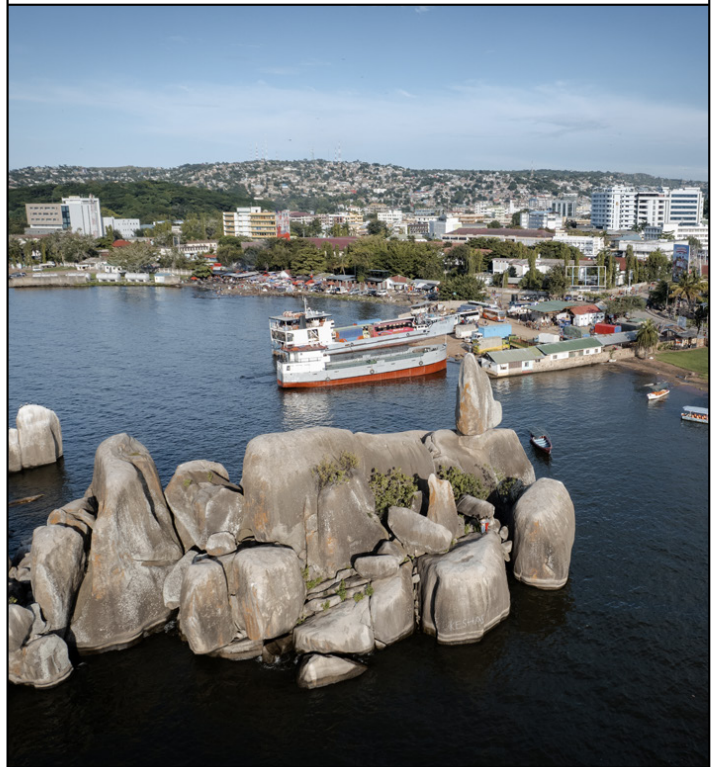


WATER OPERATORS' PARTNERSHIP

CASE STUDY



© KENNETH KOJEE

VEI, Utrecht, The Netherlands **MENTOR**

Mwanza Urban Water Supply and
Sewerage Authority (MWAUWASA),
Mwanza, Tanzania **MENTEE**

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Abbreviation List

AFD	French Development Agency
BEWOP	Boosting Effectiveness in Water Operators' Partnerships
CSR	Corporate Social Responsibility
DMAs	District Metered Areas
EAC	East Africa Community
EIB	European Investment Bank
EWURA	The Energy and Water Utilities Regulatory Authority of Tanzania
IFI	International Financial Institutions
LVWATSAN	Lake Victoria Water Supply and Sanitation Programme
MoU	Memorandum of Understanding
MWAUWASA	Mwanza Urban Water Supply and Sanitation Authority
NRW	Non-revenue water
RPM	Resident Project Manager
STEs	Short-Term Experts
WfL	Water for Life
WOP	Water Operator's Partnership
YEP	Young Expert Program

Key Facts



Partners

Mentee: Mwanza Urban Water Supply and Sewerage Authority (MWAUWASA)

Mwanza Urban Water Supply and Sanitation Authority (MWAUWASA) was established in July 1996 under Water Works Ordinance Cap 281 (as amended by Act no 8 1997 of) as a semi-autonomous executive agency of the government responsible for the provision of adequate, reliable and sustainable portable water and wastewater management services in Mwanza City at affordable and cost-effective prices. The Authority is wholly owned by the Government of Tanzania.

Mentor: VEI

VEI is the dedicated non-profit vehicle for the six Dutch public water operators in achieving their shared objective. VEI focuses on providing support for water operators in Africa, Asia and South America: countries that face immense challenges, such as increasing water demand, water quality problems, water shortages and climate change. VEI collaborates with these colleague water operators to expand their capabilities and help them professionalise their operations by actively sharing long-standing Dutch expertise and experience. For example, VEI assists by improving basic operations such as non-revenue water (hereafter: NRW) management and water operations, by setting up stable financial procedures or by creating a better infrastructure.



Duration

Phase I: 2018-2021

(This WOP is currently in Phase II of WaterWorx Programme, which runs from 2022-2026)



Cost of Phase 1

Total:

EUR 2.8 million (38% in infrastructure)
EUR 1.5 million in grant funding provided by Dutch Ministry of Foreign Affairs (38% in infrastructure)
EUR 1.1 million from VEI (29% in infrastructure)
EUR 165,500 from MWANZA



Objectives

Main objective for the VEI-MWAUWASA WOP:

To improve the operational and financial performance of MWAUWASA, through on-the-job training in the development/implementation of an NRW Reduction Plan, GIS, online reporting system, Asset Management, hydraulic modelling, management and leadership training and policy/study development (such as a pro-poor strategy).

Specific objectives:

- Capacity development (cross-cutting objective which includes trainings and workshops for leadership, use of specific technology, building skills for young experts, among others)
- New connections (directly to 33,000 poor people; indirectly through 20,000 connections)
- Implementation of GIS (>90% of assets digitalized)
- Implementation of preventative maintenance software (>905 of assets digitalized)
- Reducing NRW (10% reduction)
- Improve energy efficiency (<1 kWh/m³)

Approach

The WOP is part of the WaterWorX (WWX) programme, which seeks to contribute to ensuring sustainable access to safe drinking water and sanitation to 10 million people in the period 2017-2030.

WaterWorX (WWX) is a partnership of water operators aimed at improvement in utility performance and access to (improved) services. The overall goal of the programme is “well-performing utilities that provide sustainable, inclusive and climate resilient water services (basic or safely managed) to their current customers and to an additional 10 million people by 2030.” WWX is co-funded and jointly implemented by the Dutch Ministry of Foreign Affairs, and the 10 Dutch Water companies (represented by VEI, WorldWaternet, Oasen, WMD and Dunea), in partnership with 39 selected water utilities in 15 countries in Africa, Asia and Latin America.

WWX is structured in three main phases with Phase I occurring between 2017-2021 and focusing on sustainable technical and financial improvements for the selected water utilities, in this case, MWAUWASA. The WWX’s Theory of Change (ToC) for Phase I anticipates that improving business practices and the financial situation of local water companies creates capacity (and financial) scope for expansion investments, which can then be managed, maintained and financed adequately.¹

Following an initial inception phase wherein a preliminary assessment of the Authority was conducted, the inception plan for the WOP identified the following three priority areas:

1. Reducing NRW
2. Extending coverage

3. Environmental Issues regarding Lake Victoria

4. Capacity development

The activities completed over phase I of the WOP were geared towards building management and staff capacity, providing support in reducing NRW and preparing the Authority to take on. Actions were also focused on sustainably manage the Authority’s expansion, the environmental challenges associated with a growing population, and the future impacts of climate change.

WOP activities include classroom and online trainings (including videos, webinars and remote workshops), on-the-job operational guidance, review of existing managerial and operation practices, and technical support regarding the incorporation of tools and systems intended to modernize operations.

Due to the implications on work and travel resulting from the COVID-19 pandemic, the timing of certain activities had to be adjusted, particularly those involving foreign Short Term Experts (STEs). Aside from delays of certain activities, the pandemic has required a greater reliance on remote communications, trainings, and workshops as well as involvement of national expertise.



Results

- Progress in the number of new household water connections (66% increase) and handwashing facilities (21% increase of people with access to sanitation).
- A number of trainings and capacity development activities have taken place, including the participation in the MSc Delft Programme, the hiring of young

¹ VEI. (2017). *Annual Report 2017*.

professionals under the YEP program, non-revenue water (NRW) reduction training, project management training, management and leadership training and Asset Management training.

- A pre-feasibility study has been produced indicating future investment needs and has been shared with potential financiers. Furthermore, detailed reports and strategies have been produced, including proposals for providing people with direct access to improved water and/ or sanitation facilities.



Success Factors

- Length of the WOP
- Financial linkages to parallel projects

- Strong fiscal position
- Contextual familiarity of partnership
- Dedicated local team



Challenges

- Utility leaders endorsement on the added value of a WOP and providing additional focus on leadership strengthening.
- Staff availability has, at times, been an issue especially when large-scale investments require the attention of a significant proportion of the technical staff (and are priorities over the WOP by Authority management).
- Generating commitment to the WOP from lower-level staff can be problematic as they view the WOP as additional work

Introduction

The Global Water Operators' Partnerships Alliance (GWOPA) helps water operators help one another to provide quality services to all. The Global Water Operators' Partnerships Alliance (GWOPA) is an international network created in 2009 to support water operators through Water Operator's Partnerships (WOPs). WOPs are peer support exchanges between two or more water operators, carried out on a not-for-profit basis with the objective of strengthening operators' capacity and performance to provide a better service to more people.

A Water Operators' Partnership (WOP) is a collaboration between two or more water or sanitation operators, conducted on a not-for-profit basis, in the aim of developing their capacity. These partnerships are being used as a way of helping the world's public operators to sustainably deliver adequate water and sanitation for all.

This report analyzes the progress to date of the Mwanza Urban Water Supply and Sewerage Authority (MWAUWASA) in regards to improved performance derived from the Water Operator Partnership (WOP) with the Dutch company VEI during the first phase of the partnership (2017-2020).

The Boosting Effectiveness in Water Operators' Partnerships (BEWOP) analysis framework was applied to understand the partnership scoping, the partnership creation, the project implementation, the evidence of progress towards impact and effectiveness of the project, and project evaluation. This analysis builds off of the Mid-Term Review conducted by Eyob Defere and Richard Ward of IRC in January 2020 and supplements the information compiled in that review with interviews with relevant parties involved in the VEI-MWAUWASA WOP as well as additional secondary sources.

The following sections will walk the reader through the different phases of the WOP, from partnership scoping, partnership creation and partnership formalization, and when relevant (as the WOP is ongoing and in the first implementation phase), to project implementation, evidence of progress and project evaluation. The main objective of this report is to understand the initial success factors of Phase I of the VEI-MWAUWASA WOP and assess the sustainability of the improved performance of MWAUWASA going forward in the partnership as well as after the partnership.

Partnership scoping

Contextual Factors

Mwanza, an important Port City

Mwanza is located in the northwest of Tanzania on the southern shore of Lake Victoria. The city of Mwanza has an estimated population of 781,819², making it the second largest city in the country (after Dar es Salaam), and serves as the capital of the Mwanza Region, which has

² Defere, E. and Ward, R. (Aguaconsult). (2020). *Mid-Term Review of the Water Operator Partnership Mwanza, Tanzania*. (Final).

a regional population of approximately 2.7 million.³ An important Port City given the geographical significance of Lake Victoria in the region, Mwanza serves as an important transportation hub, both within Tanzania and to neighboring countries such as Kenya and Uganda. The city is split into two municipal districts (Illemela and Nyamagana).

High growth in the population and the economy

The United Republic of Tanzania is located in East Africa and is spread across a total area of 947,300 square kilometers. According to the National Bureau of Statistics, in 2022 the country's population is estimated to be slightly over 61 million, an increase of over 16 million from the last official national census in 2012 (45 million), where MWANZA appears as the second most populous city in Tanzania. This rapid growth stems in large part from the country's birth rate of nearly 36 births/1,000 population,⁴ which is one of the highest in the world, and has resulted in more than 44% of the population being under the age of 15.

The Tanzanian economy has experienced robust growth over the past five to ten years, corresponding to real GDP growth of between 5 and 10 percent per annum over that period and significant gains in per capita nominal income. Drivers of growth nationwide have included gains in the construction sector, along with transportation, storage and agriculture.⁵

The primary growth industries of the city and region of Mwanza are fishing and fish processing as well as mining.⁶ An industrial census conducted in 2015 revealed that Mwanza region was the 4th region after Dar es Salaam, Arusha and Kagera in terms of number of large-scale manufacturing industries in the country, although the vast majority of businesses are small scale.⁷

Water and sanitation provision in Mwanza: a mismatch between population growth and services expansion rates

Service Level Provision

Mwanza City is supplied with water from Lake Victoria, which undergoes treatment at the Capri Point Water treatment plant. Due to the hilly topography of the city, distribution of water throughout the city requires the use of 5 primary booster stations and 16 small-scale pump stations. Primary booster stations are located at Mabatini, Kona ya Bwiru, and Nyegezi. The installed water production capacity is reported to be 108,000 m³ per day with actual average capacity of 80,000 m³ per day.⁸ However, average demand per day is reported as around

³ The United Republic of Tanzania. (2013). *Tanzania in Figures 2012*. National Bureau of Statistics Ministry of Finance.

⁴ CIA. (2017). World Fact Book.

⁵ Bank of Tanzania (2018). *Annual Report 2017/18*.

⁶ Tairo, A. (2018). "Mwanza Grows its Lakeside Economy". The East African.

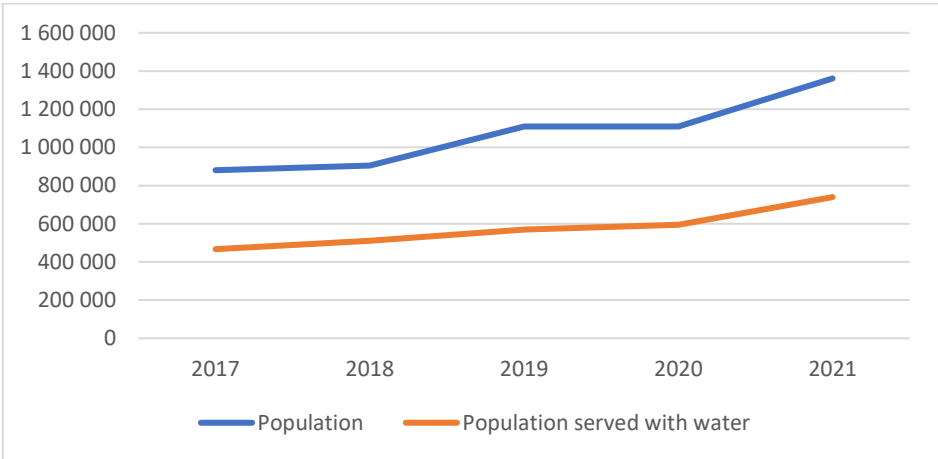
⁷ The United Republic of Tanzania. (2017). *Mwanza Region Investment Guide*. The President's Office Regional Administration and Local Government Mwanza Region.

⁸ Defere, E. and Ward, R. (Aguaconsult). (2020). *Mid-Term Review of the Water Operator Partnership Mwanza, Tanzania*. (Final).

150,000 m³, a mismatch that results in inconsistent service provision in certain areas of the city⁹.

While the challenge of coverage expansion keeping pace with population growth in Mwanza is not new, the longer these trends continue, the larger aggregate number of connections will be required to meet full coverage of water supply provision (see **Figure 1** below).

Figure 1: Water supply coverage and population growth Mwanza¹⁰



A review of Key Performance Indicator (KPI) data¹¹ reveals that the baseline (2017) drinking water service population was 467,121, representing coverage of the service area of approximately 53%. Drinking water service population increased to 739,737 in 2021, with an average yearly increase of about 12%. The population growth rose to 1,361,052 in 2021, with an average growth rate of 12% as well. This increase in both the population served and total population is reflected the increased service area of MWAUWASA, as they have been assigned to take responsibility for 4 satellite towns as per 2020.

In terms of sanitation service levels, the population served was found to have risen moderately between the 2017 baseline and 2021 (from 23,922 to 30,822).¹²

Non-Revenue Water (NRW) in Liter per active connection per day (utility level) has steadily decreased since 2017. For the purposes of this WOP, NRW (L/c/d) was 433 L/c/d at the 2017 baseline (12 month moving average). That figure has steadily fallen to 330 L/c/d in 2021 representing a 24% reduction.

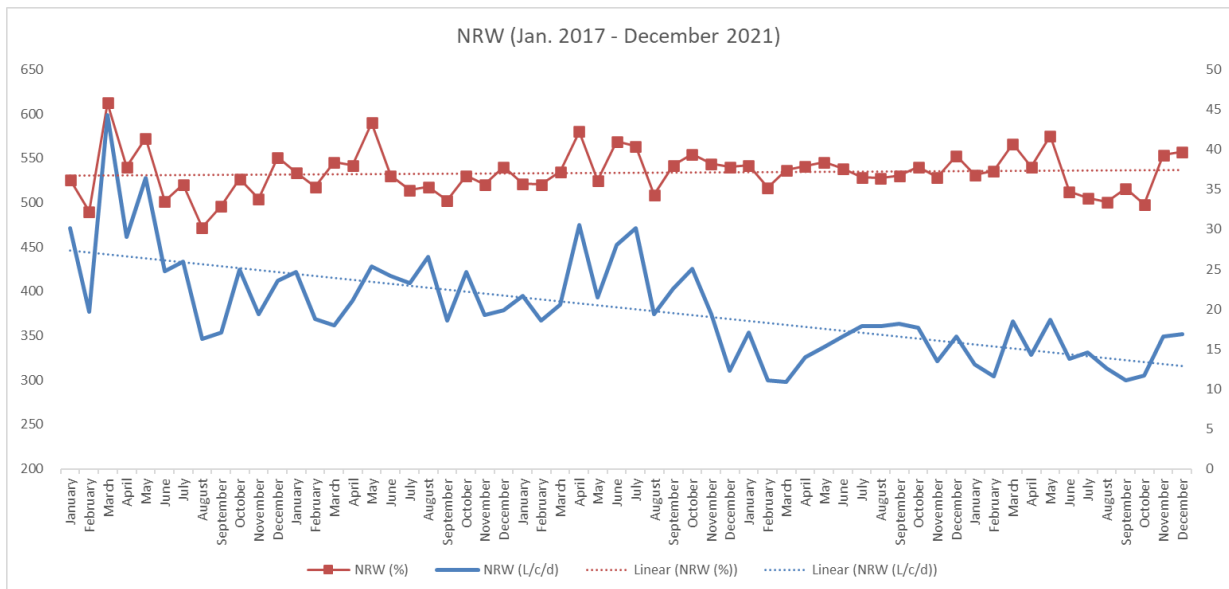
⁹ VEI and Mac Donald, Mott. (2020). *Mwanza Water and Sanitation Pre-Feasibility Study*.

¹⁰ Assuming 6.4 pp/HH and 250pp/kiosk; includes end target 45% coverage

¹¹ MWAUWASA performance indicators, based on EWURA reported data

¹² MWAUWASA performance indicators, based on EWURA reported data

Figure 2: Non-Revenue Water and Production Volume



Source: MWAUWASA performance indicators, provided by VEI Resident Project Manager, Reinder van den Brink-Bil

However, the overall percentage of NRW as a factor of volume of water produced has remained steadier over this same period (36% in 2017; 37% in 2021), which reveals that the decrease shown in the first indicator is due to the augment of connections.¹³

MWAUWASA Business Plan for development

MWAUWASA development programs and strategies are largely derived from national sector program and strategies. MWAUWASA operates within the policy framework of the National Water Policy (2002), the National Water Sector Development Strategy (2006 – 2015), Environmental Management Act, 2004, and the Tanzania Vision 2025.¹⁴

MWAUWASA has developed a detailed Business Plan for 2018 to 2021 to which the WOP will contribute to achieve. The plan sets out specific actions to address a series of utility priorities, including but not limited to:

- Developing new and improve existing water sources
- Developing plans for future water supply
- Expand and rehabilitate the water distribution network
- Maintain both National and International water quality standards
- Developing and implementing measures to reduce NRW

¹³ MWAUWASA performance indicators, based on EWURA reported data

¹⁴ Defere, E. and Ward, R. (Aguaconsult). (2020). *Mid-Term Review of the Water Operator Partnership Mwanza, Tanzania*. (Final).

- Establishing reliable water supply service hours
- Developing and implementing maintenance plans
- Increase the overall customer base (households and commercial users)
- Support the organisation's capacity building efforts.

Major planned investments in the Business Plan are shown in **Table 1** below:

Table 1: Planned investments in 2018-2021 Business Plan¹⁵

	Description	Financing	Cost
1	Rehabilitation Works and Extension of Water and Sewer Networks in Mwanza City (Contract No. AE/042/2015-2016/W/01).	Government of the United Republic of Tanzania through MoW, EIB and AFD	€14.7 Million
2	Improvement of sanitation in schools and public places (Contract No. AE/042/2015-2016/4a & 4b).	EIB and AFD	€2.8 Million
3	Construction of Simplified Sewerage.	EIB and AFD	€98,104
4	Priority Works in Mwanza. This project is for Construction of Simplified sewerage and customers' connection in Mwanza City.	EIB and AFD	€1.5 Million
5	Construction of New waste stabilization ponds at Nyamhongolo and sewer Networks in Nyakato industrial area and Igoma (Contract Number AE/042/2015-2016/W/0a).	Government of the United Republic of Tanzania through MoW, EIB and AFD	€104.5 Million
6	Transmission main from Butimba water treatment plant to Sahwa and distribution network to Buhongwa, Igoma, Buswelu, Kisesa, Isangijo and Usagara (Contract No. AE/042/2015-2016/3b).	AFD	€3.5 Million
7	Construction of water treatment plant at Butimba area (Contract Number AE/042/2015-2016/3c).	AFD	€42.3 Million

¹⁵ Defere, E. and Ward, R. (Aguaconsult). (2020). *Mid-Term Review of the Water Operator Partnership Mwanza, Tanzania*. (Final).

Additional investments identified as part of the Phase I of the pre-feasibility undertaken by Mott MacDonald and VEI in April 2020 part of the WOP are shown below in **Table 2** include:

Table 2: Additional identified investment needs

Description	Cost Estimate
Mwanza North WTP reservoirs Kabangaje including reservoirs and network	€ 39 million
Upgrade transmission mains from Capri Point to Bwiru Corner	€ 900,000
Replacement of small diam. Network at Bulale and lower Buhongwa	€ 400,000
Network rehabilitation and pressure improvements	€ 500,000
Expand Butimba WTP to 80MLD	€ 20 million

Institutional background of MWAUWASA

Mwanza Urban Water Supply and Sanitation Authority (MWAUWASA) was established in 1996 under Water Works Ordinance Cap 281 (as amended by Act no 8 1997 of) as a semi-autonomous executive agency of the government charged with the provision of “adequate, reliable and sustainable potable water and waste water management services in Mwanza City”. It was declared fully autonomous from January 1998 and was authorized to extend services to Kisesa Township in Magu District from September 2007. The Authority is wholly owned by the Government of Tanzania.¹⁶

The Authority operates according to a series of legislative agreements including: the Water Supply and Sanitation Act no 12 of 2009, the Water Works Regulations of 2013, a Memorandum of Understanding (MoU) with the Ministry responsible for Water, the Public Procurement Act No 7 of 2011 and its subsequent regulation passed in 2013, the Public Finance Act 2001 (as amended), an MoU between the Government and Development Partners (2006), an Operating License issued by EWURA, as well as its own internal operational guidelines. The Authority is managed under the Executive Board of Directors.¹⁷

Governance structure

MWAUWASA is constituted as a public semi-autonomous executive agency of the government for the provision of water and waste water management services in Mwanza City. The utility is led by a Managing Director, who is directly supported by four Department Heads responsible for the interpretation and implementation of policies and decisions made by the Board of Directors. Currently with 407 employees, a significant increase from the 2017 total of 288.

The four Departments are Technical, Commercial, Financial, and Administrative & Human Resources. The Technical Department oversees water plants and production, water quality

¹⁶ MWAUWASA. *About MWAUWASA*. Retrieved December 15, 2020, from <https://www.mwauwasa.go.tz/pages/background>

¹⁷ MWAUWASA. *About MWAUWASA*. Retrieved December 15, 2020, from <https://www.mwauwasa.go.tz/pages/background>

control, water supply network operations, sanitation operations, and infrastructure development; the Commercial Department is responsible for billing and customer database management, credit control (revenue collection), marketing and customer services and zone operations; the Financial Department is responsible for financial accounting, management accounting and supplies matters; and the Administrative & Human Resource Department oversees management of human resources and administration.

From the mentor side, a full-time Resident Project Manager (RPM) from VEI manages the project (including other Water Operator Partnerships in Arusha and Dodoma). The RPM's counterpart at MWAUWASA is the Managing Director who is responsible for achieving outputs of Karibu Maji Mwanza project.

Lake Victoria Mwanza Project as the main financial aid and parallel investment

As reported in the Project Plan, and per MWAUWASA Financial Manager, the operator is receiving grants from various international institutions to finance a series of investments.¹⁸ Of particular note is the Lake Victoria Mwanza Project, also referred to as the Master Plan, which falls under the broader Lake Victoria Water Supply and Sanitation Programme (LVWATSAN), a regional effort being implemented by the United Republic of Tanzania Ministry of Water and Irrigation in partnership with the East Africa Community (EAC) and UN-Habitat. The Lake Victoria Mwanza Project is financed by the French Development Bank (AFD) and EIB (European Investment Bank) and is focused on extending and upgrading water supply and sanitation services.¹⁹

Aside from international finance institutions (such as EIB and AFD), financing options for MWUAWASA are somewhat limited. For the most part, government (local, regional or national) does not have the financial capacity in providing investment or offering loan programs to utilities for capacity improvements, which leaves commercial banking as the only viable option. However, high interest rates required from commercial banking significantly reduces the feasibility of MWUAWASA pursuing projects through such means of financing.

Concerns about the sustainability of Lake Victoria as unique water supply

MWUAWASA sources the vast majority of its water supply from Lake Victoria. However, environmental concerns remain regarding the sustainability of the lake as a water source going forward as well as regarding the lake's level of pollutants and biodiversity. As Lake Victoria affects multiple jurisdictions (and countries), and serves as the basis for a wide variety of economic activities, the lake faces a number of trans boundary issues.

For Mwanza City and MWUAWASA specifically, environmental sustainability of Lake Victoria is discussed regarding the planning and implementation of a wastewater treatment facility and the rehabilitation of several water stabilization ponds. However, the growth of unplanned settlements and increasing (economic) activity on the lakeshore in and around Mwanza City

¹⁸ VEI. (2018). *Inception Phase III: Project Plan: Karibu Maji Mwanza*.

¹⁹ United Republic of Tanzania. (2015). *Lake Victoria Water & Sanitation Initiative – Mwanza Project Stakeholder Engagement Plan*. Ministry of Water and Irrigation.

continue to negatively impact the lake and the increasing challenges derived from settlement growth are largely ignored. For that reason, the implementation of a MWAUWASA Water Safety Plan is encouraged, which would ideally incorporate the concerns of relevant stakeholders.

Gender, climate and pro-poor policy

The indicators on gender balance in MWAUWASA shows positive trends in both the proportion of female staff overall and the percentage of women in management positions suggesting the utility is serious about addressing gender representation in the workplace.

The percentage of women out of the total staff of MWAUWASA remained stable around 17% (2017) and 18% (2021). More impressively, in 2017 there were only 5 women in management positions (of a total of 28 management roles), representing 18 percent of the management roles²⁰.

Pertaining to MWAUWASA pro-poor policy, the utility's 2018-2021 Business Plan discusses free provision of water supply services (40 liters/day/resident) to a limited number of Mwanza city residents who were approved by the Board of Directors as meeting a certain standard of 'urban poor'. Other water services to residents with low income are provided through 414 public standpipes and water kiosks. Discussions are ongoing on how to reach low-income households with a yard tap connection, especially on how to overcome the initial costs for the Service Connection. A subsidized program, as implemented under WWX Phase 1 is currently under evaluation. Phase 2 will include a pilot on a micro credit facility.

Partnership creation

The WOP partnership with MWAUWASA began in January 2018 as part of a wider global programme, WaterWorX. While the WaterWorX programme marked the beginning of this WOP, a previous WOP between MWAUWASA and Dunea (a Dutch operator that makes up part of the VEI consortium) occurred over a five-year period between 2012 and 2016. The Dunea WOP primarily focused on financial and operational performance including laboratory certification support, efforts to improve customer and employee satisfaction, and efforts to boost revenue collection.

Enabling factors

As MWAUWASA had recently engaged in a five-year WOP with Dunea, one of the Dutch utilities comprising the VEI consortium, there existed a level of mutual respect and understanding of WOP processes and expectations. Furthermore, while the Dunea-MWAUWASA WOP and the current WaterWorX partnership are different in scope, approach,

²⁰ VEI. (2020). *MWAUWASA KPI Workbook*. (Working Draft).

etc., according to interviews with WOP partners, a pre-existing familiarity with cultural norms (from both partners) has been an enabling factor in the partnership.

Partnership formalization

A Memorandum of Understanding (MoU) for Phase 1 was officially signed in September 2017 by VEI and MWUAWASA. The MoU for Phase 2 has been signed in May 2022.

The parties: mentor, mentee, facilitators

Mentor (VEI)

VEI is the dedicated non-profit vehicle for the six Dutch public water operators in achieving their shared objective. VEI focuses on providing support for water operators in Africa, Asia and South America: countries that face immense challenges, such as increasing water demand, water quality problems, water shortages and climate change. VEI collaborates with these colleague water operators to expand their capabilities and help them professionalize their operations by actively sharing long-standing Dutch expertise and experience. For example, VEI assists by improving basic operations such as non-revenue water (hereafter: NRW) management and water operations, by setting up stable financial procedures or by creating a better infrastructure.

Table 3: Size and service indicators of VEI (2020)

Population served (in millions)	13,89 customers
Number of households (in millions)	6,7
Water produced (millions of m ³)	970
Number of employees	3683
Number of water treatment plants	n/a
Length of network (in kilometers)	103,410 km
Unaccounted for water (percent of total)	n/a
Staff per 1000 connections (water supply)	0.55
Staff per 1000 population served (water supply)	0.26
Turnover (in millions EUR)	1,063
Average drinking water price per m ³ (EUR)	1,04 (Vitens)

Motivations, interests, opportunities

As noted previously, the Authority was previously engaged with the Dutch operator in a five-year partnership between 2012 and 2016. The Dunea-MWAUWASA WOP focused primarily on financial and operational performance improvements. Specifically, the WOP addressed laboratory certification processes, improving customer and employee satisfaction, and boosting revenue collection. Given the previous WOP’s focus on ensuring adequate systems were established and followed by Authority staff, VEI was interested in addressing capacity challenges in a more holistic, and hopefully, sustainable manner with the current WOP.

More broadly, the motivations of the WaterWorX programme range from the desire for a sustainable contribution to the realization of the Sustainable Development Goals through the provision of sustainable access to water and sanitation for 10 million people.

Furthermore, another underlying motivation for VEI is the Corporate Social Responsibility (CSR) of the participating Dutch utilities in VEI and the will to increase the interest of a younger workforce to work at the Dutch utilities with the perspective to work abroad for VEI.

MWAUWASA: a fully autonomous Authority with expanding coverage

Mwanza Urban Water Supply and Sanitation Authority (MWAUWASA) was established in July 1996 under the Water Works Ordinance Cap 281 (as amended by Act no 8 1997 of) as a semi-autonomous executive agency of the government responsible for the provision of adequate, reliable and sustainable portable water and wastewater management services at affordable and cost-effective prices in Mwanza City.

The Authority is wholly owned by the Government of Tanzania. Beginning in 1998, the Authority was declared fully autonomous. In 2007, the Authority was authorized to expand services to Kisesa Township in Magu District, representing a significant increase in total coverage.

Prior to the current WOP, a five-year partnership with Dunea, a Dutch operator, provided technical assistance to MWAUWASA.²¹

Table 4: Size and service indicators of MWAUWASA (2019)²²

Size and Service Indicators	2019
Estimated population in service area	1,361,052
Estimated percentage of low income population in service area	23%
Number of active household connections	99,412
Number of total connections	104,639
Population served (water supply)	739,737
Population served (improved sanitation facilities)	30,822
Coverage water supply	54%
Water supply (total annual input m ³)	29 million
Number of employees	407
Number of FT female employees	72
Number of FT employees in management positions	37

²¹ MWAUWASA. *About MWAUWASA*. Retrieved December 15, 2020, from <https://www.mwauwasa.go.tz/pages/background>

²² VEI. (2018). *Inception Phase III: Project Plan: Karibu Maji Mwanza*.

Number of FT female employees in management positions	12
Non-revenue water (NRW, %)	37%
Non-revenue water (NRW, L/c/d, 12 month moving average)	330
Staff per 1000 connections (water supply)	3.9
Total Operating Revenue (EUR)	11M

Financing

In recent years, MWAUWASA has demonstrated success in attracting large-scale investment from international financial institutions such as AFD and EIB. These investments are primarily focused on infrastructure improvements, including large-scale infrastructure development such as the siting and construction of a sewage treatment plant to service Mwanza City.

While undertaking large-scale infrastructure development projects in parallel to the WOP is not without its challenges (namely, managerial and technical staffing limitations for WOP activities), the infrastructure improvements and capacity development efforts undertaken as part of the WOP are, without a doubt, mutually beneficial in that the targeted support underlying a WOP help to provide a more secure and effective investment platform and mitigate challenges that large scale investments may bring. The Authority's ability to convey the benefits of the support provided through a WOP vis-à-vis new investment can, in turn, help attract new investment in the future.

Motivations, interests, opportunities

MWAUWASA sought to engage in WaterWorX program, and in turn in a partnership with VEI, in order to address specific capacity building needs, along with identifying practical solutions to NRW challenges, maintenance requirements and leadership training.

Financing of the WOP

The total WOP budget for Phase I is approximately 2.8 million euro, with the vast majority allocated to personnel and staff (short term experts (STEs), travel, per diem costs, local staff, etc.) and Goods and Services (primarily financial investments associated with pro-poor services and NRW reduction). Excluding operational investments and new connections, the budget was of about 1.7 million euro. This investment needed to be requested separately through proposal writing and is partly funded by WWX (55%) and the remaining by VEI through the Water for Life Fund²³ and the beneficiary partner.

²³ The Water for Life Fund is a Dutch organization dedicated to supporting projects for sustainable water and/or sanitation access around the world. It is funded mainly by donations coming from tap water customers in The Netherlands.

Diagnosis of needs

The WOP was designed and structured in response to clear needs articulated by MWAUWASA management and supported by detailed planning and analysis of the social, financial and natural resource context that the utility operates in. Given the challenges documented in the previous Dunea-MWAUWASA WOP, discussions between VEI, Authority management and staff, and data on KPIs provided by the authority, the WOP has a clear mandate to focus on capacity development, NRW, connection levels, and resource management. These focus areas were articulated in the priority areas identified in the inception plan for the WOP:²⁴

1. Capacity development
2. Reducing NRW
3. Extending coverage
4. Environmental Issues regarding Lake Victoria

To address these priority areas, the WOP seeks to build management and staff capacity, provide support in reducing NRW, and to prepare the utility to take on and sustainably manage its expansion and the environmental challenges associated with a growing population and the future impacts of climate change.



Field visit of NRW reduction pilot area and low-income area

Capacity Development

In order to address any of the three priority areas discussed below in a sustainable manner, to embed the necessary skills and knowledge in MWAUWASA management and staff was imperative. Additionally, creating work environment conducive to sustained improvements across the Authority is dependent on a motivated staff that is not overburdened with their responsibilities, and sequentially developing a workforce capable of maintaining a high level of operational performance for the utility going forward. The Authority was found to face challenges regarding employee satisfaction, the level of female representation in the

²⁴ VEI. (2018). *Inception Phase III: Project Plan: Karibu Maji Mwanza*.

workplace – both across the Authority and in management positions --, and in having insufficient number of technical staff.

Non-Revenue Water (NRW)

The biggest challenge for MWAUWASA is reducing NRW, which is reflected in the committed budget for staff hours (STEs) outlined in the Project Plan. However, an accurate level of NRW was not known at the time of the WOP's inception as the existing approach to measuring NRW was to use the bulk meter before the Treatment Plant and subtract the estimated production losses (which corresponded to an estimated 15%). This calculation results in an inferred NRW average of approximately 38% or 450L/conn/day (or 160 m³/conn/year), however, the Project Plan does suggest that overall NRW losses could be significantly higher. Volumetrically and financially, this level of NRW translated to an annual loss of 10 million m³ and an estimated USD 4.4 million USD in revenue to MWAUWASA. From a financial perspective, these losses significantly weaken the capacity of MWAUWASA to invest in repair, rehabilitation, replacement, and extension of its infrastructure.²⁵

Service Coverage

In 2017, coverage was reported by MWAUWASA to be nearly 94%. However, this figure was based on an underlying assumption of 12 people per connection (1.5 families per connection) and 250 people per kiosk.²⁶ In reality, in 2017 the total number of active connections was 62,885 and the total population in the service area was 777,000. Assuming a more reasonable one household per connection ratio and 6 persons per household (which was derived a survey of 7,500 Mwanza households²⁷), VEI estimated the population served was nearly 390,000, corresponding to a coverage level of around 50%.

Over the course of phase I, the number of connections did indeed increase significantly (66% from 2017 to 2021), however, the population increased at an even more rapid pace, therefore outpacing connection improvements by a substantial margin.

Lake Victoria: The single water source for MWAUWASA

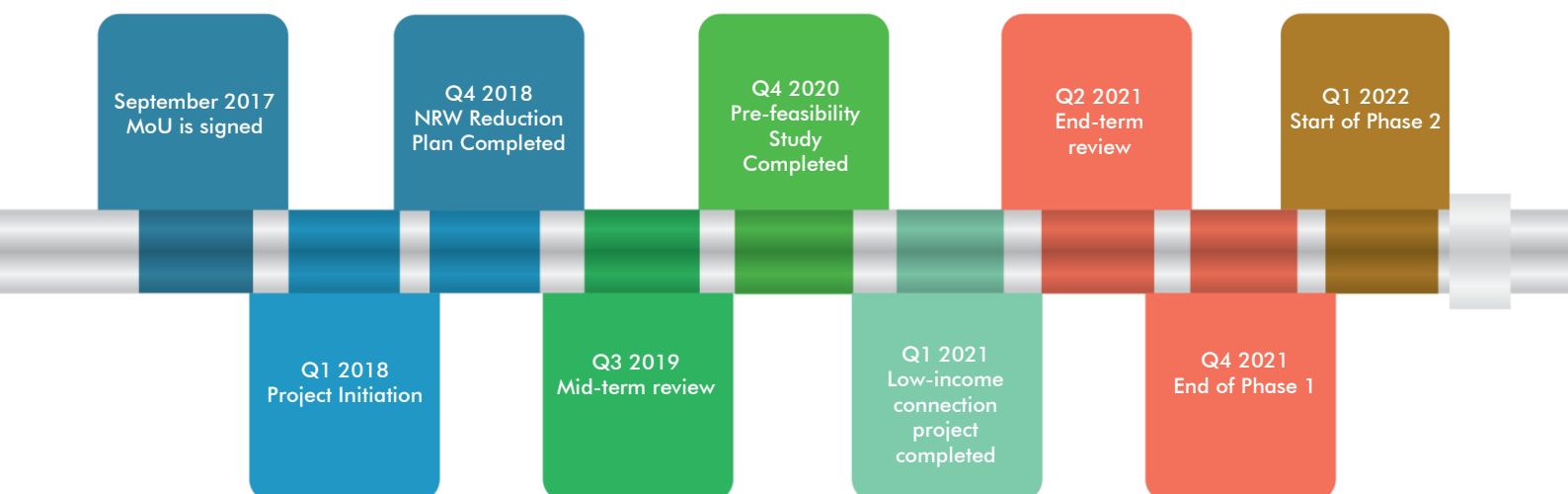
MWAUWASA relies on a single water source: Lake Victoria. If the lake is no longer a viable water source, communities in Mwanza City would face existential challenges to their livelihoods (as would communities throughout the regions of Tanzania, Uganda and Kenya which rely on Lake Victory as their primary source of water). Irreversible changes in the lake's catchment due to environmental stress beyond natural carrying capacity may affect the water level and water quality of Lake Victoria. Additionally, pollution by discharge of untreated sewage is likely to worsen water quality. Efforts to ensure the continued viability of Lake Victoria as a water source is therefore essential.

²⁵ VEI. (2018). *Inception Phase III: Project Plan: Karibu Maji Mwanza*.

²⁶ VEI. (2018). *Inception Phase III: Project Plan: Karibu Maji Mwanza*.

²⁷ VEI (2020). *MWAUWASA KPI Workbook for WaterWorx Programme*. (Working Draft).

Timeline



Project implementation

Management of the partnership and inter-organizational dynamics

The VEI Project Manager (PM) oversees and coordinates the project activities together with the Project Coordinator (PC). High level planning and risk management efforts are undertaken in consultation with the MWAUWASA Technical Manager and VEI's Project Director. Regular meetings are held with MWAUWASA management, the VEI RPM, the PC, and the project staff to discuss and approve major milestones, such as the annual report, and to coordinate and plan activities and associated budgetary needs going forward.

Interviews with project partners and findings from the 2020 MTR both suggest that communication between the project partners and MWAUWASA management could be improved. Given existence of numerous large-scale projects/initiations that compete for the time and energy of MWAUWASA management (as well as technical staff), it is believed that through the incorporation of more regular meetings a more efficient working relationship could be achieved.^{28, 29}

Improvement tracks

The priority areas for the VEI-MWAUWASA WOP are: 1) capacity development, 2) extending coverage, 3) NRW reduction, and 4) robust environment³⁰, these four objectives are also referred to as 'clusters of activities', which in turn correspond to measurable KPIs and key outputs, which are outlined below in **Table 5**.

²⁸ Defere, E. and Ward, R. (Aguaconsult). (2020). *Mid-Term Review of the Water Operator Partnership Mwanza, Tanzania*. (Final).

²⁹ Interview with VEI Resident Project Manager for WaterWorX Karibu Maji Mwanza, Reinder van den Brink. October 2020.

³⁰ VEI. (2018). *Inception Phase III: Project Plan: Karibu Maji Mwanza*.

Table 5: Objectives, KPIs, and Outputs for VEI-MWAUWASA

Priority Areas	Key Performance Indicators	KPI Target	Outputs
Capacity Development	% Female Employees Management	23%	<ul style="list-style-type: none"> Leadership and organizational development program prepared and implemented Training workshops to be given in relation to the project objectives (New Connections, NRW reduction, building a robust environment). Exchange visits (to Netherlands or other utilities in the region) IHE short courses will be provided for staff members (max. 8) New project staff (potential MWAUWASA employees) will be contracted and trained Specific training will be given to 2 young high potentials under the Young Expert program
	% Female Employees	25%	
	FTEs per 1,000 connections	3.7	
New Connections (Extending coverage)	Direct connections	33,000 low-income people by 2021 (20,000 connections expected to be realized by MWAUWASA by 2021)	<ul style="list-style-type: none"> Pro-poor vision, strategy and objectives developed Proposals developed for new water connections Access to water via pro poor infrastructure Access to water via new water household connections Water distribution program developed and implemented
	Indirect connections	100,000 people	
	Coverage	48%	

NRW Reduction	NRW	10% red.; 127 m ³ / conn/year	<ul style="list-style-type: none"> • Water distribution program developed and implemented • NRW reduction plan developed • Training in NRW reduction approach • Level of NRW reduced in one or several DMAs • Experience in DMAs scaled to utility level
	Operating Ratio	0.75	<ul style="list-style-type: none"> • GIS improved • Customer processes analyzed and improved
Robust Environment	Energy Reduction	0.61kwh/m ³	<ul style="list-style-type: none"> • People trained in maintenance and management • Energy saving program
	Investment Proposals to generate new funding	Funding to connect 600,000 people to water and/or sanitation	<ul style="list-style-type: none"> • Climate resistant water supply program 2050 developed • Climate robust investment proposals developed

Evidence of impact and effectiveness of the project

The objectives outlined for the four improvement tracks were envisioned to be realized through a combination of material and non-material means. More specifically, the following section provides a brief overview of the budgetary and staff-related allocations that occurred during Phase I, for each of the four improvement tracks.

1) Capacity Development

In addition to an organisational and leadership development program that took place in Q2 2020, a series of trainings addressing the three other improvement tracks (New Connections, NRW, and Robust Environment) took place over phase I.

Discrete capacity building efforts have included the participation of local students in the MSc Delft Programme, the hiring of one (1) young professional under the Young Expert Program (YEP), and training for a number of Authority staff on NRW reduction. **Table 6** below provides greater detail regarding the timing, description, cost estimates and staff time estimates for highlighted capacity development activities.

Table 6: Capacity development activities^{31,32,33}

Activity	Timing	Description	Cost Est.	Staff Time Est.
Leadership and organizational development program	Originally scheduled for Q2 2020 <i>Postponed due to Covid</i>	Leadership trainings with Herman Wittockx focusing on Board of Directors, higher management and middle management. Attention is paid to governance, organization culture and change management.	€10,000 (trainer)	3 weeks of HR 3 weeks of upper management
Preparation and implementation of a capacity development program; organizational improvement plan	Q2 2020	Building off of plan development during Dunea WOP, program and associated improvement plan intended to: <ul style="list-style-type: none"> • Assess training and resource needs • Assess organizational structure of Authority • Develop with focus on gender, diversity; NRW and pro-poor units 	€20,000 (inclusiveness and training)	3 weeks of HR 3 weeks of upper management
NRW reduction approach	Q2 2018 and continuing throughout Phase I	Training from range of STEs intended to reach 80 employees trained (on meter readers, lumbers, leakage detection team); training types include 'on the job', 'classical' and 'shared experiences'.	N/A	Every STE to give classroom or on the job training during mission

³¹ VEI. (2020). *Mwanza WOP Workplan*. (Working Draft).

³² VEI. (2018). *Inception Phase III: Project Plan: Karibu Maji Mwanza*.

³³ Interview with VEI Resident Project Manager for WaterWorX Karibu Maji Mwanza, Reinder van den Brink. October 2020.

Preventative maintenance and management training and plan development	Q2 2019 and continuing throughout Phase I	At least 5 persons to be trained in preventive maintenance and / or asset management	€5,000 (training)	2 x 3 weeks for STEs
Training of new project staff (including Young Expert Program)	N/A	Training of young staff with high potential under the Young Expert Program	N/A	N/A

2) New connections

The new connections improvement track of the Karibu Maji Mwanza project involves the largest direct budgetary commitment of the four, as the WOP allocates €600,000 to provide 33,000 poor people with water by 2021. In parallel, an additional 20,000 connections (providing connectivity to an estimated equals 96,000 people) is anticipated to be realized 2021 under the responsibility of MWAUWASA, which is the project contributes to indirectly through the reduction of NRW and increasing utility revenues.

Further investments (financed by the European Investment Bank (EIB) and African Development Bank (AfDB)) under the Master Plan are also anticipated to facilitate new connections through network expansion and increased production capacity.

Activities planned or completed supporting this improvement track are summarized in the **Table 7** below.

Table 7: New Connections Activities^{34,35,36}

Activity	Timing	Description	Cost Est.	Staff Time Est.
Development of pro-poor vision, strategy and objectives	Q3 2020 – Q2 2021 <i>Postponed due to Covid</i>	Development of pro-poor access strategy and action plan	N/A	Pro-poor coordinator (6 months) Dutch expert and/or local

³⁴ VEI. (2020). *Mwanza WOP Workplan*. (Working Draft).

³⁵ VEI. (2018). *Inception Phase III: Project Plan: Karibu Maji Mwanza*.

³⁶ Interview with VEI Resident Project Manager for WaterWorX Karibu Maji Mwanza, Reinder van den Brink. October 2020.

				project manager
Proposals for providing people with direct access to improved water and/ or sanitation facilities	Q3 2018 – Q1 2019	Implemented projects reaching 33.000 people with water and / or sanitation	€50,000	Pro-poor coordinator (12-24 months) Distribution STEs (2 weeks) Asset Management STEs (2 weeks) Dutch expert and/or local project manager
Water distribution program developed and implemented	Q1 2020 – end of Phase I	The distribution plan aimed to provide a framework for the optimization of the production and (more so) the distribution of water to all utility consumers	N/A	Hydraulic Modelling Specialist (15 weeks)

3) NRW Reduction

Reducing NRW was a priority of the Dunea-MWAUWASA WOP and continues to be a focus of the MWAUWASA. Through reducing NRW, the overall objective for the Authority is to reduce production requirements (and associated costs) while increase water sales, thereby strengthening its operational and fiscal performance. In addition, NRW reduction is seen to positively contribute to a more sustainable relationship regarding the use of water from Lake Victoria, which remains a vulnerable source due to its over exploitation and pollution.

Achievement of these objectives were realized through a combination of material and non-material inputs including the development of a NRW reduction plan (short and long term), the establishment of 10 District Metered Areas (DMAs), and the implementation of a pressure management strategy. The WOP has contributed to a number of efforts at the MWAUWASA level through the use of new plumbing tools, on-the-job training for plumbers, classroom training on NRW, improvements to transportation for MWAUWASA technicians to more easily respond to issues (e.g. identified leaks), newly established leakage monitoring tools and processes, an analysis of the existing customer database to identify anomalies and/or patterns. In addition, plumber trainings have taken place, which are key to reducing water loss through faulty pipes (the main identified cause of NRW).

At the DMA level, household surveys were conducted in 2018 to detect anomalies, leakage repair began in 2018 and continued through Phase I, efforts have been made towards the rehabilitation of the network (removal of 'spaghetti') and on the establishment of a 'Zonal Dashboard' tracking NRW KPIs in two DMAs. Additionally, Pressure Reducing Valves (PRVs) were installed in 2019, and a customer analysis to identify 'zero readings' and other anomalies were implemented

See below in **Table 8** for a summary of some of the key activities that have been implemented or planned in support of the NRW Reduction improvement track.

Table 8: NRW Reduction Selected Activities^{37,38,39}

Activity	Timing	Description	Cost Est.	Staff Time Est.
Development and implementation of water distribution program	Q1 2020 – end of Phase I	The distribution plan aims to provide a framework for the optimization of the production and (more so) the distribution of water to all utility consumers	N/A	Hydraulic Modelling Specialist (15 weeks)
Development of NRW reduction plan (part of Organizational Plan; see <i>Capacity Development</i>)	Q2 2018 – Q4 2018	Plan focuses on the NRW unit and pro-poor unit in order to sustain the results of the project after completion	€20,000	3 weeks of HR 3 weeks of upper management
Training in NRW reduction approach (part of Capacity Development Program; see	Q2 2018 – end of Phase I	Trainings focusing on the NRW objective and sustainability after project completion	N/A	Every STE to give classroom or on the job training

³⁷ VEI. (2020). *Mwanza WOP Workplan*. (Working Draft).

³⁸ VEI. (2018). *Inception Phase III: Project Plan: Karibu Maji Mwanza*.

³⁹ Interview with VEI Resident Project Manager for WaterWorX Karibu Maji Mwanza, Reinder van den Brink. October 2020.

Capacity Development)				
Training on reducing level of NRW in DMAs	Q2 2018 – end of Phase I	To achieve 40% reduction in NRW in DMAs compared to baseline, implementation of NRW Reduction Plan	€55,200	Distribution Expert (12 weeks)
Workshop and ongoing support for improvement to GIS asset digitization	Q2 2018 – end of Phase I	To improve existing GIS through establishment of improved data entry templates, identification of missing clients and leaks	€5,000	GIS Expert (12 weeks)
Analysis and improvement of customer processes	Q3 2020 – end of Phase I	Analysis of existing billing and collection processes, as well as connection and customer communication processes; support in improving processes, procedures and systems	N/A	Commercial expert (3 weeks)

4) Robust environment

Through the reduction of NRW and integrating Water Demand Management practices into day-to-day operations, MWAUWASA will have the opportunity to improve efficiency in its sourcing of water from Lake Victoria. Additionally, through educational efforts in the community and investments in infrastructure, the Authority can work to reduce environmental pollution to Lake Victoria. The VEI-MWUAWASA WOP seeks to contribute to supporting a robust environment through two distinct approaches:

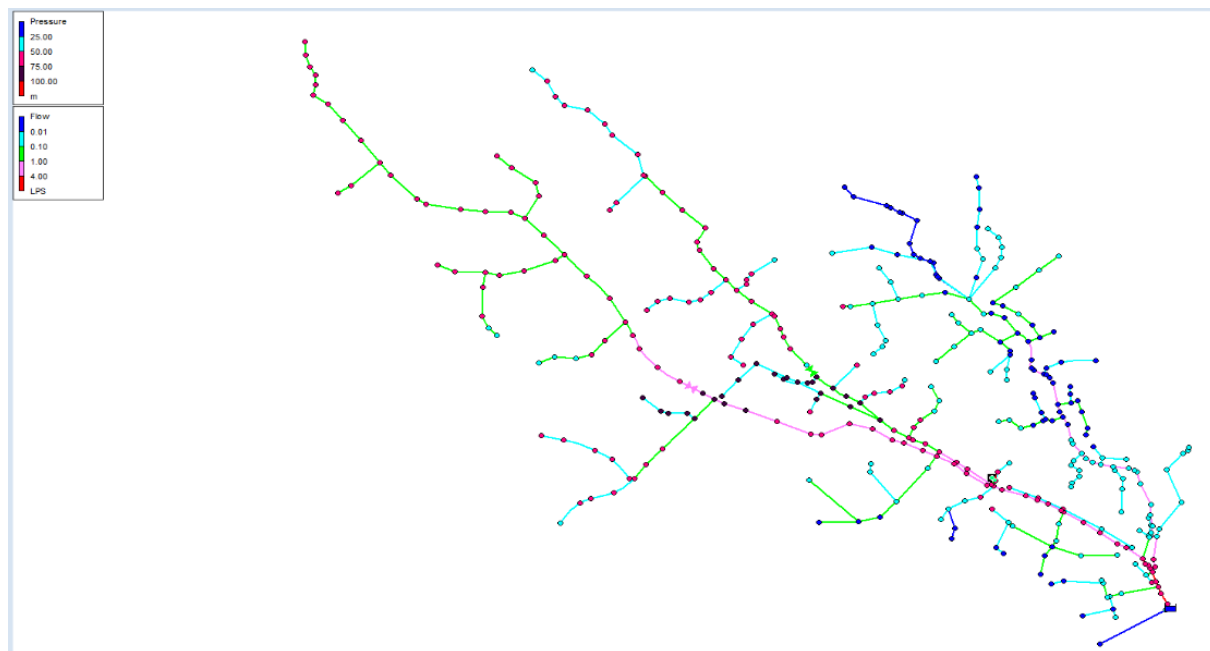
- **Reduction of energy use**
The realization of energy reduction was achieved primarily through the development and implementation of the Energy Saving Programme and the optimization of pressure management within the system enabled by the development of a hydraulic model and facilitated by the planned ABB Frequency controllers identified under the Masterplan.
- **Attract International Financial Institutions (IFI)**
As outlined in the 2030 Masterplan, attracting financial support to fund climate-related infrastructure investment will be key to address water and sanitation coverage deficiencies. The role of the WOP, and VEI in particular, includes: helping MWUAWASA

to specify investments needs, support in proposal development and financial lobbying. The end goal is to secure financing sufficient for funding water and/or sanitation connectivity investments for 600,000 people.

Changes in capacity

While it remains to the second phase of the partnership to fully recognize the capacity changes that will occur at both the individual and organizational level of MWAUWASA, the training on and adoption of certain technological systems is worth noting. For instance, trainings that have been conducted on hydraulic modelling and pressure management and due to a 'sustainability agreement' between the Authority and VEI, the cost of necessary GIS software was covered by VEI for three years. Through the agreement, however, the Authority has guaranteed that it will not only continue covering the cost of the GIS software, but small number of GIS staff (four or five) going forward, ensuring that all technicians and engineers will be able to incorporate hydraulic modelling into pressure management and distribution designs.

Figure 3: Hydraulic modeling



Source: Provided by VEI Resident Project Manager, Reinder van den Brink

In addition, the hiring of local team which, due to limitations in the local job market, were recruited from across Tanzania, and the expectation of the local team's absorption into the Authority at the end of the WOP, represents a significant level of capacity that is to be embedded in the Authority.

In terms of gender balance within the workforce of the Authority, monitored key indicators suggest that gender balance did not improve in general staff levels in the water authority, staying at the 18% of female staff from the beginning until the end of the first phase of the

WOP. At the managerial level though, the improvements have been very noteworthy, overtaking the target and reaching 32% of female employees.

The staff efficiency indicator suggest that a great improvement happened in that area. Even though the target wasn't met, a significant reduction of almost 1 employee per 1,000 connections happened. By the end of the first phase 3,7 employees were needed per 1,000 connections in comparison to 4.8 at the beginning of the partnership.

Table 9 Gender balance ad staff efficiency⁴⁰

KPI	Target (2021)	Baseline (2017)	Measurable Progress (2021)
% Female Employees Management	20%	17%	32%
% Female Employees	30%	18%	18%
FTE/1,000 Connections	3,7	4,8	3,9

Regarding water connections, MWAUWASA has increased their connections since the beginning of the WOP. This fact has been partially attributed to the partnership but also to the organic growth of the Authority. By the end of the first phase, MWAUWASA reached a number even higher than expected, with a total of 284 thousand new people served with drinking water.

Even though connections increased, population did in a faster way than expected, deriving in a decrease of coverage, from 53% in 2017 to 51% in 2021.

Table 10 New Connections⁴¹

KPI	Target (2021)	Baseline (2017)	Measurable Progress (2021)
Total number of people served with drinking water	614.963	413.135	696.614
Number of active other connections: commercial, institutional, industrial	6.821	4651	6115
Water coverage (total service area)	79%	53%	51%

⁴⁰ VEI (2022) MWANZA Monitoring and Evaluation Annual Report. Compiled by: Reinder van den Brink

⁴¹ VEI (2022) MWANZA Monitoring and Evaluation Annual Report. Compiled by: Reinder van den Brink

As shown in Table 11, the WOP aimed to reduce NRW to 26% (m3/active connection/year) by the end of Phase I of the WOP. The Authority notably overpassed the target and reached the number of 101 m3/active connections/year, equivalent to a reduction of the 41%, but this number is greatly attributed to the increase on the number of connections. For that reason, NRW as percentage of produced annual volume didn't show any decrease. MWAUWASA is putting more efforts in place to reduce NRW, such as the implementation of a new NRW unit as part of the Authority.

Table 11 Non-revenue water⁴²

KPI	Target (2021)	Baseline (2017)	Measurable Progress (2021)
NRW in m3 per active connection per year (utility level)	127	172	101
NRW as percentage of produced annual volume (utility level)	27%	37%	37%

As can be seen below in Table 12, capacity changes regarding energy efficiency has not yet reached the WOP target. The Authority has experienced an increase of energy consumption, caused by external factors and not by WOP activities. It is foreseen that this number will improve in the coming years.⁴³

Table 12 Energy efficiency⁴⁴

KPI	Target (2021)	Baseline (2017)	Measurable Progress (2021)
Energy Consumption	.61/kwh/m ³	.93	1,07

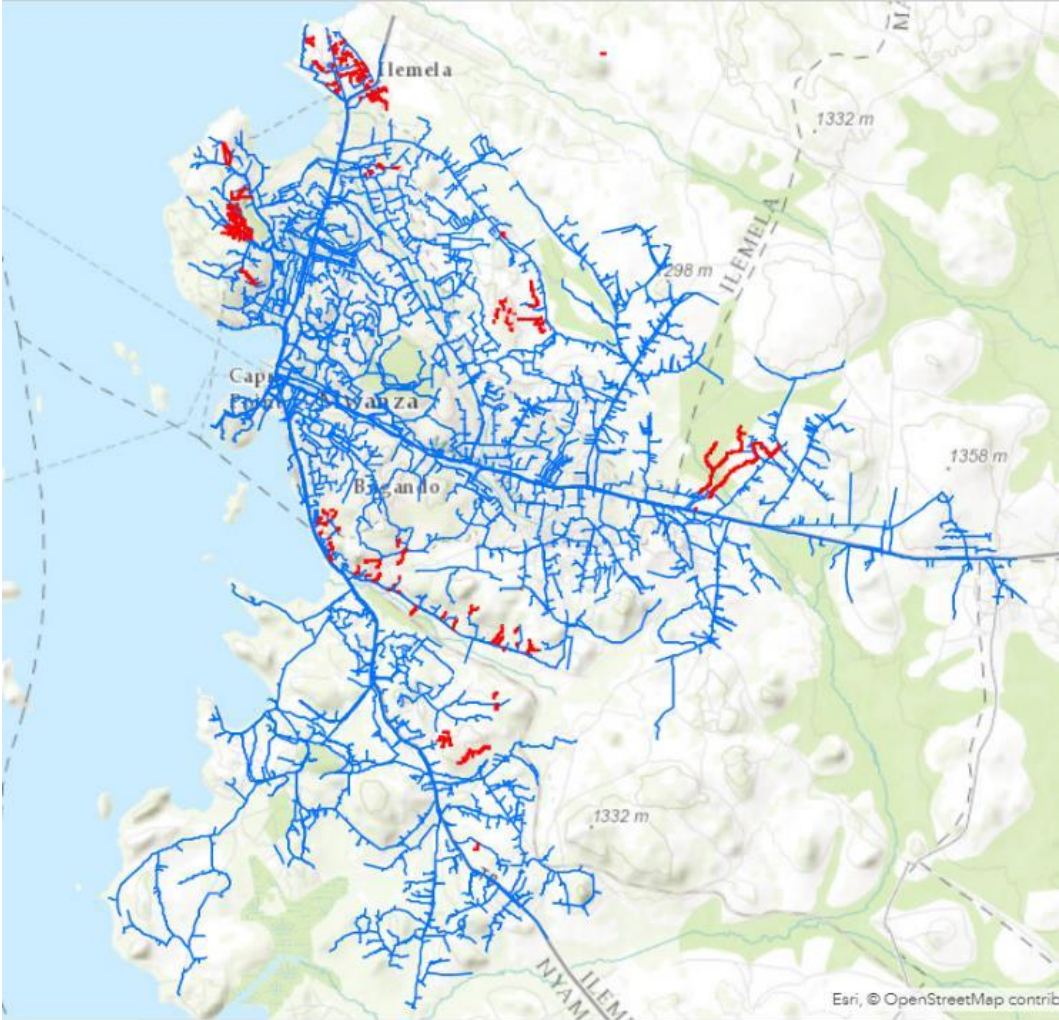
The multifaceted approach

Many of the key activities integral to generating the results achieved in this WOP are discussed in the previous section and documented in **Tables 6, 7, and 8**. Measurable improvements as illustrated through the selected KPIs, likewise, are illustrated in **Table ,10,11 and 12**.

⁴² VEI (2022) MWANZA Monitoring and Evaluation Annual Report. Compiled by: Reinder van den Brink
⁴³ VEI (2022) MWANZA Monitoring and Evaluation Annual Report. Compiled by: Reinder van den Brink
⁴⁴ VEI (2022) MWANZA Monitoring and Evaluation Annual Report. Compiled by: Reinder van den Brink

To achieve the main objectives of the WOP, a multifaceted approach has been employed, marrying a series of classroom-style trainings and workshops, on-the-job trainings incorporating new tools/software, processes, systems, etc., and the direct implementation of new connections and piping in low-income areas (see **Figure 5**).

Figure 4: 40 km of new pipe laid in low-income areas (LIA)



Source: Provided by VEI Resident Project Manager, Reinder van den Brink

An indicative example of this multifaceted approach involves one of the efforts undertaken to address NRW, and particularly in the establishment of 5 DMAs. DMAs were prioritized as a means by which to gain a more accurate sense of how much water is coming in versus how much is being billed in selected areas. The establishment of DMAs allows for utilities to implement new strategies or procedures, test new software or other tools, and employ new systems of working in a small, easy to track zone within the larger service area. The eventual goal is then to scale up the processes and systems that are effective in the DMA pilot to the greater service area where possible.

In the case of the VEI-MWAUWASA WOP, following trainings conducted by VEI for plumbers (on new tools and approaches), on leakage monitoring (and software), and customer database

analysis, newly gleaned practices and procedures were implemented in selected DMAs such as Malaika DMA, resulting in fewer water losses and improved monitoring of leakages and other anomalies so leaks can be identified more effectively and fixed. Furthermore, targeted leakage repair, network rehabilitation (i.e. removal of 'spaghetti'), the installation of new household connections and pressure reducing valves (PRVs). Using the DMA structure has allowed for step-by-step evaluation of NRW progress within the DMA. In the case of Malaika, on a per connection basis, NRW has decreased over the course of the WOP while the percentage of NRW has remained unchanged.



National Water Conference 2020 Tanzania

Sustainability of MWAUWASA improved performance

The WOP is likely to experience sustainable results, especially in terms of improvements to the utility’s operational and management processes, specifically those addressing NRW. However, it is difficult to project how gains related to particular performance improvements (e.g., coverage levels, female representation in the workplace, NRW per capita) will be maintained given the level of growth anticipated in the service population and new capacity-related infrastructure investments being developed in parallel to the WOP (i.e., treatment plant).

Project evaluation

Impact in terms of sector targets

New connection targets were met, but coverage expansion targets envisioned as part of the WOP were behind schedule and not met by the end of Phase I, the main reason being the rapid population growth beating water connection expansion speed. Sector targets related to NRW reduction (at the per connection level and system input level) have not met established targets. However, for both coverage and NRW objectives, gains made as part of the WOP regarding structural, procedural and embedded knowledge and skills have been quite fruitful (see trainings and established processes on Leakage repair and reporting through Arc GIS), indicating that gains in these areas will be perceived to a greater extent as the WOP develops further as well as after the WOP has been completed.

Effectiveness

The WOP appears to have been effective during Phase I. According to interviews with project partners and those conducted as part of the MTR, Authority staff feel the WOP is quite valuable, especially in regard to technical training (e.g. NRW reduction techniques and process). However, it should be noted that given the number of ongoing projects in and around Mwanza, with multiple development partners working simultaneously on interlinked infrastructure and environmental management projects, the environment has been described as 'crowded' and potentially limiting the impacts of the WOP. Much of this limitation stems from the challenges associated with coordination with parallel projects and competing for Authority staff time and management prioritization. Thus, while there are clear advantages for cooperation and linking capacity development at the individual and organizational level to broader investments on network expansion and improvements (or in collaborative work on technical aspects like GIS, such is the case with EIB/AFD-funded consultancy), in practice, such parallel endeavors can be challenging.

WOP Efficiency

Answering to the question of the partnership execution and its efficiency, the interviews conducted and project documentation reviewed generally suggest that the partnership has been executed efficiently thus far under the circumstances. However, while unavoidable, delays stemming from the COVID-19 pandemic have impacted the intended WOP approach. For instance, the leadership training program for management and other senior staff, which in other WaterWorX partnerships has been quite impactful and generated shifts in prioritization, was delayed multiple times.

The number of parallel project going on in Mwanza, was also perceived as a subject of analysis. Although this fact can certainly bring broader efficiency by aligning multiple projects and development partners;, there too exists competition for staffing, managerial engagement, and an understandably overall prioritization to large infrastructure investments over smaller-scale activities undertaken as part of the WOP.



Plumbers vehicle and new tools with STE Mwanza Tanzania

Success factors and challenges

Success factors

- **Length of the WOP.** Long-term commitment to the partnership provides a foundation for significant and sustainable capacity building and performance improvements.
- **Financial linkage.** MWAUWASA is successfully engaged with a number of other large-scale infrastructure projects funded by international donors (primarily AFD and EID). The WOP is perceived as very valuable for outside investment in that the partnership is seen to be capable of mitigating some of the challenges that large-scale investments may bring.
- **Strong fiscal position.** The financial sustainability of MWAUWASA is not seen as a concern and the utility is expected to collect increased revenues in the coming years stemming from an expanded customer base. The utility has also secured funding for an immediate investment plan and longer-term funding and financial management is understood to be a strength.
- **Contextual familiarity of partnership.** Due to the lessons learned and mutual respect development during the previous WOP with Dunea, VEI benefits from a strong contextual understanding of challenges faced by MWAUWASA and the Authority benefits from being previously acquainted with engaging in a WOP as well as, specifically, working with a Dutch team.
- **Dedicated local team.** The recruitment of a dedicated local team, which was recruited from outside of the Authority (from all across Tanzania), has provided a consistent and motivated, well-trained group of professionals that is 100% available for operational activities. The expectation is that after the WOP, the local team will be absorbed into Authority.

Challenges

- Demonstrating the value of the project to MWAUWASA utility leadership and providing additional focus on leadership strengthening.
- Staff availability has at times been an issue, especially when large-scale investments require the attention of a significant proportion of the technical staff (and are priorities over the WOP by Authority management).
- Generating commitment to the WOP from lower-level staff can be problematic as they view the WOP as additional work.

Replicability

As this WOP is part of the WWX programme, the intention is that the partner utility will continue onto Phase II. While the challenges discussed above are certainly worth consideration, the overall perceived success of the WOP thus far and satisfaction between the partners in their involvement in the project suggests that the overall approach of the WaterWorX model is indeed replicable.

On a more technical level, the success demonstrated by training (combination of classroom and on-the-job), implementation of new systems and processes (hydraulic modeling, use of DMAs, etc.), and direct infrastructural improvements (newly laid pipe, new connections, leakage repair) reinforce the efficacy of a holistic approach to mentoring. And while the

sophistication and technical expertise of the mentee utility staff and management enabled swifter and more effective absorption of the technical training, and sufficient WOP duration and funding is required (specially to support the direct infrastructure improvements), it appears likely that this multifaceted and comprehensive approach could be replicated in a wide range of WOPs going forward.

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References

Bank of Tanzania (2018). *Annual Report 2017/18*.

CIA. (2017). *World Fact Book*.

Defere, E. and Ward, R. (Aguaconsult). (2020). *Mid-Term Review of the Water Operator Partnership Mwanza, Tanzania*. (Final).

Interview with VEI Resident Project Manager for WaterWorX Karibu Maji Mwanza, Reinder van den Brink by Walker Toma. October 2020.

MWAUWASA. *About MWAUWASA*. Retrieved December 15, 2020, from <https://www.mwauwasa.go.tz/pages/background>

Tairo, A. (2018). "Mwanza Grows its Lakeside Economy". *The East African*.

United Republic of Tanzania. (2017). *Mwanza Region Investment Guide*. The President's Office Regional Administration and Local Government Mwanza Region.

United Republic of Tanzania. (2015). *Lake Victoria Water & Sanitation Initiative – Mwanza Project Stakeholder Engagement Plan*. Ministry of Water and Irrigation.

United Republic of Tanzania. (2013). *Tanzania in Figures 2012*. National Bureau of Statistics Ministry of Finance.

VEI. (2018). *Inception Phase III: Project Plan: Karibu Maji Mwanza*.

VEI (2020). *MWUAWASA KPI Workbook for WaterWorx Programme*. (Working Draft).

VEI (2022) *MWANZA Monitoring and Evaluation Annual Report*. Compiled by: Reinder van den Brink

VEI. (2020). *Mwanza WOP Workplan*. (Working Draft).

CASE STUDY



UN-HABITAT

Water Operators' Partnerships (WOPs) are peer support relationships between two or more water or sanitation operators, carried out on a not-for-profit basis in the objective of capacity development. This is one of a series of four impact-oriented case studies conducted on WOPs in Africa. It is intended for water and sanitation service providers, governments, development banks, donors, WOPs facilitators and all who are interested in gaining a better understanding of this solidarity-based approach to helping public operators improve their capacity to sustainably deliver water and sanitation services for all.

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