CWIS SAP

A TOOL TO SUPPORT INCLUSIVE SANITATION

LEARNING BRIEF SERIES

STRENGTHENING UTILITY ACCOUNTING AND COST MANAGEMENT SYSTEMS

to Enhance Decision-Making for Urban Sanitation

LEARNING BRIEF #3

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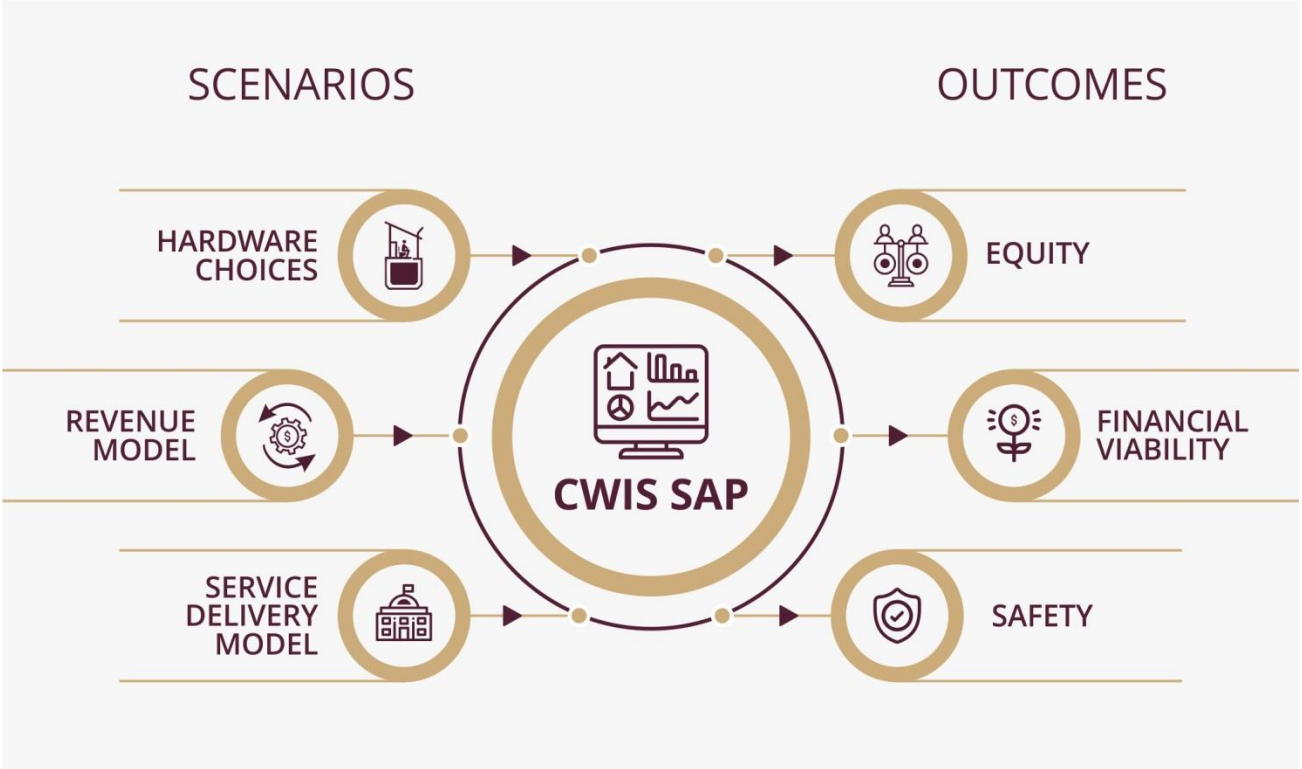
INTRODUCTION

About CWIS SAP

The Citywide Inclusive Sanitation Services Assessment and Planning (CWIS SAP) tool is a software tool to help decision-makers compare the outcomes of different sanitation interventions or investments based on criteria of equity, financial sustainability and safety of sanitation services. In 2019-2020, the Water Services Regulatory Board (WASREB) and Nakuru Water Supply and Sanitation Company (NAWASSCO) in Kenya and the National Water Supply and Sanitation Council (NWASCO) and Lusaka Water Supply and Sanitation Company (LWSC) in Zambia piloted the tool.



The tool starts with a mapping of current city-level sanitation coverage and the costs to provide services, revenues and safety levels associated with each of the sanitation systems in use. It then allows the user to model up to three scenarios that consider changes to hardware, alternative revenue and service delivery models, or any mix of those interventions. Using data provided by utilities and regulators, the tool compares the outcomes of each scenario on:

- **Equity**, with indicators on coverage rates for different income groups, how public funds are targeted, and affordability for service users;
- **Financial sustainability**, measured by the cost coverage ratio and the net income of service providers; and
- **Safety**, defined as the percentage of waste safely managed.

The tool results allow decision-makers to weigh the trade-offs between different options and assess which intervention best meets their objectives. The CWIS SAP tool is intended to support utilities, regulators, and other stakeholders including ministries, local governments, and development finance institutions to make informed

decisions about how to prioritize limited resources for new investments in sanitation, structure tariffs, and design business models to deliver inclusive sanitation services. The process of gathering the data the tool requires can also provide a framework for identifying data points necessary to analyze sewered and non-sewered services and guide utilities and regulators to strengthen data collection and management.

ABOUT THIS LEARNING BRIEF

This learning brief is part of a series produced to document the piloting of CWIS SAP in Nakuru and Lusaka. This piloting was carried out by regulators and local utilities, with technical assistance from Athena Infonomics, Aguaconsult and the Eastern and Southern Africa Water and Sanitation Regulators Association (ESAWAS).

The brief documents key learnings from the pilot cities of Nakuru and Lusaka on current systems for capturing financial data and the ways these systems affect decision-making processes. The brief outlines improvements planned by pilot cities and their regulators for upgrading utility financial management systems and the role of CWIS SAP tool in that process. It summarizes action steps for utilities to consider while planning system upgrades.

Improvements to existing accounting and financial management systems can support better-informed decisions on sanitation investments, management, and tariffs. Key reforms for utilities and regulators to consider include disaggregating water and sanitation into separate business lines, further separating costs and revenues into sub-business units, and building comprehensive data systems that integrate financial information with other data. The CWIS SAP tool can support these efforts by providing a framework for identifying data needs and designing processes that make greater use of financial data. As utilities' accounting systems improve, they also can expect better results from data-driven decision making processes like those supported by CWIS SAP.

STATUS OF EXISTING UTILITY ACCOUNTING SYSTEMS

A key sub-goal of the CWIS SAP project is to identify gaps in and suggest improvements to data systems for Citywide Inclusive Sanitation. Strengthening utility accounting and cost management systems is a critical step toward wider use of data in sanitation decision-making, especially in the context of expanded sanitation mandates for city utilities.

In the course of piloting the CWIS SAP tool, consultants reviewed existing accounting and financial management systems to understand their data capture efficiency and learn about plans for strengthening them. At present, utility accounting systems do not disaggregate cost and revenue data for sanitation to the level required to inform detailed decision-making, and utilities and regulators are in the process of improving them.

Existing utility accounting systems typically aggregate revenues and costs into lumpy units with little traceability to the actual units of revenue and expense. In many cities, the sanitation service delivery mandate is bundled with the water supply services mandate, and operational and financial data may not be delineated between these lines of business.

Ideally, data would be reported at a much more granular level. For example, data on the operational costs of wastewater treatment plants and pumping stations would ideally need to be maintained at the level of each plant/station. This would enable us to understand the current consumption of electricity, consumables and other costs required to meet current levels of demand. We could use this data to derive metrics such as cost to serve per meter cube of sludge handled that could be used to forecast the costs for projected increases in demand. However, in practice, much of these costs are aggregated across plants and pumping stations, and we have to

rely on ballpark estimates–to forecast future costs. The lack of granular data presents a massive challenge in understanding the capital investment and operational costs involved under different investment scenarios.

WHY FOCUS ON THE UTILITY?

The utility is the key starting point for strengthening the sanitation data ecosystem because it is typically the primary service provider for network systems and increasingly a key enabler for non-sewered sanitation systems. Utilities often manage multiple service lines under the umbrella of sanitation services, such as construction and management of community/public toilets, construction and maintenance of sewer systems, mechanized desludging, transportation and wastewater treatment. While utilities may not always be involved in operations of on-site sanitation systems, they do provide important services to enable private sector participation. This includes construction and maintenance of combined-use wastewater treatment plants or faecal sludge treatment plants, operating trucks for transporting sludge, issuing permits to private sector emptying and transportation service providers, etc. Utilities are therefore a key source for both operational and economic data in the sanitation sector.

Utilities can also aggregate multiple types of data, including customer profiles, demand trends, volume of waste in the system, operational inefficiencies and revenue leakages, and various types of costs (capital expenditure, operating expenditure, fixed costs, variable costs, financial costs, etc.). In most cases, these datasets do not sit on a single platform and many may not be available in digital formats. However, utilities are often best positioned to build systems to compile and manage these data, while water and sanitation regulators have an important role to play in setting standards and providing guidelines on utility data systems.

HOW DO STRONG ACCOUNTING SYSTEMS IMPROVE DECISION-MAKING?

Decision-makers need detailed information not only on service needs, but on the costs and revenues associated with specific types of sanitation services in order to prioritize interventions toward the achievement of SDG 6.2. A strong accounting system provides a foundation for data-driven decision making to deliver inclusive, sustainable sanitation services.

PRIORITIZING COST-EFFECTIVE INVESTMENTS

Disaggregated cost and revenue data will allow utilities and other stakeholders to better estimate impact of investment decisions and assess the financial viability and affordability of projects better. For example, a new sewer line might bring in substantial tariff revenue but could require large amounts of capital expenditure and costly maintenance and create large net losses for the utility. Conversely, providing emptying services using vacuum trucks might serve more customers at a lower cost. However, the data needed to evaluate these options is not always available from existing accounting and information systems. With more granular data, utilities can choose the set of hardware that achieves both scale and cost-effectiveness at each step of the service delivery chain.

MAKING PRICING AND SUBSIDY DECISIONS

More detailed accounting data can inform management decisions such as the price of services and the level of cross-subsidization across services and customer categories. Disaggregated data enables utilities to identify specific areas where they are not recovering their costs and guide the utilities to devise corrective actions. A

utility could address the issue either by increasing the price charged or by identifying other areas of the service delivery chain where they can charge more to cross-subsidize operations.

ENHANCING TRANSPARENCY AND ACCOUNTABILITY

Reporting on financial and operational performance for each sub-business can enhance accountability. Particularly in combination with other data on performance, financial data can be a powerful source of information on how effectively the utility's resources are being used to serve customers, and can help managers identify specific parts of the business that need to improve. Well-structured data systems can also improve transparency by making it easy for utilities to generate reports and share information, internally and with regulators and other authorities.

WHAT CAN UTILITIES DO TO STRENGTHEN ACCOUNTING AND FINANCIAL MANAGEMENT SYSTEMS?

DISAGGREGATE WATER AND SANITATION BUSINESS LINES AND SUB-BUSINESS UNITS

Clearly allocating income and expenses, including shared costs, between water supply and sanitation services is a first step toward strengthening accounting systems.

The logical next step is to break down the overall sanitation line of business into distinct profit and cost centers. A utility's sanitation business line consists of several sub-business units, such as the sewer network, public toilets, vacuum trucks, treatment plants, etc. Depending upon the utility's business model, each sub-business unit is either a 'cost-center' or a 'profit-center' (which accrues revenues as well as costs). Delineating and grouping sub-business units into profit and cost centers is a well-known corporate accounting practice and will help utilities to capture more granular financial and operational data and transparently report on performance.

Disaggregating cost and revenue data to the sub-business unit level will require utilities to invest in new software packages and training for accounting and other staff.

UPGRADE AND INTEGRATE INFORMATION SYSTEMS

To fully reap the benefits of restructuring their accounting systems, utilities will have to go further and create integrated data systems. Accounting data becomes even more valuable when linked to other systems such as billing, customer relationship management, complaint management, asset maintenance and inventory management. Comprehensive data systems will significantly improve the precision and speed of decision making, leading to higher-quality services and lowering costs. For example, an unforeseen cost from a broken pipe or pumping station could automatically trigger performance reports on the maintenance department, or a trend in revenue collection delays could trigger service quality or customer satisfaction queries.

Specific steps for utilities to consider when reorganizing and enhancing their accounting and financial management systems are presented in Box 1.

Box 1: Suggested steps to reorganize, automate and strengthen accounting and financial management systems

1. Review current cost and financial management systems, including chart of accounts, principles used, data capture and flow processes and decision-making framework.
2. Understand data needs and key uses across levels of management.
3. Design a detailed user-centric structure of accounts and data flow management processes.
4. Develop business unit and sub-business unit level accounting structures and propose suitable integration of accounting and cost management data across modules and systems.
5. Conduct a rapid cost/benefit assessment to determine how better-quality data could have improved the quality of past decisions and notional losses resulting from operational inefficiencies or poor planning. This will help justify investing in a comprehensive financial information management system.
6. Develop a system requirement terms of reference for software vendors.
7. Select a software package that suits the service provider's unique requirements and constraints. For example, an online version is useful only in regions with reliable broadband internet.
8. Identify an integrator to help implement the software and integrate various modules with the utility's current operating systems (the software vendor is often able to provide a recommendation).
9. Develop templates, generate key reports, and design and set up a real-time data monitoring platform/dashboard for senior management.
10. Train staff across departments to enter data, generate reports and use the reports.
11. Ensure the software vendor and system integrator provide ongoing troubleshooting and maintenance support.

LUSAKA WATER SUPPLY AND SANITATION COMPANY'S EXPERIENCE

Both WASREB and NWASCO are beginning to require utilities to disaggregate costs of water and sanitation services and are rolling out this requirement to utilities. This effort has advanced further in Lusaka than in Nakuru, which is not yet part of WASREB's pilot initiatives, and LWSC's experience is outlined below.

PROCESS

Zambia's National Water Supply and Sanitation Council (NWASCO), which regulates water and sanitation services, has issued detailed guidelines to utilities including a requirement to delineate income and expenses between water supply and sanitation services. Lusaka Water Supply and Sanitation Company (LWSC) is currently putting in place systems to allow them to understand the revenues generated by each business unit and each business unit's share of overhead expenses currently treated as a single cost, such as administrative personnel.

In 2018, LWSC separated its water and sewered sanitation businesses in line with the NWASCO Accounting Guidelines, which all Zambian utilities are expected to follow. (This has not yet been done for non-sewered services, given that these are a new mandate.) To separate the costs in the tariff adjustment model, LWSC used an apportionment method looking at the size of the two businesses. Costs that were directly related to each business were easily allocated to the appropriate business line, while indirect costs were separated based on the proportions of the water supply and sanitation business in terms of number of customer connections (i.e. over 115,000 for water and around 35,000 for sewer connections).

LWSC has encountered several challenges during the process of separating its business lines. Some assets had not been valued, which prompted the utility to start an asset valuation exercise expected be finalized in 2020. Allocation of shared staff between water and sanitation has also been challenging. Finally, to carry out the

separation exercise successfully, the utility needs a robust accounting system that can compile and aggregate its business from the Branch, District and Head Office levels. LWSC is therefore in the process of procuring additional modules for its accounting package, updating its chart of accounts, and integrating the accounting system with the billing system.

The utility has purchased several modules of Sage 300 software and is in the process of integrating and launching them. While some of these modules are straightforward accounting tools (such as receivables, payables, general ledger, inventory, assets, cashbooks and job costing) others are more advanced business intelligence and customer engagement tools. LWSC has implemented a customer relationship management (CRM) software to handle customer complaints and communications. However, this is not currently integrated with their accounting software, for example to track receivables or triangulate customer satisfaction to collection efficiency. LWSC believes this is a crucial integration to bridge operational and financial data. Granular and integrated CRM data could enable the utility to understand consumption patterns and connection rates in the different regions in its service area. This will help LWSC plan sewer expansions better and provide a more realistic picture of the potential revenue that could be collected as the utility extends services to new areas.

OUTCOMES

The initial aim of LWSC's effort was to improve the sustainability of sanitation investments by ensuring that tariffs were cost-reflective for both water and sanitation, as recommended in a tariff study. Separating costs between water and sewered sanitation has helped the utility to track the financial performance of both business lines. It is now working to develop tariff structures for both water and sanitation that will eventually reflect each service's costs. Separating each business line's financial data is helping LWSC provide justification and transparency for tariff adjustments, especially to customers, and informing LWSC's planning. The utility is distributing its effort to grow both businesses, but the more granular data has informed an effort to grow its customer base for sanitation, which is not yet financially sustainable.

LWSC's experience also shows how strong accounting systems are a step in the direction of improving transparency. Disaggregating the water and sanitation business lines helps provide more accurate information on revenue, costs, investment returns, and overhead charges necessary for reports LWSC is required to submit to NWASCO and the Auditor General. A more robust system could make reporting more efficient by integrating data from multiple sources and automatically generating reports.

NEXT STEPS

Further reforms are in progress in Zambia. NWASCO has issued guidelines to encourage utilities to treat their sanitation business line as a profit center, which means that sanitation services' business line is expected to maintain clear records of revenues and costs and eventually be expected to cover their own expenses. The NWASCO tariff adjustment guidelines (which are currently under review) will also require that utilities' water and sanitation businesses are separated for purposes of more efficiently differentiating prices for different customers. This will allow utilities to charge higher prices to well-off customers, while keeping services affordable for the poor. LWSC recognizes the importance of capturing financial and operational data at the sub-business unit level (i.e. as cost centers and profit centers) and plans to begin this process of delineation from 2021.

HOW CAN CWIS SAP HELP?

The CWIS SAP tool provides utilities, regulators and other sanitation decision-makers with a mechanism to assess the costs and benefits of various hardware options, service delivery models and revenue models and compare different intervention strategies. This enables utilities to identify the investments and interventions that best align with sector priorities, including cost-effectiveness, inclusion of low-income communities, safe management of fecal waste, and financial and environmental sustainability.

IDENTIFYING DATA NEEDS

The tool provides decision makers with a structured set of data points that are required to estimate crucial metrics such as cost-to-serve and aggregate losses/profits. This data is typically provided primarily by the utility, and a portion of the data required may not be immediately available from a utility's existing accounting systems. Data gaps are especially likely to arise when utilities are evaluating new lines of business, especially for newly mandated non-sewered services. However, the process of using the tool can provide a structure for making reasonable estimates and a framework for gathering data going forward.

The process of aggregating data from different departments within the utility and different institutions provides utilities and regulators with an opportunity to assess the data they have available and identify key data points that are missing. For example, if utilities seek to enter the removal and transportation business, the utilities are required to estimate the cost for procuring vacuum trucks, labor costs for operating the trucks, number of trips that the trucks would make in a year, cost of repairs and maintenance and other such aspects. This information is also critical to set prices and service standards for regulated private providers. However, these data points may not be captured in a utility's accounting system-especially if non-sewered sanitation a new focus area. If certain data points are not available, the CWIS SAP data framework can guide new data collection initiatives, as has been the case in the pilot cities of Lusaka and Nakuru.

BUILDING DATA-DRIVEN PROCESSES

The tool's results support utilities, regulators and other decision-makers to compare hardware and service delivery options at each stage of the sanitation service delivery chain to minimize costs and maximize reach. Even when the input data is imperfect, as is likely to be the case when a utility begins using the tool to evaluate new service delivery options, results based on estimates can demonstrate the value of the kind of analysis that data from a better-structured accounting system can provide. As utilities begin using the tool and gathering data, regulators can maintain a database of costs to serve and compare this data among the various utilities under their purview. This would greatly augment peer learning and would enable the regulators to guide utilities in making better informed investment decisions for all.

The process of testing and rolling out the tool can help create a virtuous cycle of increased usage of data in planning and tariff setting processes and related improvements to data quality and data management systems. As data collection and accounting systems improve, decision-makers can expect more accurate results not only from the CWIS SAP tool, but from all planning processes.

CONCLUSION

Strengthening accounting and cost management systems is a multi-tier process. Many utilities in emerging markets have traditionally not separated water and sanitation businesses. Regulators have recently begun exploring requirements that utilities delineate sanitation as a separate business line to improve their

accountability and obtain more granular data on cost recovery and financial sustainability. In the ESAWAS region, the Lesotho Electricity and Water Authority was the first regulator to adopt a requirement that utilities separate the water and sewerage business lines. NWASCO is the second regulator to adopt this model, and others, such as the Water Services Regulatory Board in Kenya, are currently developing procedures for separating water and sewerage costs and piloting these with selected utilities. Non-sewered sanitation has not yet been included.

Even utilities that have begun considering the sanitation line of business as a separate profit center have typically not established distinct sub-business units. Utilities may also need to further disaggregate their accounting data into multiple geographic units, such as districts or branches. Once utilities have taken this critical step, they can go further by creating comprehensive, integrated data systems, investing in more robust data collection, and building capacities and processes that support data-driven decision making.

Building robust systems for managing financial data is costly and challenging, but is an essential prerequisite for achieving inclusive, financially sustainable service delivery. By giving decision-makers – whether within utilities, regulators, other government agencies, or financial institutions – the information they need to understand the costs of making a particular investment and the ways it will (or will not) generate revenue over time, accounting system reforms will save money and contribute to a more efficient allocation of resources. A strong system to manage financial and other data is not a superfluous addition to already-costly investments in sanitation; rather it is a prerequisite for using resources wisely and should be a top priority for governments and development partners.