

Life-cycle cost analysis for Splash school interventions in Addis Ababa, Ethiopia Update 2021

Final Report

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Key findings

- The WISE project has adapted since 2019 and been raising the provided service levels. Particular by reducing intermittent water, by including faecal sludge aspects, and by broadening hygiene training with janitors. This has led to increase of CapEx cost per student from ETB 886 to ETB 3103. Main CapEx cost is sanitation (63%) and therefore improving costs effectiveness of sanitation should have priority.
- The annual recurrent expenditure is ETB 256 per student per year, of which ETB 184 (71%) is covered by Taxes (School budgets), 6% by Tariffs (parents paying for soap) and ETB 57 by Transfers (Splash mainly on support costs and operation costs for water).
- To achieve good quality basic service levels ETB 595 per student per year on recurrent cost is needed. This gives a current finance gap of ETB 338, which is mainly toilet paper for students, which arguably should be covered by Tariffs (parents or other sources of income).
- The key to securing funds for sustainable funding for WASH is working with sub-city and woreda staff on the allocation of the available budget. The annual recurrent expenditure of ETB 184 per student per year should be raised to ETB 240 to remove dependency on Splash funds for annual recurrent costs. This is respectively 6% and 4% of primary and secondary school fund allocation.

Background

Addis Ababa Education Bureau (AAEB), supported by Splash have set themselves the task to supply all 483 government schools in Addis Ababa with safe water, good sanitation and good hygiene services, based on the model that Splash has developed worldwide. Splash has partnered with IRC to understand the Life-cycle costs of these interventions. The Life-cycle Cost Approach (LCCA) captures the costs/expenses that are needed to keep services running. This study is an update of the 2019 study¹ and focusses on identifying changes and trends since start of the WISE project and identifying mechanisms that need to be put in place for longer term financial sustainability.

Methodology

As per agreed Terms of Reference, the updating of the 2019 study focussed on secondary financial data available within the WISE project, both within Splash and AAEB. For this around ten virtual calls were conducted with colleagues of Splash Ethiopia and budgets and reports were shared and analysed. Furthermore, the Ethiopian team member discussed with the following AAEB staff:

- W/ro Gebyanesh Tesfaye (AAEB School Improvement program Directorate, Director)
- Ato Dawit Lemessa (Addis Ababa city Administration Construction Bureau Construction Design Directorate, Director)
- Ato Yirgalem Eshetu (AA city Administration Finance and Economic Development bureau Budget planning and Administration Directorate, Director)

The consultant would like to thank all the colleagues for being available, sharing and discussing openly. The obtained information informed the update of the 2019 calculation file. The values that could not be updated, were brought to 2021 figures by applying 20% inflation.

For dissemination, aside from making both reports available online and an internal dissemination call, results are made available in the newsletter and a short 5 minute video. In addition, support the intention is that Splash provides a letter to local partners (woreda, sub-city and schools) to share unit costs for budgeting.

¹<https://www.ircwash.org/resources/life-cycle-cost-analysis-splash-school-interventions-addis-ababa-ethiopia>

Overarching changes

See annex for details

1. Annual inflation rate in Ethiopia has been around 20% in 2020 . Similarly the exchange rate went up 33% from 1 USD =30 ETB (2019) to 1 USD = 40 ETB (early 2021).
2. The impacts of Covid are multitude, with school closures, slashed budgets, yet with increased (political) attention for WASH in schools, an ambitious project such as WISE, needs to remain adaptable. The government for example had to reduce their commitment from 80 million Birr down to 50 million Birr due to accommodate changes paused by COVID.
3. Any updates in costs need to be seen against the uncertainty of the current political situation, the disruption of global supply chains and Covid. Many markets are volatile particular cement and other building material.
4. Splash internal budget has matured with more budget lines, allowing better specifications across interventions and thus enabling more detailed cost categorisation. Most recommendable is the detailed behaviour change budgeting and inclusion of MHM.
5. Splash has deepened their understanding and is increasing the service levels, particular by addressing intermittent water supply, securing water for sanitation and starting to address faecal sludge management. Many other recommendations from the 2019 report have also been followed through, particular around including janitors, woreda and sub-city staff in trainings.

Water:

- Contrary to expectations, AAWASA has maintained the same tariffs since 2019.
- Unit costs for hand/drinking water stations and the filtration units have increased, but less than inflation rate, mainly because they are imported and don't depend on local market. Water quality tests have decreased in unit cost considerably since 2019.
- Unit cost on Electromechanical, pipes and fittings have gone up (+184% and + 659%) considerably mainly because the system has been expanded at schools.
- Overall, CapEx Water unit cost have gone up considerably due to offering of higher service levels:
 - Inclusion of raised water tank (about ETB 316,000 per school) – ETB 219 per student. This helps schools achieve improved JMP service level (no-longer intermittent)
 - Better water reservoirs are now provided, with unit costs up from ETB 36,000 to ETB 241,000.
 - More drinking stations / handwashing units allocated per school

Sanitation:

- Considerable improvements have been made since 2019, with better cost understanding which is based on Government detailed standardised bill of quantities, updated every quarter. This makes making procurement easier and more transparent. However, due to very volatile building material market (particular cost of cement which has doubled since 2019), contractors are struggling to make it fit.
- Project WISE has worked admirably to make new sanitation designs, with better service levels (doors, space, storage tank), yet trying to reduce building material cost (particular concrete). There are indications that the new designs may fit in existing budgets.
- Increase in costs from ETB 86,000 per seat to ETB 173,000 per seat (factor 2)
- Comparison between 2019 and 2021 in unit costs is tricky as design has changed and more seats per schools are allocated

Hygiene:

- Anecdotally, the cost of soap has gone up due to the pandemic, but this could not be verified in this exercise
- Compared to 2019, MHM has received much more importance in the WISE project and now allows a budget figure per pupil per year (ETB 4 per student). This represents about 25% of the current hygiene budget of WISE project
- The cost of toilet paper remains the biggest financial gap – leading to many students resorting to alternative means, using newspaper, cloth or other, leading to challenges in drainage, septic tank and maintenance of hygiene.

Life-cycle Costs

Table 1 Costs per pupil from 2019 to 2021

	Item	2019		2021		2019-USD		2021-USD	
		CapEx	Annual recurrent expense	CapEx	Annual recurrent expense	CapEx	Annual recurrent expense	CapEx	Annual recurrent expense
Water	CapEx	57		792		\$1.90		\$19.81	
	OpEx		9		11		\$0.30		\$0.27
	CapManEx		5		6		\$0.17		\$0.15
	ExpDs		13		37		\$0.43		\$0.92
	Sub-TOTAL	57	26	792	54	\$1.90	\$0.87	\$19.81	\$1.34
Sanitation	CapEx	535		1953		\$17.83		\$48.84	
	OpEx		90		108		\$3.00		\$2.70
	CapManEx		13		16		\$0.43		\$0.39
	ExpDs		13		22		\$0.43		\$0.54
	Sub-TOTAL	535	116	1953	145	\$17.83	\$3.87	\$48.84	\$3.63
Hygiene	CapEx	294		355		\$9.80		\$8.87	
	OpEx		29		35		\$0.97		\$0.87
	CapManEx		1		1		\$0.03		\$0.03
	ExpDs		13		22		\$0.43		\$0.54
	Sub-TOTAL	294	29	355	58	\$9.80	\$0.97	\$8.87	\$1.44
Total	CapEx	886		3101		\$29.53		\$77.52	
	OpEx		128		154		\$4.27		\$3.84
	CapManEx		20		23		\$0.67		\$0.57
	ExpDs		38		80		\$1.27		\$2.00
	TOTAL	886	185	3101	256	\$29.53	\$6.17	\$77.52	\$6.41

Yellow indicates costs with significant changes

The initial investment, or capital expenditure (CapEx) was found to be ETB 886 in 2019 and has gone up to up to 3101 in 2021. The increase is mainly caused by the addition of raised tanks for water and the storage tanks for sanitation. Both succeed in providing higher service levels and reach JMP standards, but clearly have higher costs. With Sanitation forming 63% of CapEx cost, sanitation still is the area where most cost gains can be achieved with innovation. A good development is the new blocks and the calculation for Meri Hidase Primary School Toilet was ETB 1,600,000 for a 14 hole toilet, compared to the 2020 government budget of ETB 2,000,000.

Annual costs have remained within inflation rates and no major shift has been observed, though water quality tests have dropped in cost. There are other changes in administrative costs (see annex) that shape annual operational expenses, but overall the shift is minor.

Financing

The government schools in Addis Ababa have a well-designed budget system, consisting of 25 items, which allows good financial rigor and comparability between schools. This budget is based on per capita student expenditure that AAEB use to allocate for different sub cities- 3930 per student for primary schools and 5408 per student for secondary schools. There is no separate budget item for WASH maintenance however; instead it is included under general maintenance activities (6244), which includes repair of buildings, and school compounds, etc. The budgeting is based on government funds, however following the SWASH Implementation Guideline¹, the main sources of SWASH financing in Ethiopia are:

- Taxes: Government treasury department.
- Tariffs: Internal income, Parent and student contributions, Private contributions
- Transfers: Development partners

The guideline emphasizes the need for schools to cover operation and maintenance costs from contributions by parents, communities, school general budget and internal incomes.

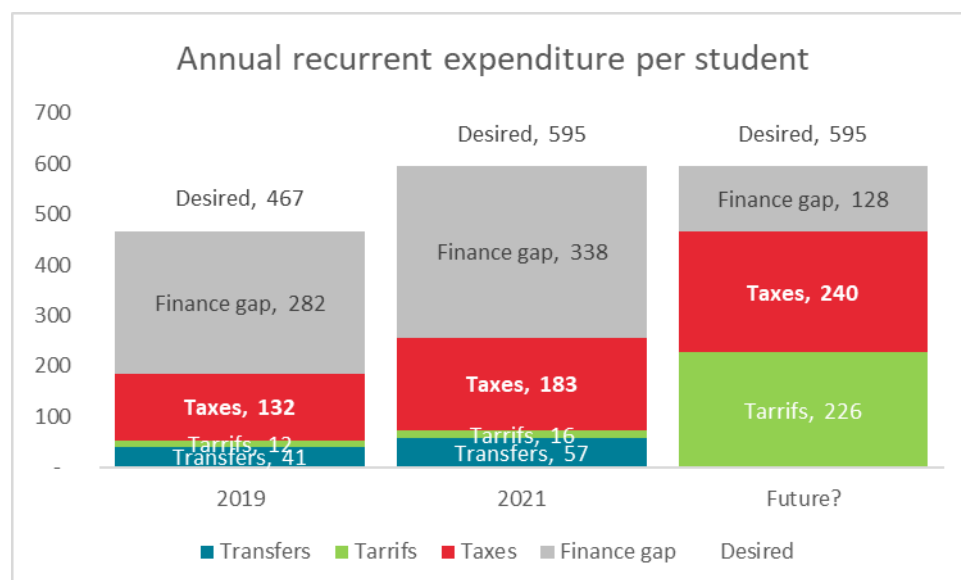


Figure 1 Financing methods for annual recurrent costs

Figure 1 shows that the annual recurrent cost per student has gone up from ETB 467 to ETB 595. The key to securing funds for sustainable funding for WASH is working with sub-city and woreda staff on the allocation of the available budget. The annual recurrent expenditure of ETB 183 per student per year should be raised to ETB 240 to remove dependency on Splash funds (transfers) for annual recurrent costs. In addition, different sources of income should be explored for raising income by tariffs.

¹ Sanitation and Hygiene (SWASH) Implementation Guideline. Federal Democratic Republic of Ethiopia. <https://www.cmpethiopia.org/content/download/2675/11157/file/Final%20National%20School%20WASH%20Guideline,%20Oct%202017.pdf>

Recommendations

To make the WISE project financially more sustainable, a shift in financing is needed as the project transitions out Figure 1. In order to accompany the required shift in expenditure, the following measures are recommended:

1. Apply asset management principles to the infrastructure build – and provide support to schools for understanding and working with this. Schools currently work on ad-hoc basis for repairs and maintenance. Using asset management principles could guide the budgeting and control expenses. It may be considered to trial this at a few schools.
2. The general budgeting format of schools in Addis is well developed and has clear and publicly available budget lines. However, the lack of WASH-specific budget and expenditure lines may pose a challenge if schools are to budget sufficiently for maintenance. We recommend to explore using budget line 6244 or 6259 for this. This should be explored with AAEB, finance and economic development bureau and respective sub city finance and economic development offices.
3. It is the sub-city and woreda staff with schools that decide how the available budgets are divided among the budget lines. It is recommended for Splash to understand this process, provide the unit costs to allow for better budgeting. Ideally a budget of at least ETB 240 per student per year is allocated to WASH. This represent 6% and 4% of allocated annual amount per primary and secondary student respectively.

Regarding opportunity to implement the SWASH Implementation Guidelines and reducing the finance gap,

- The government produces very detailed, itemised standard Bill of Quantities. This is an impressive effort and a unique tool to follow cost developments over time. It is recommended that Splash starts monitoring the changes over time in key budget lines as indicators for WASH (such as item 12.34.9- 10,000l tank; 12.27.1-soak pit).
- Review budgeting and planning on at least a yearly basis and plan for shifting from CapEx to CapManEx. In year 4 for example, CapEx should be smaller than the maintenance budget. This trend was not yet visible.
- As sanitation is the biggest expense, the biggest reduction and cost savings can be achieved there. Splash should keep being innovative in this area and share their learnings.
- Furthermore, also monitor water usage and repair leaks to reduce water bills.
- The biggest part of the finance gap is caused by lack of toilet paper or similar for students. Splash could consider approaches similar as the soap initiative (students bring), the sanitary pad drive (local production), or work together with companies to sponsor in kind (e.g. Unilever to provide reduced or sponsored).

A separate aspect for consideration is the role of adult evening classes. As per 2019 report, these schools typically have a lower functionality of WASH facilities, probably due to higher (and non-supervised) usage. Splash has indicated that evening classes are considered in their design, and it is recommended to explore specific a “WASH levy” to increase income for operation and maintenance. Note that evening classes have proportionally more women (66%) and MHM needs to be considered.

The increase in service levels, combined with the rising costs of construction materials in Addis Ababa have made unit costs for water and sanitation go up significantly. It is recommended that project WISE checks that the available budget is still sufficient to cover all 483 schools.

Finally, the unique full coverage approach (municipal wide) that the WISE project has been able to adopt and the excellent lead and funding from the government can serve as an example to other WASH in school initiatives through Ethiopia and beyond. It is hoped that the budgeting and the unit costs as presented here can provide a good basis for budgeting and planning such follow-up initiatives.

Annex

Unit cost changes in Project WISE budget

	Description	Unit	2019 Unit Price (ETB)	2021 Unit Price (ETB)	% increase	Comments
Water	Drinking stations with 3 faucets	# of stations	8,400	10,876	29%	
	Handwashing stations with 2 faucets	# of stations	9,268	10,282	11%	
	Large water filtration system (VZN441V)/541	# of filters	47,908	60,797	27%	
	Small water filtration system (UF216cc)	# of filters	19,796	-	-100%	No longer used
	Electromechanical (Booster & others)	# of schools	18,984	53,862	184%	
	Water Reservoirs	# of schools	36,092	241,407	569%	Fiberglass Water reservoirs (90% of the schools), Ultrasteel Water reservoirs (2% of the Schools), Masonry water reservoir (8% of the Schools)
	Pipes and fittings	# of schools	16,996	129,058	659%	Biggest unit cost increase
	Water Tower / Raised Structure	# of schools		316,547		New- not in 2019; in 2021: Masonry Tanker seating for all Schools Steel Tower 5m height to 70% of sites (10000 liter)
	Donor Recognition (donor plaques and hygiene signages)	# of schools	1,932	6,356	229%	
	Operations & maintenance support to Sites	# of schools	1,624	2,500	54%	
	Water quality test kits	# of schools	644	120	-81%	
	Technical skill training to Partner site staffs	# of schools	3,976	3,976	0%	
	Fuel, Oil lubricants and vehicle maintenance (Four vehicles)	# of months	25,000	30,286	21%	
	Delivery truck for equipment – Minibus	#	2,240,000	1,700,000	-24%	
	Project vehicle	#	1,960,000	1,360,000	-31%	
Completing school sites delayed for COVID	# of Schools		47,281		New-not in 2019	
Consultant fee for preparation of O and M Strategy	Number		1,200,000		New-not in 2019	
Sanitation	Latrine construction including urinals and consultant fee at Group 2 batch 2 schools	# of stalls	86,660	250,000	188%	Difficult to compare as it relates to #stalls. Used 1,600,000 per school as per Meri Hidase Primary School Toilet
	Latrine renovation at Group 2 schools	# of stalls	16,660	-	-100%	Not in 2021

	Description	Unit	2019 Unit Price (ETB)	2021 Unit Price (ETB)	% increase	Comments
	Urinals for renovated latrines	# of stalls	2,604	-	-100%	Not in 2021
Behaviour change and sustainability	Health & hygiene Education for children/students	# of schools	14,896			Much better disaggregated in 2021
	WaSH training for Adults (i.e. School principals, PTSA ,HEW, Focal persons and KG teachers)	# of schools	7,448			Much better disaggregated in 2021
	WASH training for school hygiene club members (students)	# of clubs		22,500		Not disaggregated as such in 2019
	School leadership and PTSA engagement training	# of persons		1,425		Not disaggregated as such in 2019
	Training of trainers (ToT) for school focal teachers	# of persons		1,600		Not disaggregated as such in 2019
	Training of trainers (ToT) for KG focal teachers	# of persons		2,725		Not disaggregated as such in 2019
	Janitor training and associated materials/supplies	# of schools		4,920		Not disaggregated as such in 2019
	Menstrual health (MH) and BC program design			-		Not disaggregated as such in 2019
	Woreda/sub-city supervisors training	# of persons		916		Not disaggregated as such in 2019
	O and M Training			-		Not disaggregated as such in 2019
	Inauguration Ceremonies/ handover sessions	# of events	4,816	1,000	-79%	
	Global WASH Event Days	# of events		5,000		Not disaggregated as such in 2019
	Project launching meeting	# of persons		-		Not disaggregated as such in 2019
	Experience sharing event for highest and lowest performing schools	Lump sum		10,000		Not disaggregated as such in 2019
Newsletter Publication	Lump sum		250,000		Not disaggregated as such in 2019	
Administrative costs	Fuel, lubricants, insurance and vehicle maintenance	# of months	5,000	30,286	506%	
	Warehouse facility - rent expense	# of months	23,800	49,500	108%	
	Office space and utilities	# of months	56,000	74,064	32%	
	Parking space	# of months	7,000	1,114	-84%	
	Telecommunications (internet, phone, etc.)	# of months	42,000	49,980	19%	
	Furniture and equipment/computer software and hardware (laptops, tablets, printers)	# of months	56,000	258,525	362%	
	Office supplies, refreshment, moral, security and maintenance	# of months	35,000	60,514	73%	

	Description	Unit	2019 Unit Price (ETB)	2021 Unit Price (ETB)	% increase	Comments
	Professional Services (consulting, graphic design, audit, legal, etc.)	# of months	17,500	71,343	308%	
	Staff professional development and training	# of months	19,600	46,679	138%	
	Travel for conferences and meetings (in-country, regional, and international)	# of months	19,600	146,410	647%	
	Printing & Coping	# of months	7,000	8,268	18%	
	Tools and safety equipment	# of months	10,500	9,291	-12%	
	Recruiting and hiring costs	# of months	10,034	1,394	-86%	
	Stakeholder Costs (technical committee, steering committee, MLE, communications)	# of months		408,145		Not in 2019
	Supervisor Training (Education & Health sector)	# of schools	7,448			Not in 2019
	Project MLE costs	Quarterly	6,400			Not in 2019

Note: costs related to salaries have been analysed separate and due to better disaggregation in 2021 was not directly comparable.