – works in Kumasi, Ghana

x-runner – works in Lima, Peru

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