Water SHED

Water, Sanitation & Hygiene Enterprise Development

Civic Champions Hybrid (2018-19)

Cost-Efficiency Analysis

In partnership with WaterAid

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ACRONYMS

CC	'Civic Champions', i.e. commune councilors who are skilled and experienced in leadership
CEA	Cost-Efficiency Analysis
CER	Cost-Efficiency Ratio
COA	Coaching
D	Discover Conference
DFID	UK Department for International Development
DWS	District Workshop
GEN	General expense
HH	Household
MTOT	Master Training of Trainers
ODF	Open Defecation Free
PTOT	Provincial Training of Trainers
PWG-AG	Provincial working group – Advisory Group
PWS	Provincial Workshop
RCT	Randomized Control Trial
VfM	Value for Money
VIP	Ventilated Improved Pit
WASH	Water, Sanitation, and Hygiene

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GLOSSARY of TERMS

Cost-Efficiency Analysis	A form of analysis that compares the costs of an intervention or program against the outputs of an intervention. Outputs are tangible deliverables of the intervention such as goods or services that are achieved or created by the program interventions as a result of the activities undertaken.
Cost-Effectiveness Analysis	A form of analysis that compares the costs of an intervention against the outcomes of an intervention. Outcomes are the benefits or results that are produced as a result of the outputs delivered by the intervention.
Stakeholder	Any party that is involved with or affected by an intervention.
Implementing stakeholder	Any party that is directly involved in planning, implementing and delivering a program. In Civic Champions' case this includes WaterSHED, WaterAid, and district and provincial government counterparts who are involved in planning and/or implementing program activities.
Incremental Analysis	Incremental analysis pertains to both incremental outputs and incremental costs that are a result of the intervention. This analysis takes into account all outputs and costs that occurred during program implementation, and subtracts those outputs and costs that would have occurred in the absence of the program.
Activity-based costing	This approach allows for a detailed, disaggregated understanding of program implementation costs by the activities that make up an intervention (e.g., training activities, coaching activities, etc.) to more accurately estimate delivery costs.
Ingredient-based costing	This approach provides a detailed, disaggregated understanding of program implementation costs by the resources that are used during program implementation (e.g., travel costs, per diems, etc.), to identify major and minor cost contributors to the program.
Social perspective	An economic perspective that takes into account all costs for all activities, goods and services that have contributed to achieving socially desired benefits, including relevant activities by stakeholders who were not directly implementing the activity. This perspective also accounts for benefits to society beyond the direct influence of the intervention.
Program perspective	An economic perspective that takes into account costs of only the implementing stakeholders' activities that have contributed to achieving outputs (and does not include relevant activities by stakeholders who were not directly implementing the program). This perspective does not capture the full cost of providing the program outputs and their subsequent outcomes to society. It is a useful perspective for understanding the efficiency of programs from the donor, government, and/or implementing partner's perspectives.
Household Leverage	The household leverage ratio (the ratio of household investment per program output to program costs per program output) at the program level can be included in the analysis as an indicator of cost-efficiency, as it measures the extent to which the program has been able to leverage additional funding to achieve results.
Fixed Cost	Fixed costs are costs that are independent of output. Fixed costs often include rent, buildings, machinery, taxes, insurance, interest, salaries, and wages.
Variable Costs	Variable or operational costs are costs that vary with output. Generally, variable costs increase at a constant rate relative to labor and capital. Variable costs may include materials, per diems, etc.
Discounting	Discounting is the idea that any amount of money has greater value today than an equal amount of money has in the future, as viewed from the present.
Inflation	Inflation is a quantitative measure of the rate at which the average price of selected goods and service in an economy increases over time. Inflation affects the market price of a good or service.

1.0 PURPOSE

This research study provides a cost-efficiency analysis (CEA) of the 2018-2019 Hybrid iteration of WaterSHED's Civic Champions program, a leadership development program for commune councilors to address sanitation deficits in their jurisdictions. The Hybrid iteration operated in 7 provinces from November 2017 to October 2019. The cost-efficiency of the program is internally benchmarked by comparing provinces in which the program was more and less efficiently implemented, and which factors may have contributed to variations. Then the cost-efficiency of the program is externally benchmarked against other relevant latrine promotion interventions in rural Cambodia.

2.0 EXECUTIVE SUMMARY

Access and usage of sanitation has been linked to a broad range of positive health outcomes.[1] This is enshrined in the Sustainable Development Goals (SDGs) which are fundamental to the policymaking and development goals of Cambodia. Increasing access to sanitation therefor is the goal of many organizations in Cambodia including the government and development partners and many approaches have been implemented across the country. This research adds to the body of work on the efficiency of sanitation interventions by examining the efficiency of WaterSHED's Civic Champions program which aims to increase basic sanitation access in addition to other outcomes. The main output of the program is the installation of new household pour flush latrines, which contribute to the establishment of open defecation free communities (100 percent use of sanitation facilities and greater than 85 percent improved sanitation coverage as required by the Government of Cambodia[2]). We compared the program efficiency in different provinces where the Hybrid iteration was implemented and in relation to other approaches used in rural Cambodia to increase basic sanitation access, to understand what methods are useful for the context and resources available. This research does this through the following analytic cases presented in Table 1 below.

Table 1. CEA Analytic Cases

	Case A	Case B	Case C	Case D
CEA at the Province-Level	WaterSHED + Government (6 provinces, organized as 5 cohorts)	WaterSHED + WaterAid + Government (1 province/cohort)		
CEA at the Program-Level	**Cases A + B:** Civic Champions Hybrid Iteration (7 provinces/6 cohorts combined: all three implementation partners)		Sanitation promotion programs	Programs offering hardware subsidies

2.1 Key findings

The Civic Champions 'Hybrid' program iteration was found to be a cost-efficient approach relative to other latrine promotion and subsidy interventions examined in the rural Cambodian context, based on comparing Cost Efficiency Ratios (CERs) measured as total program costs divided by the output of interest. At the provincial level, program implementation in some provinces (i.e., Pursat, Takeo) was two to three times more efficient than in the least efficient provincial cohorts (Kampong Cham, Kamgong Chhnang).

[1] Martin. n.d. "Water and Sanitation." United Nations Sustainable Development. Accessed April 30, 2020. https://www.un.org/sustainabledevelopment/water-and-sanitation/.
[2] National Action Plan Rural Water Supply, Sanitation and Hygiene 2019–2023. Ministry of Rural Development. Government of Cambodia.

Internal Benchmarking - Cases A and B

The results are presented below in 2018 dollars where all costs per province are added together and divided by that province's number of new households with an installed pour flush latrine to create province-level CERs. Case A (i.e., WaterSHED's five provincial cohorts) with an overall CER of $21.05, compared to Case B, (Kampong Chhnang) at $34.04 is more efficient. This appears to be primarily a function of lower fixed (salary and overhead) costs in Case A provinces. The CER of $21.05 per new pour flush latrine installed for Case A further demonstrates the efficiency of Civic Champions Hybrid when compared to CERs of prior iterations of the program. The program cost per new pour flush latrine was estimated at $26.12 (2013 USD; equivalent to $28.14 in 2018 USD) for the Pilot iteration[3] and $14.60 (2015 USD; equivalent to $15.47 in 2018 USD) for the Scale-up iteration.[4] However, neither of these earlier CERs accounted for costs of government partners' contributions to implementation.

Table 2. Provincial CERs per latrine installed (real, undiscounted), in 2018 dollars (Hybrid iteration)

	Case A					Case B
	Pursat	Takeo	Tbong Khmum	Battambang/Pailin	Kampong Cham	Kampong Chhnang
Total costs (fixed + operational)	$84,278	$64,428	$59,789	$82,472	$70,094	$117,833
Number of households installing new pour flush latrine over 10-month period	6,687	3,453	2,418	2,595	2,001	3,462
CER (USD per latrine installed)	**$12.60**	**$18.66**	**$24.73**	**$31.78**	**$35.03**	**$34.04**

The internal benchmarking activity revealed that drivers of efficient provinces were found to be:

- Lower costs for provinces where activities were held closer to participants (Pursat) and higher costs where government participants had to travel farther to participate; one cohort included government officials from two provinces which required some officials to travel farther for conferences (Battambang/Pailin).
- The highest total costs occurred where both implementers (WaterSHED and WaterAid) were overlapping (Kampong Chhnang); however, this province experienced a notable increase in coverage.
- When the team conducted the same activities in multiple provinces on the trip (i.e., without returning to Phnom Penh headquarters between activities), a systematically greater share of costs associated with staff preparation and travel were assigned to the first province visited (Battambang/Pailin and Kampong Cham).
- The most efficient province (Pursat) was not implemented at the lowest total cost; however, was able to effectively scale (cover a larger geography) and deliver a very high number of households with an installed pour flush latrine.

External Benchmarking

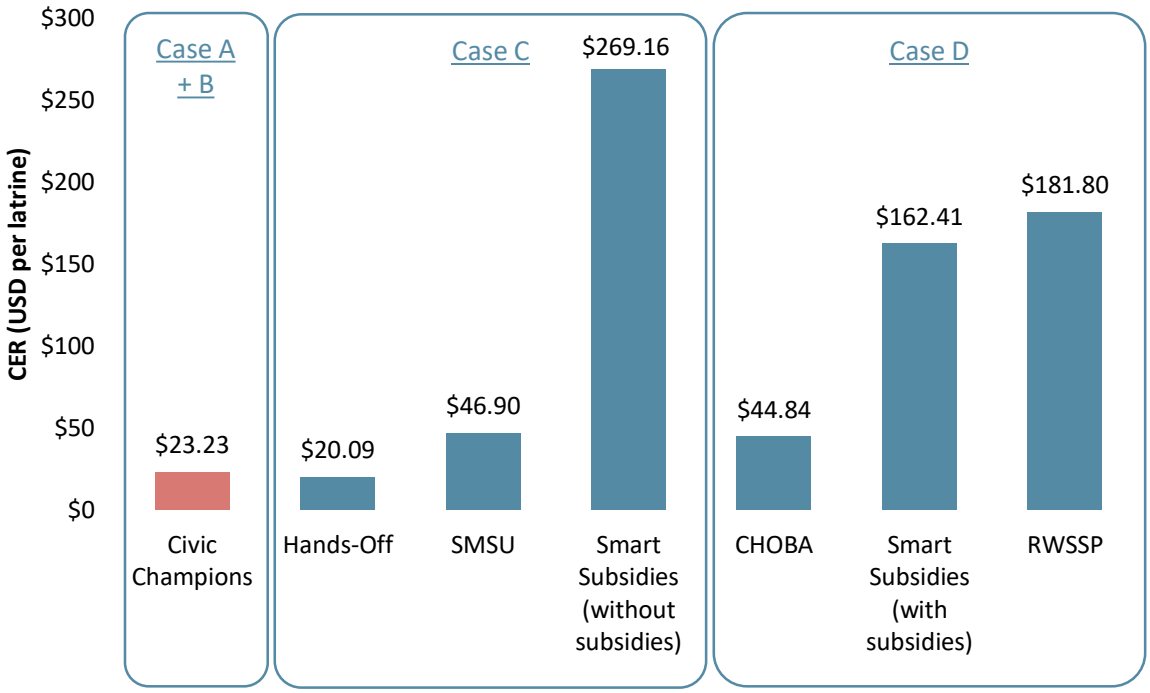
Case A and Case B costs and outputs presented in the previous section were added together to create a program-level CER for the Hybrid iteration of the Civic Champions program. Overall, total program implementation costs across WaterSHED, WaterAid, and the provincial and district government were $478,894 (2018 USD). Total pour flush latrines installed between the beginning and the end of the 10-month intervention in each program area equaled 20,616, equivalent to 6.5 percentage points in household pour flush latrine coverage gain across the population of participating communes. This results in a CER of **$23.23 per latrine installed**. This is the figure benchmarked against program-level CERs for other rural Cambodian sanitation promotion and subsidy projects, described below.

This analysis suggests that Civic Champions Hybrid has been an extremely cost-efficient sanitation program within the rural Cambodian context.

[3] Ann, S., Ky, S., and Heng, B. (2014). Cultivating Civic Champions: Evaluating leadership capacity development among elected, local-level government representatives in rural Cambodia. WaterSHED Asia.

[4] Bartell, J., Jenkins, M., Vizintin, P., and Salinger, A. (2020). Civic Champions 2015-2016 Scale-Up Evaluation. WaterSHED, Phnom Penh, Cambodia.

Figure 1. Cost-Efficiency Ratios* for Cambodia Sanitation Promotion and Subsidy Programs (2018 USD per latrine)



* Only Case A+B includes costs of government implementation partner staff time, in-kind facilities, and out-of-pocket expenses.

A number of factors may have contributed to the cost efficiency of the Civic Champions Hybrid program. Specifically, the Civic Champions Hybrid program:

- Benefitted directly from WaterSHED's "Hands-Off" sanitation marketing program that preceded it and was expressly designed to follow investments in local market development.
- Reduced costs through joint planning and implementation with sub-national government. Government staff time and in-kind resources dedicated in each province to implement key program activities and tasks were considerable and considerably more cost-efficient than if executed from Phnom Penh by the WaterSHED or WaterAid staff.
- The government and many commune councilors in these areas had also been previously introduced – via the Hands-Off program – to promoting and marketing latrines.
- Implemented more recently than any of the programs it is compared to. Over the past 10 years, Cambodia has seen uninterrupted economic growth and steady infrastructure development and the Civic Champions program may have benefited from these changes more than earlier programs.[5]

Household Leverage

Per dollar spent by all partners on the program, Civic Champions Hybrid was able to leverage $17.47 dollars of household resources, a relatively high value compared to household leverage in South and Southeast Asia reported in a review of market-based sanitation projects ($5 to $13.5) and sanitation subsidy projects ($1.20 to $10.3).[6]

Communes exceeding 85% improved coverage

At the end of the 10-month intervention, pour-flush household coverage in 16 of the 144 participating communes exceeded 85%. Of these 16 communes, 15 passed this threshold as a result of newly installed latrines. Exceeding 85% is the key infrastructure criteria for ODF status in Cambodia.[7] These 15 communes consisted of

[5] GDP growth rates have been above 6.0 percent since 2010. Source: World Bank Development Indicators.
[6] See Agarwal et al. 2020. Global assessment of grant-funded market-based sanitation development projects. Waterlines, Vol 39, no.2&3, pp 1-21.
[7] Ministry of Rural Development, Royal Government of Cambodia. (2013). *National Guidelines on ODF Verification.*

40,334 households and an estimated 201,670 people at an estimated program cost of $2.37 per person (assumed) living in an ODF community. The Civic Champions Hybrid program cost of $2.37 per person compares favorably with reported cost efficiencies of CLTS-based programs in South and Southeast Asia of $4 to $37 (pre-2015 USD values) per person (assumed) living in an ODF community, and appears highly cost efficient compared to Cambodia's 5+ year GSF-funded CLTS program with a cost-efficiency of $17 per person.[8],[9] Note that these comparative efficiencies do not consider potential government partner costs.

2.2 Conclusion and Recommendations

Taken together these results show that the efficiency of the program is due in no small part to its partnership with the government to implement the program and to prior WaterSHED investments in developing the local sanitation market, supported by the wide array of development actors who also work or worked in the same provinces. This analysis cannot say if the Civic Champions program was the most cost-efficient sanitation program in Cambodia, however the evidence presented throughout this report is sufficient to suggest the systems-approach promoted by WaterSHED and embodied in their Civic Champions program is certainly very cost-efficient, at $23.23 per latrine installed, when implemented in established sanitation markets. While this analysis likely over-attributes latrines to the program (because the Civic Champions program attributes any latrine installed in its communes during the 10-month program), this research has shown that under reduced attribution assumptions conducted via a sensitivity analysis, the Civic Champions program remains cost efficient.

It is clear that the program (if it remained similar in implementation) should be considered for scaling to other provinces and districts. However, this report has not considered whether or not the program would be sustainable outside of the direct supervision of WaterSHED or if those areas have the conditions in which the program would thrive, namely a developed sanitation market among other conditions. Further research should be done on the efficacy and sustainability of this approach relative to other programs especially in its attribution and its relationship and dependency on previous iterations of Civic Champions or other programs; specifically, more work should be done to understand the program's relationship with and dependency on previous iterations or other programs as well as the degree to which latrines installed in the program's target areas can be legitimately attributed to the program itself. Yet, throughout this research we have found that by effectively integrating and empowering key Cambodian stakeholders responsible for sanitation (i.e., sub-national and local government and households themselves) in the implementation of sanitation improvements, the program is able to reduce external development program implementation costs and achieve a considerable government contribution and household leverage ratio which is a unique and cost-efficient approach.

[8] White, Z., and P. Burr. (2016). *"Value for Money Study in Global Sanitation Fund Programmes: Synthesis Report."* 2016.UK: Oxford Policy Management and WSSCC.

[9] Trémolet S, Prat M-A, Tincani L, Ross I, Mujica A, Burr P, et al. (2015) *Value for Money analysis of DFID-funded WASH programmes in six countries. Ox*ford, UK: Oxford Policy Management.

3.0 DESCRIPTION OF INTERVENTION

WaterSHED uses a systems-approach to build the rural market for water, sanitation, and hygiene products and services in Cambodia. The organization conducts in-depth research to identify strategic opportunities and gaps in the wider system, and then works to strengthen the capacity and relationships between key actors to create a more dynamic and resilient market. By engaging key actors in the system, including small businesses, customers, and local government, WaterSHED facilitates the adoption of toilets, water filters, and handwashing stations – building a market that functions independent of traditional aid. To date, WaterSHED's Hands-Off marketing approach has successfully enabled small businesses to sell more than 200,000 toilets, generating more than USD $10 million in revenue for rural businesses, and helping accelerate sanitation coverage from a stagnant 25 percent to nearly 60 percent in six years.[10] WaterSHED has won awards from USAID's Development Innovation Ventures, Canada Grand Challenges, Bill and Melinda Gates Foundation's Grand Challenge: Putting Women and Girls at the Center of Development, and the Reed Elsevier Environmental Challenge. The WaterSHED team believes integrity comes first, strives for the highest efficiency and quality in their work, and promotes leadership at all levels.

About Civic Champions

Civic Champions stands apart from conventional capacity development programs in several aspects. Elected commune officials must apply in order to join and pay to participate. Rather than absorbing a predetermined curriculum during a one-off training, participants drive the 10-month iterative training process themselves. Through this process of creating a vision for community development, developing a plan of action, and executing against it, the program couples soft skills development with tangible gains in sanitation. Ultimately, WaterSHED hopes for other NGOs to replicate the program and for government ministries, such as the Ministry of the Interior, to adopt and institutionalize this program and to be able to deliver the program using government staff and budgets.

WaterSHED piloted the program in 2013-2014. Assessment of the pilot's impact on sanitation coverage revealed accelerated uptake among the two intervention districts compared to the control district.[11] A scaled-up iteration of the program was implemented in 2015-2016 and explored ways to make the program scalable and more cost-efficient. The evaluation of the scaled-up iteration indicated similar leadership development outcomes and accelerated latrine uptake, albeit lower per participating commune, than in the pilot.[12] However, at an estimated USD $14.60 (2015) in program expenditure per new pour flush household latrine installation, the evaluation found the scaled-up iteration was nearly two times more cost-effective than the pilot (estimated USD $26.12 (2013) per latrine).

The most recent Hybrid iteration was implemented in seven provinces. Costs for this iteration began in November 2017 and continued until October 2019; each province experienced 10 months of program activities, but not all provinces began implementation simultaneously. The first participant-focused activities were held in March 2018 (in this report, we refer to the most recent iteration as the Hybrid iteration or the 2018-2019 iteration). Seven provinces were divided into six provincial cohorts: 1) Kampong Cham, 2) Tbong Khmum, 3) Takeo, 4) Battambang / Pailin, 5) Pursat, and 6) Kampong Chhnang. Implementation was similar to the Scale-up iteration (See: Bartell et al., 2020); however, the Scale-up iteration featured three-day conferences and the Hybrid iteration (2018-19) held two-day conferences. Additionally, WaterSHED has re-designed the program to

[10] Jenkins, M.W., McLennan, L., Revell, G., and Salinger, A. (2019). Strengthening the Sanitation Market System: WaterSHED's Hands-Off Experience. IRC WASH Systems Symposium. Den Haag, The Netherlands.

[11] Ann, S., Ky, S., and Heng, B. (2014). Cultivating Civic Champions: Evaluating leadership capacity development among elected, local-level government representatives in rural Cambodia. WaterSHED Asia.

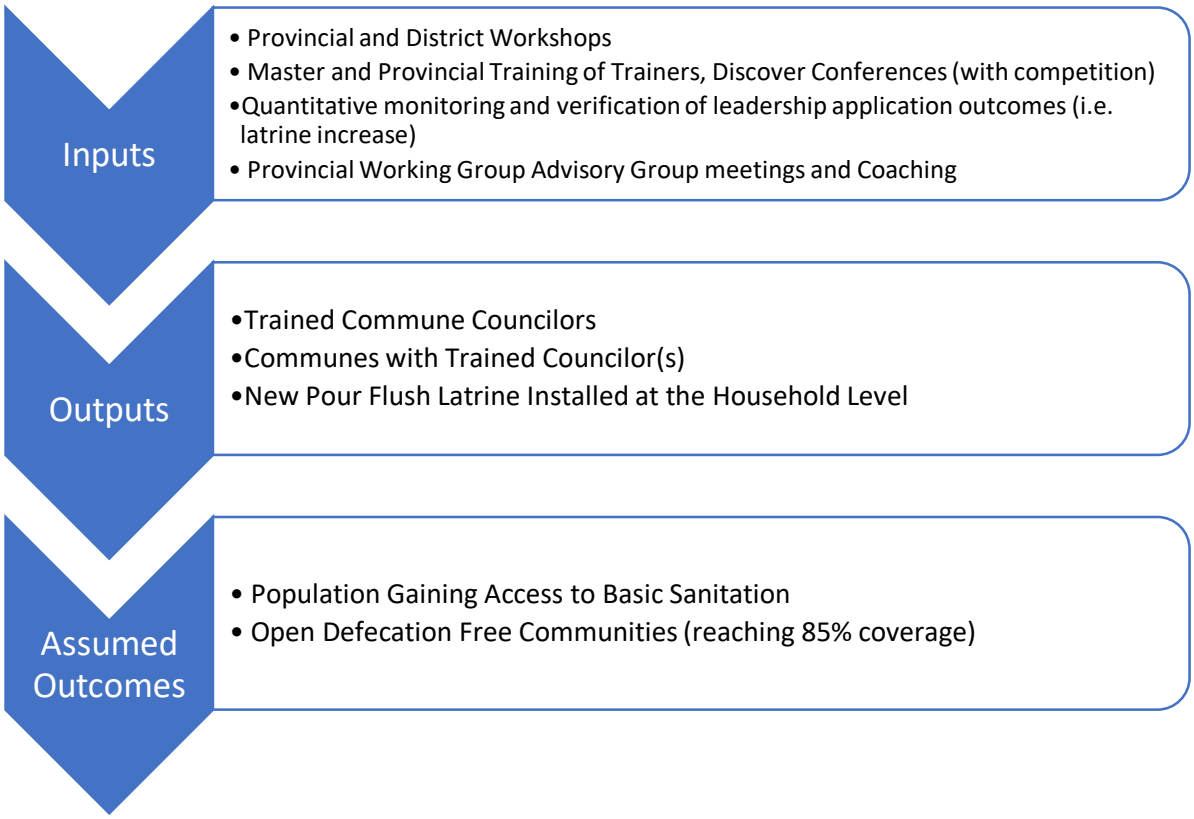
[12] Bartell, J., Jenkins, M., Vizintin, P., and Salinger, A. (2020). Civic Champions 2015-2016 Scale-Up Evaluation. WaterSHED, Phnom Penh, Cambodia.

empower provincial government to take a more significant role in funding and implementing the approach in the Hybrid iteration.

Civic Champions Hybrid involves a number of activities designed to enable and empower local leaders to promote sanitation in their communities. The key components of the 10-month training program include:

- Recruitment: elected officials (i.e., commune councilors) must apply to join and pay to participate. Activities associated with this component include provincial and district recruitment workshops in participating areas, collection and processing of applications and fees.
- Training cycles: the program's cyclical design has proven to be important to introduce ideas over time, reinforce earlier concepts, provide repeated opportunities to put new leadership skills into practice, and most importantly, inspire participants' confidence as they see others around them achieve goals and model behavior. Activities associated with this component include Master Training of Trainers, Provincial Training of Trainers, and "Discover" Conferences. Immediately following each Discover Conference, meetings of the Provincial Working Group Advisory Group (PWG-AG) are organized to reflect and make changes for the next/future Discover Conferences.
- Learning by doing: Participants drive the iterative process themselves with goal-setting, problem-solving, and peer reporting on achievements and challenges in addressing the household sanitation deficit in their jurisdiction. A peer-judged competition (in which a target number of new household pour flush latrine installations is assigned to each commune team to achieve over the next three-month cycle) is used to motivate effort and achievement. Trained district government staff provide one-on-one and team coaching in the field between conferences during each cycle.
- Quantitative measurement of leadership performance: By establishing the baseline sanitation coverage at the start of the 10-month program in each participating commune, and monitoring and independently verifying increases of new installed household pour flush latrines during each cycle, the program ensures a transparent, objective measure of leadership performance, while also producing tangible gains in sanitation. These data collection and verification activities are critical to the competition element of the program that motivates effort and application of new leadership skills during each cycle.
- Awards mechanism for peer recognition: A core component of the program is the peer-judged competition for leadership awards among those teams that reach their target each cycle. The competition involves team presentations, question and answer discussions, and peer voting. This process enables peer learning and peer recognition during each cycle. The participation fees cover the costs of cash prizes awarded for various achievements at the end of each three-month cycle.

Figure 2. Civic Champions Results Chain



According to Civic Champions' theory of change, the direct output of these activities is a cohort of trained 'Civic Champions' (CCs) (i.e. commune councilors who are skilled and experienced in leadership) who can continue to tackle sanitation deficits and other development problems in their jurisdictions even after the program concludes. These CCs return to their communes with workplans and enhanced leadership skills that they share with other members of the commune council. For this reason, the program also counts the number of communes with at least one trained CC as an important program output. Trained CCs apply their leadership skills to solving the sanitation problem as a component of the program itself and, therefore, new pour flush latrines installed by households is another direct and key output of the program. Tangentially, although not captured here, district and provincial government staff who are involved in planning and implementing program activities also gain new leadership skills and capacities to address sanitation deficits in their areas.

The assumed outcomes of new household pour flush latrines installed are that the affected populations in Cambodia gain access to basic sanitation, which then leads to the establishment of open defecation free communities (100 percent use of sanitation facilities and greater than 85 percent improved sanitation coverage as required by the Government of Cambodia[13]). This results chain is illustrated in the Figure below.

[13] National Action Plan Rural Water Supply, Sanitation and Hygiene 2019–2023 .Ministry of Rural Development. Government of Cambodia.

4.0 OBJECTIVES OF COST-EFFICIENCY ANALYSIS

This CEA analyzes the cost-efficiency of the Civic Champions Hybrid iteration by:

- Assessing the program delivery cost per new improved latrine[14] installed at the household level, as well as for other Civic Champions outputs (see Fig 1), resulting from the Hybrid iteration (2018-2019) of the Civic Champions program overall and by province, accounting for the costs of in-kind, staff time and financial inputs for implementation from government partners.
- Comparing cost-efficiency per latrine of Civic Champions Hybrid to that of other relevant programs designed to increase basic sanitation uptake in rural Cambodia, including sanitation promotion interventions and programs offering hardware subsidies.

5.0 METHODOLOGICAL APPROACH

The methodological approach is commensurate with the two objectives outlined above. This section will outline the approach and perspectives used to answer these objectives followed by the methodological components and limitations of this study.

5.1 Summary of CEA perspectives used in WASH analysis

In a cost-efficiency analysis there are several perspectives that can be used. According to a synthesis report by Oxford Policy Management: "It is more straightforward to assess the [Value for Money] VfM of a donor programme based on programme costs alone, when these costs are allocated by programme components. From a donor's perspective, VFM analysis based on programme costs can be seen as more relevant, since it provides a direct assessment of the quantity of donor funds invested to achieve a given result. However, in programmes that seek to leverage significant funding from other sources (including government funding and household contributions), these additional contributions need to be included in order to derive the total costs of achieving those results and to provide a basis for comparisons with other programmes."[15] Hence, CEA encourages the use of a perspective sometimes referred to as a Value for Money (VfM), social, or economic cost perspective. In this evaluation this is referred to as the **social perspective**. The UK Department for International Development (DFID) defines VfM as "maximising the impact of each pound spent to improve poor people's lives" (DFID, 2011). Oxford Policy Management wrote a guidance note for VfM analyses in the Water, Sanitation, and Hygiene (WASH) sector that specifies cost data "should be collected for all activities that have contributed to achieving outputs and actual outcomes in a sustainable manner, including relevant activities by actors outside the programme."[16] This perspective is important as "Neglecting local investments leads to underestimated total costs, leaves potentially disadvantaged beneficiaries out of cost considerations, and contributes to poorly informed policy"[17]. In the social perspective, household cash and in-kind expenditures would be included in the final cost-efficiency analysis.

The WaterSHED team indicated a preference for the donor's perspective (Prat et al, 2015): that of the business operator or **program perspective**. While this perspective does not capture the true cost of providing the benefits of sanitation to society, it is a useful perspective for understanding the efficiency of programs from the donor,

[14] Defined in this study as a new pour flush latrine installed at the household level that meets the following criteria: i) fully installed pour-flush latrine with superstructure, ii) installed in a household that does not already have a latrine, iii) installed during the data collection period for the Civic Champions program, iv) household must be within a commune that had at least one participating Civic Champion commune councilor, and v) household must contribute some (no specified amount) of their own money to the sub-structure. .

[15] Trémolet S, Prat M-A, Tincani L, Ross I, Mujica A, Burr P, et al. (2015) Value for Money analysis of DFID-funded WASH programmes in six countries. Oxford, UK: Oxford Policy Management

[16] Marie-Alix Prat, Sophie Trémolet and Ian Ross. How to do Value for Money analysis for water, sanitation and hygiene (WASH) programmes. GUIDANCE NOTE (August 2015).

[17] A.M. Garber, C.E. Phelps (1997). Economic foundations of cost-effectiveness analysis. J. Health Econ., 16, pp. 1-31 and Crocker, Jonny, Darren Saywell, Katherine F. Shields, Pete Kolsky, and Jamie Bartram. 2017b. "The true costs of participatory sanitation: Evidence from community-led total sanitation studies in Ghana and Ethiopia." Science of the Total Environment, 601, 1075-1083.

government, and implementing partner's perspectives. This perspective is often used to understand where cost savings can be achieved for the implementing organization(s), for example by leveraging external partners to bear some of the costs or finding efficiencies in their own approach. The program perspective is also used to compare alternative development approaches for achieving the same output (i.e., an improved latrine) and (often assumed) outcome (i.e., basic sanitation access, in this case). In the program perspective, household expenditures and all other indirect, local investment, or non-program costs would *not* be included in the final cost-efficiency analysis. Instead, these can be considered and evaluated as leveraged contributions from other parties.

5.2 Methodology for the WaterSHED CEA

This CEA is designed to inform WaterSHED on the cost-efficiency of the investment in Civic Champions Hybrid. Additionally, the cost-efficiency of this program is benchmarked against the costs of other rural sanitation programs in Cambodia to inform other stakeholders, including the Ministry of the Interior, on which approaches may be more cost-efficient in achieving increased basic sanitation access in Cambodia.

An important element in the cost-efficiency analysis is to examine the incremental impact of the program; that is how results and costs to the project implementers can be expected to differ from those that would prevail in its absence. Analysis was conducted on an incremental basis wherever it was relevant to do so. These incremental analyses isolate and analyze the incremental costs associated specifically with each program/intervention discussed in the external benchmarking section. Incremental costs are relevant if, for example, provincial government officials were already engaged in active community outreach, and as part of the Civic Champions program they increased their engagement by an additional two hours per month. In this hypothetical case, the incremental cost to the Civic Champions program is two hours, rather than their full community engagement costs each month.

The program perspective CEA assessed the incremental, program implementation costs and associated outputs (i.e., installed improved latrines) of two implementing models of the Civic Hybrid program (Cases A and B) and compared them to the costs of programs using other design and financing approaches (Cases D and C) to promote latrines in rural Cambodia. **Table 3** below outlines the general characteristics of the two Hybrid cases and two other design and financing cases examined.

	Case A	Case B	Case C	Case D
CEA at the Province-Level	WaterSHED + Government (6 provinces, organized as 5 cohorts)	WaterSHED + WaterAid + Government (1 province/cohort)		
CEA at the Program-Level	**Cases A + B:** Civic Champions Hybrid Iteration (7 provinces/6 cohorts combined; all three implementation partners)		Sanitation promotion programs	Programs offering hardware subsidies

Table 3. CEA Analytic Cases

Internal Benchmarking

Case A examined direct WaterSHED and government implementation costs (i.e., participating district and provincial staff time and in-kind and out-of-pocket contributions) against outputs in: 1) Kampong Cham, 2) Tbong Khmum, 3) Takeo, 4) Battambang / Pailin, and 5) Pursat. **Case B** examined WaterSHED, WaterAid, and government implementation costs in Kampong Chhnang where WaterSHED provided a consultancy service to help WaterAid implement and work with District WASH Committees to implement the program. The cost-

efficiency results for Cases A and B are internally benchmarked against one another by province (i.e., results are disaggregated and compared at the province level).

External Benchmarking

The cost-efficiency of these two Civic Champions implementation models (Case A and Case B) were combined (Case A + B) into a program-level result for cost-efficiency of the whole Civic Champions Hybrid program, which aggregated the costs from all relevant implementing stakeholders (i.e., WaterSHED, WaterAid, and participating district and provincial government partners). This was then compared against other sanitation intervention approaches in Cambodia that seek to achieve the same outputs as the Civic Champions program. This included: **Case C** which represents other sanitation promotion interventions; and **Case D** which represents programs where hardware subsidies are offered to encourage people to install latrines, often limited to specific target groups.

To identify interventions in Cambodia for Cases C and D, an internet search was conducted for publicly available literature that provided data for cost-efficiency of sanitation programs in Cambodia (see Civic Champions' Cost-Efficiency Analysis Plan for details on all programs reviewed) measured on a per latrine basis. We only selected publicly available data that provided costs and output data on actual project achievements rather than hypothetical or anticipated achievements. To ensure that the per-unit output variable for the external benchmarking exercise is similar to the one used for Cases A and B, we primarily used programs that promote or sell ***pour flush latrines at the household level.*** There is one program that is an exception to this, discussed below. It should also be noted that Civic Champions counted latrines as "installed" only if they also had a fully installed superstructure. In the cases that were selected for the external benchmarking exercise, latrines were counted as sold or installed if they included sub-structures at a minimum, although some may have also included super-structures. Finally, the Civic Champions program only counted latrines that had been installed, but not all cases selected for benchmarking counted installed latrines; some counted latrines that were sold or contracted. This does not guarantee that the latrines were in fact ever installed or used. This limitation does mean that these cases are not perfect comparisons to the Civic Champions program. All deviations are identified in Section 6.5 below.

All programs used for external benchmarking only consider grant-funded program implementation costs, and do not include external stakeholder costs such as those incurred by the household or by local or sub-national government when involved as implementation partners.

Interviews were used to complement the cost-efficiency data in the literature; stakeholders representing five of the six programs chosen for the External Benchmarking exercise were interviewed in February 2020.[18] These key informant interviews explored qualitative aspects of each externally benchmarked program to properly interpret its similarities and differences with the Civic Champions approach and any limitations for comparison. Key questions followed the Prat et. al. (2015) Value for Money Guidance for WASH programming including:

- Have the planned number of outputs been achieved, and if not, why not? Was this due to implementation challenges or to other factors, independent of the program's ability to deliver?
- How were latrines measured by and attributed to the program?
- Was the program able to leverage resources from other parties?
- What costs might not be considered in the publicly available literature?

Excluded Costs from Civic Hybrid analysis

Costs that are not included in this program perspective approach include the cost of commune councilors' time as well as the fees they paid. Commune councilors were the main participants in the program, who received the training and were expected to promote household sanitation uptake in their area. However, the costs of their

[18] Stakeholders were interviewed for all programs with the exception of the Asian Development Bank program, which did not return our requests for an interview.

time spent with the Civic Champions program is not captured in the program perspective used in this analysis as it was not a program cost incurred by the program implementers. Commune councilors in Cambodia have a mandate to improve the sanitation situation, among other development tasks, in their communes.[19] As part of WaterSHED's Hands-off Sanitation Marketing program, implemented from 2009-2017, WaterSHED supported provincial governments to operationalize this mandate among commune councilors. Therefore, the Civic Champions program is considered professional development training and commune councilors' time spent promoting sanitation during the program period is part of, not additional to, their regular job tasks.

Time spent by village leaders who were responsible for primary data collection and reporting of new household latrines, and who were often mobilized by participating commune councilors to promote new latrine installations in their village is not included in the program perspective. Their time is unknown and likely varied greatly across program intervention areas, and some of this time is likely part of normal job duties.

One of the most significant non-program implementation costs is the capital expenditure on the latrine, which was paid for by the households and not the program. This cost was excluded in the program perspective of the cost-efficiency analysis as it is not a direct program implementation cost. However, household contributions were separately estimated in the analysis of the household investment leveraged (described below).

Household Investment Leveraged

In kind (i.e., materials), time, and financial resources invested by the households themselves in constructing their latrine are considered non-program implementation costs and, therefore, are not considered in the cost-efficiency perspective chosen by WaterSHED for this analysis. However, households are key investors in household sanitation facilities. The household leverage ratio at the program level has been included in the analysis as an indicator of cost-efficiency, as it measures the extent to which the program was able to leverage additional funding from households to achieve results.

$$HH\ Leverage\ Ratio = \frac{Total\ Household\ Investment\ per\ Latrine}{Total\ Program\ Costs\ per\ Latrine}$$

Household investment includes their total cash expenditure for purchasing and installing the latrine including costs for sub- and super-structures, costs of any household time/labor to purchase and install the latrine, and costs of in-kind materials used in construction (e.g., bricks, tin roofing, wood for roofing, tarpaulin, bamboo, thatch, or stone that they had acquired previously or obtained without purchase). We also took account of any subsidies that households received toward the cost of constructing their latrines in addition to the value of their own investment. Data sources are discussed below. The total program costs per latrine figure in the denominator is the same figure as the CER per latrine (see "Cost-Efficiency Analysis Results" below).

Communes exceeding 85% household pour flush latrine coverage

Using data collected over the 10-month intervention in each participating commune as part of the Civic Champions program, we identified communes newly reaching the ODF coverage threshold of 85% by the end of the intervention. We estimated the number of people living in these newly coverage-qualified communes based on Civic Champions baseline data. During baseline data collection, village chiefs recorded the total number of households in their village and the total number of households without pour flush latrines. We utilized an average of 5 persons per household to establish the total number of people per commune.[20] While this is not the central focus of cost efficiency in this study, it is none-the-less an important objective for the program (see Figure 1) and a key priority of the Government of Cambodia.

[19] Mansfield, Cristina and MacLeod, Kurt. (2004). Commune Councils & Civic Society. Phnom Penh, Cambodia: Pact Cambodia.

[20] The 5 person/house average comes from a WaterSHED-administered census of its program areas that was carried out in 2019.

Period of Analysis

It is essential that the period of analysis across all programs match, to the extent possible. For Cases A and B, we match the period of analysis to the time period that best matches the program implementation period (i.e., 2018-2019) using 2018 as a base year (using real figures by removing inflation from the analysis)[21]. For Cases C and D, which were implemented in different time periods, cost-efficiency results are adjusted and reported in the same base year values (2018) to enable cost comparisons across Cases. For example, a CEA result from 2010 is not comparable to a CEA result in 2018 due to inflation in the Cambodian economy over that period of time. All CEA ratios from the literature for Cases C and D are converted to 2018 USD values[22] and presented as such in this report. This analysis does not discount the cash flows or outputs; therefore, the analysis is not in present value terms for the two-year period of analysis.[23] The publicly available data for the CEA ratios in Cases C and D did not specify if they were discounted, therefore we have assumed they were not discounted and made no further adjustments.

Cost-Efficiency Analysis Results

This analysis evaluated the cost-efficiency ratio (CER) for the four Cases. The CER reflects the cost on a per latrine basis. The ratio takes the form below and is calculated separately for each of the four Cases:

$$CER = \frac{Total\ Program\ Costs}{Number\ of\ Latrines}$$

Total program costs are calculated by aggregating incremental fixed costs and variable costs for Cases A and B (Civic Champions). This level of disaggregation was not available for Cases C and D in the External Benchmarking exercise. The data and results are presented in 2018 U.S. Dollars.

5.3 Limitations

One challenging aspect of measuring incremental results is the extent to which the increases in improved latrines at the household level can be attributed to the Civic Champions program since other sanitation improvement activities were active in some of the same geographic areas. This analysis assumes all pour flush latrines measured during the 10-month intervention in each commune where Civic Champions was operating are directly attributable to the Civic Champions program. However, interviews confirmed that there were other programs also promoting or subsidizing pour flush latrines at the household level in rural Cambodia at the same time as the Civic Champions program. These included the ADB supported Rural Water Supply and Sanitation Sector Project (RWSSP) offering subsidies for pour flush latrines, East Meets West Foundation offering subsidies, UNICEF with a community-led total sanitation (CLTS) program, and the Provincial Department of Rural Development providing latrines to marginalized households.[24] These stakeholder interviews did not offer sufficient retails and reliable data to determine overlap or attribution. Additionally in Kampong Chhnang, PLAN International operated a CLTS program through which two local NGOs promoted latrine uptake, including pour flush latrines, which overlapped with part of the period of WaterAid's Civic Champions program implementation.[25] As such, it is not possible to identify which households may have been influenced by Civic Champions or other programs. This almost certainly means that this analysis is limited by some degree of over-attribution of toilet installations to Civic Champions. To assist in evaluating the impact of over-attribution on the cost-efficiency of this program, the report tested

[21] Base year means that the analysis will be done in 2018 USD. This implies that inflation in 2019 and all other years has been removed from the cost calculations, allowing for a comparison on real costs alone. Adjustments were done with the World Bank World Development Indicators.

[22] Adjusting for 2018 dollars used the World Bank Consumer Price Index the U.S. Dollar; government salaries and labor wage rates in Cambodian Riel were converted to U.S. Dollars using the exchange rate from the year in which the Cambodian Riel values are reported.

[23] While we know this is an error, this approach comes at the request of WaterSHED.

[24] Stakeholder interviews, February 2020.

[25] Stakeholder interviews, February 2020.

different assumptions for the number of recorded new latrines installed during Hybrid attributable to Civic Champions Hybrid (i.e., 25%, 50%, and 75% of the total number of installed latrines).

6.0 DATA

The following section outlines the available data used in the CEA and how the analysis and its associated calculations were used.

6.1 Fixed Costs (Overhead and Salary)

Fixed Costs are business costs that would occur to the program whether the Civic Champions Hybrid program was actively operating or not. These include the rent for the offices, staff salaries, and other incidental overhead costs to the organization like equipment and other investments. To ensure the costs are appropriately allocated across all of the various programs run by WaterSHED and by WaterAid out of their country offices, it was necessary to calculate the share of each organization's fixed costs attributable to the Civic Champions Hybrid implementation activities. In both cases this was done by estimating the share of time spent by all staff in the organization on planning and implementing Civic Champions Hybrid[26]; however, the available data differed across each organization and therefore the approaches for estimating the staff time for WaterSHED and WaterAid are specified separately below.

WATERSHED

WaterSHED extracted data from recorded timesheets for the period November 2017 to October 2019 for staff employed by WaterSHED across all of its program departments (including directors). This summarized the number of hours that each staff member spent directly or indirectly on supporting and implementing each Civic Champions Hybrid activity and on general implementation and human resources management, planning and administrative tasks for the Hybrid iteration, out of their total available hours.

For program department teams that were involved in supporting or directly implementing Hybrid activities, the Hybrid Proportion (see equation below) was calculated separately for each team. Staff salary costs for these teams were calculated by multiplying each particular staff member's salary by the team-specific Hybrid Proportion.

$$Hybrid\ Proportion\ = \frac{Total\ Hours\ Spent\ on\ Hybrid\ Activities}{[Available\ work\ days - (1.67\ days\ of\ leave\ per\ month + Days\ of\ maternity\ leave)]\ *\ 8\ hours\ per\ day}$$

When aggregated across all staff members for all program departments, regardless of their involvement in the program, the proportion of program time spent on the Civic Champions Hybrid iteration across the organization was 26.53%. This proportion was then used as the share of total organizational overhead and administration costs (HR, Finance, administration and IT salaries; Building Rent; Vehicles, equipment, utilities, services, supplies, etc.) attributed to the Civic Champions Hybrid program during 24 months of implementation.

WATERAID

WaterAid provided estimates through a response to a Causal Design questionnaire of the time spent on the Civic Champions program by each of the program staff directly involved in implementation and for the operations team (i.e., operations manager, finance officers, and drivers). This was determined by eliciting the percent of all WaterAid staff working on Civic Champions (28%) and the average percent of time spent by these staff on Civic Champions (21%). Multiplying these percentages together results in the estimated share (6%) of total organizational non-salary operating overhead that can be attributed to WaterAid's implementation of the Civic

[26] Note, the Civic Champions program has additional activities which do not fall underneath the "Hybrid' iteration and are not included in this CEA.

Champions Hybrid iteration in Kampong Chhnang over 18 months of implementation. In the case of WaterAid, Hybrid was the only Civic Champions work stream.

For the total costs of salary for the 6% of staff time attributable to Civic Champions over the time period when the Hybrid iteration was implemented, WaterAid provided a percent of time of each staff member working on Civic Champions and their respective salaries, based on internal calculations.

6.2 Incremental or Variable Costs

Incremental or Variable costs have been analyzed using an activity-based accounting of program delivery costs.[27] This approach allows for a detailed, disaggregated understanding of the implementation costs by the activities that make up an intervention, and is facilitated by the detailed accounting done by WaterSHED and WaterAid of their non-salary costs. This provides more information on activities where economies of scale or efficiencies can be achieved, which may be useful for program design and management decisions. Activities included: provincial workshops (PWS), district workshops (DWS), master training of trainers (MTOT), provincial training of trainers (PTOT), discover conferences (D), provincial working group – advisory group meetings (PWG-AG), general expenses (GEN), and coaching (COA) (key inputs identified in Table 4 below).

Table 4. Activities examined by the CEA

Activities
• Provincial Workshop • District Workshop • Master Training of Trainers • Provincial Training of Trainers • Discover conference • Provincial Working Group - Advisory Group • General expense • Coaching

For an additional level of detail, we add an "ingredient-based" approach for all variable costs. This, again, tries to understand the most expensive ingredients, or resources, used during implementation to understand in which provinces there may have been efficiencies or alternatively, where program implementation was particularly costly. This information may be useful for program managers to understand where improvements might be made in the future. Key cost ingredients are analyzed for communication; travel; per diem and accommodation; materials; computers; conference costs (rooms, refreshments, lunch, facilitation); fees (bank and mail); and awards cost components (see Table 5 below). It is important to note that the cash award is paid for using participant fees, which are collected from each participating commune councilor at the start of the program. The majority of commune councilors pay the participant fee using existing commune funds, while others pay out of pocket. The 'awards' costs below represent the net costs and – therefore – have negative values in some provinces. Non-salary costs did not uniformly designate whether they were for WaterSHED or WaterAid staff members or government participants however they include costs for each of these actors.

Table 5. Ingredients Examined in the CEA

Ingredient Category	Details
Communications	Phone Credit, and Video

[27] Sometimes referred to as bottom-up costing. See: Crocker, Jonny, Darren Saywell, Katherine F. Shields, Pete Kolsky, and Jamie Bartram. 2017b. "The true costs of participatory sanitation: Evidence from community-led total sanitation studies in Ghana and Ethiopia." Science of the Total Environment, 601, 1075-1083.

Travel	Car Rental, Travel Costs, Fuel, and Gas
Per diem and accommodation	Per diem and accommodation for WaterSHED, WaterAid, provincial and district government counterparts, and commune councilor participants
Materials	Material supplies and document costs like copying, printing, and delivery
Computers	Computers
Conference costs	Room fees, Refreshments, Lunch, Facilitation fee (i.e., small payment for district trainers)
Fees	Bank fees, Exchange fees
Awards	Cash award, certificates, trophies, and medals

6.3 Government Costs

A key feature of the Civic Champions program was leveraging provincial and district government officials as implementors, facilitators (trainers) and coaches in the program. Their time on Civic Champions is taken into account in the CEA by measuring the incremental time these staff contributed to the program. Data on the number of officials who contributed time to the program (see Table 6 below) was collected via interviews with WaterSHED and WaterAid, conducted over the phone and by email, by Causal Design.

Table 6. Participating Government Staff Implementing Civic Champions in each Province

Province	Provincial Officials	District Officials
Takeo	7	6
Kampong Cham	7	6
Tboung Khmum	7	6
Pursat	7	15
Battambang / Pailin	12	9
Kampong Chhnang	6	8
Total	46	50

Through individual phone interviews with 4 provincial and 5 district officials who participated in Civic Champions, the research team estimated the average time that each government counterpart spent engaging with the program across individual activities. It is important to note that some of these activities occurred over two years prior to these interviews and interviewees struggled to accurately recall their time spent on each activity over the course of their interaction with the Civic Champions program.[28] We suspect that recall bias is a significant limitation in these estimates. Given the low number of interviews and incomplete provincial coverage of interviewees, we averaged time estimates by government level (province vs district) and applied the average time spent per individual per activity in all provinces.

In order to place a value on this time, the per person time contribution (in hours) is multiplied by publicly available salary data.[29] The hourly wages for government officials were estimated by dividing the annual salary values by the total working days per year (taking into account the 29 government holidays per year), which were

[28] Typically, we would use a shorter recall period, but pursued this approach based on WaterSHED's request to use activity-based costing of all implementation costs.

[29] Sub-decree on the modification and increase of the salaries of government civil servants. NDCC. Government of Cambodia. Collected from WaterAID, unclear what year this originates.

estimated to be 231 days. We estimated the hourly wage for Provincial and District Council Members at $1.82 and $1.46 per hour, respectively, in USD 2018 values, across all provinces.

Table 7. Hours Spent per Individual on CC Activities by Government Officials (across all provinces)

	Provincial Officials			District Officials		
	2018 Values	2019 Values	Total	2018 Values	2019 Values	Total
Provincial Workshop (PWS)	76	2	78	17	0	17
District Workshop (DWS)	8	2	10	21	0	21
Master Training of Trainers (MTOT)	0	0	0	0	0	0
Provincial Training of Trainers (PTOT)	23	17	40	77	37	114
Discover conference (D)	29	31	60	85	74	158
Provincial working group (PWG-AG)	101	96	197	45	37	82
General expense (GEN)	0	6	6	0	17	17
Coaching (COA)	6	8	14	42	14	56
Total	243	162	405	286	179	465
Total Cost (per individual)	$442	$295	$737	$418	$261	$679

In an attempt to capture out-of-pocket costs incurred by the government, Causal Design asked the provincial and district officials who were interviewed what additional costs were born by the government for the Civic Champions program. While no provincial officials reported additional costs, two district officials reported out-of-pocket expenses for gas, travel, and refreshments and materials for meetings. One reported using their own car twice a month during the project for a total contribution of USD $270 for gas and $225 on meeting refreshments in the field. Another district official reported spending USD $17.5 on travel and $25 for meeting materials during the project. Across the 5 district officer interviews, this represents an average expenditure of $107.5 USD, which we assume is a total per participating district. These out-of-pocket costs have been ascribed to the Coaching activity category. Note, this may not reflect the actual average contribution given the limited sample of interviews. In addition, sub-national government provided free use of district meeting and provincial meeting halls for Civic Champions activities, valued in Table 8.

Table 8. Government In-Kind (Facilities) and Out-of-Pocket Contributions

	Pursat (# of districts = 5)	Takeo (# of districts = 2)	Tbung Khmum (# of districts = 2)	Battambang / Pailin (# of districts = 5)	Kampong Cham (# of districts = 2)	Kampong Chhnang (# of districts = 2)

Provincial Workshop (PWS)		$225	$90	$90	$225	$90	$90
District Workshop (DWS)		-	-	-	-	-	-
Master Training of Trainers (MTOT)		-	-	-	-	-	-
Provincial Training of Trainers (PTOT)		-	-	-	-	-	-
Discover conference (D)		$870	-	$290	-	-	-
Provincial working group - Advisory Group (PWG-AG)		$210	$280	$280	$210	$280	-
General expense (GEN)		-	-	-	-	-	-
Coaching (COA)	In-kind	$70	$70	-	$70	-	-
	Out-of-pocket	$537.5	$215	$215	$537.5	$215	$215
Total In-kind		$1,375	$440	$660	$505	$370	$90
Total Out-of-pocket		$537.5	$215	$215	$537.5	$215	$215

6.4 Output Data

The primary output measure used in this analysis is installation of improved latrines, which is an intermediate output towards basic sanitation access and the ultimate goal of achieving open defecation free communities (100 percent use of sanitation facilities and greater than 85 percent improved sanitation coverage as required by the Government of Cambodia).[30]

NEW POUR FLUSH LATRINE INSTALLED AT THE HOUSEHOLD LEVEL

The CEA measures costs on a "per latrine" basis as a measure of efficiency of the program. Specifically, the measure for the effect of the program, or the output variable, is the number of new pour-flush latrines purchased and installed at the household level. This is an output in the Civic Champions program theory of change (see Figure 2) which aims for households gaining basic sanitation access and usage of an improved latrine. This does not include latrines installed in schools, healthcare centers, pagodas, etc., nor does it include households that already had latrines installed in their homes. Latrine data for Cases A and B are derived from Civic Champions monitoring data collected by village chiefs, reported by the commune councilors, and verified by WaterSHED and/or WaterAid.[31] These data were used to calculate the total number of latrines constructed during the 10-month intervention, per province for Cases A and B. They were also used to calculate the number of people newly living in open defecation free communes at the end of the 10-month intervention.

WaterSHED and WaterAid latrine data reflect latrines that meet the following criteria: i) fully installed pour-flush latrine with superstructure, ii) installed in a household that does not already have a latrine, iii) installed during the data collection period for the Civic Champions program, iv) household must be within a commune that had at least one participating Civic Champion commune councilor, and v) household must contribute some (no specified amount) of their own money to the sub-structure.

As mentioned in other areas of this report, the installation of these latrines **cannot** be directly linked to the Civic Champions program. The difficulties separating these effects is the key limitation in this CEA.

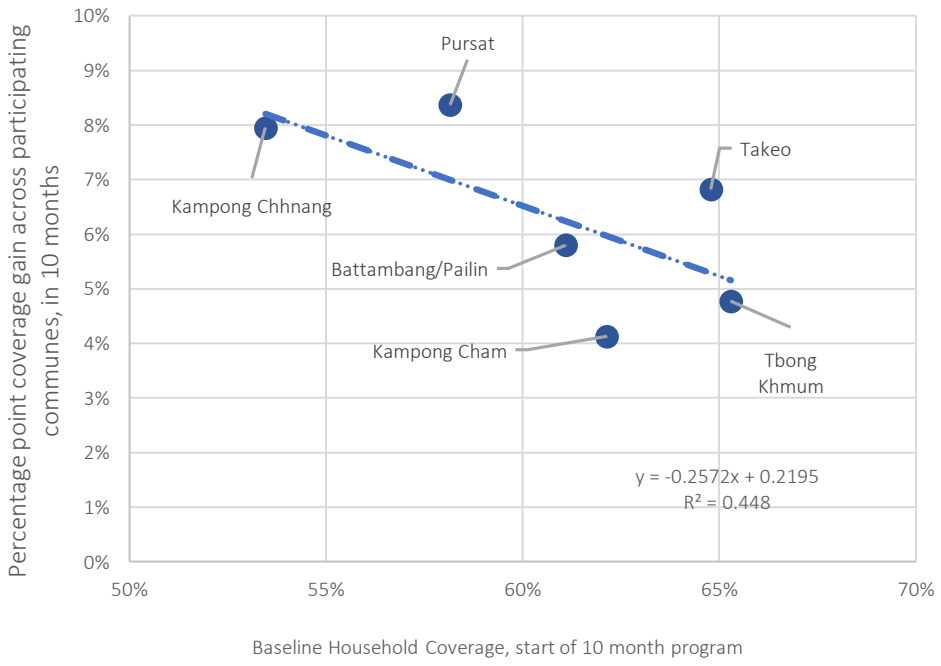
[30] National Action Plan Rural Water Supply, Sanitation and Hygiene 2019–2023 .Ministry of Rural Development. Government of Cambodia.

[31] All latrines with dates outside of the correct reporting period removed. Missing values and/or unclear HH names are clarified by WaterSHED field staff. Call checks are conducted only for those communes that met their latrine targets. Call checks involved selecting 20 households from each commune. The number of HH checks from each village within the commune was proportionate to the number of latrines that village contributed to the commune total in that program cycle. Latrines were removed from the commune total when they are found to not fit one of the necessary inclusion criteria.

Table 9. Household Level, New Pour Flush Latrines Installed, by Province (during 10-month program period)

Province	# of New Pour-Flush Latrines Installed Toilets
Battambang / Pailin	2595
Kampong Cham	2001
Kampong Chhnang	3462
Takeo	3453
Pursat	6687
Tboung Khmum	2418
Total	20,616

Figure 3. Baseline Coverage and 10-month Coverage Gain in Participating Communes



POPULATION NEWLY LIVING IN COMMUNES EXCEEDING 85% COVERAGE

At the start of the 10-month intervention (i.e., baseline) in each participating commune, only one commune had over 85% pour-flush household latrine coverage; by the end, 15 additional communes exceeded 85% coverage. Pour-flush latrine coverage averaged 60.7% at baseline and increased by 6.5 percentage points (pp) across the population of 315,836 households living in participating communes. At province/cohort level (Figure 3), pp gains in pour flush coverage achieved during 10 months in participating communes were negatively correlated with baseline coverage ($R^2 = 0.45$), while province/cohorts with the highest baseline coverage gained the most people newly living in ODF coverage-qualified communes by the end of intervention (Table 10).

Table 10. People Living in ODF Coverage-Qualified Communes by Province

Province	Households Living in Participating Communes at Baseline	Communes > 85% Baseline Coverage # (households)	Communes > 85% Endline Coverage # (households)	Household Living in Newly ODF Coverage-Qualified Communes
Battambang / Pailin	44,773	1 (3,411)	3 (6,451)	3,040
Kampong Cham	48,529	0 (0)	2 (5,031)	5,031
Kampong Chhnang	44,050	0 (0)	2 (3,965)	3,965
Takeo	50,595	0 (0)	4 (8,345)	8,345
Pursat	77,207	0 (0)	3 (7,329)	7,329
Tboung Khmum	50,682	0 (0)	2 (12,624)	12,624
Total	315,836	1 (3,411)	16 (43,745)	40,334

6.5 External Benchmarking Data

Cost and output data from other Cambodia sanitation promotion and subsidy projects and programs come exclusively from publicly available sources. Because the data derive from a variety of sources with varying levels of transparency in reporting details about each data point, we encountered a number of limitations. In some cases, it is not clear the year in which the costs are reported, which was a challenge for adjusting these costs for inflation for accurate comparisons across programs. In these cases, the assumption is the costs reflect the year the program began as this is the year when many programs tend to raise funds from donors or foundations. Specific assumptions for each program selected for the External Benchmarking exercise are explained in Table 11 below. Full details on each program, its implementation, and the costs and outputs attributed to them are explained in Section 7.2 below, along with the results of the External Benchmarking exercise. No comparison cases account for costs of government time and/or in-kind resources although they may have been important implementation partners in some cases; only grant/aid funded program costs are considered.

Table 11. Cambodian Sanitation Promotion Projects & Programs – Data and Assumptions

Case	Program	Outputs Data[32]	Costs Data (source, assumptions, adjustments)
Case C	iDE Smart Subsidies – without subsidies (trial)[33]	Pour flush latrines sold. The study reports latrines sold, although interviews with two researchers confirmed that they counted only latrines that were installed. Latrines were counted on a one-to-one basis from the orders collected by the sanitation teachers that were trained and paid a commission by iDE.	Using the results from this 10-month trial, fixed costs included operational, administrative, and staff costs required to implement the program over ten months. Further details on the costs are not available (for example, if overhead costs such as the finance and HR teams' costs are included). Operational costs included the commission paid to sanitation teachers and average loan-processing costs. No dates were associated with the reported costs, so it was assumed that reported costs were in 2015 values (when the trail began) and Causal Design adjusted for inflation to USD 2018 values.

[32] We did not examine if this output data also included the purchase and installation of latrine super-structures.
[33] Results reported during the trial period. Macaranas, R. & Nicoletti, C. January 2017. Smart Subsidies Cost-Effectiveness Analysis.

	iDE Sanitation Marketing Scale Up (SMSU) Project[34]	Pour flush latrines sold. Latrines were measured and attributed to the program by looking at records from the latrine sales agents and local business owners that were recruited and trained by the SMSU project.	These total costs reported in the source report[35] were adjusted for inflation assuming approximately $760,000 was spent on the pilot in 2009[36], $6.87 million was allocated to the first program scale-up in 2011[37], and the remainder of the total costs from our source report ($2.01 million) was then allocated to the last program iteration that began in 2014 (USD values in year indicated, not adjusted for inflation). Causal Design then adjusted these figures for inflation to USD 2018 values.
	WaterSHED Hands-Off Sanitation Marketing Program Scale-Up (Hands-Off)[38]	Pour flush latrines installed. Latrine sales were measured and attributed to the Hands-Off program by collecting sales records from the SPs in the Hands-Off network. WaterSHED verified and spot checked a sub-sample to ensure that latrine sales ultimately led to installed latrines.[39]	Costs were assumed to be reported in 2011, the year in which the Scale Up phase of the program started, and Causal Design adjusted these figures for inflation.
Case D	iDE Smart Subsidies – with subsidies (trial)[40]	Pour flush latrines sold. The study reports latrines sold, although interviews with two researchers confirmed that they counted only latrines that were installed. Latrines were counted on a one-to-one basis from the orders collected by the sanitation teachers that were trained and paid a commission by iDE.	Using the results from this 10-month trial[41], fixed costs included operational, administrative, and staff costs required to implement the program over ten months. Further details on the costs are not available (for example, if overhead costs such as the finance and HR teams' costs are included). Operational costs included the commission paid to sanitation teachers, the average subsidy value paid out, and average loan-processing costs. We assumed the reported values were 2015 values (when the trial began) and Causal Design adjusted for inflation.
	Community Hygiene Output-Based Aid (CHOBA)[42],[43]	Pour flush latrines installed. Latrines attributed to CHOBA were measured as the latrines built and installed directly by workers trained by the program.	It was unclear if reported costs included the full program operational costs, or just the output-based aid. Causal Design's interview with the stakeholder was unable to provide any clarity on this issue (as the report was not produced by the implementing partner). We assumed that the nominal costs reported in the data were in 2012 values (when the project began) and Causal Design adjusted for inflation. Program cost was estimated from the reported CER and latrine figures.
	ADB Tonle Sap Rural Water Supply and Sanitation Program (RWSSP)[44]	Latrines installed or contracted. More than half of the latrines were pour flush latrines, but the output data also included dry pit or ventilated improved pit (VIP) latrines.	Cost data includes all sanitation project costs available such as direct implementation costs (software, hardware, salaries, allowances, program management, and support), support costs (staff training, travel, research and development), and subsidies. We assumed that costs reported were in 2006 values (when the program began) and Causal Design adjusted for inflation accordingly. Cost was estimated from the reported CER and latrine figures.

[34] See page 71of USAIDb (2018), *Scaling Market Based Sanitation: Desk review on market based rural sanitation development programs.* Washington, DC., USAID Water, Sanitation, and Hygiene Partnerships and Learning for Sustainability (WASHPaLS) Project.

[35] See page 71of USAIDb (2018), *Scaling Market Based Sanitation: Desk review on market based rural sanitation development programs.* Washington, DC., USAID Water, Sanitation, and Hygiene Partnerships and Learning for Sustainability (WASHPaLS) Project.

[36] Robinson, A. (2012). *Sanitation Finance in Rural Cambodia. Water and Sanitation Program: Guidance Note.* February 2012.

[37] Sustainable Sanitation Alliance. SuSanA website, accessed February 2019. Source: https://forum.susana.org/167-market-development-in-action/11517-ide-sanitation-marketing-scale-up-smsu-1-0-project-details

[38] WaterSHED (2019). Estimating the Economic Benefits of Market-Based Sanitation Programs: Model Design and Application. April 2019. Source: http://www.watershedasia.org/wp-content/uploads/Economic-Benefits-of-Market-based-Sanitation.pdf. Please note that this is a change from the Analysis Plan submitted for this analysis. This source was preferred over the one cited in the Analysis Plan as the data were more precise, coming from the project implementer directly. It was also difficult to ascertain why the previous source quoted program cost data that exceeded the program cost data quoted directly by the program implementation team.

[39] Stakeholder interviews, February 2020.

[40] Results reported during the trial period. Source: Macaranas, R. & Nicoletti, C. January 2017 Smart Subsidies Cost-Effectiveness Analysis.

[41] Results reported during the trial period. Source: Macaranas, R. & Nicoletti, C. January 2017 Smart Subsidies Cost-Effectiveness Analysis.

[42] USAIDb (2018). *Sanitation Finance in Rural Cambodia. Water and Sanitation Program: Guidance Note.* February 2012.

[43] Rivera G. Joseph, S. Smets, V. Chan, P. Ljung, S. Um, H. Nguyen, and J. Albert. presented May 15, 2016. The Effect of OBA Subsidies Combined with Sanitation Marketing (SanMark) on Latrine Uptake Among Rural Populations in Cambodia.

[44] Robinson, A. (2012). *Sanitation Finance in Rural Cambodia. Water and Sanitation Program: Guidance Note.* February 2012.

6.6 Household Investment Data

Household expenses and time required the following data:

- Cash expenditure by households for purchasing and installation of latrines *(data collected by WaterSHED)*
- Time spent on purchase and installation (i.e., cost of time spent on making the purchase and labor for installation if household member(s) contributed labor) *(data collected in phone interviews by Causal Design)*
- In-kind contributions to materials (i.e., cost of goods purchased for another purpose or gathered materials (*data collected in phone interviews by Casual Design)*

In addition to the above, the total cost of latrine construction includes any local funds or materials provided by the commune, community or other local sources or programs as a subsidy to poor households.

The data are presented below. Please note that data collected by Causal Design via 14 interviews over the phone with households, is not statistically representative. The dataset collected by WaterSHED, for household cash expenditure, was collected by hand on physical ledgers from village chiefs and spot checked by WaterSHED.

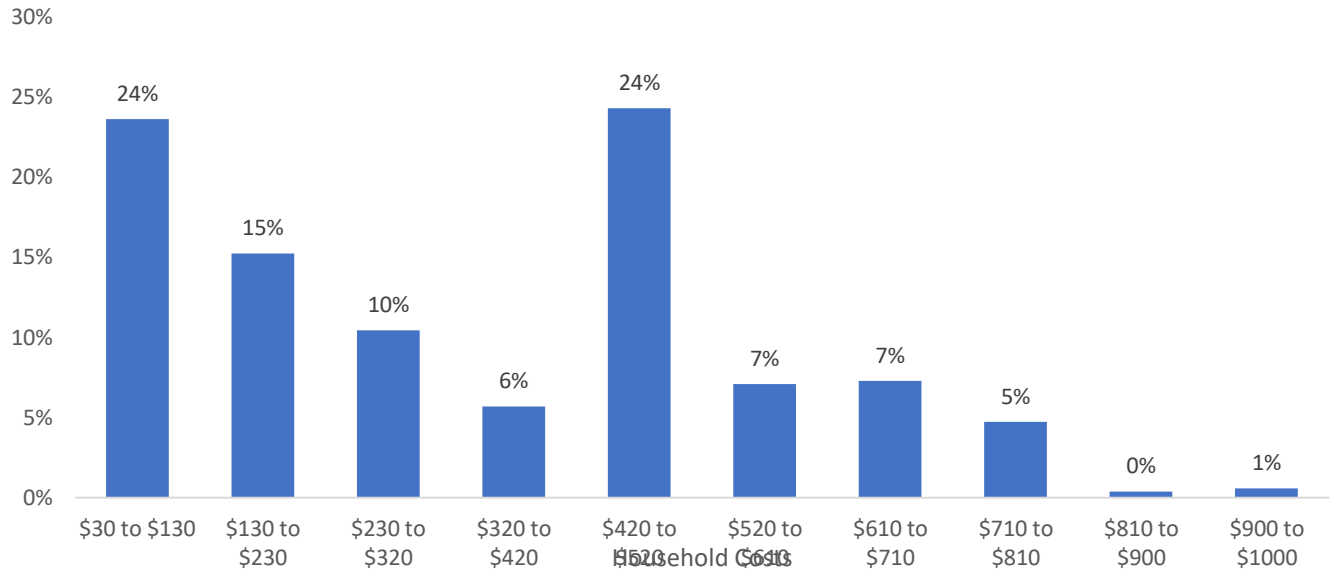
CASH EXPENDITURES FOR IMPROVED LATRINE BY HOUSEHOLDS

To measure cash expenditures for purchasing latrines, the village chief collects the amount each household spent to build their latrine directly from the household and records the amount in the monitoring form used to track latrine installations for Civic Champions Hybrid. As stated above regarding the latrine data, these logbooks are then collected by commune councilors and submitted to WaterSHED.[45] The Causal Design research team digitized a sample of 1,017 recorded latrine expenditures and the results are presented below in Figure 4. The cash expenditure reported by the household includes some combination of the cost of substructures, superstructure, and/or installation, depending on which latrine components and/or services the household purchased.

This data reveals a bi-modal distribution of latrine costs. Household cash expenditure generally clustered around two cost ranges: $30 to $130 per household and $420 to $520 per household, with 79% spending less than $500. The average cash expenditure across all households was $356. The lower range cost of $30 to $130 dollars was paid by 24% of the sample; this group of households may have only purchased a substructure, may not have opted into an installation service, and/or may have received a subsidy or rebate. The average for the 14 households contacted by Causal Design via a phone interview, was $537[46]. The households sampled for phone interviews appear not to be representative of the population, unless households continued to invest in their latrines after the program ended as is likely. Regardless, given the small sample size, the validity of estimates for additional household labor and in-kind material investments derived from the interviews is uncertain.

[45] These costs could not be verified by the Causal Design research team.
[46] N=13; Out of 14 respondents, 1 answered 'I don't know' to this question

Figure 4. Distribution of household cash expenditure for latrine purchase/installation[47]



Note: No data was available for Kampong Chhnang, n=1017 observations drawn from WaterSHED records.

COSTS OF INSTALLATION (INCLUDING TIME AND IN-KIND CONTRIBUTIONS OF THE HOUSEHOLD)

Time spent purchasing and installing the latrine was estimated from the sample of 14 phone interviews with households. In many cases, households with more available time might dig the foundation for the latrine or build the latrine superstructure by themselves and hire out a mason for only the most difficult parts of the installations. We estimated that households spend an average of 40 hours on purchasing and installation tasks, where some households spend no extra time on purchasing and installation and the highest amount of time spent was 2-3 hours per day spent over 2 months.[48]

The opportunity cost of this time was valued using the prevailing market daily wage rate in rural Cambodia and included in the household leverage ratio. WASH studies that assign a value to the opportunity cost of time (including non-economic activities) typically use the wage rate for unskilled labor or the minimum wage. The wage rate for unskilled labor is most appropriate in the rural Cambodian setting where informal employment is common; the administratively-set minimum wage rates would likely overestimate the wage for unskilled labor.

The World Food Programme collects data on prevailing daily wage rates for unskilled labor in many countries, including Cambodia; the most recent Cambodian estimate was adjusted to 2018 dollars for use in the CEA analysis.[49] This may underrepresent the value of time spent by some households, since some of the households that installed toilets included in this analysis are not among the poorest and therefore would have a higher opportunity cost of their time. The daily wage rate was estimated to be $5.39 (2018 values).

During the interviews, 5 respondents reported that they contributed resources or in-kind goods they had previously purchased for another purpose (e.g., tin roofing, wood for roofing, or tarpaulin) or had gathered materials (for which they did not pay like bamboo, thatch, or stone), of which 4 provided a USD value. Those who reported that they did not contribute any resources or gathered materials were assigned a value of zero for this calculation. The average costs, across the sample, for these construction materials was estimated to be $23[50] and is included in the household leverage ratio.

[47] Latrine cost data sourced from WaterSHED and collected by village chiefs in the Civic Champions logbook during program activities. See earlier details.
[48] N=14; Out of 14 respondents, all provided estimates of time spent.
[49] World Food Programme (2014). December 2014 Food Price and Wage Bulletin.
[50] N=13; Out of 14 eligible respondents,1 was excluded who answered that they had made in-kind contributions to their latrine but did not know the amount.

SUBSIDIES

Finally, some households may have received a subsidy to build their latrine. These include subsidies from local commune level civil society organizations, commune council funds (commune women and children fund), and subsidies from local or international NGOs (specifically a respondent mentioned Andra Organization in Pursat). Of the 14 eligible households that were interviewed for the analysis, only 3 mentioned that they received a subsidy. Of the two households that were able to list the amount of the subsidy, both reported subsidies of $50. The other reported they may have received 1 ring or help with pit digging. Averaged across the 13 households (who knew the amount of the subsidy they had received) this resulted in a subsidy of $7.52 (2018 value) per installed latrine.[51] This figure provides some limited context about subsidy options that may have been available to the households in some Civic Champions Hybrid target areas. However, this amount is not included in the household investment total as we are interested in the household investment leveraged by the program rather than the total cost of the installed latrine.

7.0 COST-EFFICIENCY ANALYSIS FINDINGS

This section presents the CEA results, relying on the data discussed in the previous sections for each province and for the program as a whole.

7.1 Internal Benchmarking

As discussed previously in this report, CERs are the total program delivery costs divided by the number of latrines installed per province and overall, for the program. The results find quite varied efficiencies between provinces (see Figure 5 below). Overall, the Civic Champions Hybrid iteration was most cost-efficiently implemented in Pursat (at $12.60 per latrine installed) and least cost-efficient in Kampong Cham (at $35.03 per latrine installed). Case A represents areas where Civic Champions Hybrid was implemented by WaterSHED (with government partners), while Case B was implemented by WaterAid (with government partners) in a partnership with WaterSHED, the first such joint NGO implementation of the Civic Champions program. Thus staff salary and overhead costs at both WaterAid and WaterSHED created high fixed costs for Case B.

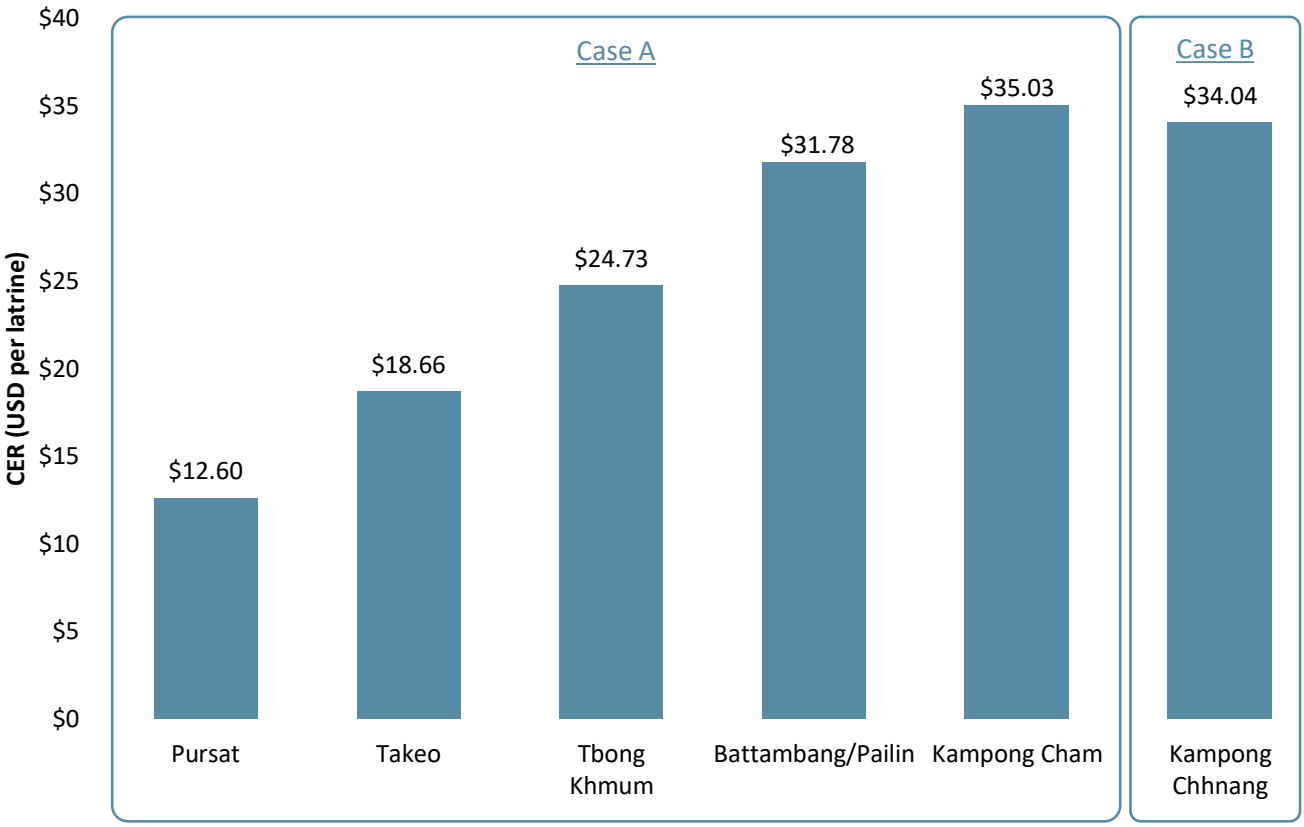
The provincial level results seem to fall into two groups. One group of provinces with relatively higher program costs per latrine (Batttambang / Pailin, Kampong Cham, and Kampong Chhnang) had an average cost per latrine of $33.56. The other group of provinces with relatively lower costs (Tbong Khmum, Takeo, and Pursat) had an average cost per latrine of $16.60 – half of the first group. This section explores why we may see these differences in cost efficiencies among the provinces.

Generally speaking, provinces with relatively lower efficiency had the highest total costs (fixed and operational costs, see Table 12). However, Pursat, which was the most cost-efficient province, had relatively high total costs (the third highest of the six provincial cohorts) but had significantly more latrines installed than other provinces. For example, Pursat's latrine increase was almost double the number of latrines installed in Kampong Chhnang, which had the second highest increase in latrines. In contrast, the low costs of the program in Tbong Khmum resulted in high efficiency despite relatively fewer latrines installed (second lowest).

Although Kampong Chhnang had the highest costs, which reflect in part the joint fixed costs of both WaterSHED and WaterAid, there were a relatively high number of latrines installed in this province resulting in a marginally higher efficiency compared to Kampong Cham.

[51] N=13; Out of 14 eligible respondents; 1 respondents was excluded who answered that they had received assistance, in the form of 1 ring and/or pit digging from their commune Womens and Children fund, but did not know the value.

Figure 5. Cost-Efficiency Ratios (CER) for Civic Champions' Provinces (USD per latrine)



The CER for Case A (i.e., average across WaterSHED's five provincial cohorts) is $21.05, which, when compared to Case B, (Kampong Chhnang) at $34.04 is more efficient. This appears to be primarily a function of lower total costs in Case A provinces. The CER for Case A further demonstrates the cost efficiency of Civic Champions Hybrid when compared to prior iterations of the program. The cost per latrine was estimated at $26.12 (2013) USD for the Pilot iteration[52] and $14.60 (2015) for the Scale-up iteration[53]; neither of which reflect time, in-kind, or out-of-pocket contributions from sub-national government implementing partners. The Pilot iteration, which was conducted in only one province, was implemented solely by WaterSHED. During the Scale-up iteration, government partners facilitated conferences and enabled the cascade facilitation model much as they did in Hybrid, which was key to implementing Civic Champions at scale. However, the cost per latrine for the Scale-up iteration does not account for government contributions. The Hybrid iteration was implemented at a similar geographic scale and saw government play an even more hands-on role as implementing partners. The Hybrid CER, although larger than the Scale-up CER in absolute value, accounts for the efforts of government implementing partners and represents important cost efficiencies that were realized as a result of these government partnerships.

[52] Ann, S., Ky, S., and Heng, B. (2014). Cultivating Civic Champions: Evaluating leadership capacity development among elected, local-level government representatives in rural Cambodia. WaterSHED Asia.

[53] Bartell, J., Jenkins, M., Vizintin, P., and Salinger, A. (2020). Civic Champions 2015-2016 Scale-Up Evaluation. WaterSHED Asia.

Table 12. Provincial CERs per latrine installed (real, undiscounted), in 2018 dollars (Hybrid iteration)

	Case A					Case B
	Pursat	Takeo	Tbong Khmum	Battambang /Pailin	Kampong Cham	Kampong Chhnang
Total costs (fixed + operational)	$84,278	$64,428	$59,789	$82,472	$70,094	$117,833
Number of households with an installed pour flush latrine	6,687	3,453	2,418	2,595	2,001	3,462
CER (USD per latrine installed)	**$12.60**	**$18.66**	**$24.73**	**$31.78**	**$35.03**	**$34.04**

TRAINED COMMUNE COUNCILORS AND COMMUNES WITH TRAINED COUNCILORS

In addition to the Cost Efficiency Ratios per latrine installed, trained commune councilors and communes with trained counselors are also key outputs in the theory of change (see Fig 1). CERs for both of these outputs are calculated and presented in Table 13 below. The program has the following definitions for these outputs:

1. Civic Champions commune with a 'trained commune councilor": is a commune (i) with at least one councilor who has paid the fee to participate and (ii) has had representation present for at least two Discover conferences, which constitutes at least one full 'cycle' of the program (i.e., training, setting latrine targets, three months of working toward targets, and reporting on targets at the second of the two Discover conferences); and,
2. Trained Civic Champion commune councilors: councilors who have paid the fee and participated in at least one[54] Discover conference.

One of the reasons that Pursat may have been particularly cost-efficient per latrine installed could be that this province had the largest number of commune councilors trained by the program (58 people) and was the most efficient in training these councilors (costing $1,453.07 per councilor trained). Similarly, participating commune councilors in Pursat covered the largest geographic area (36 communes), which suggests that Civic Champions scaled their intervention quite efficiently in this province. Takeo was also similarly efficient in their costs per councilor trained and per commune covered.

Kampong Chhnang had the highest costs per commune councilor trained and per commune. Combined with the per latrine CER results above, this suggests that Civic Champions may not have been particularly efficient in scaling their implementation in Kampong Chhnang across geographic areas, but the councilors that were trained may have been particularly effective in promoting latrine installation in the areas where they operated. It should be noted that District WASH committees were engaged as a part of a broader effort by WaterAID in the same districts where Civic Champions operated and the outputs in latrines achieved may have benefitted from this increased effort and focus on sanitation and WASH. While the share of WaterAid Cambodia's overall organization-wide overhead costs attributed to the Civic Champions program was relatively small (6%; see Section 6.1 above) compared to that of WaterSHED (26.53%), WaterAid's operations appear to be more expensive overall, resulting in higher fixed costs for Case B than for any Case A provinces. WaterAid, as a part of a much larger international organization, operates with a higher level of overhead than WaterSHED, which – as a local NGO – is able to operate in an extremely lean manner in terms of expenditures.

Kampong Cham and Battambang / Pailin had relatively high numbers of commune councilors trained but relatively low efficiency (high CERs per latrine). Thus, while these provinces may have been able to scale efficiently, the commune councilors they worked with were not particularly effective in promoting latrines in their communities.

POPULATION NEWLY LIVING IN COMMUNES EXCEEDING 85% COVERAGE

[54] The number of commune councilors who attended at least two Discover conferences drops to 239-245 depending on attendance at the fourth Discover conference, for which data was missing for six commune councilors. This has no bearing on the number of communes with at least one trained commune councilor.

We also examined the cost efficiency for delivering another output in the Civic Champions Results Chain (see Fig 1), namely the population living in participating communes that had reached the ODF household coverage threshold of 85% pour flush latrines by the end of the 10-month intervention. Cost Efficiency Ratios per person living in a newly ODF coverage-qualified communes ranged from $0.95 to $5.95 across the provinces (Table 13), with an overall program cost of $2.37 per person (Case A+B combined).

Table 13. CERs per councilor, per commune and per ODF person (real, undiscounted), 2018 dollars (Hybrid Iteration)

			Case A			Case B
Province	Pursat	Takeo	Tbong Khmum	Battambang/ Pailin	Kampong Cham	Kampung Chhnang
Total costs (fixed + operational)	$84,278	$64,428	$59,789	$82,472	$70,094	$117,833
Number of installed pour flush latrines	6,687	3,453	2,418	2,595	2,001	3,462
CER (USD per latrine installed)	**$12.60**	**$18.66**	**$24.73**	**$31.78**	**$35.03**	**$34.04**
# of Civic Champions (trained commune councilors)	58	42	30	45	42	37
CER (USD per commune councilor trained)	**$1,453.07**	**$1,534.00**	**$1,992.95**	**$1,832.71**	**$1,668.91**	**$3,184.67**
# of communes with at least one Civic Champion (trained commune councilor)	36	25	15	25	21	22
CER (USD per commune with at least one councilor trained)	**$2,341.06**	**$2,577.13**	**$3,985.91**	**$3,298.88**	**$3,337.81**	**$5,356.04**
# of people newly living in a commune exceeding 85% pour flush household coverage	36,645	41,725	61,120	15,200	25,155	19,825
CER (USD per person assumed living in an ODF community)	**$2.30**	**$1.54**	**$0.95**	**$5.43**	**$2.79**	**$5.94**

RESULTS FROM THE ACTIVITY-BASED COSTING

Takeo and Tbong Khmum certainly benefit from significantly lower Discover Conference costs which represent the largest category of all activity costs, and notably lower total activity costs (see Table 14). This may be a function of the smaller geographic size of these provinces. Discover Conference costs include travel costs to the provincial capital for participating commune councilors. These costs will be lower in smaller provinces like Takeo and Tbong Khmum where the program often also pays for fewer nights of accommodation for participants because they do not require an additional day for travel back to their communes.

Pursat as the most cost-efficient province, also had the highest activity costs of all provinces. High costs for Discover Conferences in Pursat reflect the large number of commune councilor participants and geographic coverage (number of communes) in this province and may also be a function of its geography (i.e., the province is relatively large and includes mountainous terrain, which leads to high costs for participants' travel reimbursements). Pursat remains the most cost-efficient province considering only activity costs per latrine installed, even with its relatively high activity-based costs.

Battambang / Pailin provides an interesting case in terms of the costs, as the program combined two provinces that shared some costs. However, the combination of these provinces increased costs for PWG-AG meetings and coaching (given the increased distance and number of officials). This combination approach led to a larger number of trained commune councilors; however, this did not necessarily translate into increased latrine installations relative to other provinces. These findings suggest that combing the operations in these two provinces did not necessarily lead to a more efficient implementation relative to the other provinces. Rather, it increased the costs for activities that involved provincial government officials (i.e., PTOT, PWG-AG) because these involved travel, per diem and accommodation costs for twice as many people compared to other provinces.

Finally, it is important to discuss Case B, Kampong Chhnang, where there are notably higher fixed expenditures for salary and overhead as a result of both WaterSHED and WaterAid's joint involvement in activities within this province. However, this province was not the most expensive in its activity-based costs (i.e., operational costs, which include all government costs). Kampong Chhnang captured some savings in their Provincial and District Workshops, Provincial Working Group – Advisory Group meetings, and in their coaching expenditures. In Table 14 below, we have also examined the CERs looking only at the activity–based operational costs per latrine installed (i.e., removing the fixed costs). While the relative cost-efficiencies across provinces do not change much, it is interesting to note that Kampong Chhnang becomes considerably more cost efficient in terms of operational costs.

Interviews with the government asked about what percentage of time they spent participating in activities; costs of government time (Table 7) are included in each relevant activity cost in Table 14. In-kind contributions (i.e., use of district or provincial halls for meetings or events), are included separately in the row labeled In-kind Facilities and government out-of-pocket costs (i.e., $107.5 per participating district) are included in Coaching (see Table 8 above).

Table 14. Activity-Based Costing, 2018 Dollars – All Implementing Partners including Government

Costs	Pursat	Takeo	Tbong Khmum	Battambang / Pailin	Kampong Cham	Kampong Chhnang
Salaries (fixed)	$23,931	$24,451	$24,495	$26,708	$22,580	$53,367
Overhead (fixed)	$3,884	$3,884	$3,884	$3,884	$3,884	$16,600
Provincial Workshop (PWS)	$2,121	$1,744	$1,785	$2,598	$1,764	$1,461
District Workshop (DWS)	$3,017	$1,420	$1,435	$1,946	$1,979	$680
Master Training of Trainers (MTOT)	$1,303	$1,303	$1,303	$1,303	$1,303	$1,353
Provincial Training of Trainers (PTOT)	$9,273	$6,859	$6,859	$7,718	$6,859	$9,171
Discover conference (D)	$29,846	$17,466	$12,508	$25,611	$24,077	$27,166
Provincial working group – Advisory Group (PWG-AG)	$5,423	$4,049	$4,349	$7,823	$4,533	$3,177
General expense (GEN)	$752	$528	$528	$667	$528	$3,067
Coaching (COA) and Coaching district trainer (CDT)	$3,354	$2,284	$1,983	$3,709	$2,216	$1,701
In-Kind facilities (Govt of Cambodia)	$1,375.00	$440.00	$660.00	$505	$370.00	$90.00
Total Activity Costs (does not include fixed costs)	$56,463	$36,093	$31,410	$51,880	$43,631	$47,866
CER (USD per latrine installed, activity costs only	$8.44	$10.45	$12.99	$19.99	$21.80	$13.83

RESULTS FROM THE INGREDIENT-BASED COSTING

Another view of these costs is by 'ingredient' rather than activity, as laid out in Table 15 below. These ingredient-based costs do not include Government of Cambodia costs. Salaries (WaterSHED and WaterAID staff) are the highest expense ingredient across all Case A provinces, followed by per diems/accommodations, travel, and conference costs (i.e., rooms, refreshments, lunch, facilitation). In Kampong Chhnang, salaries remain the highest expense ingredient, but are followed by overhead costs rather than other ingredient costs.

Tbong Khmum and Takeo, which had the lowest total costs of implementation, were particularly efficient in their travel and conference costs (measured in total dollars spent on these ingredients).

Feedback from the Civic Champions teams suggests that the fixed salary cost differences between some provinces may be due in part to an accounting pattern. When the teams travel to the provinces, they follow a set pattern of travel, which dictates where the costs are incurred. Battambang / Pailin are typically visited prior to Pursat, which is on the way back to Phnom Penh (the location of WaterSHED headquarters). As such, the WaterSHED team indicated that some staff travel and field based preparation salary time costs for Pursat were likely attributed to Battambang / Pailin in the staff time sheet accounting system. Some of Tbong Khmum's were likely assigned to Kampong Cham for the same logistical reasons. It should be noted, however, that travel and per diem/accommodation costs in Battambang / Pailin and Pursat are dominated by the large number of government participants, and the size and travel distances of these provinces are likely the highest contributions to the high travel and per diem costs.

Table 15. Civic Champions Ingredient-Based Costing, 2018 Dollars – WaterSHED and WaterAid Program Cost

Costs[55]	Pursat	Takeo	Tbong Khmum	Battambang / Pailin	Kampong Cham	Kampong Chhnang
Salaries (fixed)	$23,931	$24,451	$24,495	$26,708	$22,580	$53,367
Overhead (fixed)	$3,884	$3,884	$3,884	$3,884	$3,884	$16,600
Communications	$323	$257	$197	$281	$269	$517
Travel	$10,289	$5,369	$5,556	$10,475	$7,866	$11,486
Per diem and accommodation	$14,830	$11,009	$7,893	$15,170	$13,041	$14,163
Materials	$1,278	$1,038	$1,301	$1,638	$1,407	$2,839
Computers	$255	$255	$255	$255	$255	$255
Conference costs (rooms, refreshments, lunch, facilitation)	$11,397	$8,082	$5,858	$8,648	$11,011	$8,927
Fees (Bank and Exchange)	$4	$7	$11	$18	$11	$18
Award Costs[56]	$857	$207	$249	-$572	-$29	-$480

GOVERNMENT ONLY, ACTIVITY-BASED COSTING

An analysis is also presented of government costs alone to better understand the total contribution of provincial and district officials and resources. As explained in the data section above, these incremental costs are based on (i) time contributions spent on Civic Champions Hybrid, (ii) other in-kind contributions in the form of free use of district and provincial meeting halls for Civic Champions events, and (iii) out-of-pocket expenses. These costs estimates are based on very limited interviews with government officials and rely on a recall period of up to two years (see Section 6.3). Thus, the incremental time and out-of-pocket expenses spent on Civic Champions activities are rough estimates.

As expected, the greatest government time contribution was for participation in Discover Conferences and the Provincial Working Group – Advisory Groups. Pursat and Battambang / Pailin had the highest total costs for the government, but this reflects the number of participants in Pursat and the fact that officials from both provinces were participating in Battambang / Pailin.

[55] Refer to Table 3 for definition of ingredient cost categories.

[56] The 'awards' costs represent the net costs, accounting for the fact that the Civic Champions program generated income from participant fees ($30/commune councilor) that was used to offset costs of Awards and other ingredients. These costs are included in Discover conference costs in the activity-based accounting above.

Table 16. Activity-Based Costing, 2018 Dollars – Government Only

Costs	Pursat	Takeo	Tbong Khmum	Battambang / Pailin	Kampong Cham	Kampong Chhnang
Provincial Workshop (PWS)	$1,370	$1,144	$1,144	$1,929	$1,144	$1,052
District Workshop (DWS)	$591	$313	$313	$497	$313	$357
Master Training of Trainers (MTOT)	$0	$0	$0	$0	$0	$0
Provincial Training of Trainers (PTOT)	$2,989	$1,497	$1,497	$2,354	$1,497	$1,757
Discover conference (D)	$4,230	$2,150	$2,150	$3,389	$2,150	$2,503
Provincial working group - Advisory Group (PWG-AG)	$4,288	$3,217	$3,217	$5,361	$3,217	$3,097
General expense (GEN)	$448	$225	$225	$354	$225	$264
Coaching (COA)[57]	$1,941	$883	$883	$1,578	$883	$1,021
In-kind facilities (Govt of Cambodia)	$1,375	$440	$660	$505	$370	$90
Total Government Implementation Costs	*$17,231*	*$9,870*	*$10,090*	*$15,967*	*$9,800*	*$10,141*

Summary Of Results

The most influential cost factor between Case A provinces was the Discover conference costs. Improving efficiencies here can be quite significant in the relative cost-efficiency of implementation. By comparison, the most influential cost factors between Case A and Case B were in fixed costs (i.e., salaries and overhead).

Although Pursat was not implemented at the lowest total cost, this province was able to scale quite effectively. In Pursat, the program was implemented in two modalities. The program was conducted at the province level for three districts (Bakan, Krokor, and Veal Veng). This modality mirrors that of all other provincial cohorts in the Hybrid iteration. In addition, two more districts (Kravanh and Kandieng) were engaged in district-level program implementation (i.e., Discover conferences and competitions were conducted within the individual districts). For the district-level modality, participants' travel and per diem rates were lower compared to inviting them to the provincial capital, and WaterSHED did not provide accommodation to them as the district capital was near participants' homes. The smaller events also required fewer Civic Champions team staff.

Kampong Chhnang was the most expensive province, reflecting the arrangement of the two implementing partners. This province's activities were not particularly cost efficient in scale (when measured by the number of commune councilors or the geographic area), but the councilors who did join appear to have been particularly effective at promoting a high number of latrines installed.

On the other hand, Battambang / Pailin and Kampong Cham had relatively low numbers of latrine installation and relatively high numbers of commune councilors and costs associated with training these councilors. Although there may be an over-accounting of some costs in Battambang / Pailin and Kampong Cham (where some of Battambang / Pailin salary and travel costs may have actually been shared with Pursat, and Kampong Cham's with Tbong Khmum), high total program costs per latrine installation do suggest that in these two provinces'

[57] Includes all government out-of-pocket costs ($107.50 per participating district) summarized in Table 8 above.

commune councilors were less effective or less able to achieve new latrine installations, for reasons we were unable to investigate.

Pursat and Tbong Khmum may be marginally less cost efficient than they appear, due to where some WaterSHED salary and staff travel costs are incurred. Additionally, Takeo may be relatively cost efficient because of its proximity to Phnom Penh, which keeps travel/per diem/accommodation costs down, where as Kampong Chhnang suffers from being close enough for one trip, but far enough that it increases travel costs for both implementers.

7.2 External Benchmarking

The province-level results from the internal benchmarking exercise were combined to create a program-level cost-efficiency ratio for the Hybrid iteration of Civic Champions (Case A+B, see Figure 6). This program-level CER was benchmarked against, or compared, to other rural sanitation program approaches in Cambodia (see Figure 6, Cases C and D). The research team conducted a literature review to collect relevant and publicly available data concerning costs and latrines (either sold or installed) for other sanitation programs in Cambodia. From this review, primarily programs that promoted pour-flush latrines in rural areas of Cambodia were selected for the External Benchmarking exercise, as these characteristics are the most similar to the Civic Champions program. There is one exception, which is the Asia Development Bank activity where only 58 percent of the latrines we use for the CER were pour flush latrines.[58] Details on each of these programs are provided below, as well as an analysis of which programs appear cost-efficient, and the limitations of drawing conclusions from this analysis.

Note: We only compare CEAs that similarly use the program perspective (which excludes costs such as those spent directly by the household on the latrine), rather than those that use the social perspective of the CEA methodology (see discussion of these perspectives in the Methodology section above). However, none of the benchmark program CERs presented below include potential government partner costs involved in implementation. In Case A+B Civic Champions, government contributions represent 15% of the total program costs.

CASE A + B (CIVIC CHAMPIONS PROGRAM-LEVEL COST-EFFICIENCY)

All costs and all outputs from the provincial level data presented in the previous section were added together to create a program-level CER for the Hybrid iteration of the Civic Champions program. Overall, total program implementation costs across WaterSHED, WaterAid, and the provincial and district government expenses were $478,894 (2018 USD). Total pour flush latrines installed between the beginning and the end of the program equaled 20,616. This results in a CER of **$23.23 per latrine** installed. This is the figure we benchmark against program-level CERs for other Cambodian sanitation promotion and subsidy projects, described in this section below.

CASE C PROGRAMS

iDE Smart Subsidies – without subsidies (trial): iDE operated a broad sanitation marketing effort in Cambodia that resulted in over 250,000 sales of improved pour flush latrines.[59] In an effort to understand whether market actors can be incentivized to reach the poorest segments of the market, iDE and Causal Design implemented a randomized controlled trial (RCT) in Cambodia. Rural households in treatment villages were offered (1) partial subsidies (restricted to ID Poor qualified households), (2) loan financing, and/or (3) cash-only purchase options, while households in control villages were offered only (1) financing or (2) cash-only purchase options. The purpose of the RCT was to test which financing mechanism leads to the greatest change in coverage. The RCT

[58] ADB (2011). Cambodia: Tonle Sap Rural Water Supply and Sanitation Sector Project. Completion Report. Source: https://www.adb.org/sites/default/files/project-document/60159/34382-022-cam-pcr.pdf

[59] Macaranas, R. & Nicoletti, C. January 2017. Smart Subsidies Cost-Effectiveness Analysis.

was implemented in three districts of Kandal Province (i.e., Khsach Kandal, Lvea Aem, and Mukh Kampul). Case C examines the results from this trial for the control group (results for the treatment group are presented below in Case D). Households included the poor and non-poor.

Using results in control villages from the 10-month trial[60], fixed costs included a share of operational, administrative, and staff costs to implement the program over ten months. Operational costs included the commission paid to sanitation teachers and average loan-processing costs. The total of these program delivery costs for control villages was $113,315 (2018 values). Over the same period, in villages in the control group sanitation suppliers sold 421 pour flush latrines.[61] Sold latrines were counted from the orders collected by the sanitation teachers that were trained and paid a commission by iDE (and did not take into account cancelled orders).

This results in a CER of **$269.16 per latrine sold**. One limitation of comparing the Civic Champions program and others to the Smart Subsidies – without subsidies (trial) is that this trial was designed to answer a specific question about incentivizing poor households to purchase latrines and only measured a very short period of implementation. While one could argue that economies of scale, and thus lower costs per latrine, may be achievable if the program were implemented over a longer period of time, the implementation period of the trial was identical to that of Hybrid (10 months) and the geographic scale (3 districts) was comparable to that of Hybrid (2 districts per province). Therefore, the comparability of the CERs for these programs should be strong evidence in favor of the cost-efficiency of the Civic Champions Hybrid program.

iDE Sanitation Marketing Scale Up (SMSU) Project: The Sanitation Marketing Scale-Up project, implemented by iDE Cambodia, was first piloted from January 2009 until 2011, and scaled up with a three-year project (August 2011-October 2014) based on the initial success of the pilot program. This project recruited and trained latrine business owners (LBOs) operating in rural parts of Svay Rieng, Kandal, Prey Veng, Kampong Thom, Siem Reap, Oddar Meanchey, and Banteay Meanchey. Sanitation sales agents connected to the LBOs received training that taught them to focus their sales pitch on the customers' problems related to their lack of sanitation: privacy, health, and feces in the environment. Sanitation sales agents then conducted group meetings and door-to-door presentations to help rural households weigh the costs of buying a latrine versus continuing to defecate in open fields. Latrine sub-structure package orders were directed to local manufacturers who produced pour flush latrine sub-structure components and sometimes installed the latrines.[62] This project was again scaled and expanded from 2014-2018.[63] This third iteration continued to scale the project, expanded product offerings, designed and promoted cheaper latrine super-structure products, and deepened its focus on correcting market failures.

Over all three iterations of SMSU, using primarily publicly available data from 2009 – 2016[64], the SMSU project sold 228,000 latrine packages, at a program delivery cost of 10.7 million USD (in 2018 figures). Latrines were measured and attributed to the program by looking at records from the latrine sales agents and LBOs that were recruited and trained by the SMSU project.[65] The CER for the SMSU project is **$46.90 per latrine sold**.

WaterSHED Hands-Off Sanitation Marketing Program (Hands-Off): The Hands-Off program was implemented in eight rural provinces in Cambodia. Planning and product development for the program began in 2009 and Hands-

[60] Results reported during the trial period. Macaranas, R. & Nicoletti, C. January 2017. Smart Subsidies Cost-Effectiveness Analysis.

[61] The Macaranas et. al. (2017) paper counted all toilets that were "sold"; however, interviews with the authors asserted that these were latrines that were sold and installed. Despite this, we have presented the data in this report as "sold".

[62] iDE. (n.d.) Poor people can, and do, pay for toilets: Building momentum toward open defecation free status in Cambodia; https://www.ideglobal.org/key-project/building-momentum-in-sanitation-coverage-in-cambodia.

[63] iDE.(n.d.). Summary Report: Building Markets to Improve National Sanitation Coverage in Cambodia; https://s3.amazonaws.com/www.ideglobal.org/files/public/iDE-SMSU1_Summary.pdf?mtime=20160615181657.

[64] See page 71 of USAIDb (2018). *Scaling Market Based Sanitation: Desk review on market based rural sanitation development programs.* Washington, DC., USAID Water, Sanitation, and Hygiene Partnerships and Learning for Sustainability (WASHPaLS) Project.

[65] Stakeholder interviews, February 2020.

Off pilot officially rolled out in 2010 followed by scale-up in 2011.[66] Hands-Off focused on a systems-change approach to promoting sanitation, by supporting local toilet suppliers, initiating marketing activities, and fostering partnerships between the public and private sector. The aim of the program was to build demand and increase the locally designed and produced supply of affordable household toilets. Specifically, the program engaged and supported a network of small businesses, referred to as "SPs" to produce low cost, pour flush latrine sub-structure packages. The program provided SPs with technical skills training related to latrine production as well as business professionalization training on topics such as bookkeeping and inventory management. The program linked SPs to local community-based sales agents, who actively marketed these latrine packages in rural communities. WaterSHED also conducted social marketing campaigns about improved sanitation and latrine usage to generate consumer demand.[67] The market facilitation aspect of the program was completed in 2017, before pivoting more heavily towards strengthening market systems.

Using publicly available information from 2011-2017[68], the Hands-Off program sold 147,393 pour flush sub-structure latrine packages, at a program delivery cost of $2.96 million (2018 USD). WaterSHED engaged with the government at multiple levels, to create an enabling ecosystem for market-based sanitation in Cambodia. WaterSHED persuaded the provincial government to operationalize and enforce an existing government mandate for commune[69] officials and village leaders to promote the purchase of toilets. The intervention leveraged the omnipresence of local governments and their goal to increase basic sanitation coverage. Some local officials also worked as demand activators (i.e, sales agents) and contributed to increasing toilet sales for local sanitation enterprises while earning a commission from the enterprise. Latrine sales were measured and attributed to the Hands-Off program by collecting sales records from the SPs in the Hands-Off network. WaterSHED verified and spot checked a sub-sample to ensure that latrine sales ultimately led to installed latrines.[70] The 2018 USD CER for the Hands-Off program is **$20.09 per latrine installed**.

CASE D

iDE Smart Subsidies – with subsidies (trial): Here we refer to the results of the treatment group from the RCT implemented by iDE and Causal Design from 2015-2016. Rural households in treatment villages were offered (1) partial subsidies (restricted to ID Poor qualified), (2) financing, and (3) cash-only options for purchasing a latrine sub-structure package.

Using the results in treatment villages from this 10-month trial[71], fixed costs included a share of the operational, administrative, and staff costs to implement the program over ten months in these villages. Operational costs included the commission paid to sanitation teachers, the average subsidy value paid out, and average loan-processing costs. The total program delivery costs for treatment villages was $122,618 (2018 values). Over the same period, in villages in the treatment group sanitation teachers sold 755 pour flush latrines.[72] Sold latrines were counted from the orders collected by the sanitation teachers that were trained and paid a commission by iDE (and did not take into account cancelled purchases).

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[66] WaterSHED (2019). Estimating the Economic Benefits of Market-Based Sanitation Programs: Model Design and Application. April 2019. http://www.watershedasia.org/wp-content/uploads/Economic-Benefits-of-Market-based-Sanitation.pdf

[67] WaterSHED (2019). Estimating the Economic Benefits of Market-Based Sanitation Programs: Model Design and Application. April 2019. http://www.watershedasia.org/wp-content/uploads/Economic-Benefits-of-Market-based-Sanitation.pdf

[68] Ibid. Please note that this is a change from the Analysis Plan submitted for this analysis. This source was preferenced over the one cited in the Analysis Plan as the data were more precise, coming from the project implementer directly. It was also difficult to ascertain why the previous source quoted program cost data that exceeded the program cost data quoted directly by the program implementation team.

[69] A commune is the third-level administrative division in Cambodia (after province and district). Communes can consist of as few as 3 or as many as 30 villages.

[70] Stakeholder interviews, February 2020.

[71] Results reported during the trial period. Source: Macaranas, R. & Nicoletti, C. January 2017 Smart Subsidies Cost-Effectiveness Analysis.

[72] The Macaranas et. al. (2017) paper counted all toilets that were "sold"; however, interviews with the authors asserted that these were latrines that were sold and installed. Despite this, we have presented the data in this report as "sold".

This results in a CER of **$162.41 per latrine sold**. The same limitation mentioned above for the Smart Subsidies trial control group (regrading this trial's brief 10-month period of implementation and limited geographic scale) applies to the Smart Subsidies trail results for the treatment group.

Community Hygiene Output-Based Aid (CHOBA): The CHOBA program in both Vietnam and Cambodia was designed to influence households at critical stages of their decision-making process using an information and education campaign; access to affordable credit; supply chain improvement through training of masons; and incentives to poor households and to communes to participate in the program. The project used output-based aid (OBA) to accelerate household ownership of hygienic pour flush latrines, with a focus on the rural poor in Vietnam and Cambodia. The project was implemented by the East Meets West Foundation (EMW). CHOBA provided small rebates to participating poor households (always in Vietnam, initially in Cambodia, where the program pivoted to paying suppliers to discount the price) and incentive payments to implementing agencies, government staff, and promoters. All payments were based on results in the initial Gates funded program: EMW, partner organizations, and eligible poor households and suppliers only received payments or subsidies after EMW verified installation. There were multiple levels of results-based incentives targeting poor households: (1) Local mobilizers earned performance-based payments after each verified installation by a low-income household, (2) Low-income households in Cambodia received a rebate (initially) or a discount from suppliers (subsequent program) who were then compensated after verification of installation, which required that latrines must have at least temporary rudimentary superstructures (i.e., tarpaulin)[73] and (3) Communes received conditional cash transfers based on their progress towards the goal of 95% sanitary latrine coverage in their commune, which were earmarked for commune sanitation investments.[74]

Data for the program between 2012 and December 2015[75],[76] suggested that the full OBA cost for the program in Cambodia, including the rebate/discount, was **$44.84 per latrine built** by poor households (2018 USD), for the 50,500 latrines that were installed in Cambodia. As noted above, it was unclear from the data if this includes the full program operational and fixed costs, or just the OBA expenses. From the CER and latrine figures, we calculate that this program cost $2.27 million (2018 USD). Latrines attributed to CHOBA were measured as the latrines built and installed directly by workers trained by EMW. The only households eligible for the discount/rebate were poor households.

ADB Tonle Sap Rural Water Supply and Sanitation Program (RWSSP): The first iteration of the program provided rural families with access to improved sources of drinking water and access to hygienic household latrines in the provinces of Battambang, Kampong Chhnang, Kampong Thom, Pursat, and Siem Reap between 2006 and 2011. By the end of the program, the program delivered household latrines to 45,046 households.[77] Four latrine models were offered as part of this program. Latrines were subsidized by the program according to the type of latrine (design documents aimed to provide a roughly 60 percent subsidy for pour flush latrines and up to 90 percent for dry pit latrines). Most households selected wet latrines (water sealed or pour flush), while a minority selected dry pit or VIP latrines.[78] This is the only program in our external benchmarking exercise that did not exclusively

[73] Iv Bunthoeun, East Meets West/Thrive Cambodia, personal communication, Nov 16, 2019

[74] Nguyen, M., Ljung, P., Nguyen, H. (2014). Output-Based Aid for delivering WASH services in Vietnam: Ensuring Sustainability and Reaching the Poor. Briefing Paper. 37th WEDC International Conference, Hanoi, Vietnam, 2014. http://thrivenetworks.org/wp-content/uploads/2017/03/GPOBA_20140101_VN_Output-Based-Aid-for-delivering-WASH.pdf

[75] USAIDb (2018). *Scaling Market Based Sanitation: Desk review on market based rural sanitation development programs.* Washington, DC., USAID Water, Sanitation, and Hygiene Partnerships and Learning for Sustainability (WASHPaLS) Project.

[76] Rivera, G. Joseph, S. Smets, V. Chan, P. Ljung, S. Um, H. Nguyen, and J. Albert. presented May 15, 2016. The Effect of OBA Subsidies Combined with Sanitation Marketing (SanMark) on Latrine Uptake Among Rural Populations in Cambodia.

[77] ADB (2011). Cambodia: Tonle Sap Rural Water Supply and Sanitation Sector Project. Completion Report. https://www.adb.org/sites/default/files/project-document/60159/34382-022-cam-pcr.pdf

[78] ADB (2011). Cambodia: Tonle Sap Rural Water Supply and Sanitation Sector Project. Completion Report. https://www.adb.org/sites/default/files/project-document/60159/34382-022-cam-pcr.pdf

support pour flush latrines; of the over 45,000 latrines installed, nearly 58 percent were pour flush latrines.[79] By 2009, the program was paying subsidies of $145 for pour flush latrines.[80]

We relied on an estimated CER and latrine data from 2009[81], before the end of the program, for this benchmarking exercise. Cost data includes all sanitation program costs available such as direct implementation costs (software, hardware, salaries, allowances, program management, and support) and indirect support costs (staff training, travel, research and development). It also includes the subsidy to households. However, the report did not provide the value of the total cost data nor the underlying calculations for its CER. The report mentioned that the number of latrines at the time included 37,115 household latrines completed, with a further 5,870 contracted but not yet complete (for a total of 42,985 latrines) as of September 30, 2009. Using the cost-efficiency ratio, and the figure including contracted latrines, we derived an estimated value for the total program costs used in this calculation to be just under $6.3 million (2018 USD). The CER for the RWSSP program is **$181.80 per latrine contracted or installed**, including program costs which included the cost of the latrine hardware subsidy.

Results and Key Limitations in This Comparison

The results from the External Benchmarking exercise, discussed above, are summarized in the table and figure below.

Table 17. External Benchmarking Results[82]

Case	Program	Data Availability Period	Costs *(2018 USD)*	Outputs	CER *(2018 USD)*
Case A +B	Civic Champions Hybrid	2018-2019 (2 years overall; 10 months per province)	$478, 894	20,616 latrines installed	$23.23
Case C	Smart Subsidies – without subsidies	2015-2016 (10 months)	$113,315	421 latrines sold	$269.16
	Sanitation Marketing Scale Up Project[83]	2009-2016 (6.5 years)	$10,693,959	228,000 latrines sold	$46.90
	Hands-Off Sanitation Marketing Program	2011-2017 (7 years)	$2,960,587	147,393 latrines installed	$20.09
Case D	Smart Subsidies – with subsidies	2015-2016 (10 months)	$122,618	755 latrines sold	$162.41

[79] Saray, M. (2017). Rural Water Supply and Sanitation in Cambodia Results from ADB Financed Projects. Presentation materials. http://events.development.asia/system/files/materials/2017/06/201706-rural-water-supply-and-sanitation-cambodia-results-adb-financed-projects.pdf

[80] ADB (2011). Cambodia: Tonle Sap Rural Water Supply and Sanitation Sector Project. Completion Report. https://www.adb.org/sites/default/files/project-document/60159/34382-022-cam-pcr.pdf

[81] Robinson, A. (2012). *Sanitation Finance in Rural Cambodia. Water and Sanitation Program: Guidance Note.* February 2012.

[82] All costs in this table are adjusted for inflation and reported in 2018 dollars. Therefore, the figures in this table will not necessarily match the source data referenced. Additionally, this data does not necessarily reflect the results of the entire program (including those introduced in the above narrative), but rather reflects the cost and output data that was available for creating an estimate for the cost per latrine.

[83] Costs and latrine data are from December 2009 to March 2016, although the program extended beyond this period.

Case	Program	Data Availability Period	Costs *(2018 USD)*	Outputs	CER *(2018 USD)*
	CHOBA	2012-2016 (~4 years)	*$2,264,506**	50,500 latrines installed	$44.84
	RWSSP	2006-2009 (~ 3 years)	*$6,275,810**	*42,985* installed or contracted*	$181.80

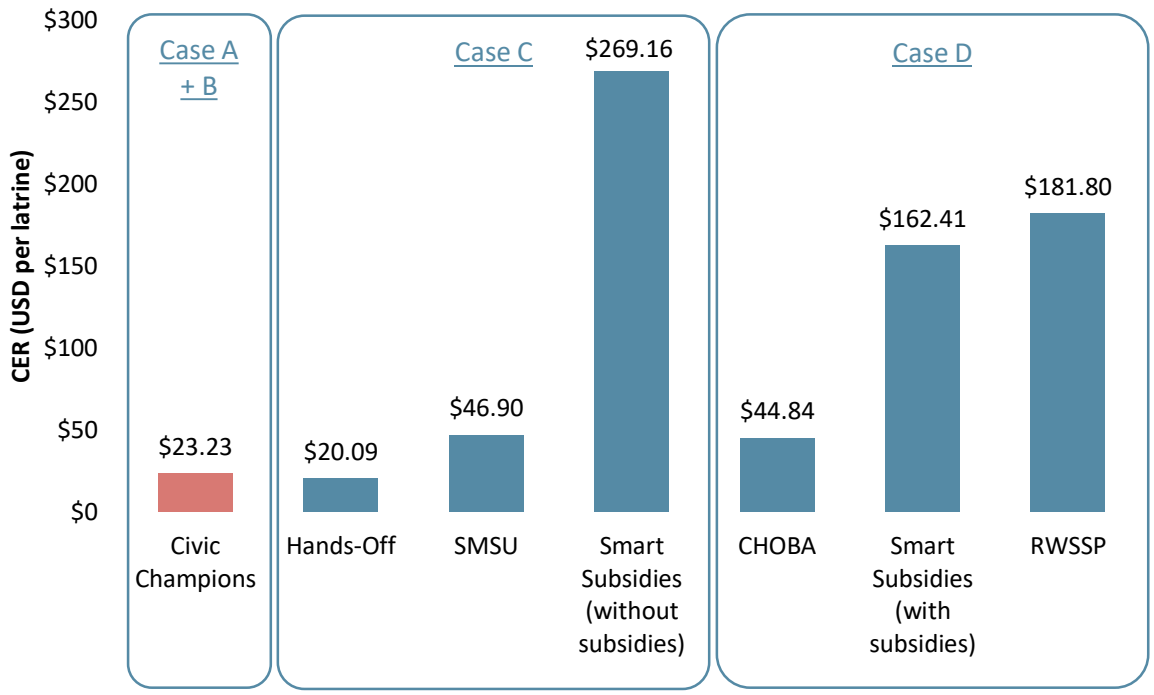
**Estimated*

This analysis does suggest that Civic Champions Hybrid has been an extremely cost-efficient program within the rural Cambodian context. There could be a number of factors contributing to these results. The Civic Champions program benefitted directly from the Hands-Off program that preceded it, also implemented by WaterSHED in close partnership with sub-national and local government. Civic Champions Hybrid worked in the same areas where the Hands-Off program spent years recruiting, training, and professionalizing small latrine businesses. The government and commune councilors in these areas had, in many cases, already been introduced – via the Hands-Off program – to promoting basic sanitation uptake. Civic Champions was able to rely and build upon this same network of suppliers to deepen and sustain the impact. Civic Champions likely would not have been as cost-efficiently implemented without the backdrop of a established sanitation market. Additionally, the Civic Champions program was implemented 2-4 years after the programs it is compared against in Figure 6 above. Over the past 10 years, Cambodia has seen uninterrupted economic growth[84] and steady infrastructure development and the Civic Champions program may have benefited from these changes more than programs that were implemented earlier. As one stakeholder pointed out in the interviews, improved road infrastructure lowers costs of delivering heavy concrete products to rural households. However, coverage levels have also accelerated each year over this same period across rural Cambodia, and as local sanitation markets approach 'saturation' – have higher and higher levels of basic coverage – sanitation promotion among the remaining households without a latrine (typically poorer or facing other constraints to adoption) can become more difficult and require more time and resource investment .[85] Baseline coverage varied greatly among communes participating in Civic Champions Hybrid – from 11.9% in a commune in Pursat to 89.7% in a commune in Battambang, and averaged 60.7% across the population of all participating communes. Therefore, the degree to which market saturation concerns come into play in any one commune will vary significantly. However, at province level, coverage gains achieved during Hybrid were strongly negatively correlated with coverage at the start of the intervention (see Fig 3) suggesting greater difficulty achieving new latrines.

[84] GDP growth rates have been above 6.0 percent since 2010. Source: World Bank Development Indicators.

[85] iDE documents the challenges of market saturation emerging in 2018 across its large scale 10+ year market-based sanitation program in rural Cambodia in an article on "The Evolution of the Sanitation Marketing" in Cambodia, January 14, 2019, available at https://washmarkets.ideglobal.org/country-learning/the-evolution-of-sanitation-marketing.

Figure 6. Cost-Efficiency Ratios for Cambodia Sanitation Promotion Programs (2018 USD per latrine)



It is important to note that Civic Champions likely benefited from other sanitation programs that were active in the same areas at the same time. Stakeholder interviews yielded reports of other sanitation programs active in Civic Champions target provinces. These included the RWSSP project offering subsidies for pour flush latrines, East Meets West Foundation offering subsidies, UNICEF with a CLTS and subsidy approach, and the Provincial Department of Rural Development providing latrines to marginalized households.[86] Additionally in Kampong Chhnang, PLAN International was operating a CLTS program through which two local NGOs promoted latrine uptake, including pour flush latrines, which overlapped with part of the period of WaterAid's Civic Champions program implementation.[87] However, interviews with district and provincial officials who were involved in implementing Civic Champions reported that other sanitation projects, including some providing subsidies, were active in Hybrid participating districts in Kampong Chhnang (at least 3 programs) and Battambong (2 programs), but not in Takeo, Tbong Khubm, Kampong Cham, nor likely in Pursat.

All programs listed in Table 17 above likely benefited from other active programs and local government initiatives to promote basic sanitation. However, this is particularly problematic for this analysis because the Civic Champions program attributes any latrine installed in its communes to the program itself. This undoubtedly constitutes an over-attribution of latrines to the Civic Champions program as other programs (and their associated costs) played a role in installation of some of the latrines in Civic Champions communes.

This over-attribution limitation also becomes an issue when attempting to draw direct comparisons of the relative cost-efficiency between the Civic Champions program and the other programs listed in Table 17. Of the seven programs examined in this section, only Civic Champions conducted data collection activities through village chiefs and credited any change in the commune as attributable to the program. As mentioned, this could quite feasibly include households that acquired latrines without ever interacting with their commune councilor.

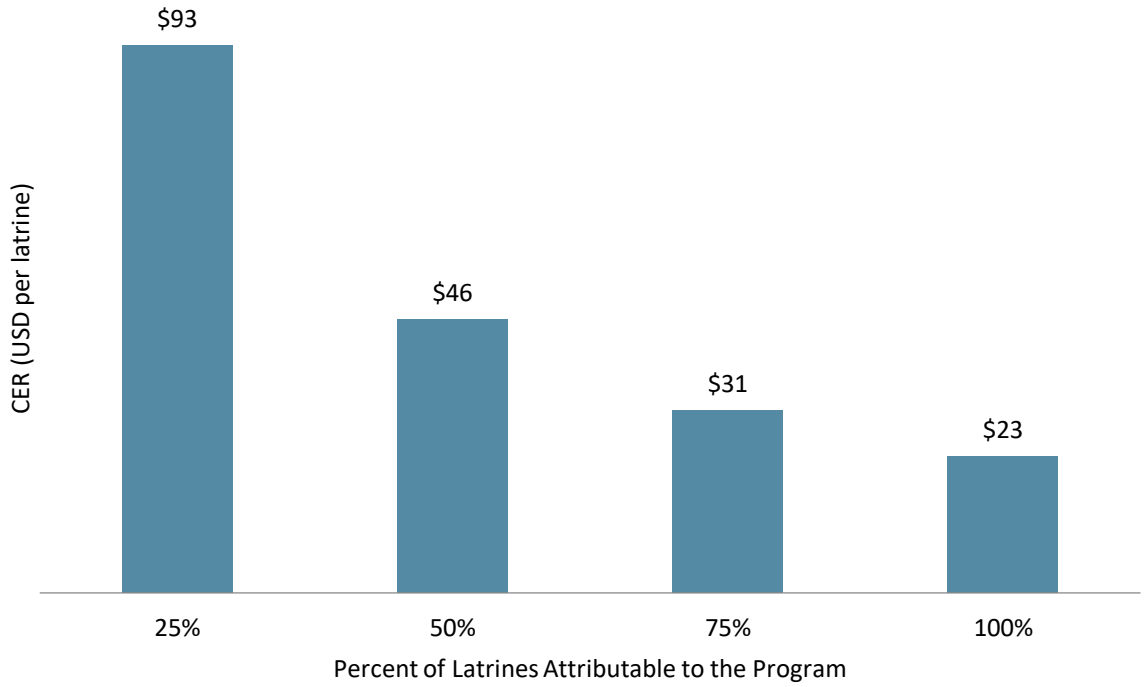
[86] Stakeholder interviews, February 2020.
[87] Stakeholder interviews, February 2020.

The other six programs all included measures of latrine outputs that were tied directly to latrine sales or orders that were facilitated by sanitation promotion agents trained, hired, or organized by the implementing programs.

For these reasons, this analysis cannot say if the Civic Champions program was the most cost-efficient sanitation program in Cambodia. However, we believe that the evidence presented above is sufficient to suggest the systems-approach promoted by Civic Champions is certainly very cost-efficient, at $23.23 per latrine installed, when implemented in developed sanitation markets.

If the assumption of attribution is reduced, where for example the program is perhaps only responsible for 50% of the toilets delivered within each province (the results of which are shown below in Figure 8), this analysis finds that still the program is among the most cost-efficient programs, and is roughly on par with many other Cambodian sanitation promotion projects. This holds true even under the assumption that the Civic Champions program can only take credit for 25% of latrines installed in their areas.

Figure 7. Sensitivity of per Latrine CER to the percent attributable to the Civic Champions Hybrid



One final consideration is that the systems-change approach underlying the Civic Champions program relies on government ownership and is theorized to be more sustainable than other approaches that rely on direct intervention from NGOs or other implementing partners. This approach may also help to amplify the efforts of other programs that are ongoing in the same areas. The CER analysis for all programs above only considers program costs and latrine installation during the implementation period and does not consider the sustainability of programs over the medium- to long-term. If the Civic Champions program proves to have sustainable impacts, as suggested by analyses of market impacts after earlier Civic Champions program iterations[88], there might be additional cost-efficiencies not captured here.

[88] Bartell, J., Jenkins, M., Vizintin, P., and Salinger, A. (2020). "Civic Champions 2016-2016 Scale-up: Evaluation". WaterSHED Asia.

8.0 HOUSEHOLD LEVERAGE RATIO

The analysis also calculated the household leverage ratio by dividing the total household expenditure per latrine (these costs are described in Section 6.6 above) by the total program costs per latrine (or the CER per latrine) to examine the amount of dollars leveraged from households per dollar spent by the program. On average, households contributed: $356 in cash for the purchase of the latrine (sub- and superstructure) $27 in time contributions for purchase and installation (40 hours of time, divided by 8 hrs/day, and multiplied by the prevailing market wage for unskilled labor of $5.39 USD per day), and $23 of in-kind materials for construction. In total, this amounts to an average household investment per latrine of $406. This figure is the average household's investment in constructing their latrine, and does not include the estimated $7.52 of subsidies paid by other actors towards the average cost of household latrines.

Figure 8. Household Leverage Ratio

Household investment per latrine	$406 USD
Total program costs per latrine	$23.23 USD
Household Leverage Ratio	17.47

This means that per dollar spent on the program, Civic Champions was able to leverage $17.47 dollars of household resources towards improving sanitation. A review of household latrine investment leverage ratios for market-based, CLTS-based, subsidy and other household sanitation promotion and loan programs from across the globe, found values ranged from a low of $0.005 (a rural CLTS program in Sub-Saharan Africa) to a high of $19.90 (a revolving fund for toilet loans in urban Vietnam) per program dollar spent.[89] Among the subset of market-based and hardware subsidy programs in South and Southeast Asia, values ranged from $1.2 to $13.5. By comparison, Civic Champions household leverage is among the highest reported.

This household leverage ratio may reflect something unique about the population of interest and/or simply reflect the high cost efficiency (i.e., low CER) of the program. For example, nearly 44 percent of households in our sample spent at least $420 on purchasing the sub- and super-structure for their new pour flush latrines (see Figure 4 above). These expenses are relatively high and suggest that many households benefitting from the Civic Champions program may not be the poorest population. However, the bimodal distribution also included a high portion of households who spent much less, around $50 to $150 dollars (24%), which suggests that Civic Champions also includes a poorer population, potentially who are able to leverage resources from family members, or some who may benefit from programs for hardware support. This is an efficient economic outcome, promoting improved latrine coverage.

[89] Agarwal, R., Kohli, A., Chennuri, S., and Jenkins, M.W. (2020. "*Global assessment of grant-funded market-based sanitation development projects*." Waterlines, 39, 2&3, 1-21. April-July 2020.

9.0 ANNEX – REFERENCES

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