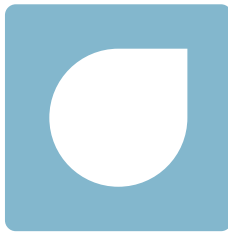


The cost of providing water, sanitation and hygiene in schools in Timor-Leste



Results of life cycle costing assessment in Liquiçá Municipality, Timor-Leste



WaterAid/Tariq Fawari

Dec 2022



washmatters.wateraid.org

Acknowledgements

WaterAid would like to acknowledge and thank the Liquiçá Municipality government staff from the Municipal Administration, Department of Education, Youth and Sports, Water Supply, Sanitation and Environment Department, Department of Health and Secretary of State for Equity and Inclusion who contributed their time and knowledge to this costing assessment. We would like to thank NGO partners in Liquiçá (Fundasaun Hafoun Timor Loro sae and Grupu Feto Foinsa'e Timor-Leste) who participated in workshops. We would also like to acknowledge the funding support that enabled this assessment: the Australian Government through the Department of Foreign Affairs and Trade's Water for Women Fund and the U.S. government through the Foreign Agricultural Service of the United States Department of Agriculture under the McGovern-Dole International Food for Education and Child Nutrition Program through the HATUTAN program.

For further information on this assessment, please contact Fraser Goff (fraser.goff@wateraid.org.au), Joraida Pereira (joraida.pereira@wateraid.org.au) or Tome Guterres (tome.guterres@wateraid.org.au).

Cover photo: Octavia, 17, and her friends outside the new toilet block at their school in Liquiçá Municipality, Timor-Leste. Credit: WaterAid/Tariq Hawari.



Executive summary



Safe, reliable water, adequate sanitation, and hygiene (WASH) services and behaviours in schools are essential to a secure learning environment. Promoting WASH services and behaviours in schools, including for menstrual hygiene needs, can improve educational and health outcomes by increasing school enrolment, attendance and retention, especially for girls.

The Liquiçá Municipal government's WASH strategy provides a roadmap to provide universal WASH services in homes and public institutions by 2030. In support of this strategy, WaterAid Timor-Leste has undertaken a life cycle costing calculation to determine how much budget is required to provide and sustain WASH services in every school in the municipality.

The calculation methodology involved the following steps:

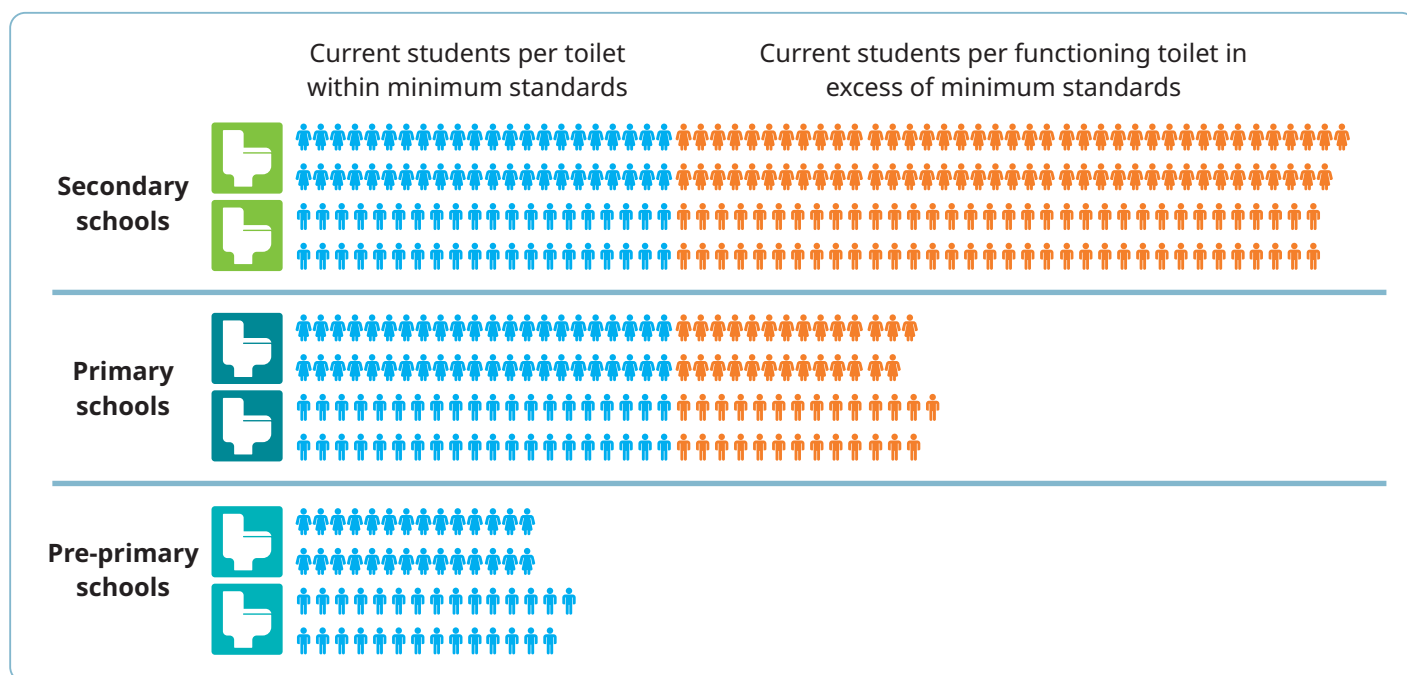
1. Assessment of WASH situation in 101 schools in Liquiçá Municipality.
2. Participatory two-day workshop with sector stakeholders to agree inputs to the life cycle costing.
3. Discussions among municipal government's cross-sectoral WASH team to fill data gaps.
4. Calculation of the life cycle costs for each school in Liquiçá as well as total costs at the municipal Level using an Excel-based tool.

While the majority of schools in Liquiçá have sufficient water storage to meet the Timor-Leste Government's minimum standards for water supply, only 5% of schools meet the minimum standards for sanitation and 16% for handwashing (Table i). The high number of students per toilet in primary schools and secondary schools (Figure i), and the limited number of available menstrual hygiene facilities present barriers to education participation, especially for girls.

Table i – Assessment against national standards for WASH in schools in Liquiçá in 2019-20

Service	Schools meeting minimum standard
Water	73 (72%)
Sanitation	5 (5%)
Hygiene ¹	(16%)

Figure i - Average number of students per toilet at different levels of school in Liquiçá in 2019-20



The analysis estimated the costs of providing and sustaining WASH in schools to the Timor-Leste Government's minimum standards (Table ii, Table iii and Figure ii). The estimated total cost of WASH in schools in Liquiçá from 2022 to 2030 is US\$3,561,587. The largest cost component is new infrastructure, largely driven by the need for additional toilets to meet student:toilet ratios. Because of their larger student cohorts, greater investment is needed in secondary schools and primary schools for both the one-off capital costs of new infrastructure and the recurring costs of operation and maintenance (O&M) and rehabilitation.

1 Data on the number and type of handwashing facility was not available for all schools. The percentages for hygiene are based on the schools for which data was available.

Table ii –Total average investment needed for each service, by type of school 2022 – 2030, USD

Service	Average cost per pre-primary school	Average cost per primary school	Average cost per secondary school
Water	\$ 4,330	\$ 6,655	\$ 12,222
Sanitation	\$ 10,878	\$ 20,332	\$ 32,336
Hygiene	\$ 2,426	\$ 4,594	\$ 6,036
Support Costs*	\$ 7,837	\$ 7,837	\$ 7,837
Total	\$ 25,490	\$ 39,429	\$ 58,431

* Note: Detailed information about current number of staff supporting WASH at each school was not available for the analysis so a municipality-wide estimation was used for the support costs over the analysis period (see Appendix 2). In reality, support costs will vary by type and size of school.

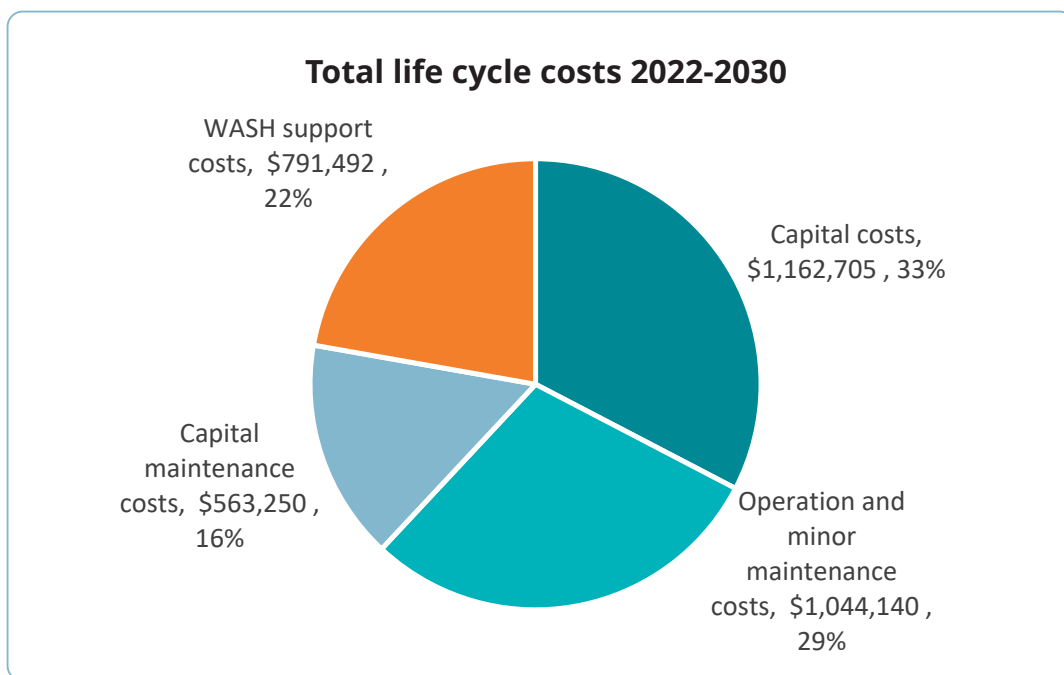
Table iii – Average investment needed for each life cycle cost, by type of school, USD

Life cycle cost category		Average cost per pre-primary school	Average cost per primary school	Average cost per secondary school
Capital investment (one-off)	Capital Costs (one-off)	\$ 8,946	\$ 12,506	\$ 18,761
Recurrent costs (annual)	Operation and Maintenance	\$ 641	\$ 1,380	\$ 2,175
	Capital Maintenance Costs	\$ 326	\$ 741	\$ 1,362
	WASH Support*	\$ 871	\$ 871	\$ 871
	Subtotal: Recurrent costs (annual)	\$ 1,838	\$ 2,991	\$ 4,408

* Note: See note on Table ii regarding support costs.



Figure ii - Life Cycle Cost Components for WASH in schools in Liquiçá 2022-2030, USD



On average, each pre-primary school requires about US\$9,000, each primary school requires about US\$12,500 and each secondary school requires about US\$18,800 in one-off capital investment to meet minimum WASH service levels. Recurrent annual costs of approximately US\$1,800 per pre-primary school, US\$3,000 per primary schools and US\$4,400 per secondary schools are required each year to sustain these service levels.

Pre-Primary Schools
US\$35.70 per student per year
 Annual per capita investments required to provide minimum standard WASH in schools.
 Comprising \$16.17 for capital investment and \$19.54 for recurring investment

Primary Schools
US\$15.51 per student per year
 Annual per capita investments required to provide minimum standard WASH in schools.
 Comprising \$4.64 for capital investment and \$10.88 for recurring investment

Secondary Schools
US\$12.67 per student per year
 Annual per capita investments required to provide minimum standard WASH in schools.
 Comprising \$3.29 for capital investment and \$9.38 for recurring investment

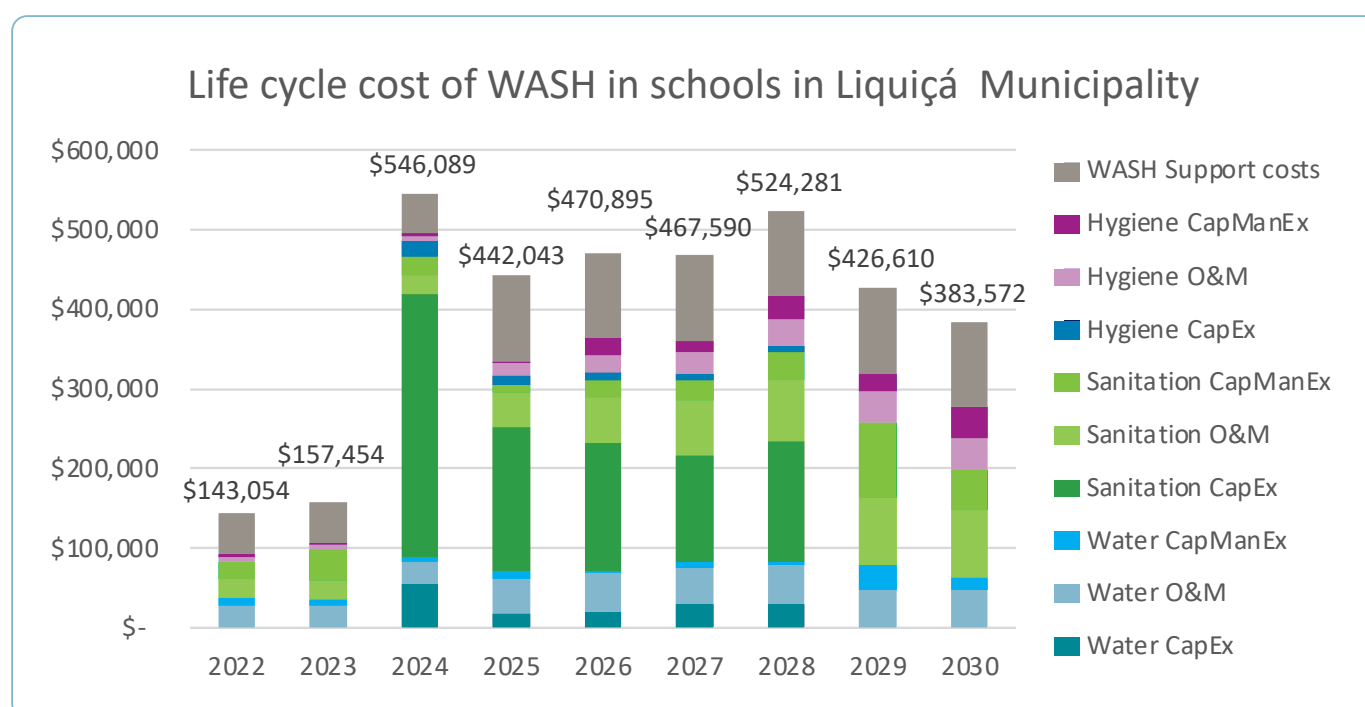
Table iv – Average life cycle cost per student per year by type of school, USD

Life cycle cost category		Average cost per pre-primary school	Average cost per primary school	Average cost per secondary school
Capital investment	Capital Costs	\$ 16.17	\$ 4.64	\$ 3.29
Recurrent costs	Operation and Maintenance	\$ 10.42	\$ 4.60	\$ 3.43
	Capital Maintenance Costs	\$ 5.31	\$ 2.47	\$ 2.15
	WASH Support*	\$ 3.80	\$ 3.80	\$ 3.80
	Subtotal: Recurrent costs	\$ 19.54	\$ 10.88	\$ 9.38
Total	Total cost per student per year	\$ 35.70	\$ 15.51	\$ 12.67

* Note: See note on Table ii regarding support costs.

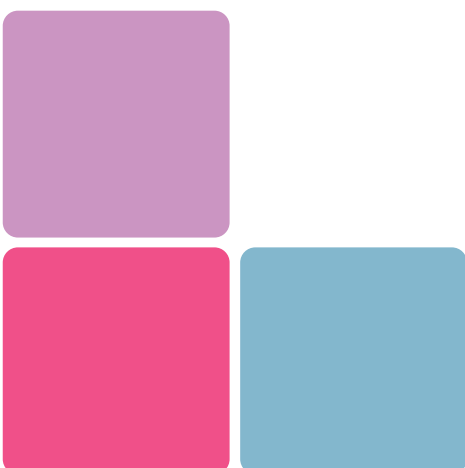
We also calculated the total cost per year for the Municipal Government between 2022 and 2030 based on estimated timelines for upgrading infrastructure and the expected lifespan of infrastructure before it requires rehabilitation (Figure iii). The largest annual cost has been estimated as US\$546,089 in 2024 as new infrastructure is constructed, with recurring costs in 2029 and beyond between US\$380,000 and US\$430,000.

Figure iii - Full life cycle costing estimates for WASH in schools in Liquiçá 2022 – 2030, USD



The current budget for WASH in schools in Liquiçá is insufficient to provide a clean and safe education environment. In order to adequately fund WASH in schools we recommend the following:

1. The national budget, prepared by the Ministry of Education, Youth and Sports, and approved by the National Parliament, should allocate at least US\$16.17, US\$4.64 and US\$3.29 per student per year for capital investment in WASH in pre-primary, primary and secondary schools respectively, and US\$19.54, US\$10.88 and US\$9.38 per student per year for recurrent costs of sustaining WASH in pre-primary, primary and secondary schools respectively.
2. The Liquiçá Municipal Administration should use these costings to coordinate sector-wide planning for a budgeted roadmap to meeting the minimum WASH standards in every school.
3. The national Ministry of Education, Youth and Sports should integrate routine WASH in school monitoring into existing monitoring processes.
4. The national Ministry of Education, Youth and Sports should review and update the national WASH in schools guidelines.
5. The national Ministry of Education, Youth and Sports should develop standard procedures for operation and maintenance of WASH in schools and develop a program for rolling these out nationwide.
6. The Municipal WASH Team should scale up contribution schemes for students' families to contribute regularly to WASH operation and maintenance.



Contents

Acknowledgements	ii
Executive summary	iii
Contents	1
1. Introduction	2
2. What are WASH life-cycle costs?	3
3. Life cycle costing methodology	4
4. National and international WASH in schools standards	6
National WASH in schools standards	6
International standards: Joint Monitoring Programme (JMP)	8
5. Assessment results: Status of WASH in Schools	9
Water supply	11
Sanitation	12
Hygiene	12
Comparison with JMP	14
6. Results: Life cycle costs for WASH in schools in Liquiçá Municipality	15
How to interpret life cycle cost results?	15
Total life cycle costs	15
Water supply costs	20
Sanitation costs	21
Hygiene costs	22
7. Limitations and assumptions	24
8. Discussion and recommendations	26
9. References	28
10. Appendices	29
Appendix 1 – JMP	29
Appendix 2: Inputs to the analysis	29
Capital Costs (CapEx) and Rehabilitation Costs (CapManEx):	29
Operation and Maintenance Costs (O&M):	30
Support Costs:	30

1. Introduction

Safe, reliable water, adequate sanitation, and hygiene (WASH) services and behaviours in schools are essential to a secure learning environment. Promoting WASH services and behaviours in schools, including for menstrual hygiene needs, can improve educational and health outcomes by increasing school enrolment, attendance and retention, especially for girls.

In 2016 the Timor-Leste Government approved a national guideline for WASH in Schools² which sets minimum and recommended standards for water, sanitation and hygiene facilities and behaviour change promotion. However, the current progress towards attainment of the WASH in schools standards is not well understood. Noting this data gap, in 2019-2020 WaterAid supported the Liquiçá Municipality's cross-sectoral WASH team – comprising representatives from the Municipal Administration, Department of Education, Youth and Sports, Water Supply, Sanitation and Environment Department, Department of Health and Secretary of State for Equity and Inclusion - to undertake a municipality-wide assessment of WASH in schools. The data from this assessment was used to identify and prioritise service improvements.

Through a series of discussions in 2020-21 the Liquiçá Municipal WASH sector developed a Municipal WASH Strategy which sets targets for achieving universal WASH by 2030, including WASH in schools. Strategy discussions noted that financing at municipal level remains limited and requires evidence-based advocacy for necessary budget allocations.

To support the achievement of the Municipal WASH strategy, WaterAid has supported a participatory exercise to determine the costs of providing and sustaining WASH services in schools for the entire municipality. This report presents the results of the costing, using a Life Cycle Costing Analysis (LCCA) methodology (life cycle costs are explained in Section 2 and the costing methodology is outlined in Section 3). A summary of the national WASH in schools standards is provided (section 4), followed by a summary of results from the 2019-20 assessment for WASH in 101 schools in Liquiçá Municipality (Section 5). The results of the life cycle cost analysis are presented in Section 6. Sections 7 and 8 conclude the report with the limitations and assumptions inherent in the calculation process and results and a short discussion and recommendations.

2 República Democrática de Timor-Leste (2016). Water, Sanitation and Hygiene (WASH) in Schools: Guidelines for Timor-Leste, Vol 1

2. What are WASH life-cycle costs?

WASH life cycle costs are the costs of delivering, and more importantly sustaining water, sanitation and hygiene services. Life cycle costs include not only the initial, one-off costs of installing new infrastructure, but also the short and long-term costs of maintaining these services long into the future.

Life cycle costs are more easily understood when they are categorised into six components (Table 1). The first three cost categories, coloured blue in this table, include most of the 'hardware' costs (along with the 'software costs of people's time to install and operate the infrastructure), while the three categories coloured orange are predominantly 'software' costs of people's time, travel and loan interest repayments.

Table 1 – Categories of life cycle costs

Cost category	Description
Capital expenditure (CapEx)	The cost of installing new services. This includes construction costs for new infrastructure, training and forming school WASH management groups.
Operation and minor maintenance (O&M)	The cost of running services, paying for regular mechanical checks, cleaning, replacing small parts, and recurring monthly costs like supply of soap, sanitary pads and water.
Major capital maintenance (CapManEx)	The cost to renew, replace or rehabilitate services after their design life. CapManEx has two components—the cost of repairing the existing facilities that are non-functioning, and the ones that will need to be repaired after their expected design life. These costs are less frequent than O&M costs but often more expensive per facility.
Direct Support	The cost of staffing support to keep the services functioning. In this costing we considered school and municipality costs for providing support to WASH services in schools, including supervising new construction, monitoring, training and behaviour change promotion. We also included the staff wages for school cleaning.
Indirect Support	The cost of support to ensure a strong enabling environment, typically incurred at national level. This might include the costs of developing strategies, policies, monitoring frameworks/tools and budgets. In this costing we only considered those costs incurred at municipal level, and combined them with the direct support costs.
Cost of Capital	The cost of borrowing money, or investing in WASH services instead of other investment opportunities. For example if the government takes out a loan for new infrastructure and is required to pay annual interest. In this costing we did not calculate the cost of capital.

3. Life cycle costing methodology

Life cycle costing assessments can serve a variety of purposes. In undertaking this analysis in Timor-Leste, WaterAid's objectives were to:

1. Assess the municipality-wide progress of WASH in schools to support municipal government to prioritise support and investment.
2. Support municipal government and school staff to identify and understand the costs required to provide and sustain WASH in schools to inform municipal planning and budgeting processes.
3. Identify the current funding gap municipal government and schools face for provision of WASH in schools and use this evidence to inform national advocacy efforts to increase the allocation of finance for WASH in schools.

WaterAid Timor-Leste's methodology involved the following steps:

1. Creation of municipal database of WASH status in each school.

- a. In 2021 WaterAid supported the Liquiçá Municipality government's cross-sectoral WASH team, which includes departments of education, water supply and sanitation, health, together with representatives from the secretary of state for equality and inclusion, to conduct quantitative municipality-wide assessments of WASH facilities in every school.
- b. A mobile-phone based survey was used to document interviews with school staff and observations of WASH facilities at the school.
- c. The assessment survey used was not initially designed for a life cycle costing analysis. Gaps in the data were later identified by participants in the municipal workshop, such as missing information on prevalence and condition of MHM facilities, urinals and septic tanks and the age of some infrastructure. To respond to these gaps, the municipal WASH team retrospectively updated the school WASH dataset based on education department records and assessment team recollections.
- d. The consolidated data was compared with the national WASH in school standards and international standards represented by basic JMP levels (see Section 4 of this report) to produce a summary of the situation of WASH in schools (Section 5 of this report).

3 Where ages of existing infrastructure were not noted in the assessment, a range of likely ages of infrastructure were estimated based on photos and assigned randomly to schools to reflect that different facilities will require rehabilitation in different years.

2. Participatory two-day workshop with sector stakeholders to agree inputs to the life cycle costing.

- a. Orientation to municipal stakeholders about life cycle costing's value and methodology for WASH in schools.
- b. Practical exercises based on data from schools in the municipality to deepen participant understanding of the life cycle costing process.
- c. Information obtained from discussions and participant consensus included unit costs for infrastructure, operation and rehabilitation, average personnel salaries and estimated time spent by various personnel on direct and indirect support. Participants also decided how they would recommend prioritising competing priorities for limited budget.
- d. Workshop participants included Municipal Government from the Municipal Administration, departments of education, health, planning, public works, and women's affairs, representatives of the Municipal Consultative Council and NGOs.

3. Calculation of the life cycle costs for each school in Liquiçá as well as total costs at the municipal Level using an Excel-based tool.

- a. Identifying the minimum number of new facilities required to meet national standards for each category of water, sanitation and hygiene considering existing facilities at each school. The capital costs were determined by multiplying the number of new or replacement infrastructure (in cases where existing infrastructure are non-functional) by the unit costs for new infrastructure (see Table 15 in Appendix 2).
- b. Estimating the year of construction for new infrastructure. The assumed prioritisation was that the schools with the largest number of students should be prioritised.
- c. Calculating the annual operation and maintenance costs for WASH infrastructure in each school based on the existing and expected future infrastructure, and the unit costs agreed by workshop participants (see Table 16 in Appendix 2). Operation and maintenance costs are expected to change once new infrastructure is installed – sometimes increasing due to the need to maintain new infrastructure, or decreasing (e.g. when new on-site water facilities provide cheaper water).
- d. Estimating the year and cost of major maintenance for rehabilitating infrastructure based on each infrastructure's expected life span and expected rehabilitation costs (see Table 15 in Appendix 2). This leads to yearly variation in cost as different infrastructure ages and requires significant investment to keep it running.
- e. Estimating the support costs for personnel time to keep services functioning. This was based on the current number of staff at school or municipality level (from the assessment survey) multiplied by average staff daily wages, travel and per diems, and estimated number of days each role spends supporting WASH and waste management. Both the current staffing situation and an 'ideal' future situation in which additional staff and time are dedicated for WASH in schools were included (see Table 17 and Table 18 in Appendix 2).

4 República Democrática de Timor-Leste (2016). Water, Sanitation and Hygiene (WASH) in Schools: Guidelines for Timor-Leste, Vol 1

4. National and international WASH in schools standards

National WASH in schools standards

The Timor-Leste Government's national guidelines for WASH in schools outlines the various roles and responsibilities for the provision and maintenance of WASH services in schools. It sets three levels of WASH standards expected in schools in Timor-Leste:

- **Essential short-term standards.** The most basic WASH requirements that every school must achieve, using locally available resources.
- **Minimum standards.** The minimum WASH quantities and qualities which WASH in schools interventions funded by either donors or government must comply with.
- **National standards.** The recommended standards which are a benchmark for optimal service levels.

This lifecycle costing analysis has determined the costs associated with achieving minimum standards, as summarised in Table 2.

Table 2 – Timor-Leste WASH in schools standards

Aspect	Minimum Standard	National standard
Water	<ul style="list-style-type: none">● 1.0L of safe drinking water per student per half day.● 1.5L of safe drinking water per student per day.● From an improved water source⁵, 1.0L of water per student for schools operating for half days or 1.5L per student for schools operating for full day.● 10L per student per day (conventional flushing toilets) or 2.5L/student/day for pour flush toilets, and 1.5L/student/day for anal washing.	<ul style="list-style-type: none">● 2.0L of safe drinking water per student per day.● From an improved water source, 1.5L of water per student for schools operating for half days or 2.5L per student for schools operating for full day.● 20L per student per day (conventional flushing toilets) or 5.0L/student/day for pour flush toilets, and 2.5L/student/day for anal washing.

5 The Timor-Leste WASH in Schools Guideline does not define what an improved water source is. See JMP definition below.

<p>Sanitation</p>	<ul style="list-style-type: none"> • 1 toilet stall for 40 girls • 1 additional stall with menstruation hygiene (MH) facility and/or with disability. • 1 toilet stall for 40 boys without urinals, or 1 toilet stall plus 1 urinal for 50 boys • 1 toilet stall fitted for use by boys with disability. • 1 toilet stall for female staff, with MH facility • 1 toilet stall for male staff 	<ul style="list-style-type: none"> • 1 toilet stall for 20 girls • 1 additional stall with MH facility • 1 toilet stall fitted for use by girls with disability. • 1 toilet stall for 20 boys without urinals, or 1 toilet stall plus 1 urinal for 30 boys • 1 toilet stall fitted for use by boys with disability. • 1 toilet stall for female staff, with MH facility • 1 toilet stall for male staff • Staff toilets in separate block
<p>Hygiene</p>	<ul style="list-style-type: none"> • Handwashing facilities at every toilet block. • Handwashing facilities at locations where children queue to collect their school meal. • A child-centred club, such as a WASH club, and at least 2 teachers with additional training in WASH and hygiene promotion, reaching every child at least once per year. 	<ul style="list-style-type: none"> • Handwashing facilities at every toilet block. • Handwashing facilities at locations where children queue to collect their school meal. • Handwashing facilities at exit of school field. • A monthly child-centred club, such as a WASH club, and at least 2 teachers with additional training in WASH and hygiene promotion, reaching every child at least four times per year.



International standards: Joint Monitoring Programme (JMP)

Beyond national standards, the WHO/UNICEF Joint Monitoring Programme (JMP) outlines globally-comparable service levels for WASH services in schools, increasing in quality from no service to limited and basic.⁶ For the achievement of the Sustainable Development Goals, specifically SDG 6 (clean water and sanitation) the JMP considers three services: water, sanitation and hygiene (full JMP definitions in Appendix 1). A minimum basic service level is desired for each service, as defined in Table 3.

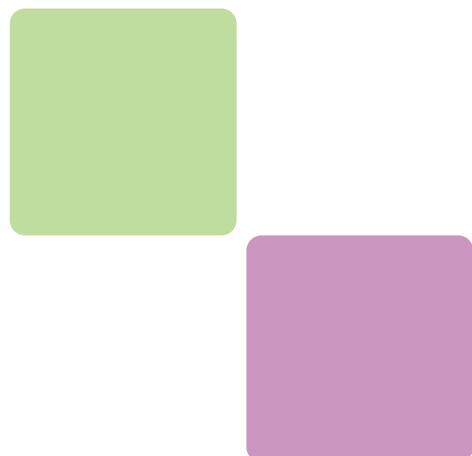
Table 3 – Basic JMP service levels definitions for WASH in schools

Water	Drinking water from an improved source ⁷ is available at the school.
Sanitation	Improved facilities ⁸ , which are single-sex and usable at the school.
Hygiene	Hand washing facilities, which have water and soap available.

6 United Nations Children's Fund (UNICEF) and World Health Organization. (2018). *Drinking water, sanitation and hygiene in schools: Global baseline report 2018*. New York: 2018

7 JMP defines improved drinking water sources as those with the potential to deliver safe water by nature of their design and construction, including: piped water; boreholes or tubewells; protected dug wells; protected springs; rainwater; and packaged or delivered water.

8 JMP considers improved sanitation facilities as those designed to hygienically separate human waste from contact, including: flush/pour flush to piped sewer system, septic tank or pit latrines; ventilated improved pit latrines; composting toilets or pit latrines with slabs.



5. Assessment results: Status of WASH in Schools

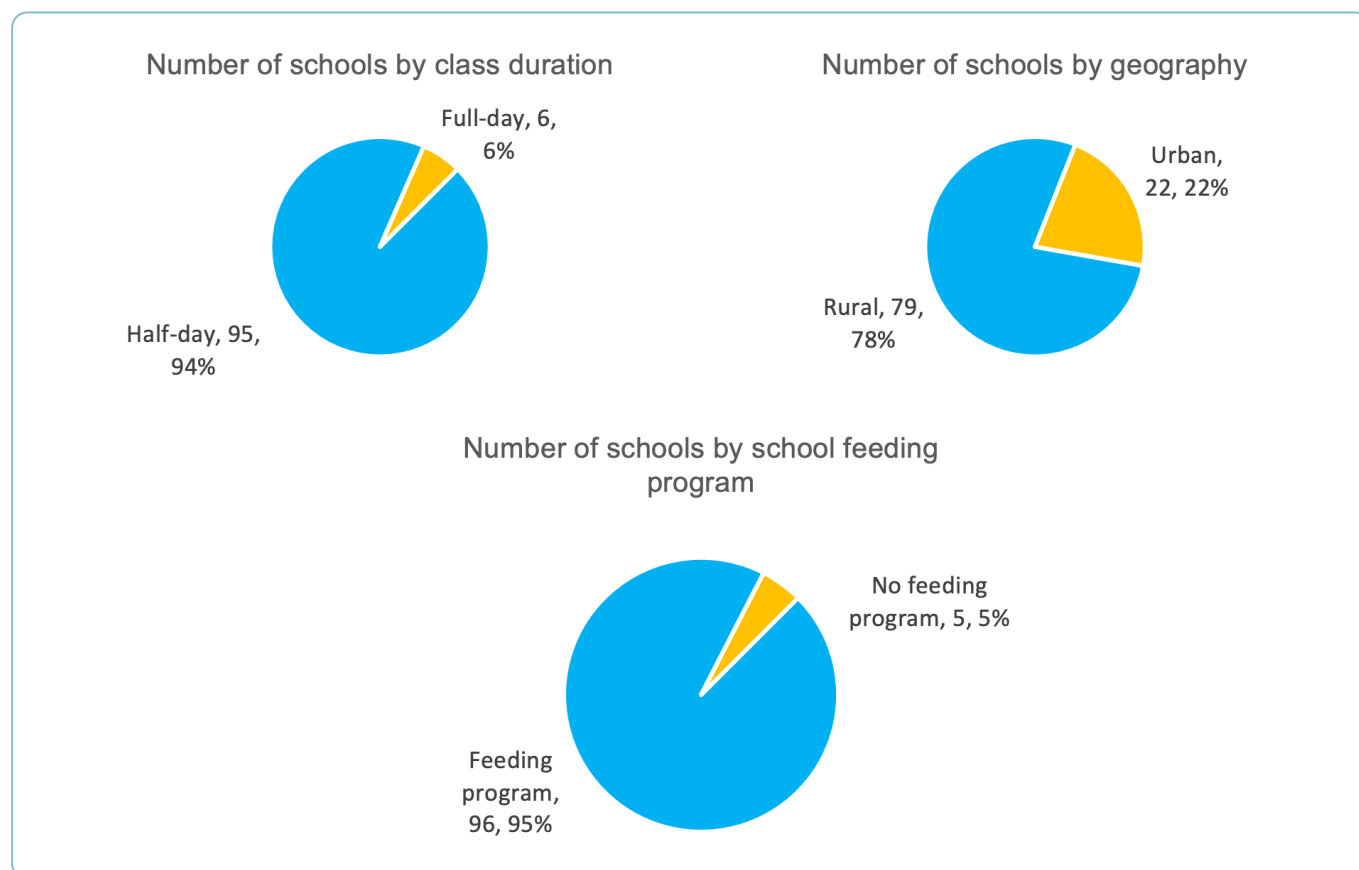
The assessment of WASH in schools was undertaken in 101 pre-primary, primary and secondary schools in Liquiçá in 2019-20. The number of schools, total and average number of students for each type of school is presented in Table 4. Among the 101 schools assessed, most (94%) run half-day classes, and most (78%) were situated in rural areas. Almost all schools (95%) provide a school feeding program (Figure 1).

Table 4 – Types of school assessed in Liquiçá in 2019-2020

Facility type ⁹	Number of schools	Total female students	Total male students	Total students	Average students per school
Pre-primary school	37	1,069	1,206	2,275	61
Primary school	59	8,650	9,033	17,683	300
Secondary school	5	1,660	1,510	3,170	634
Total	101	11,379	11,749	23,128	229

⁹ The 2022 state budget book for Liquiçá notes only 98 schools and the breakdown of facility type does not match the breakdown listed here: 30 pre-primary schools, 63 primary schools, 5 secondary schools. Due to different enumerators participating in the assessment over two years, and in a Covid-19 context, some schools were assessed twice and duplicates have been removed. It is also possible that due to different naming conventions of the enumerators some duplicate schools may remain in the dataset or some schools in the municipality may have been omitted from the analysis.

Figure 1- Characteristics of schools included in the assessment



The results of the WASH assessment are presented in Table 5. While 72% of schools met the Timor-Leste Government's minimum standard for water supply, only 5% of schools met the minimum standard for sanitation and 16% for hygiene.

Table 5 – Assessment against national standards for WASH in schools in Liquiçá in 2019-20

Service	Schools meeting minimum standard
Water	73 (72%)
Sanitation	5 (5%)
Hygiene ¹⁰	(16%)

10 Data on the number and type of handwashing facility was not available for all schools. The percentages for hygiene are based on the schools for which data was available.

Water supply

The relatively high rate of schools meeting minimum water standards is partly because the standards focus on volume of water rather than quantity and type of infrastructure. The school WASH assessment did not document maximum and minimum water flow rates and it was assumed that if sufficient storage volume was available at the school for the daily student water requirements the standard was met. In reality water scarcity in the dry season may mean that insufficient water is available to meet standards. Most schools (93 schools, 92%) have access to at least one improved water source (Table 6).

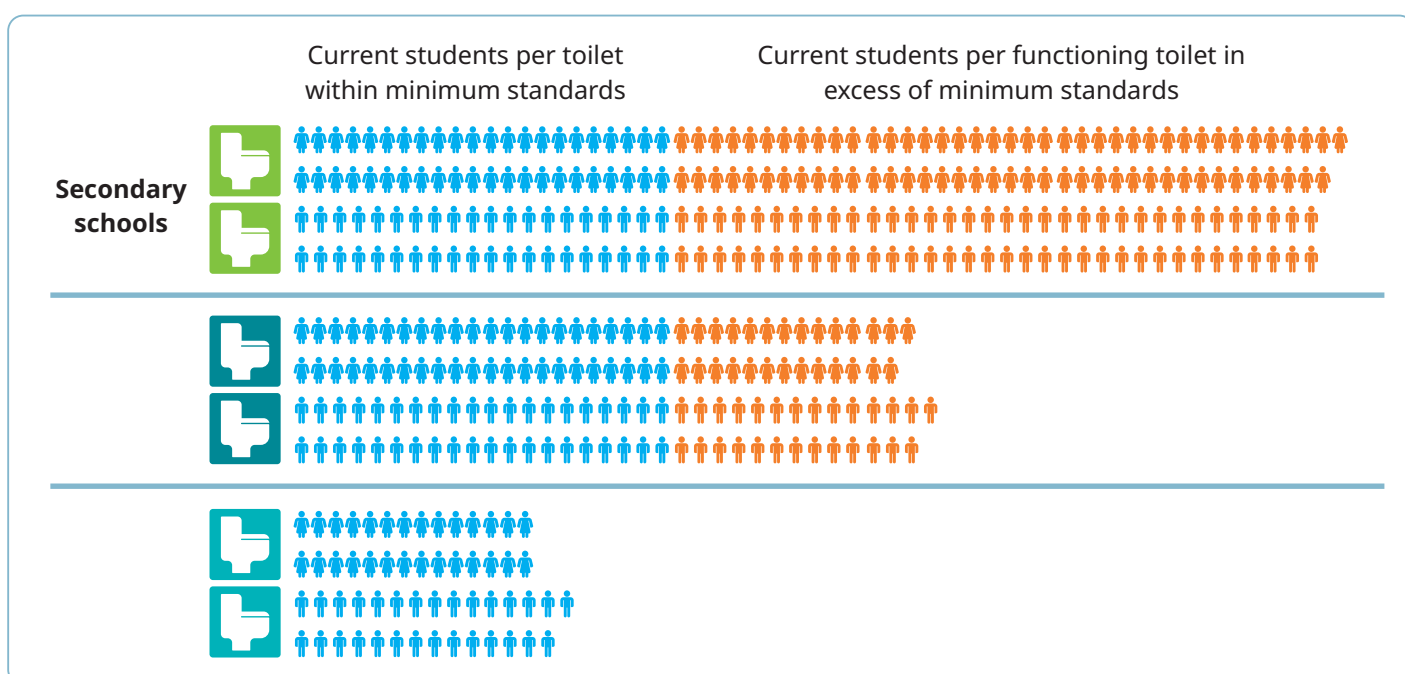
Table 6 – Water sources for school water access

Water source category	Primary water source	Number of schools
Improved	Piped into school grounds	65
	Piped into school buildings	12
	Public tapstand	9
	Protected well or borehole	5
	Rainwater	1
	Bottled drinking water	1
	Subtotal improved	93
Unimproved	No water source	3
	Surface water	2
	Trucked water	2
	Well	1
	Subtotal unimproved	8
	Total	101

Sanitation

The existing sanitation situation in schools is concerning, with very few schools meeting the minimum standard of one toilet per 40 students (Figure 2). Among the five secondary schools in the municipality there are an average of 111 female students and 108 male students per functioning toilet. In primary schools there are on average 65 female students and 67 male students per functioning toilet. Pre-primary schools are the only level which meet the minimum standards on average with 26 female students and 29 male students per functioning toilet. Very few schools have dedicated and separate toilets for male and female staff (6 schools, 6%), functioning accessible toilets (7 schools, 7%) or toilets with functioning menstrual hygiene facilities (7 schools, 7%).

Figure 2- Average number of students per toilet at different levels of school in Liquiçá in 2019-20



Hygiene

While almost all schools had some form of handwashing facilities at the time of assessment (91 schools, 90%, Table 7), the enumerators did not always note the type or number of facilities and it is thus difficult to assess whether those schools met the standard of providing handwashing facilities at both the toilet blocks and schools feeding locations. Slightly over half of handwashing facilities (57 schools, 56%) had both water and soap at the time of assessment (Table 8).

Among the 63 schools for which detailed data was available, only ten schools (16%) had enough functioning handwashing facilities to allow for students to wash their

hands after using the toilet and also at the queue for school feeding programs. Although almost every school (95%) runs a school-feeding program, the small numbers of functioning plumbed or mass handwashing facilities at schools indicate likely poor handwashing practice prior to eating - 300 primary school students queuing to each wash their hands for 20 seconds at a single tap would require an unrealistic 100 minutes of continuous water supply and student patience.

Many of the simple handwashing facilities observed in schools were recently installed as part of Covid-19 prevention measures and sustainability of their use has not yet been assessed.

Table 7 – Handwashing facilities in schools in Liquiçá in 2019-20

Handwashing facility type	Number of schools	Could potentially meet minimum standard?
No functioning handwashing facility	9 (9%)	No
Functioning handwashing facility exists but assessment did not note the type or quantity	38 (39%)	n/a
One simple handwashing facility only (bucket, tank with tap or tippy tap)	39 (39%)	No
More than one handwashing facility, but simple only (bucket or tippy tap)	1 (1%)	Yes
One simple handwashing facility only (bucket, tank with tap or tippy tap) plus mass handwashing facilities	3 (3%)	Yes
At least one individual handwashing facility which is a plumbed sink with tap	1 (1%)	Yes
At least one individual handwashing facility which is a plumbed sink with tap, plus mass handwashing facilities	5 (5%)	Yes
Only mass handwashing facilities	5 (5%)	No
Total	101 (100%)	

Table 8 – Availability of water and soap at handwashing facilities in schools in Liquiçá in 2019-20

Availability of soap and water	Number of schools
No water or soap	9 (9%)
Water only	31 (31%)
Both soap and water	57 (56%)

Comparison with JMP

The school WASH data was also assessed against the JMP service levels (Table 9) to enable a comparison with global WASH in schools indicators (see JMP service definitions in Appendix 1). While water services were the best service on average, 61% of schools met the JMP basic sanitation service levels and 56% of schools met the JMP basic hygiene service level.

Table 9 – Schools meeting each JMP service level for WASH in schools in Liquiçá in 2019-20

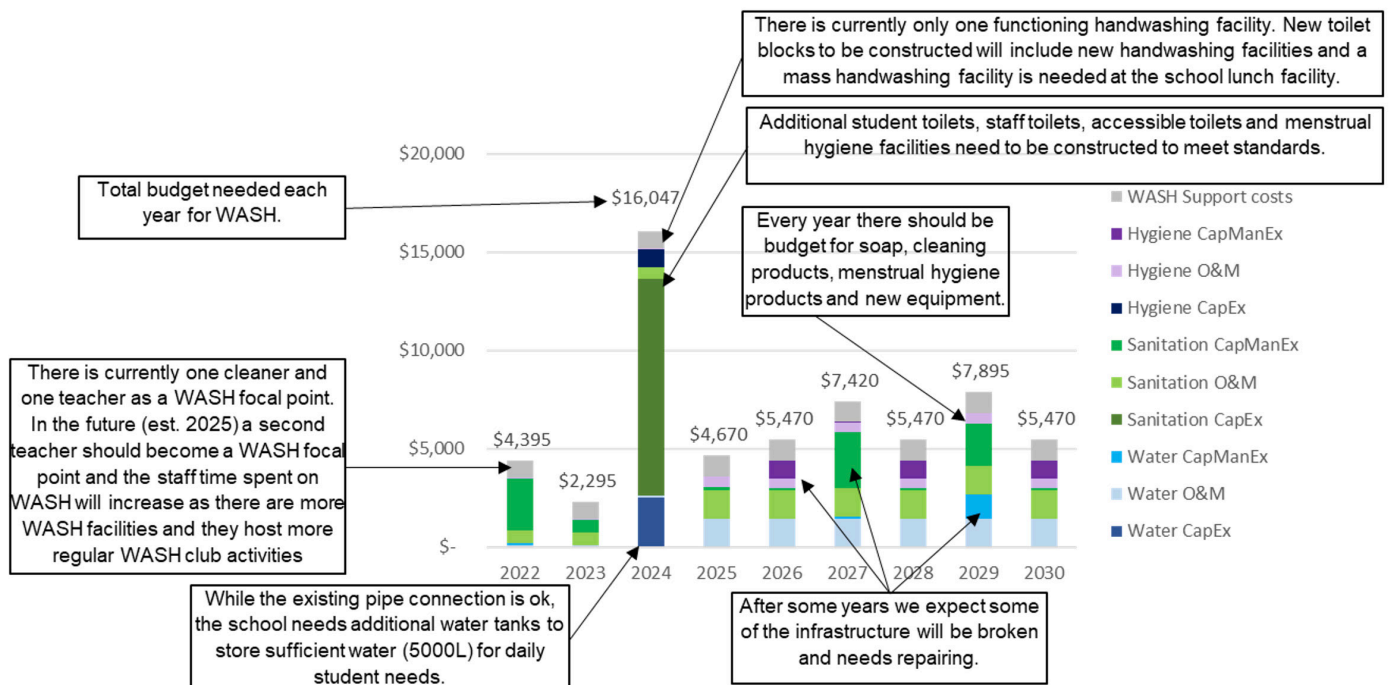
JMP service level	Water	Sanitation	Hygiene
Basic	96 (95%)	62 (61%)	57 (56%)
Limited	1 (1%)	32 (32%)	13 (13%)
No service	4 (4%)	7 (7%)	31 (31%)

6. Results: Life cycle costs for WASH in schools in Liquiçá Municipality

How to interpret life cycle cost results?

The following section presents the results of the life cycle cost assessment at a municipal Level as the sum of the results from the 101 schools. The annotated results shown in Figure 3 from one school, the EBC Bogoro primary school, can help readers to understand how to interpret the results.

Figure 3- Interpreting life cycle costs, example from one school



Total life cycle costs

The tables and graphs below show the amount of annual budget that is needed to provide WASH services in the 101 analysed schools in Liquiçá Municipality from 2022 to 2030.

The average costs for the three different types of schools are presented in Table 10. Meeting the sanitation standards requires the greatest investment in each of the three school types. In pre-primary and primary schools, the second largest investment is for personnel costs to maintain WASH services followed by water services and hygiene. In secondary schools the second largest investment is required for water followed by personnel and then hygiene.

Table 10 –Total average investment needed for each service, by type of school
2022 – 2030, USD

Service	Average cost per pre-primary school	Average cost per primary school	Average cost per secondary school
Water	\$ 4,330	\$ 6,655	\$ 12,222
Sanitation	\$ 10,878	\$ 20,332	\$ 32,336
Hygiene	\$ 2,426	\$ 4,594	\$ 6,036
Support Costs*	\$ 7,837	\$ 7,837	\$ 7,837
Total	\$ 25,490	\$ 39,429	\$ 58,431

* Note: Detailed information about current number of staff supporting WASH at each school was not available for the analysis so a municipality-wide estimation was used for the support costs over the analysis period (see Appendix 2). In reality, support costs will vary by type and size of school.

The investment needed for each of the life cycle categories is presented in Table 11. These results show that while considerable one-off investments are needed in all schools to achieve the minimum standards, ongoing annual investment to sustain WASH services are also significant.

Table 11 – Average investment needed for each life cycle cost, by type of school, USD

	Life cycle cost category	Average cost per pre-primary school	Average cost per primary school	Average cost per secondary school
Capital investment (one-off)	Capital Costs (one-off)	\$ 8,946	\$ 12,506	\$ 18,761
Recurrent costs (annual)	Operation and Maintenance	\$ 641	\$ 1,380	\$ 2,175
	Capital Maintenance Costs	\$ 326	\$ 741	\$ 1,362
	WASH Support*	\$ 871	\$ 871	\$ 871
	Subtotal: Recurrent costs (annual)	\$ 1,838	\$ 2,991	\$ 4,408

* Note: See note on Table 10 regarding support costs.

The costs for WASH in schools are directly linked to the number of students. This explains why Table 10 and Table 11 show that the larger secondary schools require a larger total investment than the smaller primary and pre-primary schools. However, because the standards require minimum numbers of WASH facilities, economies of scale mean that the annual cost per student is lower for secondary schools than for primary or pre-primary schools (Table 12 and Table 13).

Table 12 –Average cost for each service per student per year by type of school, USD

Service	Average annual cost per pre-primary student	Average annual cost per primary student	Average annual cost per secondary student
Water	\$ 7.82	\$ 2.47	\$ 2.14
Sanitation	\$ 19.66	\$ 7.54	\$ 5.67
Hygiene	\$ 4.42	\$ 1.71	\$ 1.06
WASH Support*	\$ 3.80	\$ 3.80	\$ 3.80
Total	\$ 35.70	\$ 15.51	\$ 12.67

* Note: See note on Table 10 regarding support costs.

Table 13 – Average life cycle cost per student per year by type of school, USD

	Life cycle cost category	Average cost per pre-primary school	Average cost per primary school	Average cost per secondary school
Capital investment	Capital Costs	\$ 16.17	\$ 4.64	\$ 3.29
Recurrent costs	Operation and Maintenance	\$ 10.42	\$ 4.60	\$ 3.43
	Capital Maintenance Costs	\$ 5.31	\$ 2.47	\$ 2.15
	WASH Support*	\$ 3.80	\$ 3.80	\$ 3.80
	Subtotal: Recurrent costs	\$ 19.54	\$ 10.88	\$ 9.38
Total	Total cost per student per year	\$ 35.70	\$ 15.51	\$ 12.67

* Note: See note on Table 10 regarding support costs.

In Table 14 we present the total expected cost at municipal level for each of water, sanitation and hygiene for WASH in schools, and the personnel support costs. The total cost of providing and sustaining WASH in all schools in Liquiçá for the period 2022-2030 is calculated to be US\$3,561,587.

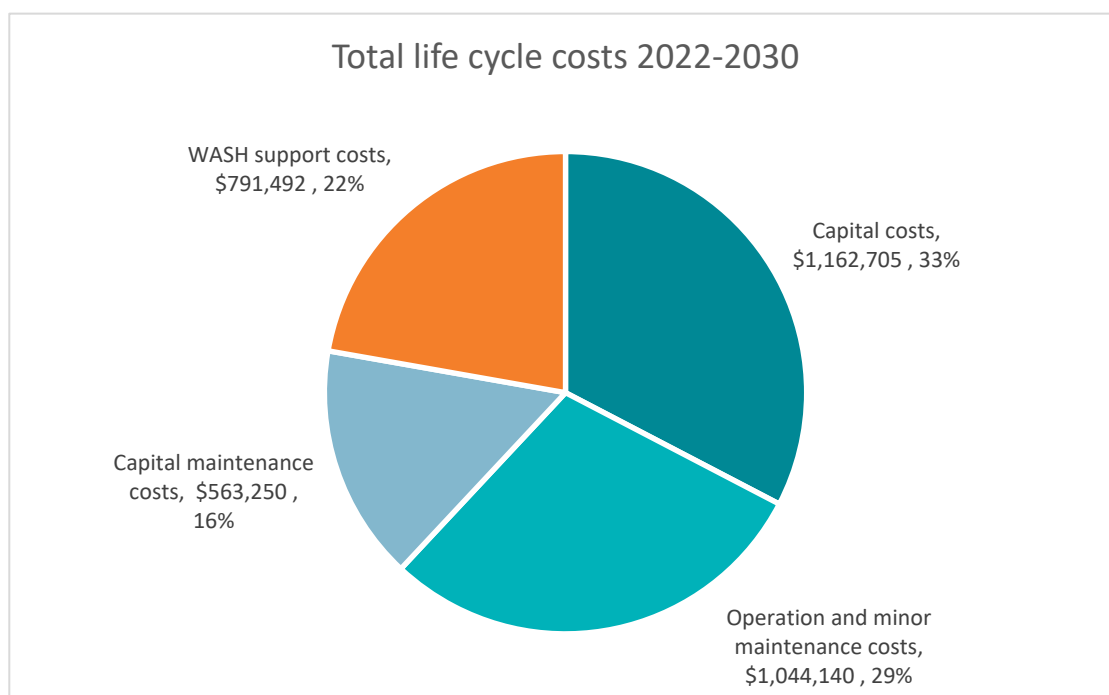
Table 14 – Full life cycle costing estimates at municipal level 2022 – 2030, USD

	Cost	2022	2023	2024	2025	2026	2027	2028	2029	2030	TOTAL
Water	CapEx	\$ -	\$ -	\$ 54,950	\$ 17,450	\$ 20,000	\$ 28,975	\$ 29,900	\$ -	\$ -	\$ 151,275
	O&M	\$ 27,030	\$ 27,030	\$ 27,030	\$ 43,940	\$ 48,980	\$ 46,660	\$ 48,190	\$ 7,130	\$ 47,130	\$ 363,120
	CapManEx	\$ 11,100	\$ 7,750	\$ 6,900	\$ 8,700	\$ 3,000	\$ 8,100	\$ 4,750	\$ 32,600	\$ 16,650	\$ 99,550
Sanitation	CapEx	\$ -	\$ -	\$330,160	\$181,148	\$160,248	\$132,838	\$152,336	\$ -	\$ -	\$ 956,730
	O&M	\$ 23,480	\$ 3,480	\$ 23,480	\$ 43,890	\$ 58,110	\$ 69,210	\$ 76,840	\$ 84,680	\$ 84,680	\$ 487,850
Hygiene	CapManEx	\$ 21,063	\$ 40,013	\$ 24,988	\$ 10,150	\$ 20,513	\$ 24,863	\$ 33,850	\$ 93,525	\$ 50,238	\$ 319,200
	CapEx	\$ -	\$ -	\$ 18,200	\$ 11,700	\$ 9,200	\$ 7,400	\$ 8,200	\$ -	\$ -	\$ 54,700
WASH	O&M	\$ 6,420	\$ 6,420	\$ 6,420	\$ 15,450	\$ 22,530	\$ 28,230	\$ 33,600	\$ 40,260	\$ 40,260	\$ 199,590
	CapManEx	\$ 3,920	\$ 2,720	\$ 3,920	\$ 2,720	\$ 21,420	\$ 14,420	\$ 29,720	\$ 1,520	\$ 37,720	\$ 138,080
	Support costs	\$ 50,041	\$ 50,041	\$ 50,041	\$106,895	\$106,895	\$106,895	\$106,895	\$106,895	\$106,895	\$ 791,492
TOTAL Water	\$ 38,130	\$ 4,780	\$ 88,880	\$ 70,090	\$ 71,980	\$ 83,735	\$ 82,840	\$ 79,730	\$ 63,780	\$ 613,945	
TOTAL Sanitation	\$ 44,543	\$ 63,493	\$378,628	\$235,188	\$238,871	\$226,911	\$263,026	\$178,205	\$134,918	\$ 1,763,780	
TOTAL Hygiene	\$ 10,340	\$ 9,140	\$ 28,540	\$ 29,870	\$ 53,150	\$ 50,050	\$ 71,520	\$ 61,780	\$ 77,980	\$ 392,370	
TOTAL	\$143,054	\$157,454	\$546,089	\$442,043	\$470,895	\$467,590	\$524,281	\$426,610	\$ 383,572	\$ 3,561,587	

Reflecting the six life cycle cost categories presented earlier (Table 1), Figure 4 shows the relative proportion of costs expected for achieving and sustaining basic WASH in schools for the life of the Municipal WASH Strategy 2022-2030.

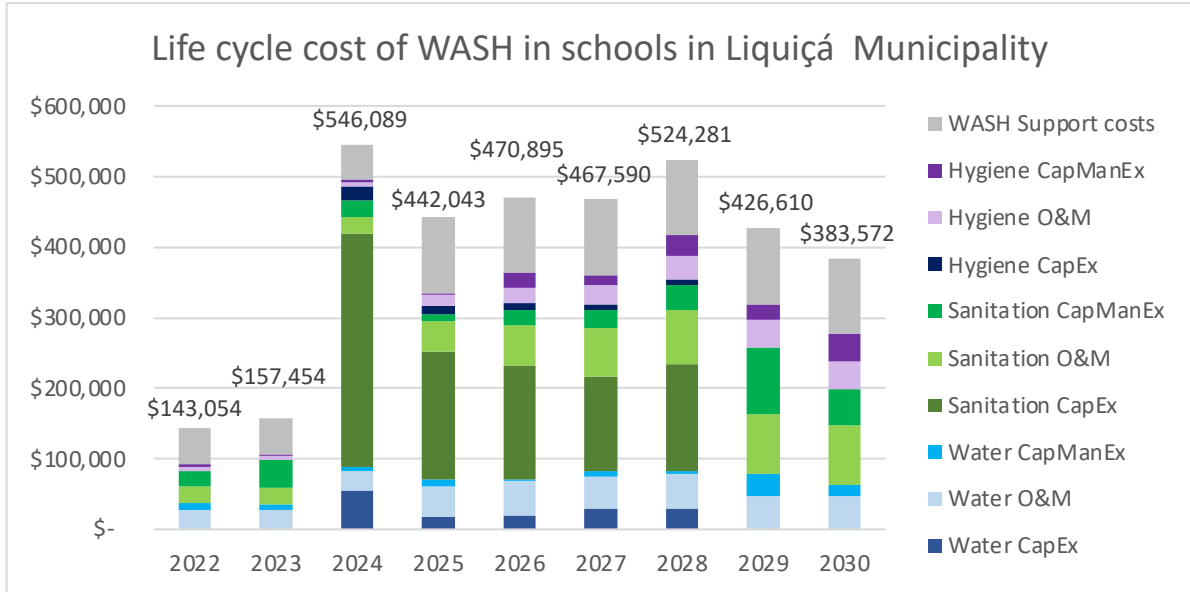
The largest proportion of costs (33%, US\$1,162,705) is expected for the one-off capital costs of new infrastructure. The second largest cost is for ongoing annual costs of running school WASH facilities – operation and maintenance – at 22% (US\$1,044,140), followed by WASH support: the costs of staff time and travel, both from school staff and municipal department functionaries, to provide supervision, monitoring, training and behaviour promotion to students and cleaning. The smallest expected budget is for capital maintenance and rehabilitation costs at 16% (US\$563,250). This chart shows that while the largest cost component is for new infrastructure, over the nine years of analysis two thirds of the investment needed is for annual recurrent costs of operation, maintenance, rehabilitation and personnel support.

Figure 4- Life Cycle Cost Components for WASH in Schools in Liquiçá for the period 2022-2030, USD



The expected costs each year for achieving the Municipal WASH Strategy for schools are presented in Figure 5. The required budget varies each year depending on how many new facilities are required and the expected life span and associated rehabilitation costs of different infrastructure. The maximum estimated annual budget required is US\$546,089 in 2024. Based on the discussions with municipal stakeholders, the costs for infrastructure in schools were distributed over five years, starting with the schools with the most students first and with completion of all new infrastructure in 2028. Beyond 2028, the annual costs for maintaining, rehabilitating and supporting services are expected to be between US\$380,000-US\$430,000. The figure shows the significant investment in sanitation relative to other services.

Figure 5- Full life cycle costing estimates for WASH in schools in Liquiçá 2022 – 2030, USD



Water supply costs

The annual costs of meeting the minimum standards for water supply services are presented in Figure 6. Construction of new infrastructure (CapEx) has been assumed in 20-21 schools each year between 2024 and 2028, with the schools with the largest number of students prioritised first. The largest annual water cost is estimated to occur in 2024 when the 20 schools with the most students construct new infrastructure. From 2029 onwards the expected operation and maintenance costs (O&M) for water supply stabilise at around US\$47,000 for all 101 schools in the municipality, with CapManEx costs varying as different facilities come to the end of their design life and require rehabilitation.

Figure 6- Full life cycle costing estimates for water in schools in Liquiçá 2022 – 2030, USD

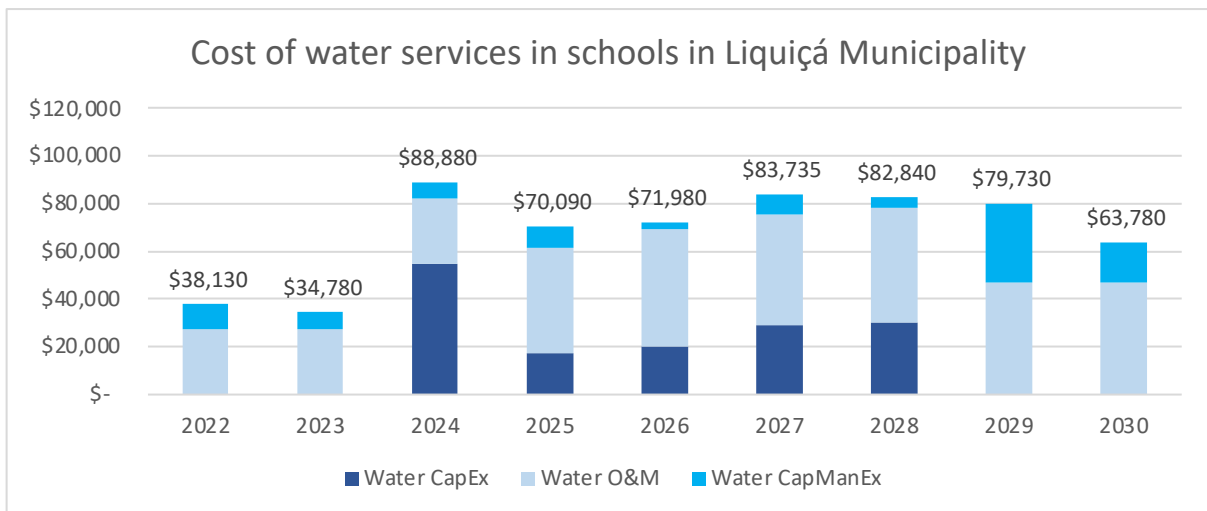


Figure 7 – The water tank at the Ediri primary school is typical of many of the school water tanks in Liquiçá. (Liquiçá Municipal Department of Water Supply, Sanitation and Environment/Herminio Soares)



Sanitation costs

The annual costs of meeting the minimum standards for sanitation services are presented in Figure 8. Construction of new infrastructure (CapEx) has been assumed in 20-21 schools each year between 2024 and 2028, with the schools with the largest number of students prioritised first. The largest annual sanitation cost is estimated to occur in 2024 when the 20 schools with the most students construct new infrastructure. From 2029 onwards the expected operation and maintenance costs (O&M) for sanitation stabilise at around US\$85,000 for all 101 schools in the municipality.

Figure 8- Full life cycle costing estimates for sanitation in schools in Liquiçá 2022 – 2030, USD

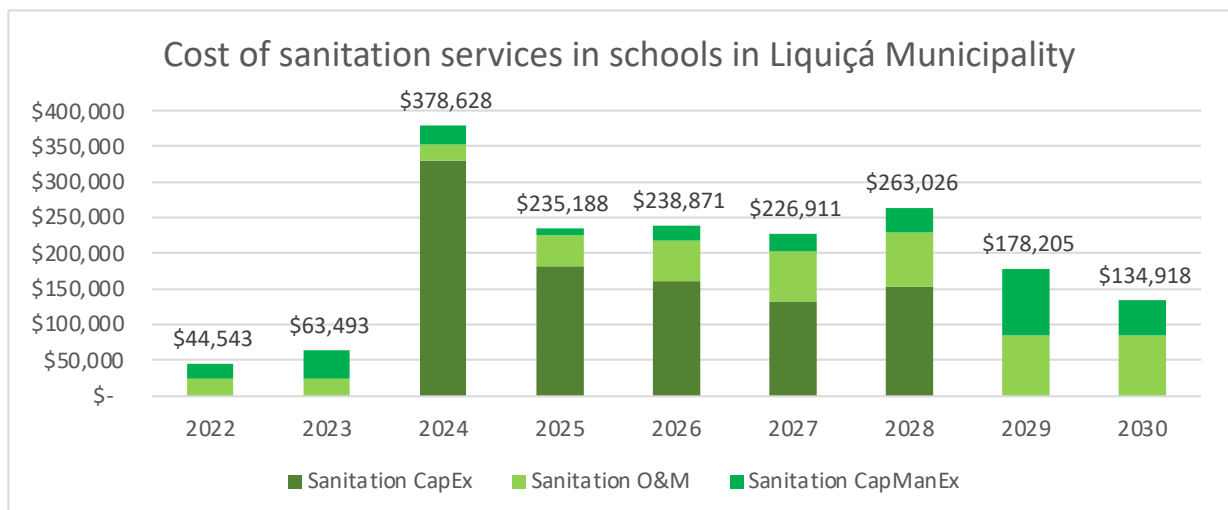


Figure 9 - Low ratios of toilets to students in many schools result in poor cleanliness and rapid failure of existing toilets.



Hygiene costs

The annual costs of meeting the minimum standards for hygiene services are presented in Figure 10. Construction of new infrastructure (CapEx) has been assumed in 20-21 schools each year between 2024 and 2028, with the schools with the largest number of students prioritised first. From 2029 onwards the expected operation and maintenance costs (O&M) for hygiene stabilise at around US\$40,000 for all schools in the municipality, but significant variation in the annual cost of rehabilitation/ replacement (CapManEx) is expected as different qualities of handwashing facilities need more or less frequent replacement (Figure 11).

Figure 10- Full life cycle costing estimates for hygiene in schools in Liquiçá 2022 – 2030, USD

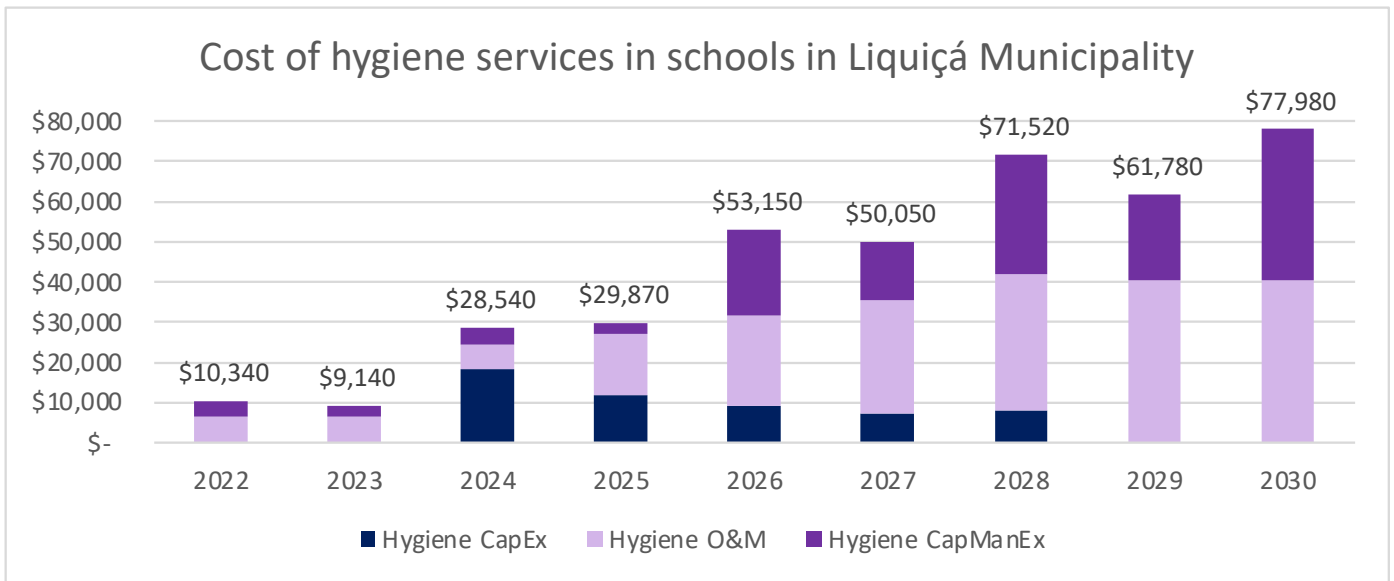


Figure 11 - Students at the Escola CAFÉ wash their hands before morning tea at their school's mass handwashing facility, Liquiçá Municipality



WaterAid/Tariq Hawari

7. Limitations and assumptions

In addition to the limitations outlined in the methodology section, the following limitations should be taken into consideration when interpreting and using the results of the life cycle costing analysis in this report:

- The data on WASH in schools was drawn from municipality-wide surveys conducted in 2019-20. Some facilities may have become non-functioning, there may have been staffing changes, and there may have been some construction of new facilities in the time between the survey and the finalisation of the life cycle costing analysis.
- The costs presented therefore reflect an estimate only. In addition to estimations of the age of infrastructure the cost of new facilities/assets were estimated based on actual bills of quantities and costs from WaterAid's projects (see Appendix 2). Construction of facilities by other actors using different procurement and construction protocols, or cost efficiencies achieved by upgrading facilities in multiple schools in a year mean that actual costs will vary from the estimations.
- The results above present total and average costs for WASH in schools, but there is considerable variation in the costs in each school due to differences in existing infrastructure and large variation in student numbers. For facility-level planning and budgeting, budget-holders are encouraged to refer to the school-level calculations in the assessment spreadsheet.
- Different actors pay for different costs for WASH in schools. For example, in some schools parent-teacher associations contribute monthly or quarterly funds for operation and maintenance of WASH to supplement funding provided through the Department of Education. The detailed budgets of the various government departments, NGOs and community were not available at the time of analysis to compare costs with budget allocations and estimate current and future budget gaps in detail but workshop participants indicated that current budgets are insufficient. It is hoped this report will prompt discussion about the differences between available and required budgets.
- No inflation has been applied in this costing analysis. Inflation in Timor-Leste has varied significantly year-to-year from as low as -1.4% to +8.9% in the past four years. When interpreting the results readers should consider that the costs in future years may be impacted by inflationary changes to actual costs of goods and services.

The following assumptions were applied during the analysis and may affect the validity of the results:

- In the absence of documented water flow rates, water supply standards were assumed to be met if sufficient storage volume was available at the school. Seasonal variations in water resource availability, and the number of water points within each school may affect students' ability to access the required daily water volumes. In some school assessments the volume of the tank was not noted and so a minimum tank size of 1000L was assumed.
- The participatory workshop was not able to achieve a consensus on how to prioritise which schools should be upgraded first. This analysis has assumed that construction of new facilities would start in the schools with the largest student cohort and that all schools would be divided approximately evenly across five years of construction works.
- The participatory workshop was not able to achieve a consensus on how many hours would be required from teachers, cleaners and Municipal Department of Education staff to sustain WASH in schools at the minimum standard, especially as this cost component is typically already funded through regular staff salaries. The WASH support costs for personnel are thus based on average salaries of government functionaries identified in a similar life cycle costing for WASH in health care facilities, and estimates of the proportion of cleaners' time dedicated to school WASH facilities, and teachers' time to run student WASH clubs (refer to Appendix 2). More detailed estimation of personnel costs would be useful.



8. Discussion and recommendations

Provision of WASH in schools is essential to enabling a healthy and secure learning environment. The low proportion of schools in Liquiçá meeting the minimum standards – especially for sanitation and hygiene – reflects a barrier to universal participation in education as well as presenting a risk to student and community health. Education, as a pillar of human capital development, was noted as one of six national priorities in the 2022 state budget. The 2022 state budget allocates 9% of its funding to education and separately 1.8% to water and sanitation (in all community and institutional settings). A detailed analysis of the public budgets available for WASH in schools has not been undertaken in this study but the reflections of the workshop participants indicate that current allocations are insufficient to cover the costs of meeting the minimum standards for WASH in schools.

While workshop focused on determining the costs for WASH in schools, participants also identified that one barrier to effective financing is the complexity of funding these services. Different departments or actors are responsible for funding different life cycle cost components using multiple public financing budget lines. Participants noted the need for better coordination between these actors and improved long-term strategic planning, especially to ensure ongoing recurrent expenses are being budgeted. We hope that the results outlined in this report can contribute to a broader discussion on both the quantity and quality of finance for WASH in schools.

Based on this analysis WaterAid recommends the following:

- 1. The national budget for education, prepared by the Ministry of Education, Youth and Sports, and approved by the National Parliament, should allocate at least US\$16.17, US\$4.64 and US\$3.29 per student per year for capital investment in WASH in pre-primary, primary and secondary schools respectively, and US\$19.54, US\$10.88 and US\$9.38 per student per year for recurrent costs of sustaining WASH in pre-primary, primary and secondary schools respectively.**
- 2. The Liquiçá Municipal Administration should use these costings to coordinate sector-wide planning for a budgeted roadmap to meeting the minimum WASH standards in every school.** Determining which schools should be prioritised, allocating human and financial resources to meeting the WASH in schools standards, and bringing together the relevant departments is the role of the Municipal Administration. A documented, costed plan to meet the minimum WASH in schools standards in every school would complement the Municipal WASH Strategy and provide useful evidence to advocate for additional national budget allocations to achieve the municipal goal.

3. **The national Ministry of Education, Youth and Sports should integrate routine WASH in school monitoring into existing monitoring processes.** In order to prioritise and monitor maintenance and rehabilitation of services there is a need to improve routine WASH asset data, which could be done through the existing EMIS. More complete data on the presence and status of all WASH facilities can improve municipal and national planning and budgeting to meet the minimum standards.
4. **The national Ministry of Education, Youth and Sports should review and update the national WASH in schools guidelines.** The level of detail provided in the minimum standards for each of water, sanitation and hygiene do not guarantee equivalent services. For example, the current minimum standard for sanitation based on student:toilet ratios ensures students do not need to wait unnecessarily long to use a toilet. By comparison, the hygiene standards are based on the number of handwashing facilities rather than the service they provide. A school could meet the minimum standard for hygiene by providing a single tippy tap at the school lunch location even though in practice the students might have to queue for hours to wash their hands thoroughly. The water standards based on volume of available water do not account for flow rates and convenience, and do not address questions about water resource management, seasonal availability and integration between school and community water use which are common concerns for school and communities in Timor-Leste.
5. **The national Ministry of Education, Youth and Sports should develop standard procedures for operation and maintenance of WASH in schools and develop a program for rolling these out nationwide.** The national WASH in schools guidelines emphasise sustainability and the need for operation and maintenance to contribute to this. However the responsibility for developing and implementing O&M plans is left to each school. Given the importance of O&M, and the large proportion of recurrent costs which are likely to be borne or managed by the schools, schools would benefit from simple operating procedures like checklists, per capita cost estimates and monitoring templates to enable more systematic O&M of WASH in schools.
6. **The Municipal WASH Team should scale up contribution schemes for students' families to contribute regularly to WASH operation and maintenance.** The second largest cost component of each service (water, sanitation, hygiene) is for operation and maintenance, which is also likely to be the component with most limited budgets. Experience from some schools such as Bogoro EBC indicate that through parent-teacher associations the family of each student can be encouraged to contribute a small amount of funding for O&M. Facilitating the schools which have successfully implemented these mechanisms to share their experience and scaling such contribution schemes to schools across the municipality could contribute significant additional finances towards the required O&M budget.

11 World Bank (2021) Inflation, GDP deflator (annual %) – Timor-Leste <https://data.worldbank.org/indicator/NY.GDP.DEFL.KD.ZG?locations=TL> Accessed 10 December 2021

12 República Democrática de Timor-Leste (2021), 2022 General State budget approved in the National Parliament. <http://timor-leste.gov.tl/?p=29807&lang=en&n=1>

13 La'o Hamutuk (2022). 2022 General State Budget. Available at: <https://www.laohamutuk.org/econ/OG22/21OG22.htm>

9. References

IRC WASH (2016) *Costing Sustainable Services: Module 1*, The Hague: IRC International Water and Sanitation Centre

República Democrática de Timor-Leste (2016). *Water, Sanitation and Hygiene (WASH) in Schools: Guidelines for Timor-Leste*, Vol 1

República Democrática de Timor-Leste (2021). *Orsamental Jeral Estadu 2022, Livru 3-B: Munisipius*. Available at https://www.laohamutuk.org/econ/OG22/books/04-BB3B_T.pdf

United Nations Children's Fund (UNICEF) and World Health Organization. (2018). *Drinking water, sanitation and hygiene in schools: Global baseline report 2018*. New York: 2018

World Bank (2021) Inflation, GDP deflator (annual %) – Timor-Leste <https://data.worldbank.org/indicator/NY.GDP.DEFL.KD.ZG?locations=TL> . Accessed 10 December 2021



10. Appendices



Appendix 1 – JMP

SERVICE LEVEL	DRINKING WATER	SANITATION	HYGIENE
BASIC SERVICE	Drinking water from an improved source and water is available at the school at the time of the survey	Improved sanitation facilities at the school that are single-sex and usable (available, functional and private) at the time of the survey	Handwashing facilities with water and soap available at the school at the time of the survey
LIMITED SERVICE	Drinking water from an improved source but water is unavailable at the school at the time of the survey	Improved sanitation facilities at the school that are either not single-sex or not usable at the time of the survey	Handwashing facilities with water but no soap available at the school at the time of the survey
NO SERVICE	Drinking water from an unimproved source or no water source at the school	Unimproved sanitation facilities or no sanitation facilities at the school	No handwashing facilities or no water available at the school

Appendix 2: Inputs to the analysis Capital Costs (CapEx) and Rehabilitation Costs (CapManEx):

Table 15 – Unit costs for new services and rehabilitation

Component	Item	Unit costs of new services (CapEx)	Expected life cycle	Rehabilitation unit costs (CapManEx)
		\$US	Years	\$US
Water	Connection to piped water system	\$ 975 +\$500 for new storage tank	5	\$ 100
	Manual borehole	\$ 2000	5	\$ 1000
	Full water package (borehole, electric pump, tank and pipework)	\$ 7000	7	\$ 3000
	Water Tank (1000L)	\$ 500	5	\$ 250
Sanitation	Standard toilet	\$ 1000	5	\$ 113
	Accessible toilet (package including ramp and handrails)	\$ 2170	5	\$ 250
	Septic Tank	\$ 510	5	\$ 350
	Incinerator for menstrual hygiene management	\$ 232	2	\$100
Hand hygiene	General handwashing facility (Sink with tap)	\$ 100	2	\$ 100
	Simple handwashing facility (tippy tap or bucket with tap)	\$ 20	1	\$ 20
	Mass handwashing facility	\$ 100	2	\$ 100

Note: all costs include materials, transportation and labour for installation

Operation and Maintenance Costs (O&M):

Table 16 – Unit costs for operation and minor maintenance

Component	Cost item	Explanation	Annual cost
Water	Connection to piped water system	Payment for water, system cleaning and spare parts.	US\$120
	Manual borehole	Spare parts and minor repairs	US\$200
	Full water package (borehole, electric pump, tank and pipework)	Electricity or diesel, spare parts and repairs, cleaning.	US\$400
	Water Tank (1000L)	System cleaning and spare parts, technical repair of cracks.	US\$290
Sanitation	Standard toilet	Toilet brush, plastic scoops, rubbish bins, cleaning products and equipment, soap.	US\$30
	Accessible toilet (package including ramp and handrails)	Toilet brush, plastic scoops, rubbish bins, cleaning products and equipment, soap.	US\$30
	Septic Tank	n/a	US\$0
	Incinerator for menstrual hygiene management	Sanitary products, tissues, wood for burning.	US\$240
Hand hygiene	General handwashing facility (Sink with tap)	Soap, minor repairs	US\$30
	Simple handwashing facility (tippy tap or bucket with tap)	Soap, minor repairs	US\$30
	Mass handwashing facility	Soap, plumbing repairs	US\$240

Support Costs:

Table 17 – Estimated current support costs

Position	Current number of people in this position in municipality	Average salary per day worked (US\$)	Estimated number of days worked per month per person					Transport/per diem per person per month (US\$)
			Direct support			Indirect support		
			WASH construction supervision	Training and health promotion	WASH facility operation, maintenance and cleaning	WASH in HCF planning, monitoring and coordination	Other (WASH in health related)	
Cleaner	50	\$5.75	0	0	10	0	0	0
Maintenance staff	5	\$8	0	0	5	0	0	0
Teachers/WASH focal points	101	\$10.20	0	0.5	0	0	0	\$0
Municipal education department staff	5	\$12	2	1	0	4	1	\$20

Table 18 – Estimated future (desirable) support costs

Position	Current number of people in this position in Municipality	Average salary per day worked (US\$)	Estimated number of days worked per month per person					Transport/per diem per person per month (US\$)
			Direct support			Indirect support		
			WASH construction supervision	Training and health promotion	WASH facility operation, maintenance and cleaning	WASH in HCF planning, monitoring and coordination	Other (WASH in health related)	
Cleaner	101	\$5.75	0	0	10	0	0	0
Maintenance staff	5	\$8	2	0	5	0	0	0
Teachers/WASH focal points	202	\$10.20	0	1	0	0	0	\$0
Municipal education department staff	5	\$12	3	3	0	4	1	\$20
Proposed year in which new human resources could be available to provide support								2025



