



Measuring WASH Cost-Effectiveness

iDE's Sanitation Marketing Portfolio

Through its sanitation marketing approach, iDE has facilitated the sale of over 680,000 improved latrines across six countries in Southeast Asia and Africa since 2010. As each of these country programs achieves scale in the tens and hundreds of thousands of latrines sold, iDE is able to measure how cost effectiveness—the amount of program funding required to facilitate each latrine sale—changes over time. iDE has performed this analysis for the five programs where we've achieved greatest scale — Cambodia, Nepal, Bangladesh, Ethiopia, and Vietnam — in an effort to increase the rigor and transparency with which we demonstrate results, and to inform our decision-making in the future.

The analysis shows that iDE gains significant cost-effectiveness over time within countries and across the WASH portfolio globally. These improvements result from country teams refining their approach and processes through investments in personnel, management systems, and research and development (R&D). Additionally, each WASH country program is connected with others through iDE's global WASH portfolio, allowing them to leverage lessons learned in other countries to improve their own technologies and implementation. The analysis also reveals some differences in scale and cost-effectiveness trends over the program lifecycle in different countries. This is the result of unique market conditions as well as the tailored approach that iDE takes in response to these conditions.

Defining and Measuring Cost-Effectiveness

Calculating cost-effectiveness requires information on both program expenses and latrine sales. iDE tracks monthly project-level expense data in its integrated accounting system, capturing all iDE expenditures associated with sanitation marketing program implementation. Country offices track monthly sales data using sales and performance tracking forms, which are often built in a system called TaroWorks and synced to a dynamic cloud-based database in Salesforce. While we do track customer latrine prices and private sector investment, these figures are excluded from our cost-effectiveness calculations.

We utilize two cost-effectiveness measures in our analysis. Both calculations focus solely on the costs incurred by iDE to build markets for sanitation products and services, excluding any costs incurred by the enterprise or customer. These expenditures are all-inclusive in that they account for direct expenses like in-country program staff, travel expenses, and materials, as well as indirect and overhead costs used to fund support from iDE's global technical and operations teams.



The first measure is a whole-program unit cost, which simply divides the sum total of program expenses over the life of the program by the number of latrines sold:

$$\text{Program Unit Cost} = \frac{\text{Total Program Expenses}}{\text{Total Latrines Sold}}$$

These calculations give us an estimate that demonstrates the overall cost-effectiveness of the sanitation marketing approach in a specific country. At present, program unit costs in each iDE WASH country are as follows:

Country	Current Program Duration (months)	Program Unit Cost
Bangladesh	51	\$16
Cambodia	100	\$50
Ethiopia	34	\$60
Nepal	40	\$28
Vietnam	42	\$48

To provide a more nuanced view of changes to cost-effectiveness over the program lifecycle, we also employ an analysis of six-month rolling averages using the following calculation:

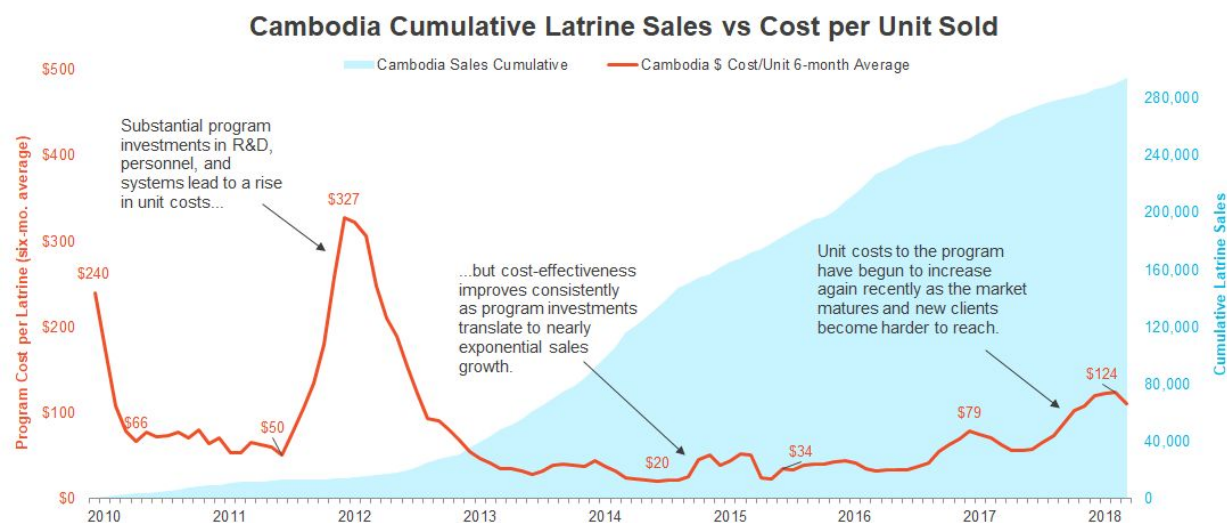
$$\text{Cost Per Latrine} = \frac{\text{Monthly Program Expenses (six-mo. avg.)}}{\text{Monthly Latrines Sold (six-mo. avg.)}}$$

This equation is more appropriate for observing trends over time, and especially for understanding how investments at different stages of a program's development are likely to translate into results. The remainder of this paper focuses on this analysis in the context of iDE's portfolio of sanitation marketing programs.

The Cambodia Case

Cambodia is home to iDE's longest-running and largest sanitation marketing program. With over 290,000 latrine sales in seven provinces and a nine-year track record, the program was iDE's starting point in examining cost-effectiveness over time. As the figure below demonstrates, the early months of the program saw relatively high per-latrine costs due to upfront expenditures in R&D and staff training. However, as the pilot phase gained traction and sales increased, program costs per latrine tracked

steadily downward until they settled around the \$50 range. This trend continued until mid-2011, when per-latrine costs jumped as the Cambodia program team made significant investments in product design and sales strategy refinements at the beginning of the program's scale-up phase. These investments quickly resulted in rapid sales growth, driving down per-unit costs to lower levels than in the pilot.

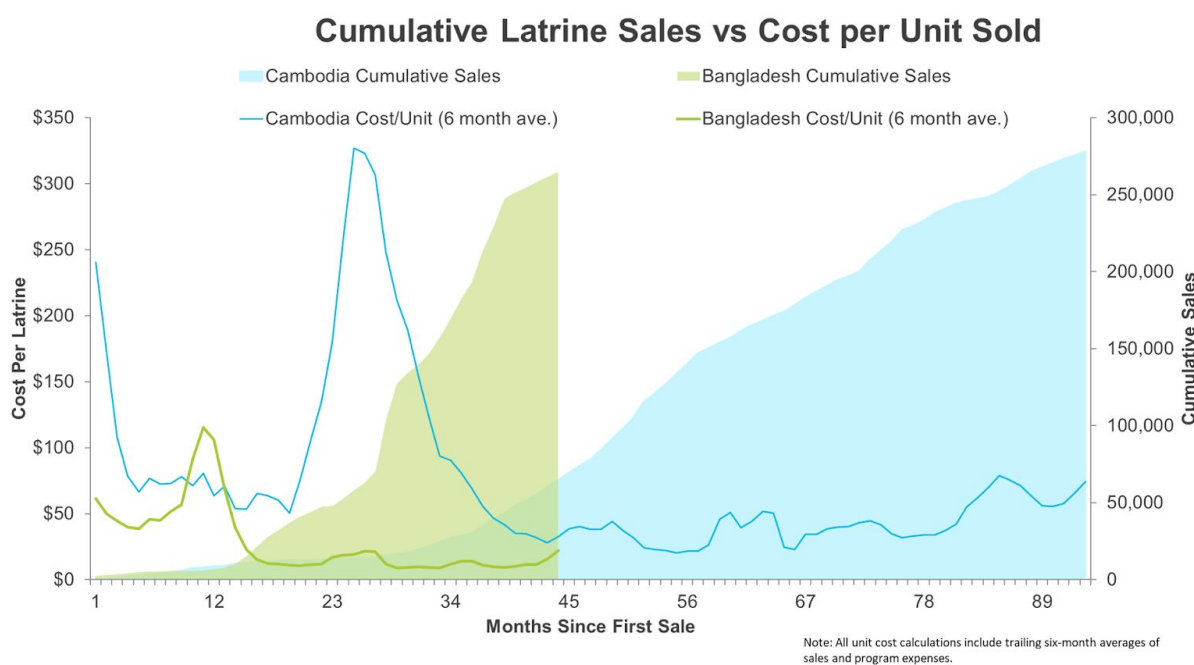


Information from Cambodia appears to confirm the hypothesis that iDE's sanitation marketing efforts drive down unit costs as they scale in low-coverage environments. In the figure above, this trend is apparent between 2012 and early 2016, when sanitation coverage rates in the project area rose from 29 percent to 56 percent. During this time, the program benefited from critical investments in management systems, staff training, and product innovation, all of which led to nearly exponential sales growth. However, unit costs began to climb again in late 2016 as the market matured and coverage rates rose further. New customers became more difficult to acquire in this environment, as sales staff were selling to poorer and more difficult to reach households. At the same time, iDE began making new investments in product and business model innovations to address the changing market dynamics. These trends have combined to drive up unit costs to levels in line with those in earlier program years.

With nearly nine years of data, we are able to see how unit costs in a sanitation marketing program change over time, from nascent to mature markets. To some degree, this analysis is unique to Cambodia, where iDE has taken an active market participant role in a weak and fragmented market. A similar look at our next-largest program in Bangladesh demonstrates a similar cost-effectiveness trend, but with key distinctions based on our unique approach in a different market environment.

A Rapid Path to Scale: Bangladesh

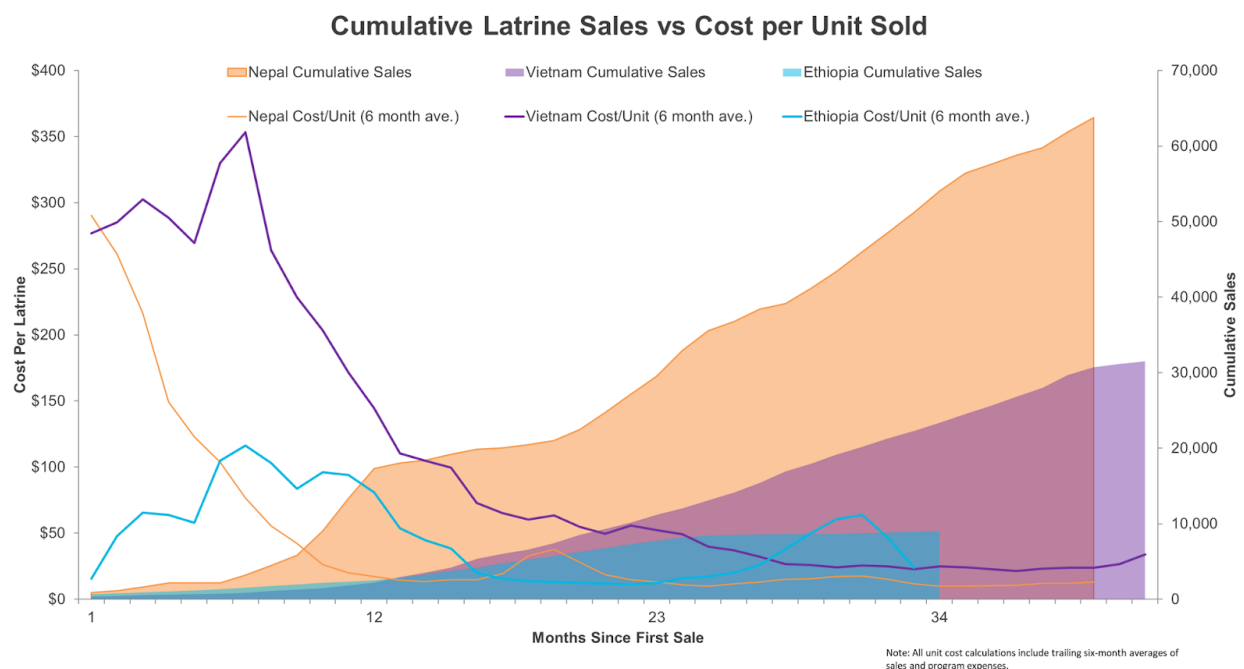
iDE's sanitation marketing program in Bangladesh has been operating since 2014, and has achieved similar scale to Cambodia in about half the time. As the figure below demonstrates, the cost-effectiveness trend in Bangladesh is remarkably similar in shape to Cambodia's: declining costs in the early stages of the program, followed by a jump as the program prepares for scale, and then a sharp decline as sales ramp up. Despite these similarities, the most obvious differences are the relatively low costs in Bangladesh and the speed with which the program achieved scale. This is due at least in part to very different market conditions: Cambodia's population is about 10 percent of Bangladesh's, and the private sector in Bangladesh is far more sophisticated in its ability to produce and deliver products (including WASH products) to consumers.



iDE adapted our sanitation marketing model to fit this market environment. In contrast to the strong market actor role we play in Cambodia, our Bangladesh team has adopted a market facilitator role by partnering with large, national-scale lead firms on product design and then connecting these partners to local suppliers, distributors, and sales networks. This model, in addition to being well-suited to the local market, has proven to be less resource-intensive than a more active market participant role. Finally, we believe that the Bangladesh program has benefited from institutional learning that occurs when similar approaches are implemented in different geographic, political, and market environments. The iDE sanitation marketing program in Bangladesh did not begin operating until 2014, about five years after the program in Cambodia. This allowed the Bangladesh team to learn from the Cambodian experience and instigated earlier programmatic investments to begin transitioning to scale.

Preparing to Scale: Vietnam, Nepal, and Ethiopia

More recently, iDE has adapted the Cambodia sanitation marketing model to two additional countries in Asia and one in Africa.¹ As with Cambodia and Bangladesh, different operating environments in each of these countries have led to distinct implementation models. Governments play a relatively strong role in the sanitation space in both Vietnam and Ethiopia. As a result, our teams there have designed their approach to leverage public-sector partners' resources and local knowledge to drive sanitation improvements. In Nepal, our team works directly with the private sector to provide a "one-stop shop" experience for the customer, a stark contrast to the weak and fragmented market we uncovered in our initial research.



Despite taking different approaches, each of these three countries has followed a similar path in terms of cost-effectiveness. As in Bangladesh and Cambodia, initially high unit costs have followed a consistent downward path over time as program investments result in growing sales numbers. Ethiopia does stand out with slightly higher unit costs currently, though they are comparable to both Vietnam and Nepal's unit costs when those countries had reached similar cumulative sales numbers.

¹ iDE is also operating in Ghana, but the relatively short implementation timeframe to date makes the data difficult to visualize in a useful manner.



How We Use Cost-Effectiveness Analysis

iDE has used these analyses to inform strategic planning and costing exercises across our WASH portfolio. For example, historic sales and cost-effectiveness data from Cambodia shaped financial modeling for our program in Ghana, where our for-profit social enterprise Sama Sama is poised to transition to scale after selling more than 1,000 toilets in the rural northern region of the country. The Cambodia program itself has used the six-month average unit-cost analysis to determine scale and financial milestones as the team pushes toward universal coverage in the final phase of the Sanitation Marketing Scale-up program. Finally, iDE WASH teams across the portfolio use the cost-effectiveness analyses as a gauge for “truth-checking” targets when working with potential donors and other partners.

Looking Forward

iDE views this cost-effectiveness analysis as just one example of the strategies that the WASH sector might use to understand the impact and sustainability of sanitation programs. The analysis suggests that well-tailored market-based models can drive improved cost-effectiveness over time through steady or even exponential sales growth. While each country looks different to some degree, the trends in cost-effectiveness and the correlation between targeted program investments and sales growth are useful evidence for demonstrating the potential for sanitation marketing to use limited resources to deliver meaningful results.

iDE also analyzes the impact of WASH programming by calculating benefit-to-cost ratios across the portfolio and annual income increases for WASH customers. As iDE’s other country programs achieve scale, we will continue to improve our measurement methodology while seeking partners and funders who can help us identify new and innovative ways to assess our impact.

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