IRC Ghana

Asutifi North District Assembly's Full WASH Coverage Initiative

Costing and financing sustainable WASH services in Asutifi North District

February 2020

Supporting water sanitation and hygiene services for life

CONRAD N. Hilton FOUNDATION

aquaya

CDC Centers for Disease Control and Prevention

Safe WATER NETWORK

World Vision

We would like to acknowledge the contribution of the Conrad N. Hilton Foundation grantees (Safe Water Network, World Vision Ghana, Aquaya Institute, Center for Disease Control and Prevention and Netcentric Campaigns) and the Asutifi North District Assembly towards the preparation of the report. Your data and useful inputs have enriched the document.

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February 2020

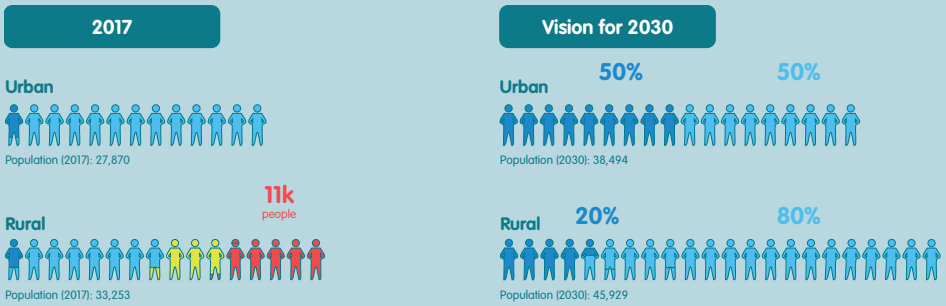
COSTING SUSTAINABLE WASH SERVICES IN ASUTIFI NORTH DISTRICT

How can we finance the gap?

Asutifi North District Assembly in Ghana made a commitment to ensure universal access to at least basic and sustainable water, sanitation and hygiene services for all in the district by 2030.

The ANAM (Asutifi North Ahonidie Mpontuo) Initiative is tasked with the implementation of the master plan to achieve this ambitious goal.

What will it take to make this bold vision a reality?



DEFINITIONS BOX

CapEx: Expenditure on capital investments.

CapManEx: Expenditure on capital maintenance (major repairs, rehabilitation and replacement of assets).

OpEx: Expenditure on operation and minor maintenance.

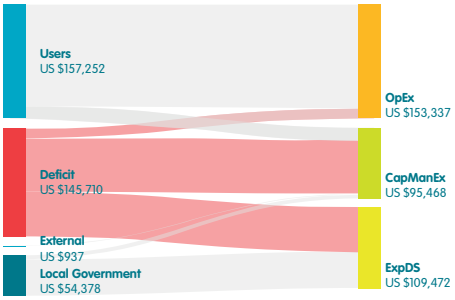
ExpDS: Expenditure on direct support (ongoing training, monitoring and technical support to WASH service providers and users).

As it stands, universal access to drinking water in Asutifi North will be severely compromised unless the finance gap is addressed.

2017 recurrent costs

Where were the gaps?

Required recurrent costs and the sources of funding.



In 2017, only **45%** of ExpDS covered

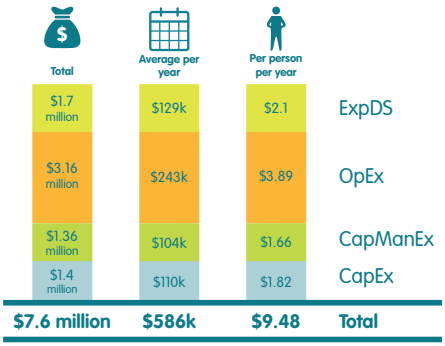
In 2017, only **25%** of CapManEx covered

The almost **146k** deficit poses a major threat to sustainability

Achieving the vision

What does it cost?

How the required costs break down across the four cost categories.



$1.4 million Total required CapEx

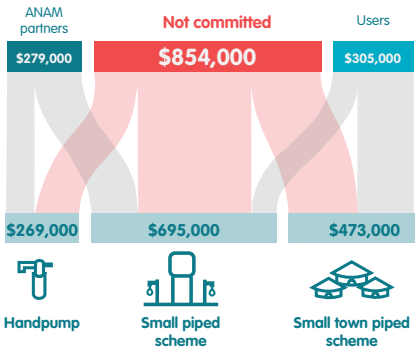
$476k Average annual recurrent costs

$9.44 Total costs per person (annual average)

Creating the infrastructure

Who pays for what?

Total required CapEx for 2018-2030 and current commitments.



Overall **41%** of required CapEx has no commitment

ANAM commitment until 2021 **14%** of required CapEx

Read about ANAM and its journey to universal access
www.anamwash.com

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ANAM Partners

Conrad N. Hilton Foundation · Asutifi North District Assembly · aquaya · CDC Centers for Disease Control and Prevention · IRC Ghana · Safe Water Network · World Vision

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Executive summary

In 2018, a Water, Sanitation and Hygiene [WASH] master plan was developed and published by the Asutifi North District Assembly (ANDA) in collaboration with its partners and support from IRC. The Master Plan forms the basis of the joint ANAM (Asutifi North Ahonidie Mpontuo) initiative, under which ANDA, IRC and other partners intend to work towards achieving the joint vision of reaching everyone in the district with at least basic water, basic sanitation, and hygiene (WASH) services by 2030. This costing and financing study report provides insight into all the necessary costs of achieving the 2030 vision and ensuring sustainable, and at least basic water and sanitation services for all.

The report covers all costs related to the provision of sustainable WASH services at district level, including the costs of implementation of new infrastructure (CapEx), the costs of capital maintenance (CapManEx) related to major repairs and rehabilitation, operational and minor maintenance costs (OpEx) and direct support costs (ExpDS). In order to assess these costs, primary and secondary data were collected for households, service providers (Water and Sanitation Management Teams), local government (ANDA) and development partners (including the Hilton Partners involved in the ANAM initiative).

Costs of water services

ANDA and its partners have set an ambitious vision of achieving at least basic services for all by 2030, with 20% of rural and 50% of the urban population accessing safely managed services. The costing estimate is based on a strategy of expanding the urban water schemes and constructing an additional 10 small rural piped schemes, ensuring that 50% of the urban population and 50% of the population in the 11 biggest rural settlements are served with household connections. In addition, an extra 76 handpumps are to be constructed to serve the currently unserved and growing rural population with at least basic services. The required **CapEx** amounts to about USD 1.4 million, with an average of about USD 111k per year, or USD 1.82 per year per person. Although promises have been made by ANAM partners towards achieving the 2030 goals, almost 60% of the required CapEx are still pending.

Due to the high number of broken down handpumps, there is a need for direct **CapManEx** of about USD 31k, of which 84% has already been committed to by ANDA and World Vision. In addition, an estimated USD 1.4 million is required in the period 2018-2030, which is an average of about USD 100k per year. It is believed that resources committed, if actually applied, would go a long way to addressing directly required CapManEx related to broken handpumps. However, structural commitment to future CapManEx is hugely inadequate and needs to be addressed.

OpEx of small-town piped schemes and limited mechanised boreholes amounting to about USD 121,000 in 2017, was covered by users through tariffs. The handpump OpEx in the same year was estimated to be considerably lower, being at about USD 17,000. However, as only 22% of handpumps had tariffs in place, handpump OpEx were only partially covered by users through tariffs.

Current levels of **direct support** are far below the required level for ANDA to be able to undertake its service authority roles of supervising, monitoring and supporting water supply in the district. ANDA is estimated to spent about 49,000 per year (USD 0.78 per person), which is only 45% of the estimated required amount of USD 109,000 per year (USD 1.74 per person).

Overall, in order to ensure everyone has access to at least basic water services by 2030 (with 50% of the urban population and 20% of the rural population accessing safely managed services), there is a need for additional investment commitments from ANDA and its partners. Furthermore, in order to ensure sustainable water service provision, there is a need to address the current deficit in the required recurrent costs, especially CapManEx and direct support costs. This area will require increased expenditure from ANDA. In addition, ANDA must make greater efforts in incentivising WSMTs to consistently and transparently mobilise funds for OpEx of handpumps by keeping records.

Costs of sanitation services

The sanitation vision for 2030 as described in the Asutifi North Master Plan is achieving 38% safely managed services (improved private facilities with safe treatment of faecal sludge) and 100% with at least basic services (improved private sanitation facilities). This is assuming that facilities with in situ treatment and disposal (improved pit latrines) are considered to provide basic instead of safely managed services. The consideration that facilities with in situ treatment and disposal can be considered as safely managed, required a revision of the vision. We now believe it desirable to ensure 100% safely managed sanitation services for all by 2030.

In order to achieve that, there is a need to phase out the existing public and shared latrines, which currently provide limited sanitation services to an estimated 63% of the population. This means a change in service delivery model, with a move away from investments in public latrines and greater emphasis on stimulating households to build and use their own private sanitation facilities. By 2030, everyone in Asutifi North is expected to be served by either household private WC or aqua privy, with temporary storage of liquid waste and with collection and transportation of liquid waste to safe treatment off-site, or household private improved pit latrines, with in-situ treatment.

The estimated number of additional household latrines to be implemented therefore amounts to about 14,000 household latrines. The **CapEx** required to put these facilities in place amounts to about USD 4.2 million, assuming a unit cost of USD 300 per improved household latrine. Thus, on average, households will have to cover a total of about USD 326,000 every year towards the provision of private latrines. On top of this, public-private sector investments need to be increased to pay for septic tank emptying services, and improved faecal disposal treatment and disposal facilities. The CapEx required to achieve the 2030 sanitation vision is high compared to past investments, estimated to amount to USD 1.6 million (about 37% of the required CapEx).

Costs related to sanitation **OpEx and CapManEx** are mainly covered by users, either through direct payment (in the case of private latrines) or through user fees (in the case of public latrines). With a move from public latrine use to private latrines, household expenditure is likely to decrease, from about USD 17 per user per year for public larine use, to USD 11 per person per year for OpEx and CapManEx of private WC or Aqua privy (including desludging every 3 years) or USD 6 per person per year for OpEx and CapManEx of private improved pit latrine.

Required **direct support costs** were estimated to amount to about USD 14,000 in 2017 (USD 0.22 per person per year), while actual expenditure on direct support was estimated to amount to only about 68% of this, at about USD 10,000 (USD 0.15 per person).

Overall, the 2030 vision of ensuring that everyone in Asutifi North has access to at least basic (private, improved) sanitation services means a move away from public latrines and shared latrines, towards private household latrines. This implies changes in financing:

- from ANDA financing the CapEx of public latrines, towards users financing the CapEx of private latrines, and ANDA financing more hygiene and sanitation promotion (direct support) and safe treatment and disposal of sludge; and
- from a considerable proportion of households paying recurrent costs (OpEx and CapManEx) through relatively high public latrine user fees, to households paying lower recurrent costs (OpEx and CapManEx) for private latrines.

The vision can thus only be achieved if households are convinced about the necessity of having private latrines and are motivated to invest in such facilities. This will require increased efforts by ANDA and its partners in hygiene and sanitation promotion (possibly beyond the required direct support costs estimated as part of this study).

List of abbreviations

ANAM	Asutifi North Ahonidie Mpontuo
ANDA	Asutifi North District Assembly
CapEx	Capital Expenditure
CapManEx	Capital Maintenance Expenditure
CWSA	Community Water and Sanitation Agency
ExpDS	Expenditure on Direct Support
KVIP	Kumasi Ventilated Improved Pit latrine
LMB	Limited Mechanised Borehole
MoU	Memoranda of Understanding
MTDP	Medium Term Development Plan
NGO	Non-governmental Organisation
OpEx	Expenditure on Operation and Minor Maintenance
SDG	Sustainable Development Goal
STPS	Small Town Pipes Scheme
SWN	Safe Water Network
USD	United States of America Dollar
WASH	Water, sanitation, hygiene
WSMT	Water and Sanitation Management Teams

1 Introduction

IRC is an international think-and-do-tank which operates at three distinct levels: global, national, and district, in support of water, sanitation and hygiene (WASH) services that last. In Ghana, IRC works with government, NGOs, businesses and people. It operates through a mix of instruments including hosting agreements, Memoranda of Understanding (MoU) and partnership agreements. Currently, IRC Ghana is working with partners on the Asutifi North District Full WASH Coverage Initiative, called the ANAM (Asutifi North Ahonidie Mpontuo) Initiative, which seeks to provide a proof of concept for achieving full WASH coverage at the district level, in line with the SDG 6. Over the next few years, IRC Ghana will be guided by a vision of building strong systems at district and national levels to deliver and maintain universal access to WASH, as well as addressing other water related goals of the SDG 6. This vision is based on the key assumption that strong national systems are underpinned by strong national leadership, and that decentralised administrative units provide the right scale at which to model behaviour, test approaches, and identify solutions to drive the route to universal access to sustainable WASH services.

1.1 Background to the current report

In early 2018, the Asutifi North District Assembly (ANDA), in collaboration with partners and supported by IRC, developed and published a WASH master plan. The plan contains the joint WASH vision for the district and strategies for achieving this vision. It forms the basis of the joint ANAM initiative, under which ANDA, IRC and other partners work towards achieving the joint vision of reaching everyone in the district with at least basic water, basic sanitation, and hygiene (WASH) services by 2030. The master plan is informed by the National Development Planning Commission of Ghana's guidelines, and framed within SDG 6 targets. The master plan provides a framework for coordinating and aligning the efforts of all actors, including the National Development Planning Commission, IRC, Safe Water Network, World Vision International, the Community Water and Sanitation Agency (CWSA), chiefs, and the Asutifi North District Assembly towards achieving SDG 6 in the district.

As part of the master plan, a first analysis was done on the estimated costs of full coverage with sustainable service provision by 2030. This provided a good first estimation of costs. The costs were based on the current and projected served population in line with the master plan strategy and the estimated unit costs for providing sustainable services to the served population. Cost estimates included CapEx, CapMAnEx and direct support costs.

However, the following challenges were identified in the analysis.

- The focus was on investment costs (CapEx), CapManEx and direct support. The costs of operation and minor maintenance, commonly covered by users through tariffs raised by Water and Sanitation Management Teams (WSMTs) and other service providers were not included in the analysis.
- Costs were based on estimated per person unit costs.
- No analysis was done on current levels of expenditure.
- Potential sources of financing for the different cost components were not identified.
- The focus was on household sanitation and water supply. The institutional WASH sub-sector was not included in the analysis.

1.2 Objectives of the report

This report aims to provide more accurate insight into all the necessary costs of achieving the 2030 vision and ensuring sustainable and at least basic water and sanitation services for all.

Its core objectives are to assess:

- Current expenditure of development partners, NGOs, users, and local government on different cost components; and
- The required costs of achieving the 2030 vision;
- Future commitments and (possible) funding gaps in financing the required costs for achieving the 2030 vision, in line with the Asutifi North master plan.

1.3 Outline of this report

Following this introduction, section 2 presents the approach and methodology of this master plan costing and financing study. Section 3 presents the findings related to water services, while section 4 presents the findings related to sanitation services. Sections 3 and 4 both start with an introduction of the current proportion (and number) of people at different levels of the service ladder and how this is to change in order to reach the 2030 vision. This is followed by sub-sections according to the cost categories (CapEx, CapManEx, OpEx, ExpDS) detailing required costs of achieving the 2030 vision, considering the current situation. Both sections end with a summary of the costs and conclusions.

1.4 Limitations of this report

The assessment presented in this report focuses on the costs related to putting in place assets needed to achieve the 2030 vision, and the costs required for ensuring that these assets continue to provide sustainable services. The costing assessment does not include the costing of systems strengthening activities, which may be needed in order to ensure that systems – including systems for monitoring, financing, asset management, water resource management, regulatory and capacity building – are in place at district and national level to enable sustainable WASH service provision for all.

The report is limited to an assessment of the costs related to the strategies as presented in the master plan. It does not consider alternative strategies with different mixes of service delivery models for achieving the 2030 vision.

The assessment of the required OpEx related to water service provision has been based on the recorded actual expenditure of water service providers, rather than on an assessment of the required costs of the various tasks related to operation and minor maintenance (e.g. using the "At-What-Costs" tool).

Finally, the assessment is limited to household water and sanitation services and does not include the costs of institutional WASH (WASH in schools, health facilities and public places) and water resources management.

2 Approach for data collection and analysis

This section introduces the approach followed and the data collected and used for the costing assessment presented in this report.

2.1 Approach

The assessment provides insight into the costs and financing of the following life cycle cost categories:

- Expenditure on capital investments (CapEx): the costs of implementing new assets.
- Expenditure on Capital Maintenance (CapManEx): the costs of major repairs, rehabilitation and replacement of assets.
- Expenditure on Operation and Minor Maintenance (OpEx).
- Expenditure on direct support (ExpDS): the costs of the provision of direct support to WASH service providers and users, including ongoing training, monitoring and technical support.

Where possible and available, commitments made by ANAM partners towards covering these costs are identified. In addition, annual expenditure at the time of the baseline of the master plan (2017) and past CapEx are assessed, in order to put the required expenditure for reaching the 2030 vision into perspective.

2.2 Data collection

The assessment involved the collection and analysis of both secondary and primary data. Table 2.1 gives an overview of the main secondary sources, while Table 22 gives an overview of the primary data collection tools applied and the data collected with these tools.

Table 2.1: Secondary data and sources of collection.

Secondary sources of data	Data
2017 service monitoring data Asutifi North (with further cleaning following 2019 service monitoring round)	Data on current number of handpumps, small town schemes (and management), Limited Mechanised Boreholes (LMBs), including the financier, and on the number of public latrines and improved public latrines. Some data on expenditure and revenues of water facilities.
Asset management data	Asset registration and assessment of required asset renewal for handpumps, piped schemes and public latrines, as developed by Asutifi North DA (ANDA) stakeholders. This provides data on required CapEx and CapManEx.
2018 REACH household survey	This household survey was conducted in ANDA as part of the REACH Empowerment in WASH project. This was useful in providing insight into sanitation coverage (as an update to the 2010 census data).
2018 data on water services and costs, by Aquaya	This was useful in providing insight and data related to handpump OpEx.

Table 2.2: Primary data and sources of collection.

Primary data collection tool	Data collection method	Data
Tool 1: Budget tracking	Data compilation on ANDA WASH budgets (from the Medium Term Development Plan (MTDP) 2014-2017 and annual composite budget for 2015, 2016, 2017) and expenditure (cash book and payment vouchers), with budget and expenditure items classified according to sub-sector (water supply, water resources, sanitation – water based, sanitation – solid waste, institutional WASH) and cost category (CapEx, CapManEx, OpEx, Direct Support Costs).	Current (2015, 2016, 2017) ANDA expenditure on WASH
Tool 2: Data collection on CapManEx	Assessment of CapManEx by ANDA staff on recently rehabilitated schemes (as identified from the 2017 service monitoring data).	ANDA expenditure on CapManEx
Tool 3: Direct support costing tool	Participatory assessment with ANDA staff of estimated expenditure on personnel time (based on estimated number of days per year spent on direct support and other service authority functions by different staff) and out-of-pocket expenses (transport, per diems etc.).	Required and actual Direct Support Costs
Tool 4: Data collection on OpEx, CapManEx and revenues	Data collected from selected WASH facilities (10 handpumps, 3 limited mechanised boreholes, all 4 piped schemes, 4 public latrines, the liquid and solid waste service provider).	Actual OpEx and CapManEx
Tool 5: User survey on costs of WASH services	User survey of 80 randomly selected households in 8 selected communities.	Household expenditure on water and sanitation services

2.3 Data analysis

The data collected have been processed using MS Excel. Where needed, cost data have been converted into 2017 USD by using gross domestic product deflators from the World Bank and an exchange rate of USD 0.23878 per Ghana Cedi. Unless stated otherwise, the cost data in this report are presented in 2017 USD.

3 Costs of water services

This section presents the main findings related to the past, current and required expenditure on water service provision in Asutifi North district.

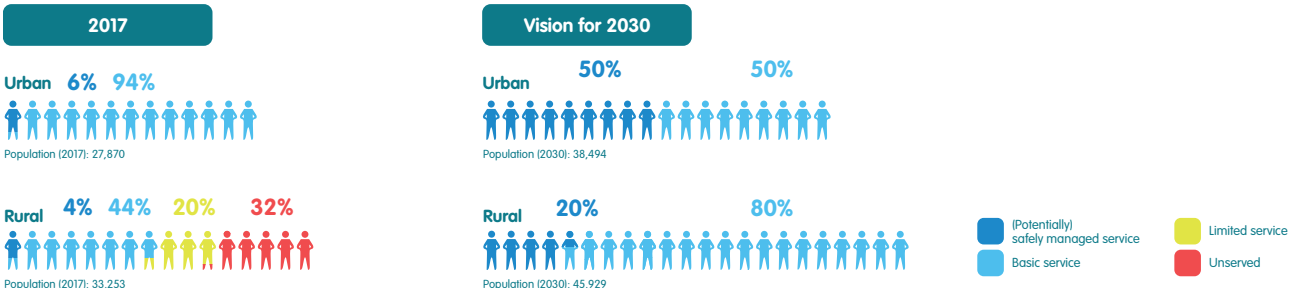
3.1 Water service ladder: baseline situation and 2030 goals

The population of Asutifi North is currently served by a variety of water service delivery models. People in the towns of Kenyasi and Ntotroso are mainly served by household connections and public standpipes connected to the Small Town Pipes Scheme (STPS) that are managed by community-based Water and Sanitation Management Teams (WSMT). People in the rural Ola and Ntotroso Resettlements, are served by community-managed Piped Water Schemes with household connections and public taps. In several other relatively large rural communities, people are served with a mix of community or privately managed handpumps and limited mechanised boreholes (boreholes with an electrical pump, overhead tank and limited distribution system, commonly with 1 or 2 standpipes). The people in smaller rural communities are mainly served by community-managed handpumps.

Household connections are potentially safely-managed services, as they provide improved services on premises. The reliability (availability when needed) and quality (free from contamination) of the water supply will largely depend on the management of the piped scheme. Currently, only about 5% of the district population has access to potentially safely managed water services. Standpipes and handpumps provide basic services (improved, within a 30 minute round trip), or limited services (improved, but not within a 30 minute round trip). Currently, about 67% of the district population has access to basic services and 11% to limited services.

The 2030 vision set out by the Asutifi North District Assembly (ANDA) and its partners in its WASH master plan, is to provide at least basic water services to all by 2030. In addition, 50% of the urban population and 20% of the rural population are to have access to safely managed water services. This implied that overall 34% of the total population are to have access to improved water supply on premises, available when needed, and free from contamination. This will require investments in additional infrastructure (CapEx) and will lead to increased recurrent costs (CapManEx, OpEx and direct support). Figure 3.1 shows the current water service ladder and the 2030 goal.

Figure 3.1: Water service coverage in Asutifi North for 2017 and 2030.



3.2 Capital expenditure (CapEx)

This section presents estimates of the Capital Expenditure (CapEx) required for putting in place the additional infrastructure needed for achieving the 2030 water service goals. It further provides insight into past expenditure related to the infrastructure which is currently in place, and in the commitments for future required investments.

3.2.1 Required CapEx for achieving the 2030 vision

In order to ensure that by 2030 all people in Asutifi North have access to at least basic services, and taking population growth into account, there is a need for an additional 31,810 people to be served with improved water services by 2030. These include the 10,716 people which are currently unserved, and the additional 21,094 people which are expected to inhabit the district by 2030 due to population growth[1]. In communities which are currently fully covered, the current facilities can cover at least part of the growing population. Overall, additional facilities are needed to cover a total of 21,425 people, who cannot be served by the current facilities. This includes an additional 4,648 people in urban areas and 16,777 in rural areas.

In order to ensure that at least 50% of the urban population and 20% of the rural population have access to safely-managed services, an additional 16,983 urban people and 7,547 rural people need to be provided with access to household connections (on premises).

Various strategies can be adopted to reach these goals, with application of different service delivery models in different areas and communities. The costing estimate presented here is based on the following strategy[2]:

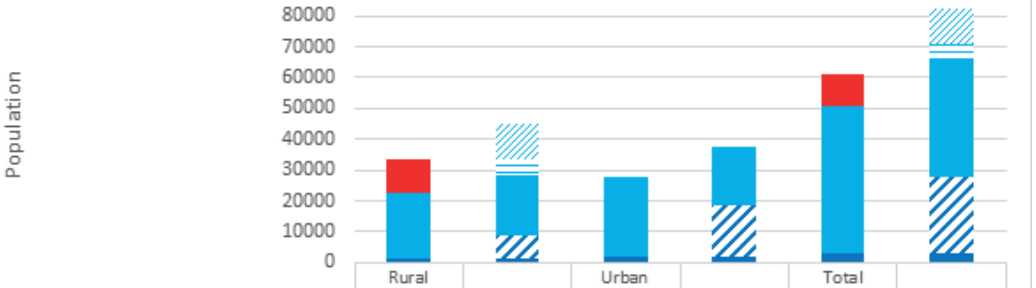
- Serving 50% of the urban population with household connections by expanding the urban water schemes in terms of production and number of household connections.
- Serving 50% of the population of the 11 biggest rural communities (representing 20% of the total rural population) with household connections, by:
    - Connecting additional household connections to the existing Ola Resettlement piped scheme;
    - Constructing an additional 10 small rural piped schemes with a mix of household connections and public taps.

Urban needs:

- 3,397 new household connections connected to existing schemes, serving an additional 16,984 people with safely managed services.
- Expansion and improved management of existing schemes to ensure adequate water services, free from contamination and available when needed.

Rural needs:

- 1,515 new household connections serving 7,549 people with safely managed water.
- 76 handpumps, serving an additional 11,679 people with basic services.



	Rural 2017	Rural 2030	Urban 2017	Urban 2030	Total 2017	Total 2030
Unserved	10716		0		10716	
Additional pop served with basic services, new facilities		11679		0		11679
Additional pop served with basic services, existing facilities		4763		0		4763
Pop served with (potentially) basic services, 2017 facilities	21300	19534	26125	18728	47425	38262
Additional pop served with safely managed services, new housheold connections		7549		16983		24532
Pop served with (potentially) safely managed services, 2017 household connections	1445	1445	1745	1745	3190	3190

Figure 3.2: Current (2017) and projected (2030) water coverage in ANDA.

1 Assumed at 2.3% per year.

2 This strategy builds on the strategy suggested in the master plan. The number of people to be served and facilities to be put in place were assessed by combining projected population data with asset data (number of non-abandoned piped schemes with household connections and standpipe spouts, limited mechanised boreholes with standpipe spouts and hand dug wells and boreholes with handpumps) based on 2017 service monitoring data. It assumes up to 5 people served per household connection, 300 per borehole handpump and standpipe spout, and 150 per hand dug well handpump, in line with CWSA guidelines.

- Serving the currently unserved and underserved rural communities (which are difficult to reach through piped schemes because of settlement patterns and remoteness) with at least basic services by constructing an additional 76 handpumps[3].

Figure 3.2 gives an overview of the number of people served in 2017 and to be served by 2030 and the additional facilities required to achieve this. The estimated CapEx related to the investments in these new facilities required to meet the 2030 vision are presented in Table 3.1.

Table 3.1: Estimated CapEx requirement for achieving the 2030 vision for water service delivery.

	Handpump	Small rural piped schemes	Small town piped schemes	Total
Required additional schemes	76	10	NA	
Unit costs per scheme (USD)	3,546	60,000		
% expansion of the STPSs			20%	
Total scheme costs (USD)	269,487	600,000	258,786	1,128,273
Addition household connections	NA	1515	3397	4,907
Total household connection costs (USD)	NA	93,930	210,614	304,234
Total required CapEx (USD)	269,487	695,445	472,797	1,437,729
Estimated required CapEx per year (2018-2030)	20,730	53,496	36,369	110,595

The unit costs for facilities for handpumps and piped schemes are based on asset management data. ANAM partner World Vision International Unit based the costs of limited mechanised boreholes on the estimated unit costs of these schemes. Unit costs per household connection were based on the average reported estimated expenditure by household questioned as part of the 2018 user survey on household expenditure on WASH.

As shown in Table 3.1, the total CapEx required to achieve the 2030 vision is estimated at about USD 1.4 million, which translates into an annual CapEx of almost USD 111,000 over the period 2018-2030. The planned small rural piped schemes will require almost half (48%) of the total CapEx, while interventions in small towns will require about a third (33%), and the handpump interventions almost 19% of the total CapEx.

3.2.2 Past and committed CapEx

This section presents the past and current committed CapEx and compares these to the CapEx required above.

Past CapEx

Table 3.2 shows the estimated past capital expenditure on the 2017 infrastructure. Expenditure has been estimated according to the number of facilities mapped during the 2017 service monitoring round and their unit costs. The table shows that the total CapEx of existing water facilities is almost USD 2.4 million, which is about USD 48 per person served. This is about 164% of the CapEx required between 2018 and 2030 for achieving the 2030 vision.

The existing facilities were financed by several financiers. The main handpump financiers over the last three years have been the national government, local government, the People's Republic of China, Newmont Ghana Gold Ltd., NGOs, churches, foundations and bilateral aid. The implementation of Limited Mechanised Boreholes (LMBs) is a relatively recent phenomenon. LMBs have been funded by different funders, with private entrepreneurs playing a relatively big role in financing and managing LMBs. The Kenyasi and Ntotroso piped schemes were financed by the Government of Ghana. The more recently constructed Kenyasi (Ola) Resettlement and Ntotroso Resettlement schemes were financed by Newmont Ghana Gold Ltd. Users (beneficiaries) contribute to CapEx through service connection fees (cost) and additional expenditure (e.g. materials and labour) at the household level.

Figure 3.3 gives an overview of the main funding partners of the existing infrastructure. The graph shows that the three main contributors to past CapEx were the national government, Newmont Ghana Gold Ltd. and the private sector.

3 Self-supply is also an option, especially for very remote communities. However, as currently self-supply options seem to be limited in the district, this will not be considered here.

Table 3.2: Estimated CapEx for existing (2017) water infrastructure.

Type of scheme	Handpump	LMBs	Kenyasi 1 and 2 piped scheme	Kenyasi Resettlement piped scheme	Ntotroso piped scheme	Ntotroso Resettlement piped scheme
Number of schemes*	164	12	1	1	1	1
Unit costs per scheme (USD)	3,546*	38,000	567,552	430,608	240,250	55,520
Number of household connections*			285	0	168	0
Unit costs of household connections (USD)**			49		75	
Total (USD)	581,525	456,000	581,517	430,608	252,850	55,520
	2,358,020					
Estimated number of people served	18,244	9,293	13,350	1,098	8,005	525
Total CapEx / user (USD)	34	49	44	392	32	106
	48					

* Based on 9000 GHC for borehole, 4200 GHC for handpump, 1,650 GHC for platform
** Based on data from User survey 2018 costing study

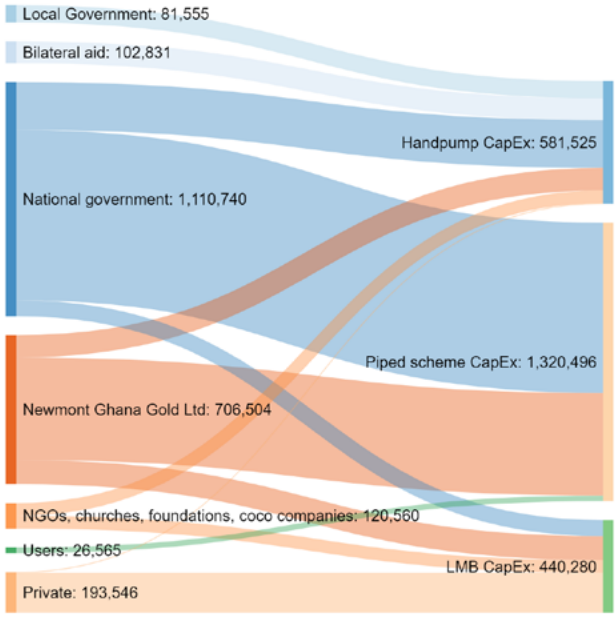


Figure 3.3: Estimated CapEx and sources of financing on existing water facilities.

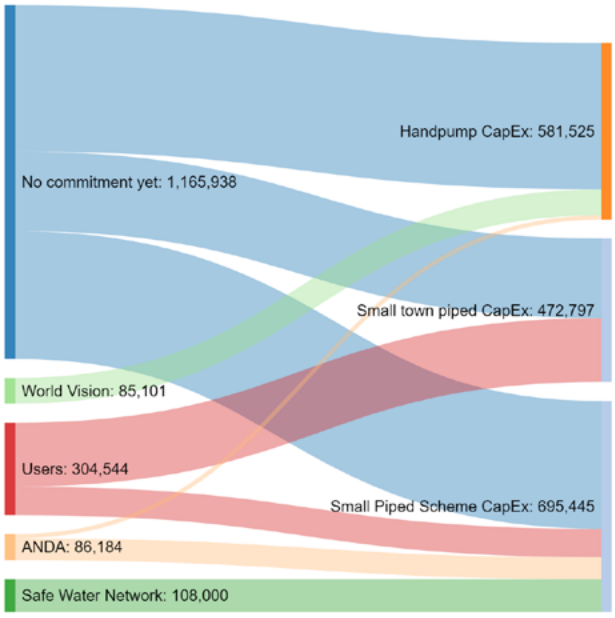


Figure 3.4: Required CapEx and sources of funding (in USD).

Committed CapEx

The following CapEx commitments have been made:

- Safe Water Network (SWN) and Asutifi North District Assembly (ANDA): construction of three small piped water systems at a cost of USD 180,000 and a ratio of 60:40 each.
- ANDA: construction of four additional handpumps.
- World Vision: construction of 24 additional handpumps.

Assuming that the costs of additional households are to be mainly covered by users, users are expected to cover a considerable part of the total CapEx (about 21%). The commitments from ANDA and World Vision amount to about 37% of the CapEx required for handpumps. The commitments from ANDA and Safe Water Network amount to a third of the required CapEx for new small schemes. Overall, at almost USD 584,000, the commitments amount to about 41% of the total required CapEx for the period 2018-2030, with about 21% covered by users and 19% by ANAM partners ANDA (5%), Safe Water Network (7.5%) and World Vision.

3.2.3 Summing up CapEx

CapEx

- CapEx of existing infrastructure: almost **USD 2.4 million**
- Required CapEx to achieve the 2030 vision: **USD 1.4 million** (about **USD 111,000 per year**)
- Committed CapEx: almost USD 584,000 (about 41% of the total required CapEx)

Conclusion: Although promising commitments have been made towards achieving the 2030 goals, almost 60% of the required CapEx are still pending.

3.3 Capital maintenance expenditure (CapManEx)

This section presents the Capital Maintenance Expenditure (CapManEx) required for covering major repairs, rehabilitation and replacement of water infrastructure in the Asutifi North district. It further presents current and committed expenditure on capital maintenance, the main sources of financing and the financing gap.

3.3.1 Required CapManEx

The required CapManEx includes both directly CapManEx for dealing with broken boreholes needing major repairs or rehabilitation, and ongoing annual CapManEx.

In 2017, at the time of the water service monitoring round, 32 handpumps were found to be non-functional, requiring direct repairs or rehabilitation. Table 3.3 gives an overview of the reasons for non-functionality and the estimated **directly required CapManEx** to restore these facilities.

Table 3.3: Required direct CapManEx based on 2017 M&E survey (in USD).

Reason for 2017 handpump non-functionality	Number of cases	Unit costs	Directly required CapManEx
Missing or broken down handpumps	19	1,003	19,057
Issues with borehole	5	716	3,580
Unknown	8	1,003	8,024
Total	32	NA	30,661

Annual required CapManEx estimations are based on design lifespan, remaining lifespan, and replacement costs of components. Handpumps consist of three major components: the borehole (or hand dug well), the handpump itself, and the platform. Borehole re-development is expected to be needed every 15 years at a cost of about USD 716. Handpump replacement is estimated to be needed every 10 years at a cost of about USD 1,003. Reconstruction of the platform is estimated to be needed every 10 years at a cost of about USD 394. This gives a total estimated annual required CapManEx of USD 187, which amounts to about 5% of the handpump CapEx. With an increasing number of handpumps from 2017 to 2030, the annual required amount for handpump CapManEx will increase over the years.

Piped schemes consist of many asset components, including the source, piped network, standpipes etc. Based on the unit costs of these components and their remaining lifespans, estimates of the annual CapManEx have been made for the period 2017-2030 as part of the asset management plan for Asutifi North. Based on this, the required 2017 piped scheme CapManEx is estimated to amount to USD 13,599. The total required piped scheme CapManEx for the period 2017-2030 is estimated to amount to USD 340,000, or an average of USD 24,279 per year over this period. However, taking into account all scheme components and their lifespans, the average required piped scheme CapManEx is estimated to amount to about USD 44,530 per year.

No detailed CapManEx calculation has been done for the limited mechanised boreholes and rural small piped schemes. The annual CapManEx for LMBs has been estimated to amount to 5% of the CapEx, which amounts to an annual CapManEx of USD 1,900.

The **total** required 2017 CapManEx is estimated to amount to almost USD 68,000. The total CapManEx to be incurred in the period 2018-2030, taking into account an increasing number of facilities needed to serve all, is estimated to amount at about USD 1.4 million, or about USD 100,000 on average per year.

Table 3.4: Required CapManEx.

Cost	Handpump	LMBs/ small scheme	Small town piped schemes	Total
Required CapManEx (USD/ year/ scheme)	187	1,900		
Total required CapManEx in 2017 (USD)	31,229	22,800	13,599	67,628
Total required CapManEx 2018-2030 (USD)	538,747	521,400	339,912	1,400,059
Average required CapManEx (USD/year)	38,482	37,243	24,279	100,004

3.3.2 Current and committed CapManEx

Both ANDA and World Vision International have committed funds for directly required rehabilitation of broken down handpumps. ANDA has committed to rehabilitate 12 handpumps, while World Vision committed to rehabilitate 15 handpumps, bringing the total number of broken handpumps to be rehabilitated at 27. This amounts to about 84% of the directly required CapManEx.

As the asset holder, ANDA is in principle responsible for the ongoing CapManEx of handpumps. However, external funders also play a role in rehabilitation and redevelopment of boreholes with handpumps. According to the expenditure and service monitoring data, in 2017 ANDA spent USD 5,343 on handpump CapManEx and five handpumps were rehabilitated by Newmont Ghana Ltd.

CapManEx of piped schemes is at least partially paid for by water users through tariffs. When CapManEx exceed the capacity of the WSMTs, the local government authority (ANDA) and/or external financiers (donors, NGOs, philanthropists etc.) come in to provide support. WSMTs are required to make financial deposits of at least 20% of all revenues into a capital account to be used for future CapManEx. However, only Ntotroso of the four WSMTs is reported to have complied with this directive in 2017, depositing an amount of USD 4,167 in its capital account. None of the four piped schemes had expenditure on capital maintenance activities in 2017.

CapManEx of LMBs are mainly paid indirectly by users through water tariffs. Based on data collected on actual expenditure on CapManEx from three LMBs, the 2017 amount spent on LBM CapManEx is estimated to amount to about USD 2,150.

As shown in Table 3.5, at only 14% of the required CapManEx, the current level of CapManEx is far below what is required.

Table 3.5: Required versus actual annual CapManEx for water service delivery (2018-2030).

Cost	Handpump	LMBs/ small scheme	Small town piped schemes	Total (USD)
Current (2017) CapManEx	6,280	2,150	4,167	12,597
Proportion current (2017) CapManEx of required	20%	9%	31%	14%

3.3.3 Summing up CapManEx

CapManEx

- For direct breakdown repairs: USD 31,000 is required, of which 84% is committed by ANDA and World Vision.
- Structural 2017 CapManEx: USD 68,000 is required vs USD 12,600 actual (about 19%)
- Total required 2018-2030: USD 1.4 million, or an average of USD 100,000 per year.

Conclusion: Committed resources, if actually applied, would go a long way towards taking care of directly required CapManEx related to broken handpumps. However, structural commitment to future CapManEx is hugely inadequate and needs to be addressed.

3.4 Expenditure on operation and minor maintenance costs (OpEx)

Water users are supposed to cover OpEx through tariffs raised by service providers, mainly Water and Sanitation Management Teams (WSMTs). This section presents current and required expenditure on operations and minor maintenance for services from handpumps, limited mechanised boreholes, small rural piped schemes and small town piped schemes.

3.4.1 Handpump OpEx

Expenditure on operation and minor maintenance of handpumps is mainly related to the procurement of materials (spare parts) related to minor repairs and labour including the services of vendors or caretakers.

Because of poor record keeping, financial data are only available for a few handpumps and the reported figures varied widely. Data collected from handpump WSMTs by Aquaya in 2018 showed an average annual expenditure of USD 102. Assuming this USD 102 average per handpump is in line with the required OpEx, the total amount of OpEx required for all 167 handpump amounts to about USD 17,000 in 2017.

By 2030, with 243 handpumps in place, the total required OpEx would amount to almost USD 25,000. Over the period 2018-2030, the total amount of required handpump Opex amounts to almost USD 277,000, or an average of about USD 21,000 per year.

During the 2017 service monitoring round, only 22% of handpump facilities had water tariffs in place (either pay-as-you-fetch or monthly fees). This means only 22% are likely to spent (sufficient) money on operation and minor maintenance. If the 22% of handpumps with tariffs spent the required amount of USD 102, the estimated actual expenditure on handpump OpEx was about USD 3,725 in 2017.

3.4.2 Limited mechanised borehole OpEx

Expenditure on operation and minor maintenance of limited mechanised boreholes are mainly related to electricity, maintenance costs and staff salaries (vendors, caretakers). However, as is the case for handpumps, poor record keeping on revenues and expenditure of these water schemes is a challenge. The costing study found an average OpEx of USD 608 from three LMBs. Assuming this is in line with the required OpEx, the total OpEx of the 12 LMBs in Asutifi North is estimated to amount to USD 7,296. Over the 2018-2030, the total required OpEx for LMBs would amount to almost USD 95,000.

Tariffs, mainly on a pay-as-you-fetch basis, are in place and are collected for all LMBs, contributing to covering the OpEx. This allows the assumption to be made that the actual OpEx is in line with the required OpEx.

Table 3.6: Required OpEx for handpumps and LMBs.

Cost descriptions	Handpump	LMB
Number of facilities with available data on OpEx	26*	3***
Average per scheme in USD (min-max)	102 (5-597)*	608 (389-800)***
Total estimated required OpEx (USD)	16,932	7,296
Proportion of facilities with tariffs	22%**	100%**
Total estimated actual 2017 OpEx (USD)	3,725	7,296
2017 revenues		7,360

Source: *: Aquaya, 2018; **: 2017 service monitoring data; *** 2018 costing survey data

3.4.3 Small rural piped schemes

For the 10 small (rural) piped schemes to be implemented in order to achieve the 2030 vision, we assume the OpEx will be more or less in line with the 2017 OpEx of the smallest of the four small town piped schemes (the Ntotroso Resettlements), which amounts to USD 14,000 per year per scheme. By 2030, required OpEx will therefore amount to USD 140,000. Assuming one scheme is implemented per year, the total required OpEx in the period 2018-2030 amounts to about USD 1 million, or almost USD 81,000 per year.

3.4.4 Small town piped scheme OpEx

Expenditure on the operation and minor maintenance of piped schemes are mainly related to electricity/gasoline to power pumps and other installations, staff salaries/wages and others (see Figure 3.5). The total operational expenditure of the four piped schemes in 2017 was reported to amount to USD 113,567 (see Figure 3.5). This is assumed to be in line with the required OpEx.

Water tariffs are well instituted for all the four piped schemes in the ANDA. The total 2017 revenue amounted to USD 130,728, which is enough to cover the total OpEx. However, the surplus of USD 17,161 is only sufficient to cover part of the required CapManEx of USD 26,147 per year. This implies that facility owners (ANDA) and external sources will have to provide support during CapManEx activities.

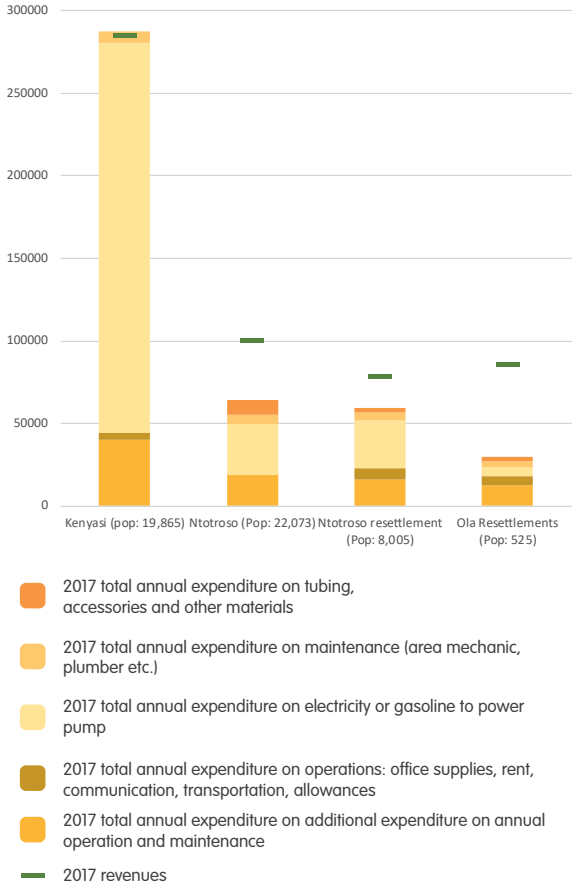


Figure 3.5: OpEx for small town piped water schemes

The required OpEx in the period 2018-2030 is assumed to be in line with the 2017 OpEx, but proportional to the number of people served by the piped schemes. In 2030, the required OpEx is therefore assumed to amount to almost USD 153,000. The total amount of required piped scheme OpEx in the period 2018-2030 is estimated to amount to USD 1.7 million, or almost USD 145,000 per year.

3.4.5 Summing up OpEx

OpEx

- 2017 handpump OpEx: USD 17,000 is required VS estimated USD 3,725 covered by users through tariffs (22%).
- 2017 LMB and small town piped scheme required OpEx: USD 121,000, fully covered through user tariffs.
- Total required 2018-2030 OpEx: USD 3.16 million, or an average of about USD 243,000 per year.

Conclusion: OpEx of piped schemes and LMBs are covered by used through tariffs. However, handpump OpEx are not fully covered, as only 22% of handpumps have tariffs in place.

3.5 Direct support costs (ExpDS)

Direct support costs include personnel costs (ANDA staff working on water supply) and non-personnel costs such as transport and per diems. These costs are usually covered by local government in their WASH service delivery activities in all communities.

The required and current direct support cost levels have been estimated by ANDA staff. They are based on the estimated time and money spent on different WASH related direct support tasks. These costs are presented in Figure 3.6, which shows that the current ExpDS levels are at USD 0.78 per person per year. This is woefully inadequate as it constitutes less than half of the required direct support costs of USD 1.74 per person per year.

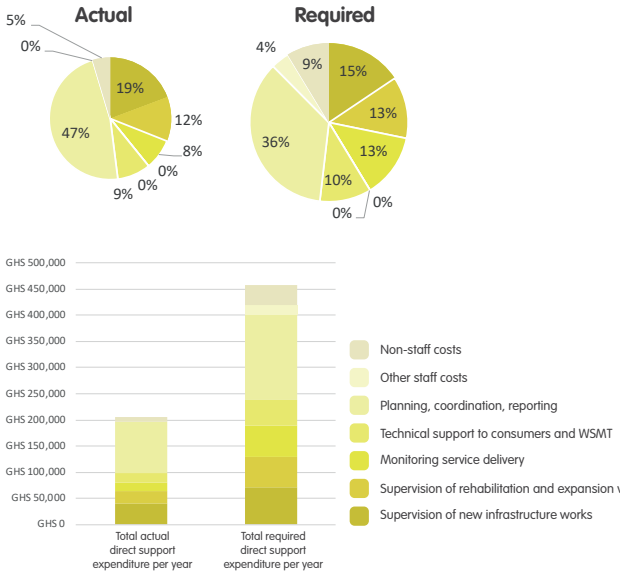


Figure 3.6: Current actual versus required ExpDS for ANDA.

3.5.1 Summing up direct support costs

ExpDS

- 2017: USD 109,000 (USD 1.74 per person) is required VS actual expenditure of USD 49,000 (USD 0.78 per person)
- Total 2018-2030 required: USD 1.7 million, or an average of almost USD 129,000 per year.

Conclusion: At 45%, current levels of direct support are far below the required level for ensuring ANDA can undertake its service authority roles of supervising, monitoring and supporting water supply in the district.

3.6 Water services cost overview

3.6.1 The 2017 recurrent costs

Recurrent costs include CapManEx, OpEx and ExpDS. Figure 3.7 presents an overview of expenditure on recurrent costs for water service provision in Asutifi North district in 2017.

Overall, only 56% of the estimated required recurrent costs in 2017 were covered. The main deficits were related to CapManEx and direct support costs, with only about 10% of the required expenditure on capital maintenance (CapManEx) and about 45% of required direct support costs covered. There was also a deficit in handpump OpEx as tariffs are only in place for 22% of handpumps. There is a small surplus in piped water scheme revenues from user fees (tariffs), which could be used to cover part of the piped scheme CapManEx deficit.

Overall, users were the main contributors to recurrent costs related to water service provision in 2017. User contribution was estimated at 79% of the recurrent costs, with piped scheme users alone covering 73% of recurrent costs.

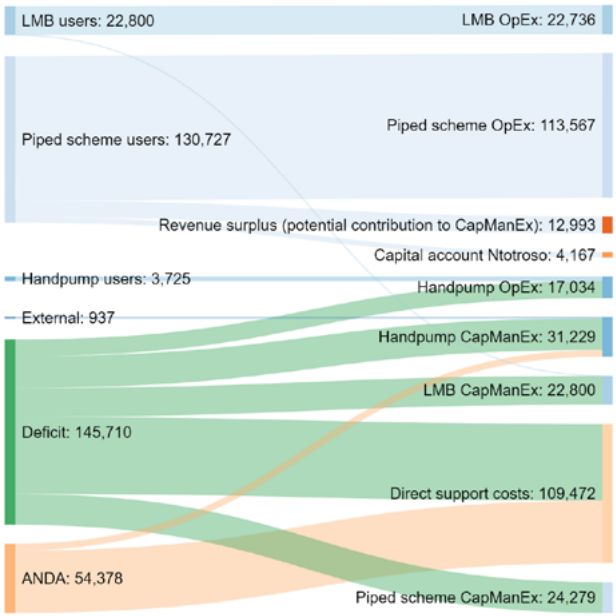
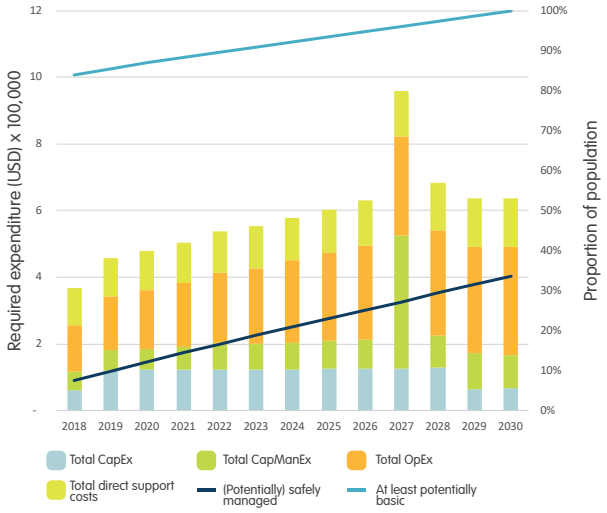


Figure 3.7: Overview of recurrent costs for water service delivery in ANDA in 2017.

3.6.2 Costs of meeting the 2030 water vision (2018 – 2030)

The graph below (Figure 3.8) shows the estimated required CapEx, CapManEx, OpEx and ExpDS needed to reach the 2030 vision to supply 100% of the population with access to at least basic water services (an improved water source within a 30 minute round trip) and 34% with safely managed water services (on premises, available when needed, free from contamination).

It shows that OpEx, commonly covered by users, is the largest cost component, followed by direct support costs, which are to be covered by ANDA. CapEx, commonly covered by national and local government (ANDA) and external financiers, and CapManEx, partly to be covered by users and partly by ANDA, both require about USD 1.4 million each over the period 2018-2030.



Total	Average per year	Average per user per year
1.7 million USD	129k USD	2.10 USD
3.16 million USD	243k USD	3.88 USD
1.36 million USD	104k USD	1.66 USD
1.4 million USD	110k USD	1.82 USD

Figure 3.8: Required costs to achieve the 2030 water supply vision for ANDA.

3.7 Conclusions on costing and financing water services

CapEx required to achieve the 2030 vision of access for all to at least basic (improved, within a 30 minute round trip) water services, and access of 34% of the population to safely-managed water services (improved, on premises, available when needed, free from contamination) amounts to about USD 1.4 million. This is about 60% of past investments which were mainly covered by the national government, a company as part of its corporate social responsibility efforts, and private entrepreneurs. So far, ANAM partners, ANDA, Safe Water Network and World Vision have committed to meeting at least 41% of the required CapEx.

In order to ensure sustainable water service provision, there is a need to address the current deficit in the required recurrent costs, especially CapManEx and direct support costs. This area will require increased expenditure from ANDA. In addition, ANDA has to make greater efforts in incentivising WSMTs to consistently and transparently mobilise funds for OpEx of handpumps by keeping records.

4 Costs of sanitation services

This section presents the main findings related to the past, current and required expenditure on sanitation services in Asutifi North district.

4.1 Service ladder: Baseline situation and 2030 goals

The service level data presented in the Asutifi North Master Plan was mainly based on 2010 census data, which is likely to be outdated. In 2018, a household survey of 300 randomly selected households under the REACH project that involves the development of an Empowerment in WASH index was undertaken. The data from this survey provided an opportunity to check the validity of the 2010 census data and, where needed, to update insights into the sanitation situation in ANDA (Table 4.1).

The following observations could be made on the survey and census data.

- Small increase in proportion of people using flush toilets or aqua privy.
- Small decrease in proportion of people practising open defecation.
- Decrease in the proportion of people with unimproved private facilities and an increase in the proportion of people using shared or public facilities.

As these changes seem to be in line with expectations, we conclude that the 2018 data probably presents a better baseline for 2017 than the data included in the master plan, which was based on 2010 data. We will therefore base cost calculations on 2018 data.

Table 4.1: Sanitation service coverage in ANDA.

	Main point of defecation	2010 census	2018 REACH household survey
At least basic	Flush toilet or aqua privy	4.5%	7%
	Improved private latrine	11.4%	10%
Limited (shared)	Improved latrine shared with other households	50.3%	21%
	Improved public latrines (shared with more than 10 households)		42%
	School latrine		1%
Unimproved	Unimproved shared latrines		14%
	Unimproved private latrine	29.5%	2%
Open defecation	Open defecation	4.3%	2%

Flush toilets and aqua privies require regular emptying. However, as there are no facilities for the safe treatment and disposal of liquid waste in the district, these are considered basic rather than safely-managed services. There is no information available on the treatment of improved private pit latrines. However, if this mainly takes place in-situ and if pits are covered and new latrines constructed when the pit is full, these can be considered safely-managed services.

The sanitation vision for 2030 as described in the Asutifi North Master Plan is achieving 38% safely managed services (improved private facilities with safe treatment of faecal sludge) and 100% with at least basic services (improved private sanitation facilities). This is assuming that facilities with in situ treatment and disposal (improved pit latrines) are considered to provide basic instead of safely-managed services. The consideration that facilities with in situ treatment and disposal can be considered safely managed, required us to review the vision. We now believe it desirable to ensure 100% safely managed sanitation services for all by 2030.

Figure 4.1 presents the updated baseline and 2030 sanitation service level overview. It shows that the biggest action to be taken to achieve the 2030 vision is to move away from shared and public latrines (limited services) towards private household latrines.

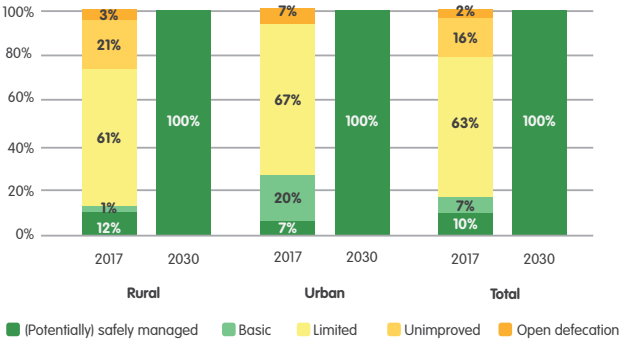


Figure 4.1: Sanitation service levels.

The next section presents an assessment of past CapEx and how these relate to the CapEx for making the transition described above needed to achieve the 2030 vision. This is followed by an overview of the estimated current and required recurrent expenditure related to capital maintenance (CapManEx), operation and minor maintenance (OpEx) and direct support.

4.2 CapEx

This section presents estimates of the Capital Expenditure (CapEx) required for putting in place the additional infrastructure needed to achieve the 2030 sanitation goals. It also discusses potential sources of financing and compares this to past investments.

4.2.1 Required CapEx for achieving the 2030 vision for sanitation service delivery

Public and shared latrines only provide limited sanitation services. In line with the Asutifi North master plan, they will be phased out over time. This means a move away from investments in public latrines and greater emphasis on stimulating households to build and use their own private sanitation facilities. By 2030, everyone in Asutifi North is expected to be served by either:

- Household private WC or aqua privy, with temporary storage of liquid waste and with collection and transportation of liquid waste to safe treatment off-site; or
- Household private improved pit latrines (including Kumasi Ventilated Improved Pit (KVIP) latrine) with in-situ treatment.

Different strategies with different mixes of these two sanitation service delivery models can be applied in the urban and rural areas of Asutifi North to achieve the 2030 goal. For the costing presented here we will assume the following mix by 2030:

- 60% WC/aqua privy and 40% improved pit latrines in urban areas, and
- 40% WC/aqua privy and 60% improved pit latrines in rural areas.

Figure 4.2 presents the existing and envisioned sanitation service ladder in the ANDA. The situation presents an ambitious vision which requires great commitment from all stakeholders involved in the sanitation service delivery, especially in contributing to the necessary cost components.

Assuming full coverage and taking into account population growth, by 2030, 84,423 people will need to be served with private latrines with adequate treatment and disposal of faecal waste. Assuming five users per private latrine, this means that 16,885 latrines need to be in place. At the time of the baseline, only about 11,206 people in the district had access to private latrine facilities, equating to about 2,242 private latrines. In addition, about 13,031 people depended on shared facilities. Assuming that on average these latrines are shared by five households each consisting of five members, there were an estimated 521 shared latrines in the district. With an increase in private facilities, these would no longer have to be shared and could serve as private facilities as well. The number of additional household latrines to be implemented therefore amounts to 14,122 household latrines.

The CapEx required to put these facilities in place amounts to about USD 4.24 million, assuming a unit cost of USD 300 per improved household latrine. Thus, on average, households will have to cover about USD 326,000 every year towards the provision of private latrines.

On top of this, public-private sector investments need to be increased to pay for septic tank emptying services, and improved faecal disposal treatment and disposal facilities.

Need for

- an additional 73,217 people to be served with private household latrines;
- an additional 14,644 household latrines – the 521 existing latrines are currently being shared by multiple households;
- safe in-situ disposal of excreta or collection, transport and safe disposal off-site.

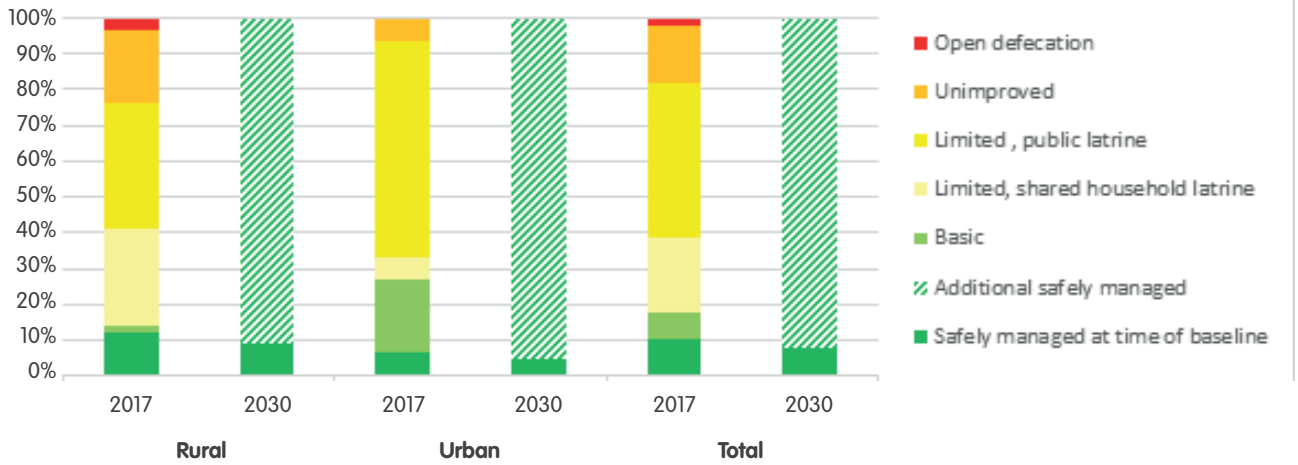


Figure 4.2: Current (2017) and 2030 sanitation service ladders.

4.2.2 Past CapEx and sources of financing

The 2,242 private latrines and 521 shared latrines in the district implies a past investment of almost USD 829,000. We assume this investment was mainly covered by households themselves.

In the past, expenditure on capital investments related to sanitation not only focussed on private latrines, but also included investments in public latrines. The past investments in **public latrines** were mainly made by ANDA. With an average estimated CapEx value of USD 13,403 per public latrine, the past CapEx related to the 50 improved public latrines in the district (19 public latrines in the towns and 31 in the rural areas according to the 2017 service monitoring data), representing a value of about USD 670,000.

In addition to the CapEx related to the capturing of human excreta (containment facilities), there is also CapEx for the collection, transport and treatment of excreta or faecal sludge. There is one septic tank emptying service provider, Haruna Abu Company Limited, serving the district. This private service provider has one septic emptier truck procured in 2016 for USD 28,578. There is also a drying bed for the disposal of septic waste which was constructed by the ANDA for USD 25,531.

Thus, total past CapEx on existing infrastructure amounted to about USD 1.6 million. Table 4.2 gives an overview of past investments. Unsurprisingly, it shows higher CapEx per user for private latrines than for public and shared facilities.

An overview of past CapEx and the main sources of financing is presented in Figure 4.3.

Table 4.2: Past investments on sanitation infrastructure in ANDA.

	Private latrines	Shared latrines	Public latrines	Faecal sludge mgnt	Total
Estimated number of users	11,206	13,031	26,450		50,687
Estimated number of facilities	2,242	521	50		2,813
Unit costs per facility (USD)	300	300	13,403		14,003
Total past CapEx (USD)	672,600	156,300	670,150	54,109	1,553,159
Total past CapEx (USD/user)	60	12	25		31

In the period 2015-2017, ANDA mainly invested in public latrines, with CapEx amounting to USD 12,714, USD 153,972 and USD 54,847 per year respectively, and averaging out at USD 73,844 per year. Future ANDA investment will have to focus on stimulating and/or subsidising household latrines and on investments related to collection, transport and safe disposal of excreta.

4.2.3 Summing up CapEx

CapEx

- Required for achieving the 2030 vision: almost USD 4.24 million (about USD 325,000 per year)
- CapEx of existing infrastructure: about USD 1.5 million (about 37% of the required CapEx)

Conclusion: Required investments are high compared to past investments.

4.3 OpEx and CapManEx for sanitation service delivery

This section presents the actual expenditure on operation and minor maintenance (OpEx) and major repairs, rehabilitation and replacement (CapManEx) and the expenditure required for ensuring sustainable sanitation services in the Asutifi North district.

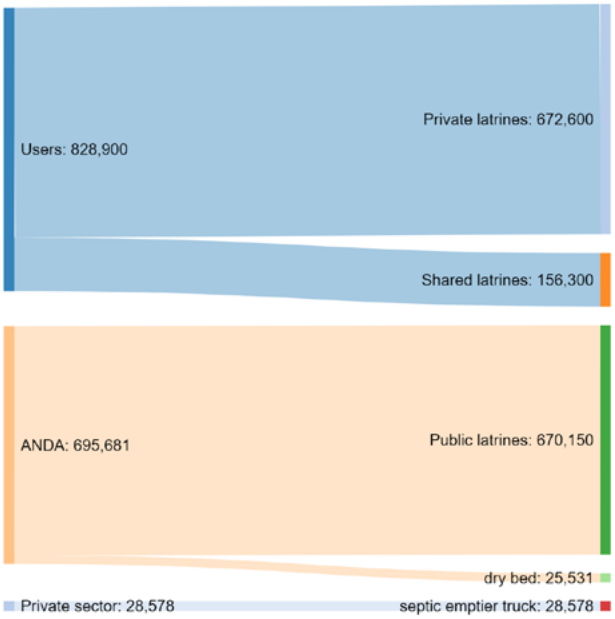


Figure 4.3: Estimated CapEx and sources of financing on existing sanitation facilities .

4.3.1 Required OpEx and CapManEx

OpEx
The expenditure on operations and minor maintenance (OpEx) of **public latrines** varies widely and includes expenditure on staff payment and on materials and spare parts. The 2018 costing study showed the average OpEx cost amounted to about GHC 20 (USD 5) per user/year. However, only about a third of improved public latrines was found to be clean or hygienic, so the OpEx needed to ensure clean public latrines may be higher.

OpEx of **household latrines** (private and shared) are expected to be minimal and are therefore not considered in this analysis.

CapManEx
Expenditure on Capital Maintenance (CapManEx) consists of two components: major repairs and latrine emptying (or burying of the pit and replacement). Latrine emptying of **public latrines** should be done four times a year. The cost each time is about GHC 500 or GHC 2,000 (USD 478) per public latrine per year.

Household latrines of the aqua privy and water closet type with septic tanks are expected to be emptied every three years at a cost per emptying service of GHC 300 (USD 73) or GHC 100 (USD 24) per latrine per year. The major repair and replacement cost for both public and private latrines is assumed to be around 10% of facility CapEx per year (so about USD 30 per latrine per year).

OpEx and CapManEx
As shown in Table 4.3, the estimated 2017 total OpEx and CapManEx per person are lowest for private pit latrines, followed by public latrines and private WCs.

In the next few years we expect to see an increase in the number of private latrines and a decrease in the number of shared and public latrines. The total estimated OpEx and CapManEx for the period 2018-2030 is estimated to amount to about USD 6.6 million or an average of about USD 508,000 per year.

4.3.2 Current expenditure and source of financing

OpEx and CapManEx of public latrines are mainly covered by user fees. The user fee tariff is GHC 0.20 per visit. Thus, a user's expenditure could amount to about GHC 73 or USD 17 per user per year, assuming one toilet visit per day. This exceeds the required recurrent (CapManEx and OpEx) cost of USD 8.68 per user per year. This suggests that public latrines, when charging user fees, make a considerable profit.

Table 4.3: Required 2017 OpEx and CapManEx for sanitation services in ANDA.

Cost component	WC or Aqua privy	Improved pit latrine	Public latrines	Total
# facilities	924 (private) + 60 (shared)	1,318 (private) + 462 (shared)	50	
OpEx (USD)		NA	132,250	132,250
Emptying (USD)	23,616	NA	23,900	47,516
Other CapManEx (USD)	29,520	53,400	67,015	149,935
Total OpEx + CapManEx (USD)	53,136	53,400	223,143	329,679
Total OpEx + CapManEx per facility (USD)	54	30	4,463	
Total OpEx + CapManEx per user (USD/user)	11	6	8	

However, not all users pay to use public toilet facilities in the district. For instance, users of two out of four rural communities surveyed as part of the household costing study survey reported that they do not pay for public latrine services. We therefore assume that half the rural public latrines do not pay tariffs. They may, for example, be run by philanthropists such as the public latrine managed by Nana in Donkorkrom). The total amount paid by users in the district is thus estimated at around USD 270,000 per year. Where users do not pay anything for public toilet service, the required recurrent costs (OpEx and CapManEx) are assumed to be borne by philanthropists.

In 2017, ANDA reported to have spent USD 18,846 on CapManEx and desludging public latrines. Because the source of funding was indicated as internally generated funds, the assumption is that the funding came from revenues from user contributions mobilised via tariffs or user fees.

4.3.3 Summing up CapManEx and OpEx

OpEx and CapManEx per user per year:

- public latrine: USD 8 (vs user fee payments of USD 17 per user)
- private WC or Aqua privy: USD 11
- private improved pit latrine: USD 6.

Total estimated required OpEx and CapManEx:

- 2017 required OpEx and CapManEx: USD 334,741
- 2030: USD 694,620
- Total for the period 2018-2030: USD 6.6 million (average per year: USD 508,556)

Conclusion: Costs related to sanitation OpEx and CapManEx are mainly covered by users, either through direct payment (in the case of private latrines) or through user fees (in the case of public latrines). With a move from public latrine use to private latrines, OpEx and CapManEx costs per user are expected to decrease.

4.4 Direct support cost (ExpDS)

Direct support activities related to sanitation services include sanitation and hygiene (S&H) promotion, supervision and regulation of sanitation service providers. The costs related to these activities are commonly covered by local government (ANDA) and include the personnel costs of staff working on water supply, and non-personnel costs like transport and per diems.

Estimated required and current ExpDS are presented in Figure 3.12. It shows that the current level of expenditure is far below the amount required to be able to support the 2030 vision. The total current actual ExpDS is around USD 10,000 per year (i.e. USD 0.15 per person per year) compared to the required amount of almost USD 14,000 per year (in 2017). The 2030 vision requires a total ExpDS of about USD 211,000, averaging out at about USD 16,000 per year.

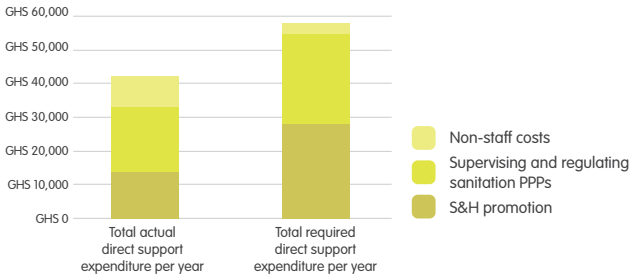


Figure 4.4: Current and required ExpDS for sanitation service delivery in ANDA.

4.4.1 Summing up direct support costs

ExpDS

- Actual 2017 ExpDS: USD 10,000 (USD 0.15 per person)
- Required 2017 ExpDS: Almost USD 14,000 per year (USD 0.22 per person per year)

Conclusion: Current levels of direct support amount to about 68% of the required level for ANDA to undertake its service authority roles of supervising, monitoring and supporting sanitation services in the district.

4.5 Sanitation services cost overview

4.5.1 The 2017 recurrent costs

In 2017, the population depended on a mix of sanitation service delivery models, including public latrines, shared latrines and private latrines. Similarly, the funding sources for the recurrent costs of sanitation services were mixed and included fees paid by public latrine users, contributions by philanthropists, expenditure by private households, and local government. As shown in Figure 3.13, public latrine revenues contribute to profit for public latrine service providers, while there is a direct support cost deficit.

In order to achieve the 2030 vision of at least basic (and hence non-shared) sanitation services for all, it is expected that by 2030, the main funding sources will be private latrine users covering all recurrent costs related to private latrines (CapManEx, OpEx), and the ANDA covering the direct support costs related to sanitation (Figure 4.5).

The 2030 vision of 100% private latrine coverage will require a shift from users paying per latrine visit (public/communal toilets) to households investing in their own private facilities (CapEx) and paying for operation, maintenance, emptying and rehabilitation (OpEx and CapManEx). It will not only be cost effective for households to shift from public latrines to private household sanitation facilities, but it will also ensure sustainable public health safety and improvement in well-being.

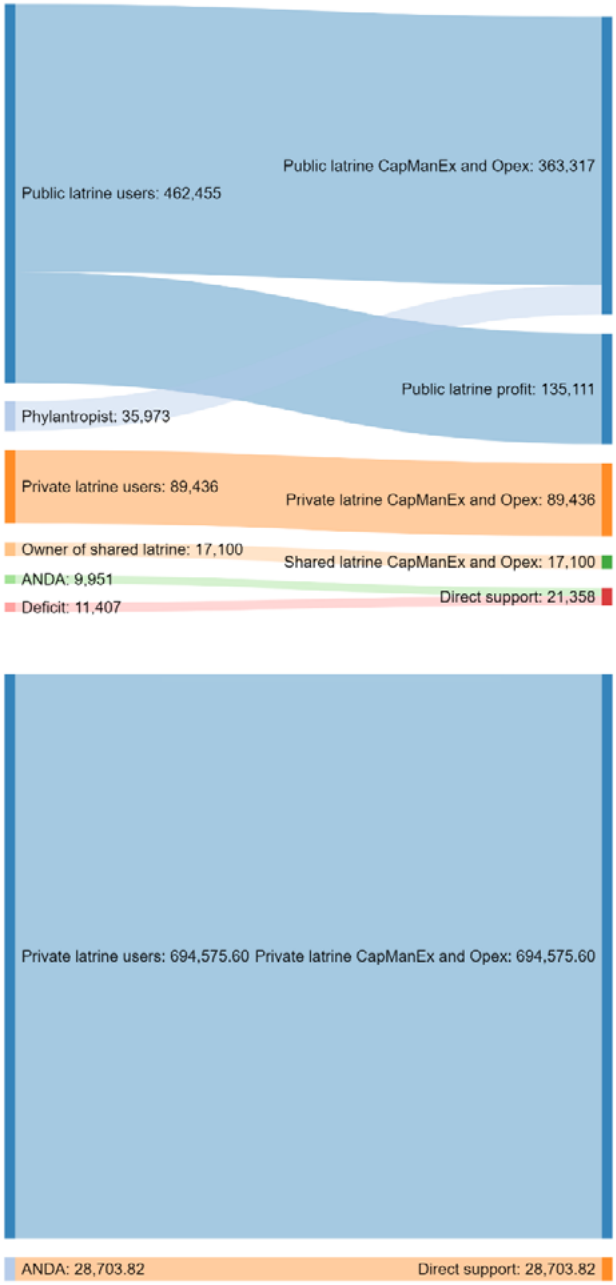
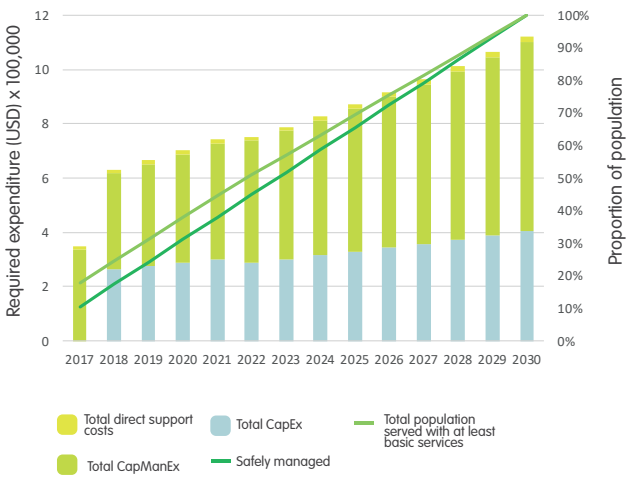


Figure 4.5: Sanitation cost and funding: Current in 2017 (left) and expected in 2030 (right).

4.5.2 Costs of meeting the 2030 sanitation vision (2018-2030)

Figure 4.5 shows the estimated CapEx, CapManEx and ExpDS needed to reach the 2030 vision of sanitation coverage for 100% of the population with access to at least basic sanitation services. While the needed CapEx is around USD 4.25 million, CapManEx is close to USD 7 million. The lowest is ExpDS at USD 207,000. In total, it requires the spending of around USD 14 per person per year between 2018 and 2030.



Total	Average per year	Average per user per year
211k USD	16k USD	0.22 USD
6.78 million USD	521k USD	7.54 USD
4.25 million USD	327k USD	4.83 USD

Figure 4.6: Required costs to achieve the 2030 sanitation vision.

4.5.3 Conclusions on costing and financing sanitation services

The 2030 vision of ensuring that everyone in Asutifi North has access to at least basic (private, improved) sanitation services means a move away from public latrines and shared latrines, towards private household latrines. This implies changes in financing:

- from ANDA financing the CapEx of public latrines, towards users financing the CapEx of private latrines, and ANDA financing more hygiene and sanitation promotion (direct support) and safe treatment and disposal of sludge; and
- from a considerable proportion of households paying recurrent costs (OpEx and CapManEx) through relatively high public latrine user fees, to households paying lower recurrent costs (OpEx and CapManEx) for private latrines.

Overall, the CapEx required for the 2030 sanitation vision are high (USD 4.24 million) compared to past investments (USD 1.6 million). The vision can thus only be achieved if households are convinced about the necessity of having private latrines and are motivated to invest in such facilities. This will require increased efforts by ANDA and its partners in hygiene and sanitation promotion (possibly beyond the required direct support costs estimated as part of this study).

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