A Research Study on the Technical and Economic Viability of the Decentralized Kiosk Model and its Potential Social Impacts

Report Presentation

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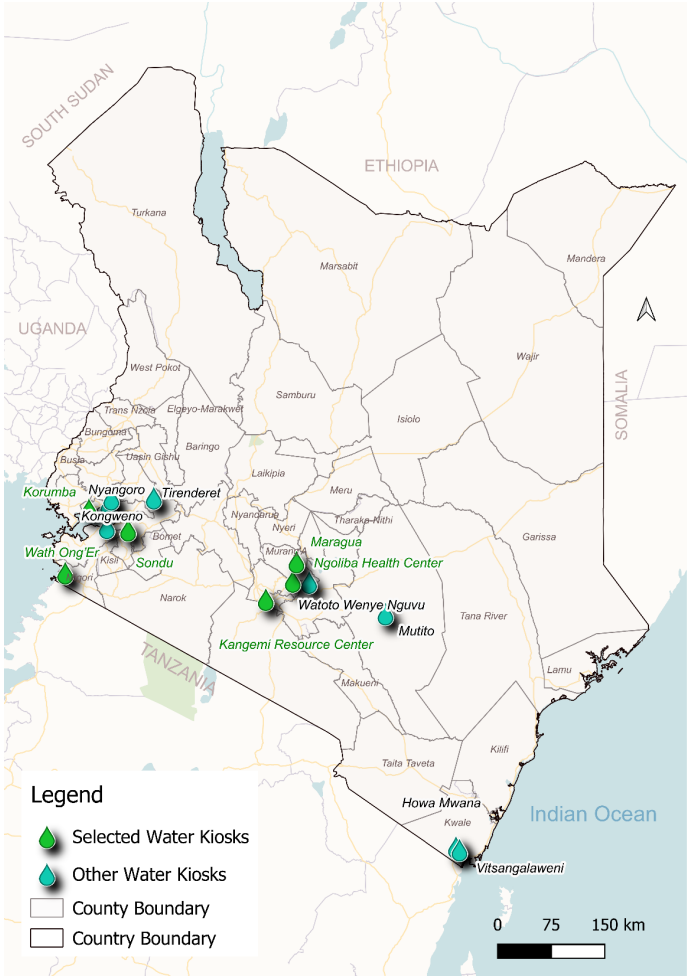
SIEMENS | Stiftung

What to Expect

SIEMENS Stiftung initiated the SWE Kiosks to fill the safe water access gap and proof-concept the decentralized Water kiosk model as a social entrepreneurial business



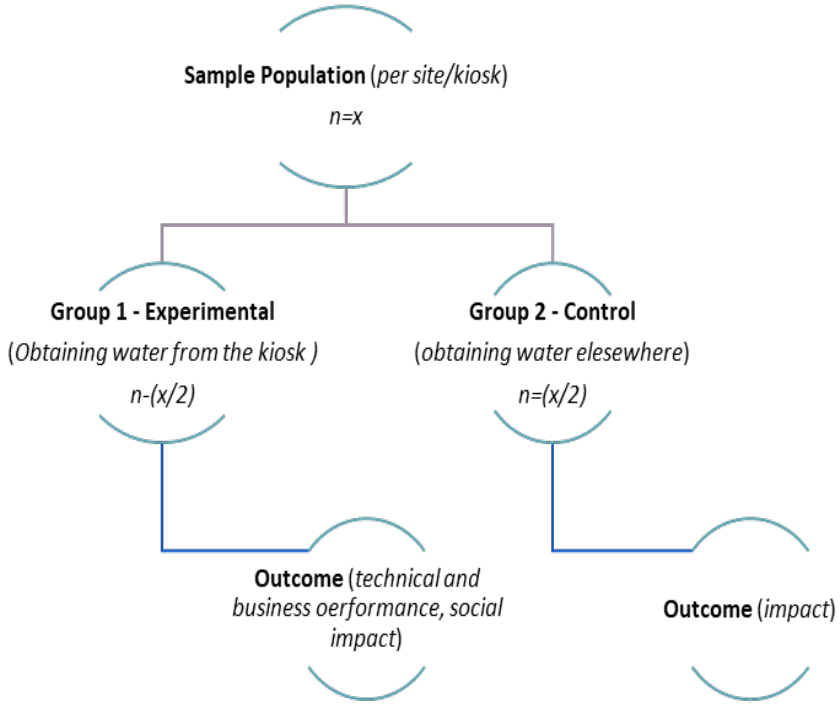
- It is reported that **about 28 million Kenyans still lack access to safely managed water.**
- For Kenya, universal access to Water, Sanitation, and Hygiene Services (WASH) by 2030 is a **USD 22 billion question in investment** needs to expand and improve the current services.
- Cognizant of the **water access challenges in rural and underserved communities**, Siemens Stiftung and Sky Juice Foundation Inc. together initiated the Safe Water Enterprise (SWE) Project in Kenya in 2012/13
- The SkyJuice Foundation's **filter technology is well-suited for surface water (rivers, dams etc) and some groundwater (shallow wells and boreholes)**. It can produce up to **10,000 liters of clean water per day** for around 1,000 families.
- The Safe Water Enterprises (SWE) project, locally labeled and known as **Maji Safi kiosks**, were set up to **increase access** to a steady supply of clean drinking water in underserved rural and peri-urban communities with limited infrastructure.

A Mixed Methodology was used in evaluating the impact of the SWE Kiosks to the beneficiaries in the respective local communities

Approach: Five sequential steps were followed in implementing the study from inception to reporting

Activity	Technical and Business Performance Evaluation	Sustainability and Scalability Assessment	Social and Health Impact Analysis	Identifying Lessons Learnt	Identifying Best practices and key success factors
Target Respondent	• Kiosk management; • Kiosk Operators	• Key Informants; • Kiosk management and operators, • Households	• Households; • Businesses; • Water Vendors; • Key Informants	• Kiosk management; • Kiosk operators; • Partners; and • Siemens Stiftung Team	• Kiosk management; • Key Informants
Data Collection Method	• Key Informant Interviews (KIIs) – (n=**27**)	• Vendors Interviews – (n=**27**)	• Households' Interviews - (n=**512**)	• Business Interviews - (n=**57**)	• Observations – (n=**6**)
Data Collection Tool	• KII Guides	• HHs Questionnaire	• Business Questionnaire	• Vendors Questionnaire	• Observation Checklist

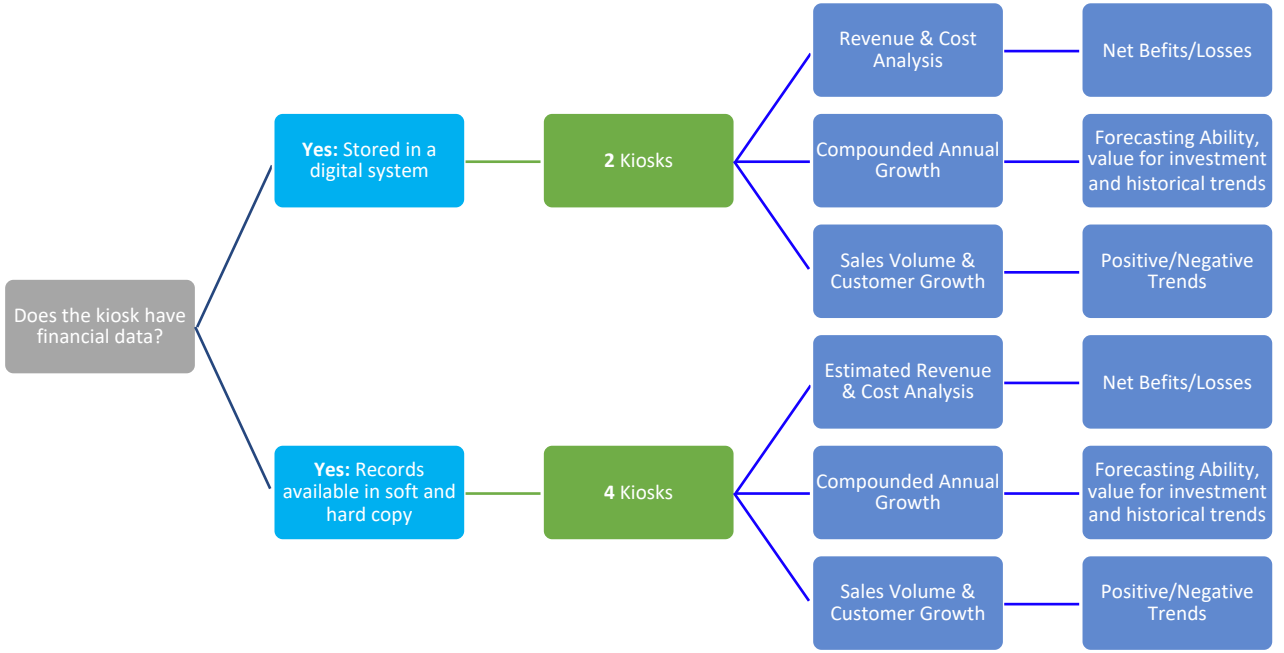
Design: The study employed a **Randomized Control Trial (RCT) study design**. An equal number of households were targeted from both the **experimental group and the control group**



Both operating and non-operating revenue was established through interviewing the kiosk owners and operators

Indicator	Score	Performance	Points Allocated
Frequency of maintenance of water filtration unit	Daily	Good	2
	Weekly	Moderate	1
	Monthly	Poor	0
Water Quality	-	Good	4
	-	Moderate	2
	-	Poor	0
Reliability of water source	Highly reliable	Highly reliable	4
	Reliable	Reliable	2
	Unreliable	Unreliable	0
Alternative water source	Alternative source	Yes	2
	Alternative source	No	1
Hours of supply	>12 hours	Good	2
	7-12 hours	Moderate	1
	<7 hours	Poor	0
Accessibility of the Source	<30 minutes for a round trip to collect water	Good	4
	=30 minutes for a round trip to collect water	Moderate	2
	>30 minutes for a round trip to collect water	Poor	1
Non-Revenue Water (%)	Below 20%	Good	2
	20%	Moderate	1
	Above 20%	Poor	0
Total Maximum points- 20	**High Technical Viability: Scores 14-20**		
Total Medium Score- 13	**Moderate Technical Viability: Scores 7-13**		
Total Minimum Score - 6	**Low Technical Viability: Scores 1-6**		

- **Financial Analysis Approach**: A **positive or surplus financial benefit** meant that the water kiosk was generating revenues that were sufficient to cover the operation and maintenance expenses



The sustainability indicators informed the scalability in three ways; the financial standing of the kiosks, customer growth trends, and the social standing of the kiosks based on customer perception

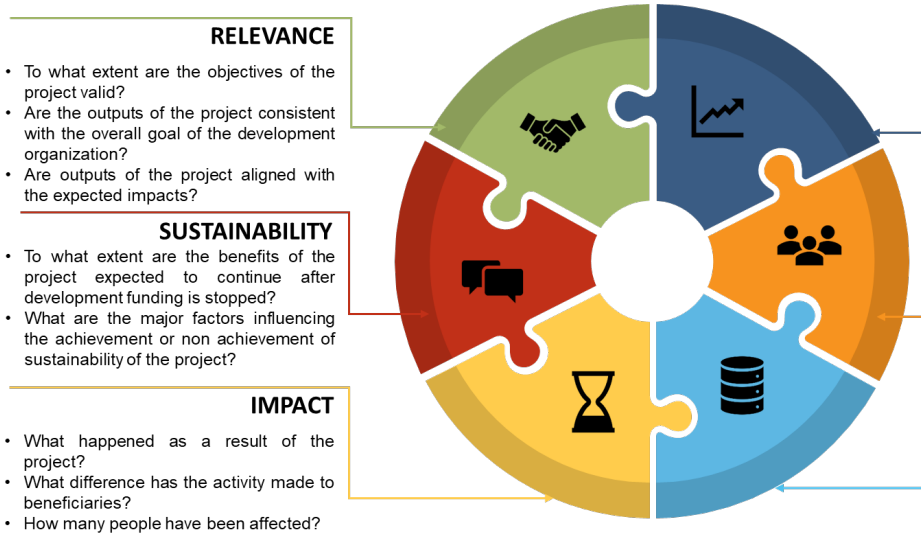
Sustainability Dimensions

Financial Sustainability
- Customer growth trends
- Sales/Revenue trends
- Sources of revenue

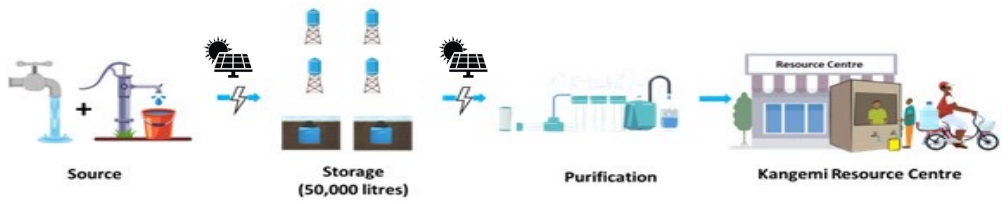
Social Sustainability
- Customer perception
- Businesses and Vendors perspective on the kiosk

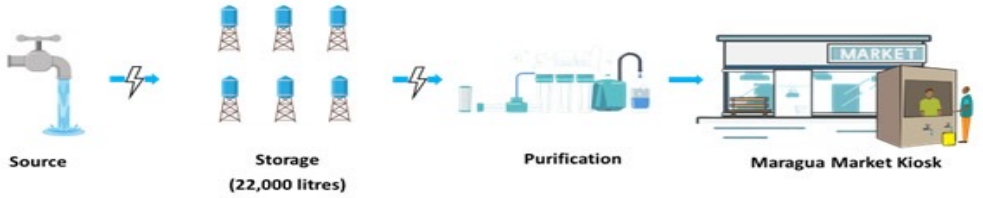
Environmental & Technical Sustainability
- Type of water source
- Quality of water
- Kiosk infrastructure and maintenance

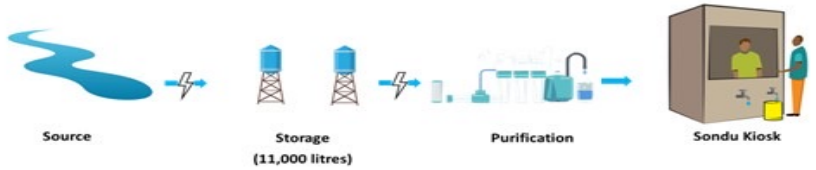
Evaluation Criteria: The OECD criteria for monitoring and evaluation was employed in evaluating the overall project performance. This entailed an assessment of the results achieved relative to the set targets in the project TOC log frame.

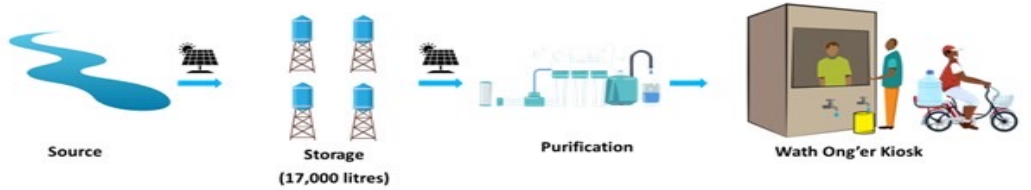


The six SWE kiosks under assessment are located within a community set up across the five counties.



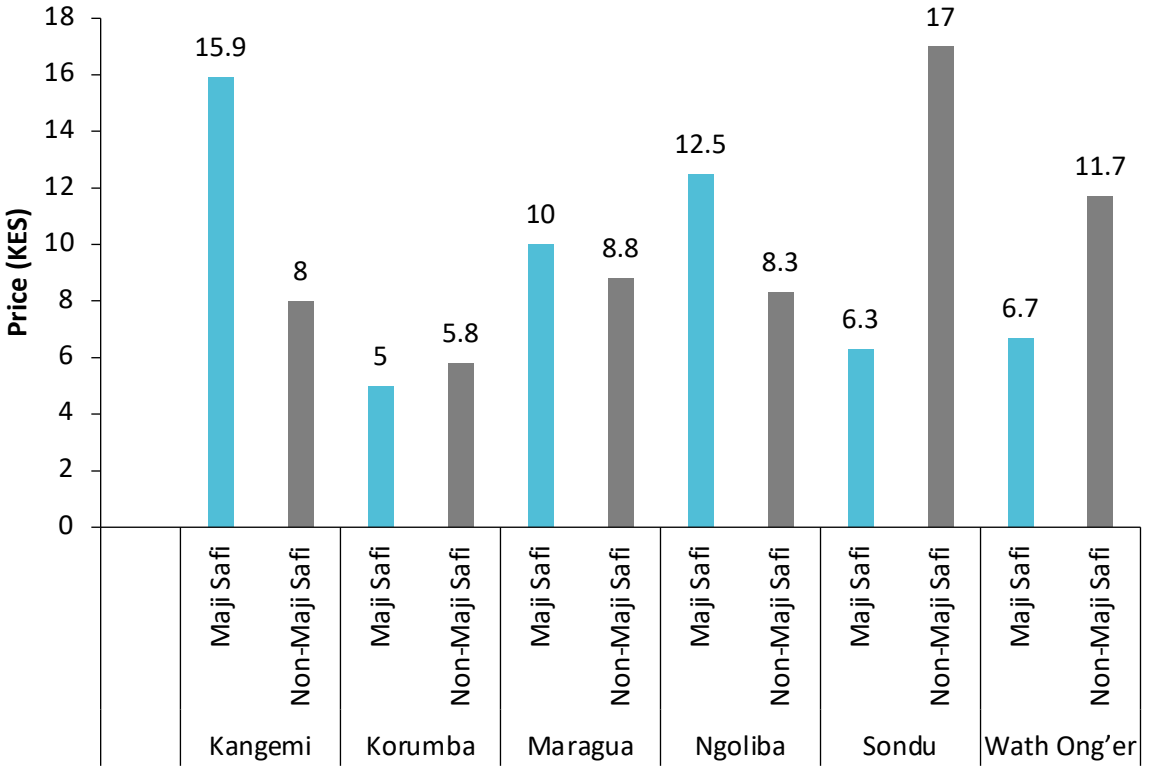




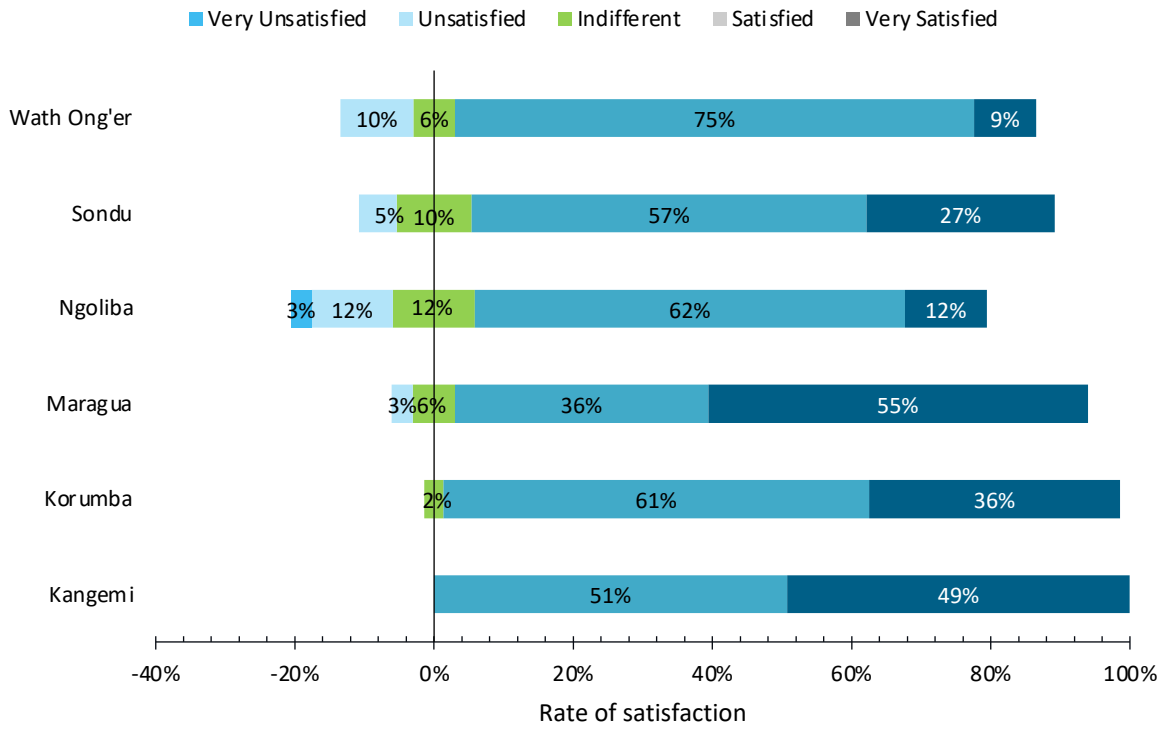


Households in Kangemi incur the highest average price per 20-liter jerrican at KES 15.9, followed by Ngoliba at KES 12.5. Despite the high price in Kangemi, 64.6% of Maji Safi households are satisfied with it

Average Price per 20-litre Jerrican at the Household level



Maji Safi Households Satisfaction with Amount of Water Received



It is evident that the establishment of another Maji Safi kiosk in each location, excluding Kangemi, is a top priority among the Maji Safi respondents

Kiosk-Specific Interventions to Improve their Technical Viability

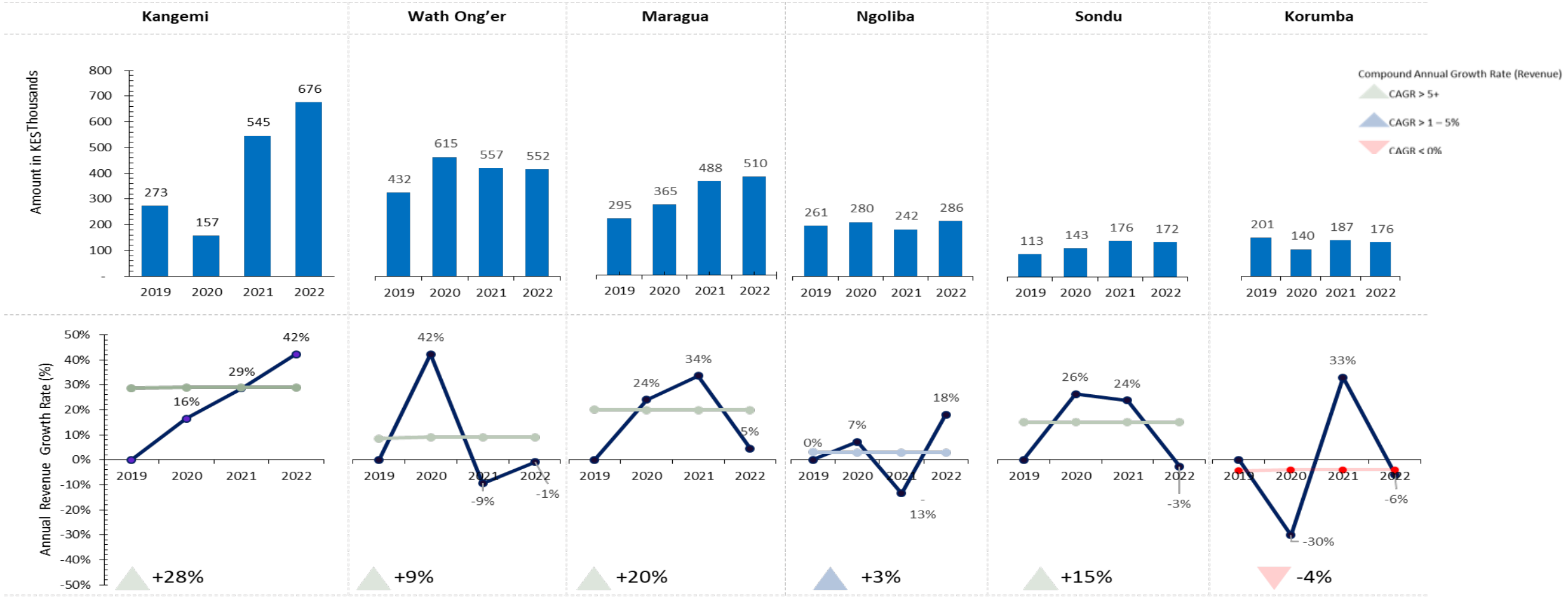
Kiosk	Establishing Additional Kiosk(s)	Addressing causes of NRW	Regular Water Testing and Record Keeping of Results	Improving Time Taken to Restore Water Services	Establishment of Transportation Value Chain
Kangemi					
Maragua					
Wath Ong'er					
Korumba					
Ngoliba					
Sondu					

Technical Viability Rating for the Maji Safi Kiosks

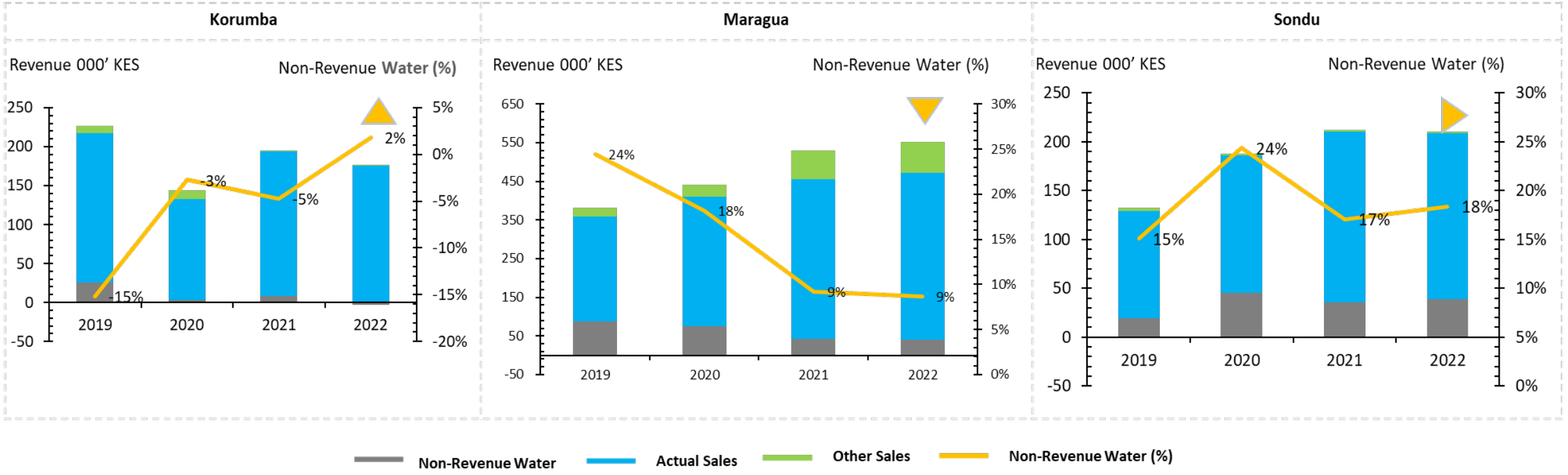
- The indicators with higher weighting include **water quality, reliability, and accessibility.**
- **Except for Korumba and Ngoliba** that are moderately viable, all the water kiosks are high technical viability

Kiosk	Frequency of maintenance	Water quality	Reliability	Alternative water sources	Hours of supply	Accessibility	Non-Revenue Water (%)	Overall rating
Kangemi	2	4	3	2	2	3	2	**17**
Maragua	2	4	3	1	1	1	2	**14**
Wath Ong'er	2	3	3	1	3	1	2	**15**
Korumba	2	3	3	1	1	1	2	**13**
Ngoliba	2	3	3	1	2	1	1	**13**
Sondu	2	3	3	1	2	1	2	**14**

Over 3 years, most of the SWE kiosks showed revenue growth, regardless of the setting with Kangemi and Maragua recording a compounded annual growth rate of 28% and 20% respectively

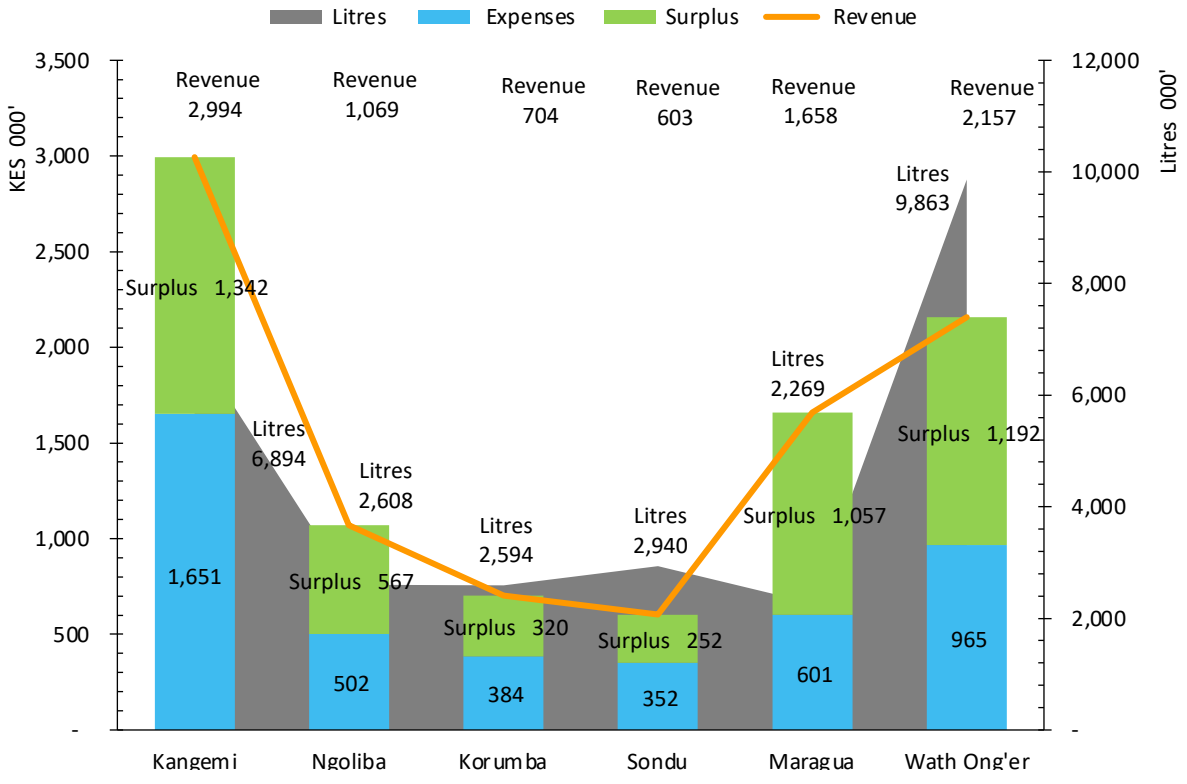


Where a differentiated pricing mechanism is not employed, both reducing non-revenue water and the right alternative source of revenue will critically grow revenues

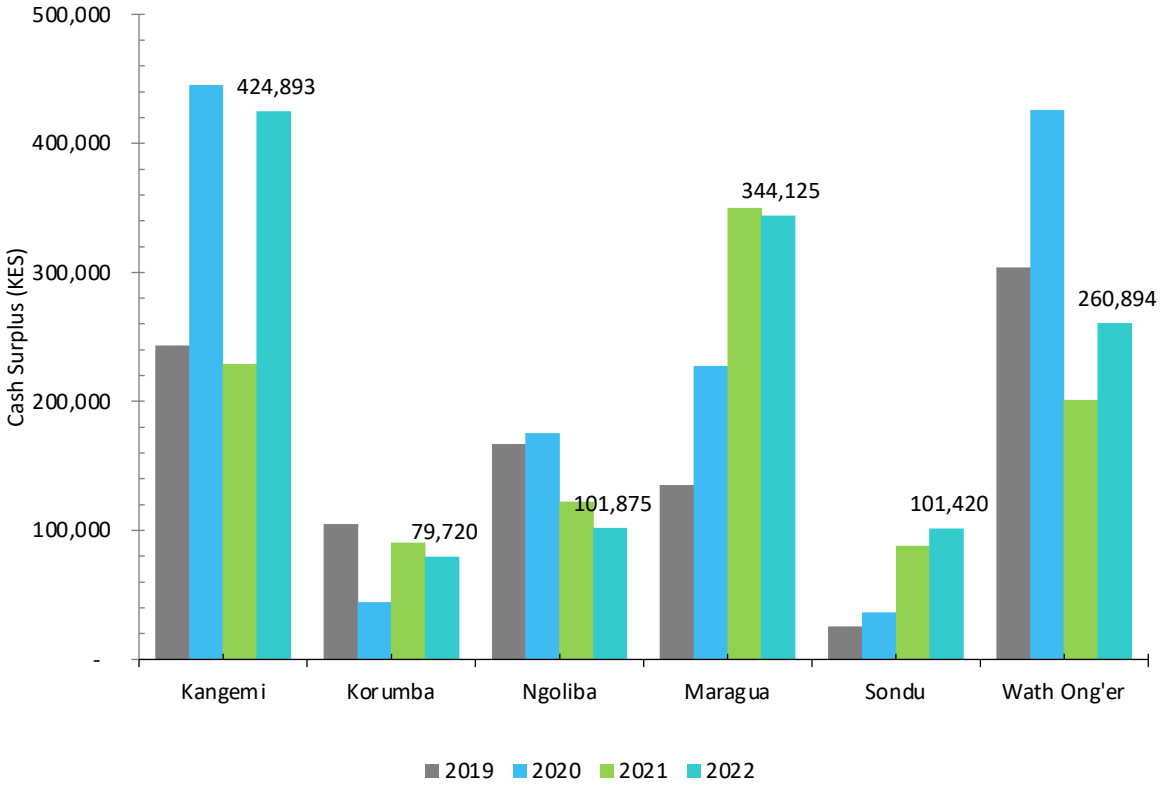


Regardless of the setting, cumulatively each of the kiosks posted a positive net cash balance when revenues and expenses are compared

Comparison of Revenue, Expenses, and Net Balance across the SWE models

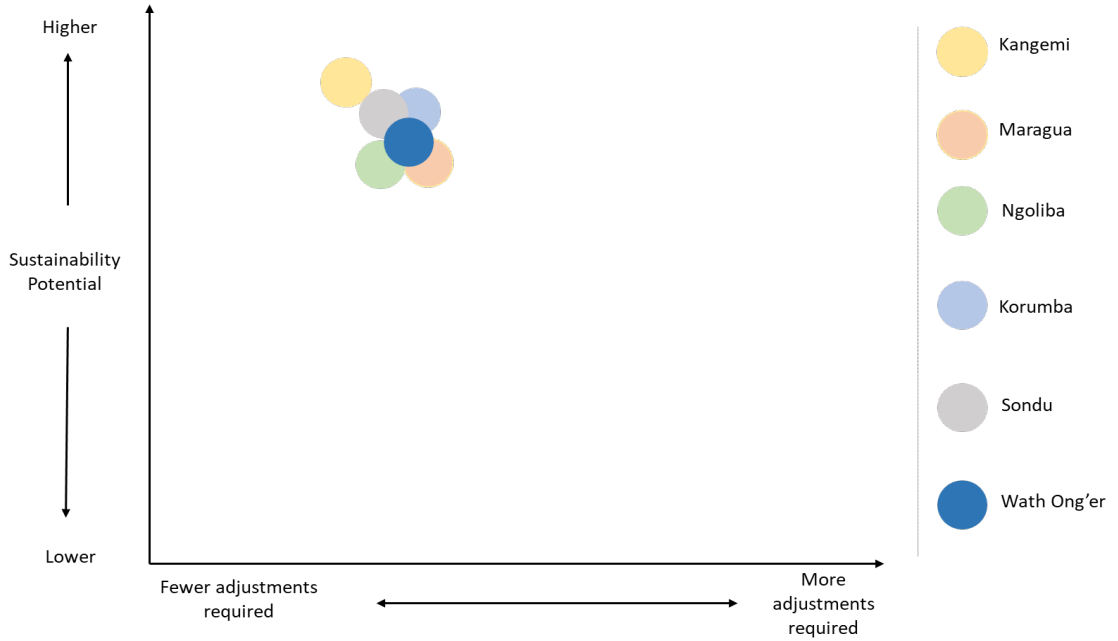


Year-on-Year Cash Surplus per Kiosk



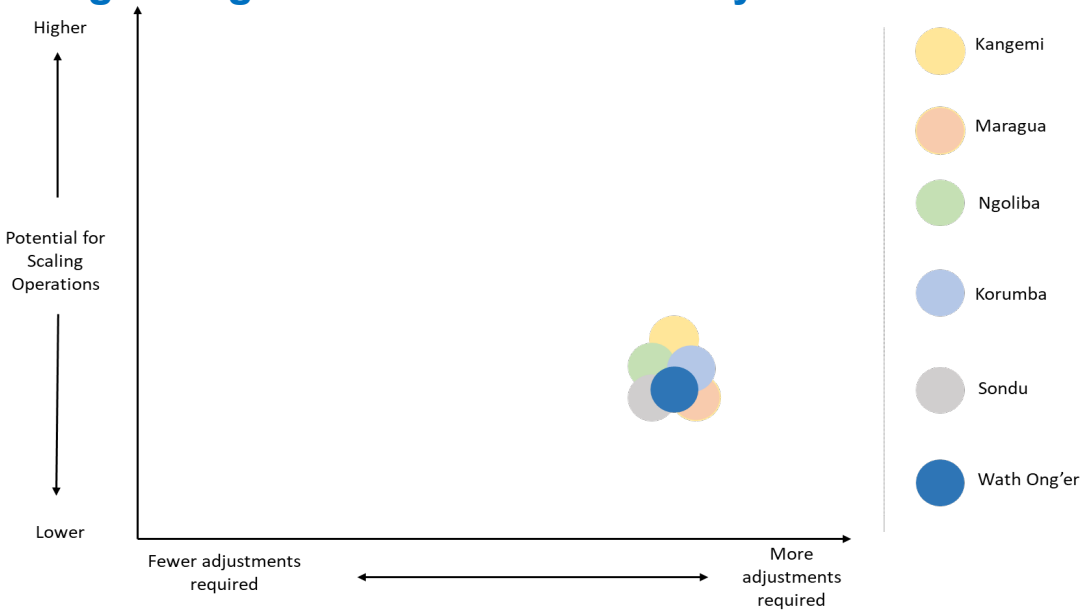
While the SWE kiosks are sustainable, none can scale in their current state

The sustainability potential of the kiosks are was determined by their technical and financial performances



- All the water kiosks are technically, financially and environmentally sustainable and would need minor operational adjustments to remain sustainable in the long run

Scalability involves the capacity to expand or adapt the water kiosk infrastructure, services, and resources to meet the growing needs of the community it serves

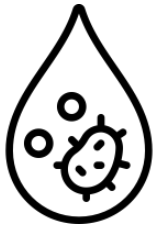


- None of the kiosks, in their current state, can scale their operations without external support

The Maji Safi Kiosks have reduced disparities in access to clean water

The majority of Maji Safi users experienced minimal wait times, with an average wait of **5 minutes or less**.

The existence of the Maji Safi kiosks have led to the rise in business establishment especially **water vending.** This promotes social and economic wellbeing



Across six sites, users report a reduction in waterborne diseases, with **over 90%** of respondents rating the water as clean and safe

Improved hygiene and sanitation standards is reported across the six sites with Maragua and Sondu kiosks having latrine that serves the local community

The SWE project appears to be points to a very impactful project, albeit with some lessons that could be picked for future projects.

Improved Quality Water Access

- *"…I no longer have to worry about treating or boiling drinking water, Maji Safi has been of great help"* **Reports a a Maji Safi User in Ngoliba**

Entrepreneurial Mind-set and Income Generation Opportunities

- "*…from the water vending business, I have been able to take my son through high school and now enrolled for college studies*" – **reports Mary (a water vendor at Wath Ong'er)**

Shorter Waiting time and Distances

- **"..***my kids now have more time to play and finish their homework, as I attend to other household chores***" – Reports a household from Sondu Kiosk.**

Reduced Waterborne Diseases and Improved Hygiene

- An interview with a health officer at Wath Ong'er indicated that there were **reduced cases of diarrhea and cholera** in the community thanks to the Maji Safi Kiosk.

The SWE project was an impactful project, albeit with some lessons that could be picked for future projects.

Efficient Water Provision requires Reliable Technology

- The SkyJuice Foundation's filter technology is well-suited for **surface water (*rivers, dams etc*) and some groundwater (*shallow wells and boreholes*)**. It can produce up to 10,000 liters of clean water per day for around 1,000 families.

Revenues generated from the Kiosk may only ensure sustainability but not scalability of the kiosks

- **"***…we are looking to set up satellite kiosks in Nyakweri and Osiri, but this would require us to seek financial assistance as our current revenues are inadequate to support this initiative***" – reports an informant from Wath Ong'er – Migori county**

Adequate and Continued Stakeholder Engagement is Instrumental for The Decentralized Systems

- Different actors were engaged for different purposes; the Public Health Officers (PHOs) and Community Health Volunteers (CHVs) were engaged at the county level alongside KWAHO and SWAP Kenya to assist in capacity building and awareness creation

Ultimately, the kiosks can only project what they can track

- The classification of revenues, and recording keeping still require guidance/ training/capacity building. As the majority of the kiosks would require financial assistance to be able to scale up, clear records would be necessary to access credit.

The SWE kiosks have increased access to clean and safe drinking water for the respective communities in the six sites under assessment

Relevance

- The water access gap in rural and underserved communities requires urgent and immediate attention.
- We find that the project outputs aligned to the expected outcomes with businesses attributing part of their growth to the existence o the kiosk

Coherence

- Consultant finds the SWE project consistent with other Siemens Stiftung interventions
- Across Africa and globally, Siemens Stiftung projects aim to enhance the livelihood projects of various communities
- The provision of safe water is one aspect of enhancing livelihoods

Sustainability

- The customers are satisfied with access to clean and safe water and the health benefits that come with it
- That, notwithstanding, consultant finds that the kiosks would need to put more effort into ensuring these benefits are enjoyed post-handover

Effectiveness

- Based on the study findings, consultant finds that the objectives have been achieved but not fully as there as factors that still limit achievement of the objectives
- The kiosk operators would still need additional training record-keeping

Impact

- More customers continue to demand clean water
- At least 50% of the consumers have reported general satisfaction with the kiosks and service provision
- The kiosk has facilitated the growth of businesses and water vendors who can earn a living from the distribution and selling of water

Efficiency

- The sky-juice foundation's filter technology is well-suited for surface water (rivers, dams, etc.) and some groundwater (shallow wells and boreholes). It can produce up to 10,000 liters of clean water per day for around 1,000 families
- Partnerships with local CBOS, counties, NGOS and implementing partners like KWAHO and SWAP Kenya made the awareness creation and training cost-effective

While there is immense potential for the kiosks, their sustainability, and scalability would depend on their technical and fiscal management

Training and Capacity Building

- There is a greater need to capacity build the kiosk management and operators on fiscal management and maintenance practices

Rationalization of the tariffs

- There is a disparity in water tariffs across the six kiosks and with the growing number of alternatives especially for kiosks in the peri-urban areas, there is a threat of decreased customer growth.

Partnership and collective action

- For the kiosks to be scalable, there is a need for the local administrations especially the county government to support the community-based social enterprise models.

Adoption of a guaranteed service model to cover the operation and maintenance (O&M) needs

- A guaranteed service model like that previously employed by Fundifix in which the entity is granted a portion of the operating costs to cover infrastructural maintenance based on annual contractual agreements would be useful in addressing the O&M challenges.

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