Joint Annual Operations Monitoring Report 2018

HARAMBEE

WaterFund
Financing the Water Sector

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EXECUTIVE SUMMARY

The Water Sector Trust Fund (WSTF) has developed an operations monitoring framework for assessing the functionality, performance and sustainability of all its investments. The investments in water, sanitation and water resources management are towards fulfilling the mandate of the Fund in providing conditional and unconditional grants to counties and assist in financing in development and management of water services in marginalised or underserved areas as established in Water Act. 2016.

With increased demand for clean and safe water, basic sanitation and pressure from negative effects of climate change on water resources, the Fund is emphasizing the need to ensure sustainability of its investments so as to increase access to both water and sanitation services as well as mitigate against the negative effects of climate changes. In order to determine the sustainability of the investments, the Fund conducts a Joint Annual Operations Monitoring Exercise (JAOME) with the objectives of: Establishing operational status of investments, Addressing utility implementation and management issues, Updating the WSTF GIS databases, Assessing outcomes and impact of Investments over time and Following through and closing outstanding questioned costs in WSTF supported projects resulting from Technical and Financial Audits.

JAOME enabled for data collection on sampled WSTF-funded investments annually covering implemented projects during the previous five years (2013-2018). The data was analysed to determine the sustainability index (SI) of investments and it comprises of four indicators: (1) Operational status; (2) Revenue collection; (3) Age and success rate, and; (4) Condition of facility.

By establishing the operational status of the WSTF-funded infrastructure, the JAOME supports long term planning and robust monitoring through identifying supply and service gaps, highlighting underserved areas and ensuring better controls for future funding based on performance. It also supports learning lessons on what kind of investments work and why, thereby informing future investment planning and priorities. Finally it allows key stakeholders to monitor coverage and access, ensuring accountability for the past investments.

The JAOME 2018 sample targeted to monitor 490 projects out of 794 funded projects within the 5-year period which represents 62% of the total projects. The field exercise covered 451 sampled projects representing 92% of targeted number. However, the key challenges of insecurity, vastness of project areas, team formations and time allocation per project impeded the reaching of some projects. The 451 projects covered 2,413 investments (i.e. individual project components), out of which 26 were under Results Based Financing (RBF), 1,011 under the Urban Investment Programme (UIP), 937 under Rural Investment Programme (RIP) and 439 under Water Resources Investments (WRI). The sampled projects under urban and results based financing investments were 100% covered with challenges majorly experienced in Water Resources and Rural Investments.

The geo-referenced data on the investments was collected by WSTF Staff and County Resident Monitors (CRMs) using a mobile application WaSHMIS , analysed and published on a dashboard including geo-referenced maps and graphics on key parameters. In order to enhance transparency, accountability and sustainability, the information is made publically available by embedding the dashboard in the WSTF website.

The overall SI for JAOME 2018 sampled projects was 50% which was evaluated based on the weights assigned to the four indicators. The weights per metric indicator was assigned as follows:(1) Operational status (25%); (2) Revenue collection (50%); (3) Age and success rate (15%), and; (4) Condition of facility (10%). Across all investments windows, the analysed results indicated that 74% of the projects were operational at the time of the visit. Revenue was being generated by 31% of the sampled projects, 71% were still operational after two years whereas 57% were in good condition and functional.

The SI per investment was on these weights show that under rural investments window the projects achieved SI of 52%, with water supply SI at 51% and sanitation SI at 61% respectively. The urban investments SI of 70% for combined for both water (68%) and sanitation projects (85%) whereas water resources investments scored 33%. The high SI of Urban investments is largely related to revenue collection, which is higher for urban investments compared to rural and water resources investments.

However, the exercise had limitations and this affected the targeted sampled projects and investments reached. A key challenge was insecurity especially in the far flung areas of Arid and Semi-Arid Areas where there existed threats of attack in the Counties of Garissa, Wajir, Mandera and Lamu. The other challenge was the time allocation to clusters which led to some sampled projects and investments being left out of the itinerary owing to limitation of time. In addition, there were challenges of preloaded project data briefs on the WaSHMIS tool being inconsistent with WSTF funded investments especially whereby there were other add-on funded investments to the project by other partners.

As a lesson learnt going forward, the team formations for JAOME should be balanced between technical staff and supporting staff so as to enhance coordination in the exercise. There should be desk reconnaissance survey report by the CRMs to inform the planning for the JAOME. In addition, the exclusion of projects and investments that did not show any progress in terms of issues raised in previous JAOME visits was crucial in saving time and cost as well increasing the confidence level of the analysis.

The JAOME 2018 had a key recommendation that the Fund should reconsider the intention of investment in Rainwater Harvesting Tanks in ASALs as 67% and 70% were found to be non-operational based on the results of JAOME 2017 and JAOME 2018 respectively. The highest contributor to non-operational ability of investments was inadequate/lack of water source at 37%, therefore it is recommended that future investments follow the integrated approach whereby water sources are assured before commencement of distribution systems.

Through JAOME, some audit issues in various projects were being addressed and audit follow-ups should be entrenched as an objective of the JAOME exercise as it has recorded progress in reducing the number of projects with outstanding audit queries. With the operationalization of the geo-referenced interactive projects dashboard, the presentation of the analysis is recommended to be in synch with the dashboard. Further, it is recommended that the technical working group be appointed for planning of the JAOME to enhance better coordination of the exercise.

ISMAIL F. M. SHAIYE

Chief Executive Officer

Water Sector Trust Fund

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LIST OF ABBREVIATIONS AND ACRONYMS

ASAL	Arid and Semi-Arid Lands
CBO	Community Based Organisation
CFA	Community Forest Association
CPC	Community Project Cycle
CRM	County Resident Monitor
CSI	County Sustainability Index
DERP	Drought Emergency Response Programme
DP	Development Partner
DTF	Decentralized Treatment Facility
GESI	Gender Equality and Social Inclusion
IFAD	International Fund for Agricultural Development
J6P	Joint 6 Programme
JAOME	Joint Annual Operations Monitoring Exercise
KWSP	Kenya Water and Sanitation Programme
MHM	Menstrual Hygiene Management
MIS	Management Information System
MTAP	Medium-Term Arid and Semi-Arid (ASAL) Programme
MWS	Ministry of Water and Sanitation
NRW	Non-Revenue Water
OBA	Output Based Aid
PSF	Public Sanitation Facility
RBF	Results Based Financing
RIP	Rural Investment Programme
RWH	Rainwater Harvesting
SI	Sustainability Index
UBSUP	Upscaling Basic Sanitation for the Urban Poor
SIP	Systems Integration Project
UIP	Urban Investment Programme
UPC	Urban Projects Concept
VIP	Ventilated Improved Pit-latrine
WASH	Water, Sanitation and Hygiene
WASREB	Water and Sanitation Regulatory Board
WaSHMIS	Water and Sanitation Hygiene Management Information System
WRI	Water Resources Investments
WRUA	Water Resource Users Association
WSP	Water Service Provider
WSTF	Water Sector Trust Fund
WU	Water Utility

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BACKGROUND

1.1 Introduction

The Ministry of Water & Sanitation and Irrigation (MWSI), Water Sector Trust Fund (WSTF) and Development Partners (DPs) are increasingly emphasizing the need to ensure sustainability of investments in the water sector. In response, the Fund conducted a comprehensive and intense Joint Annual Operations Monitoring Exercise (JAOME) in late January and early February, 2019 to assess the functionality and performance of WSTF-funded infrastructure implemented and investments made since 2013. The purpose of the joint monitoring exercise was to assess the present condition of investments commissioned in the last 5 years. It was expected that 95% of all infrastructure would still be fully operational and in good technical and operational condition by the end of 5 years.

The JAOME 2018 entailed the collection of geo-referenced data and photographic images of investments funded during 2013-2018 using WSTF commissioned GIS applications. Seven (7) clusters comprising of the County Resident Monitors (CRMs) and WSTF programme staff carried out this nation-wide data collection exercise over a two weeks period. The enumerators received orientation training so as to prepare them for the exercise. The training mainly focused on the use of field data collection applications, their scope and limitations; logistical arrangements and schedules as well as on security issues.

The JAOME 2018 was the third time the operations monitoring was being conducted. Operations monitoring has been previously conducted in 2016 and 2017. During JAOME 2018, 490 projects were sampled covering 62% of all projects funded during the review period. The sample was designed to be representative in terms of the age of the investments, the different investment programmes as well as the counties. The sample was designed so that 100% of 1-year old and 5-year old projects are visited, and that each project is visited three times during the assessment period of 5 years. In addition, JAOME 2018 methodology was revised such that projects sampled using the criteria prescribed and visited twice with the same unresolved issues were dropped to focus on the objectivity of the exercise.

The data collected during the exercise provided up-to-date findings for informing the implementing agents on the operational challenges in order to formulate mechanisms for addressing such issues and for the Fund to continuously improve its systems. The joint operations monitoring is a key pillar in streamlining and harmonizing strategies that the Fund is currently implementing and its actualization is expected to inform future decision making in the funding of investments. The results of the exercise are to be made publicly available on a geo-referenced database embedded on a web platform to enhance transparency, accountability and encourage sustainability.

1.2 Rationale for the Joint Annual Operations Monitoring Exercise

The JAOME is a unique approach in which the sustainability of the projects is determined using weighted indicators to derive their sustainability index. These indicators are: revenue collection, functionality, operation status and longevity of the projects. Public and private entities continually mobilize resources for investment in the water sectors and after the implementation of the projects is completed, it is imperative to determine whether the outputs and outcomes of the project intervention are being realized post project implementation.

In order to objectively determine the results of the inputs into the projects, the Fund uses JAOME to determine the key outputs and outcomes resulting from the projects interventions under its four investment programmes of rural, urban, water resources and Results Based Financing (RBF). The results of the exercise is critical in decision support for the Fund as it's a yard stick against which investment performance is measured. Further, the Fund through JAOME addresses some of the outstanding technical and financial audits arising from the implementation of its projects and investments thus ensuring transparency, equity and accountability to stakeholders.

1.3 Objectives of the Joint Annual Operations Monitoring

The main objectives of the operations monitoring exercise are to;

(1) Establish the percentage of the WSTF-funded infrastructure which is operational ("as working") and to compare it with the initial project scope ("as planned") and the infrastructure ("as built").

(2) Enable the Fund to present detailed, reliable and complete geo-referenced data on the operational status of all funded infrastructure. This information is visualized on online platforms and accessible for all stakeholders.

(3) Develop and implement remedial measures and, if deemed necessary, to prevent poor performing utilities from having their proposals funded (focusing on sustainability of past investments).

(4) Prepare the Fund for the evaluation ("as used") and assess the outcomes and impacts of investments over time.

2 STUDY METHODOLOGY

2.1 Consultations and initial planning

A work plan was initially created in the 2nd week of May 2018 for the undertaking of the JAOME 2018 exercise. The tentative work plan was utilized to schedule and arrange the initial planning meeting to discuss the actual road map, sampling framework, training of enumerators and field logistics. An outline for the report was also prepared in the initial planning stage to ensure that the team would take every step necessary as per the reporting requirements.

The objective of the JAOME exercise is to assess the sustainability, functionality, operations and performance of the funded projects, infrastructure and schemes. During the planning of the 2018 JAOME exercise the M&E in coordination with the Investments & Programmes deliberated on the previously identified implementation challenges. It was necessary to have a clear understanding so as to decide whether the projects with known challenges were to be revisited and what action steps or recommendations were to be given.

In order to successfully carry out the exercise, consultative meetings were held so as to determine the timeframes for the JAOME 2018 exercise as well as the budget of the exercise and how to secure the required amount of funds. Once a budget was allocated, the team could then prepare to proceed to the field.

2.2 Preparation of Data Collection Tools and Instruments

The data collection tools that were used in the previous year were simple and understandable to the enumerators. The main preparation was the finalization of the JAOME 2018 project list for preloading the project scopes and constituencies on the forms to be filled in the app. There were also a few comments and suggestions for improvement of the tools. After reviewing the tools, an updated version of the general form and investment monitoring form were uploaded on the system.

The general form includes questions on governance, financial management and project beneficiaries of the project and the investment form contained 3 investment categories namely; water supply, sanitation and water resources (Annex 1). The investment form has specific questions on the completion status, condition, maintenance, operational status and operations responsibility of each investment; revenue collection, no. of beneficiaries, service reliability, and specific questions on Gender Equality and Social Inclusion (GESI). The data structure for the investment types in the investment form is presented in Annex 2.

In addition, a nationwide map of the previous data collection exercises was prepared and shared in KML format that could be opened on any device that has a Google Earth application. The map was an additional tool that guided and assisted enumerators in identifying projects and direction as well as in planning of ground logistics.

The team planned to have a finalised online JAOME dashboard as an instrument to easily visualise and analyse the JAOME data. However, only the demo version of the dashboard was available as the dashboard is currently still in the development phase.

2.3 Re-Fresher Training on the JAOME exercise

The re-fresher training involved a group discussion lead by the Manager, Planning, Research, Monitoring and Evaluation and the Technical Advisors. The main purpose of the training was orientation of the team comprising of WSTF programme officers, programme assistants and interns involved in the field data collection. Since all the enumerators had participated in the previous year's JAOME exercise, the training was shortened and was carried out in one day as annexed. (Annex 4).

All the enumerators were reminded that they would require to have the WashMIS app installed in their phones or Tablets because the data was collected using an android application.

After the briefing every team was given the opportunity to discuss their detailed field plans and ground logistics that would be most suitable to cover the assigned work in the time that was available.

2.4 Field Survey and Organization of the Field Survey/ Data Collection

The organization of the field survey entailed the formation of a team based on roles and responsibilities that were agreed upon as follows: -

1. Manager, Planning, Research, Monitoring and Evaluation
    - Responsible for overall coordination of the joint operations monitoring exercise
    - Responsible for final budget and plans
    - Final authorizations and official communications to partners.
2. JAOME 2018 Planning Committee
    - Projects sampling
    - Review and updating data collection tools
    - Formulation of field plans and budget
    - Conducting orientation training for field staff
    - Planning for field logistics
    - Post field review and reporting.
3. Technical Advisors
    - Technical advice and backstopping at all levels; planning, field data collection, analysis and reporting
    - Support Training of field teams
    - Supporting data analysis and final reporting.
4. Cluster Team Leaders
    - Coordination of field data collection within the allocated cluster(s)
    - Directly responsible for data quality, completeness and transmission
    - Responsible for field operations including transport coordination, work ticket authorization, team security and communication
    - Responsible for data cleaning prior to analysis
    - Ensuring timeliness and adherence to field schedules
    - Simultaneous formulation of issue logs during data collection
    - Conducting orientation training for CRMs
    - Cluster specific reporting.
5. Field Officers
    - Participating in formulation of field schedules
    - Data collection and team performance valuation
    - Responsible for provided field equipment
    - Assisting in data cleaning.
6. County Resident Monitors (CRMs)
    - Liaison and advance communication with projects prior to visits
    - Identification of investments within the cluster
    - Participating in formulation of field schedules

- Data collection and team performance valuation
- Security assessments and advice prior to field visits.

2.4.1 Sampling

All programmes funded by WSTF, including urban and Output Based Aid (OBA), were part of the JAOME 2018 sampling frame. The sampling frame which was first employed in JAOME 2017 and was designed as follows: All projects are monitored when they reached their five-year completion anniversary (sample size of 100%). Also all newly completed projects are monitored within their first year of operation. The 2nd, 3rd, and 4th year-projects are sampled so that each year 33 percent of the projects were visited. The 33% rotates so that all of the projects are visited once within the three years.

Using the sampling criteria shown on the table below, a total of 490 projects were sampled including 139 new projects completed in 2017/18. The rest were completed during 2013-2017, and have also been visited in the previous JAOME monitoring. The sample also included projects that were in the sample of JAOME 2017, but were not visited and therefore were carried over to JAOME 2018.

Table 1. Sampling Frame for JAOME 2018.

			Sampled projects (including carry-overs) per investment window				Total sampled	Sampling criteria	
Year	Completion dates	Total projects	Rural	Water Resources	Urban	RBF		Sample size	%
1st year	30th June 2017 – 30th June 2018	144	76	41	22	0	139	All	1.0
2nd year	30th June 2016 – 30th June 2017	169	47	19	15	2	83	Sample	0.3
3rd year	30th June 2015 - 30th June 2016	61	6	6	9	1	22	Sample	0.3
4th year	30th June 2014- 30th June 2015	357	125	1	17	0	143	Sample	0.3
5th year	30th June 2013- 30th June 2014	103	48	4	51	0	103	All	1.0
TOTAL		834	302	71	114	3	490		

Projects monitored

The JAOME 2018 targeted to monitor 490 projects, out of which 451 were reached (92% of targeted number). Factors such as weather, security or difficulty to access impeded the reaching of some projects. The rural and water resources investments were 1,376 representing 57% of the total investments reached during the monitoring exercise.

Sampling of investments

Under each project, there are a number of project components, i.e. investments. For some investments types, the number of funded investments included such a large number that it was not practical to visit all of them. These were:

- Individual connections
- Institutional connections
- Industrial connections
- Consumer meters
- UBSUP – household toilets

It was thus agreed that for connections and consumer meters, the team would sample 10 per project, with a target of covering all types of connections. For household toilets, a sample of 3-5 toilet blocks per project was agreed upon.

2.4.2 Field organization and logistics

The field teams were organized into 7 clusters with each cluster allocated a team leader. The cluster were based on proximity of the projects to ease movement of the cluster teams. Logistically, the clusters were allocated a vehicle each and wherever there were challenges, a provision for car hire was facilitated. The reporting structure was such that the team members reported to cluster leader whom then reported to the JAOME coordinator through daily reports. The clusters were as per table 2 below

Table 2. List of Counties in each cluster and number of sampled projects in each County.

Cluster No	County	Sampled projects
1	Lamu	73
2	Nairobi	2
	Kiambu	13
	Kajiado	3
	Machakos	8
	Makueni	8
	Kitui	4
	Taita Taveta	2
	Mombasa	2
	Kwale	11
	Kilifi	4
3	Wajir	24
	Garissa	69
	Tana river	46
4	Isiolo	25
	Marsabit	29
	Samburu	1
	Laikipia	13
5	Meru	11
	Tharaka N.	22
	Embu	9
	Kirinyaga	12
	Nyeri	11
	Muranga	17
6	Kericho	4
	Bomet	3
	Nyamira	1
	Kisii	3
	Homa bay	5
	Migori	11
	Kisumu	2
	Siaya	1
	Bungoma	2
	Kakamega	2
	Vihiga	4
7	West Pokot	1
	Transnzoia	4
	Nandi	11
	E. Marakwet	1
	Baringo	3
	Nakuru	6
	Nyandarua	2
	Narok	3
	Turkana	2

2.5 Data cleaning and screening

The first step of data cleaning and screening was similar to the previous JAOME exercise. All teams were advised to perform data integrity checks prior to submission of data to minimize wrong submission of data. Each team leader had the responsibility of checking the entries of the entire team and clarifying to ensure the inputs were correct.

When the data collection exercise was complete there were 446 records on general project form and 2469 records in the investment monitoring form. The data was exported from the system and a team was formed for the screening and validation of the data. The team agreed on the approach and criteria to be used for the screening of the data and each member was assigned a fixed number of rows in the data sheet. On average each member had a total of 500 records to thoroughly review.

2.6 Data analysis

Prior to the field work an analysis framework was developed in order to clarify the kind of data that was needed and how the data is analysed once it is handed to M&E. The analysis framework mainly focuses on the sustainability of investments and a major part of the analysis was geared towards the ranking of counties based on their Sustainability Index score.

2.6.1 Sustainability Index

The sustainability index (SI) was developed as a key performance metric to facilitate assessment and monitoring of sustainability of investments in the Counties. It is a statistical measure describing the sustainability of investments for each County. For the purposes of the assessment of outcomes and outputs of the investments, sustainability was defined as the ability of an investment to realize the objectives within 5 years of operation.

In addition to the County level assessments, the National Level average was assessed and any County with an index of less than 70% of the National Average was red flagged and considered as a High Risk County.

The sustainability Index comprises of four categories- the Functionality and Reliability of an investment, Revenue collection, Age and Survival rate, and the Condition of the investment.

The function is specified as:

SI=f (FR, RC, AS, GC)

Where:

SI is the Sustainability Index

FR is the Functionality of the investment

RC is the Revenue Collection

AS is the Age and Survival (and operational) rate of an investment

GC is whether the investment is in Good Condition (and operational)

The Sustainability Index score is between 0 - 100%, with 100% depicting a high sustainability rate of the investments.

The highest weight (50%) was given to revenue collection with the idea that without revenue collection, the investment does not have long term sustainability. Functionality, i.e. the operational status, is a key attribute to describe the status of the services and is given the weight of 25%. The age and survival rate of the investment is given a weight of 15%. The condition of an investment is given a smaller weight (10%) since the condition is, while important, not essential for the usability and sustainability of the facility.

The Indicators, definition, formula and weight are presented in Table 3.

Table 3. SI indicators, their definitions, formula and weighting used for the calculation of the index.

Indicator	Definition	Formula	Weighting in Index
1. Revenue Collection	Indicates if water charges are collected.	Calculated as a percentage of investments with revenue collection from total number of investments. This is limited to investments that are expected to collect revenue, namely: Distribution systems; intakes; water resources management structures; livelihoods; Public Sanitation Facilities (PSFs), and; Decentralized Treatment Facilities (DTFs).	50%
2. Functionality of the investment	The percentage of investments that are operational.	Percentage of investments that are fully operational from the total number of investments.	25%
3. Age and Survival (operational) rate of an investment	The percentage of investments that are still operational after 2 years since completion.	Percentage of investments that are operational and are over 2 years old out of all the investments of the age over 2 years.	15%
4. Condition of an Investment (that is also operational)	The percentage of operational investments that are also in good condition.	Investments that are in good condition and operational divided by total number of investments.	10%
Total			100%

The other various kinds of analysis undertaken can be found in this report on Chapter 3. Study Findings.

3

STUDY FINDINGS

3.1 Monitored projects and investments

The JAOME 2018 targeted to monitor 490 projects, out of which 451 were reached (92% of targeted number). Factors such as weather, security or difficulty to access impeded the reaching of some projects. The 451 projects covered 2,413 investments (i.e. individual project components), out of which 26 were under Results Based Financing (RBF), 1,011 under the Urban Investment Programme (UIP), 937 under Rural Investment Programme (RIP) and 439 under Water Resources Investments (WRI) (Figure 1).

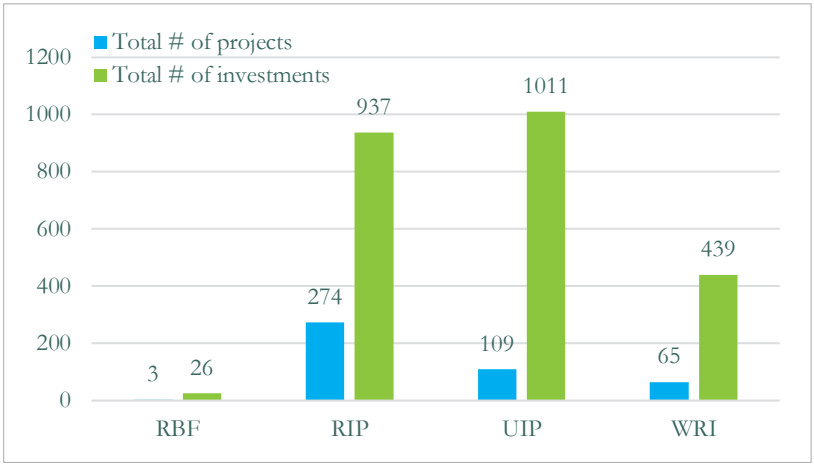


Figure 1. Total number of projects and investments monitored by investment window: RBF (Results Based Financing), RIP (Rural Investment Programme), UIP (Urban Investment Programme), WRI (Water Resources Investments).

The largest number of monitored projects were under the MTAP I Programme with 153 projects covering 324 visited investments, followed by UPC with 89 projects covering 889 visited investments, and J6P with 52 projects covering 479 visited investments (Figure 2).

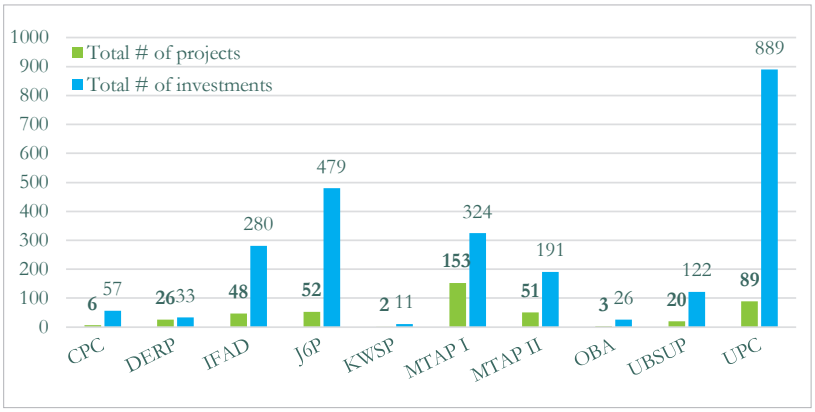


Figure 2. Total number of projects and investments monitored by Programme.

Figure 3 presents the locations of the monitored investments by investment window. Most of the investments under the rural investments (RIP) are located towards the north-eastern and coastal part of the country, whereas the investments under the water resources investments (WRI) are largely located around the Mount Kenya region. The investments under the urban investments (UIP) spread from the coast to the central and western parts of the country. In comparison to JAOME 2016 and 2017 (Figure 4), JAOME 2018 covered more projects in the Mount Kenya region under the water resources investment window. Otherwise the geographical coverage of the monitored investments has been approximately the same each year, since the sample of the projects monitored aims to be representative in terms of the county distribution.

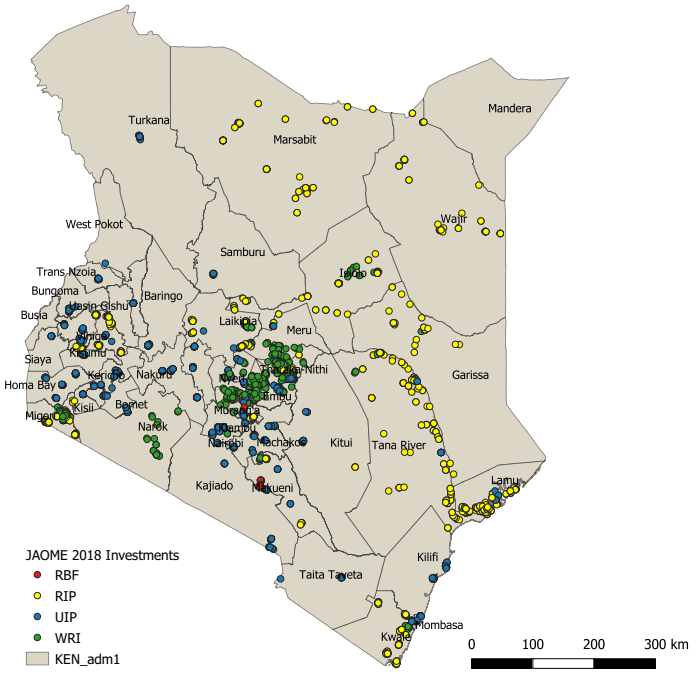


Figure 3. Geo-coordinated locations of the monitored investments of JAOME 2018 by Investment window.

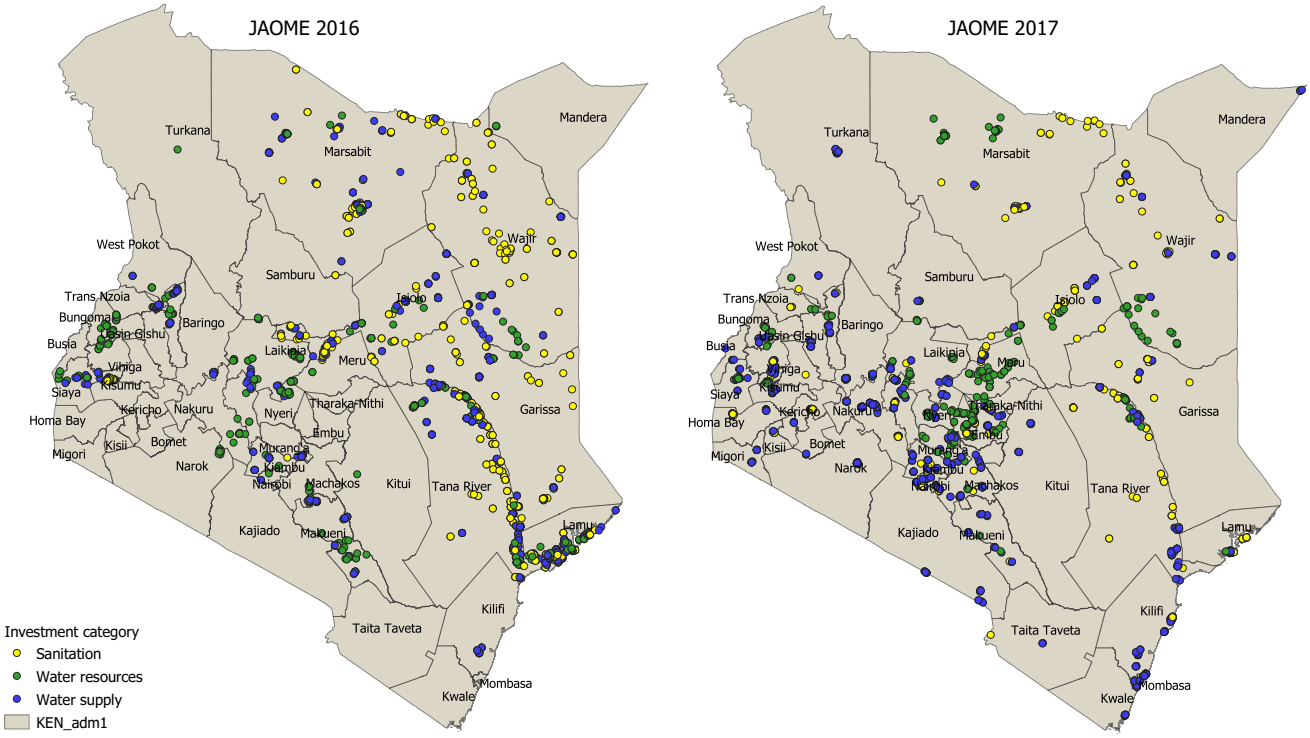


Figure 4. Investments monitored during JAOME 2016 (left) and JAOME 2017 (right) by investment category: Sanitation, Water resources and Water supply.

The total number of counties with monitored projects were 43, with only Busia, Mandera, Nairobi and Uasin Gishu with no monitored projects (Table 4). The largest number of investments were monitored in Lamu county, 163 in total, followed by Migori with 138 investments, Nandi and Kwale with 111 investments and Tharaka Nithi with 109 investments.

Table 4. Number of investments monitored during JAOME 2018.

COUNTY	RBF	RIP	UIP	WRI	TOTAL
BARINGO	0	0	45	0	45
BOMET	0	0	26	0	26
BUNGOMA	0	0	22	0	22
BUSIA	0	0	0	0	0
E. MARAKWET	0	0	23	0	23
EMBU	0	0	31	36	67
GARISSA	0	62	3	20	85
HOMA BAY	0	0	54	0	54
ISIOLO	0	52	10	15	77
KAJIADO	0	0	21	0	21
KAKAMEGA	0	0	29	0	29
KERICHO	0	0	40	0	40
KIAMBU	0	10	88	0	98
KILIFI	0	0	70	0	70
KIRINYAGA	0	0	0	83	83
KISII	0	0	35	0	35
KISUMU	0	0	21	0	21
KITUI	0	0	16	0	16
KWALE	0	98	0	13	111
LAIKIPIA	0	63	16	21	100
LAMU	0	133	7	23	163
MACHAKOS	0	0	59	0	59
MAKUENI	20	20	32	4	76
MANDERA	0	0	0	0	0
MARSABIT	0	87	0	0	87
MERU	0	0	14	46	60
MIGORI	0	106	0	32	138
MOMBASA	0	0	15	0	15
MURANGA	6	7	22	43	78
NAIROBI	0	0	0	0	0
NAKURU	0	0	103	0	103
NANDI	0	87	24	0	111
NAROK	0	0	0	23	23
NYAMIRA	0	0	11	0	11
NYANDARUA	0	0	38	0	38
NYERI	0	0	27	21	48
SAMBURU	0	0	16	0	16
SIAYA	0	0	13	0	13
TAITA TAVETA	0	0	14	0	14
TANA RIVER	0	99	6	3	108
THARAKA NITHI	0	33	20	56	109
TRANSNZOIA	0	0	11	0	11
TURKANA	0	0	13	0	13
UASIN GISHU	0	0	0	0	0
VIHIGA	0	26	15	0	41
WAJIR	0	54	0	0	54
WEST POKOT	0	0	1	0	1
TOTAL	**26**	**937**	**1011**	**439**	**2413**

3.2 Completion status of Projects

Out of all the investments, 98% of the projects visited were found completed. The Result Based Financing (RBF) projects were 100% complete, 99% for the Urban Investments (UIP) and 97% for both the Rural (RIP) and the Water Resources Investments (WRI) as illustrated in Figure 5 below. If categorised by year of completion, clear majority of investments (99%) were completed for 1- and 2-year old projects, while the older projects had a slightly lower, though negligible, completion rate (Figure 6).

Figure 5. Completion status by investment window.

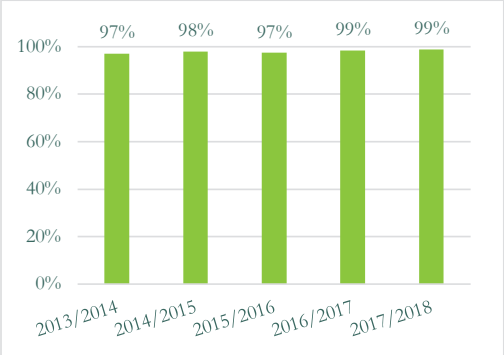


Figure 6. Completion status by completion year.

3.3 Operational Status of the Projects

Out of all the monitored investments, 76% were found to be operational[1] and 14% of the investments were non-operational at the time of visit (Figure 7). Figure 8 presents the reasons for the investments not being fully operational, the most common ones being: Water source / connection being unreliable or lacking (37% of cases), vandalism (16% of cases), natural / climatic causes (11% of cases), poor structural integrity (9% of cases) or challenges with operational responsibility (9% of cases).

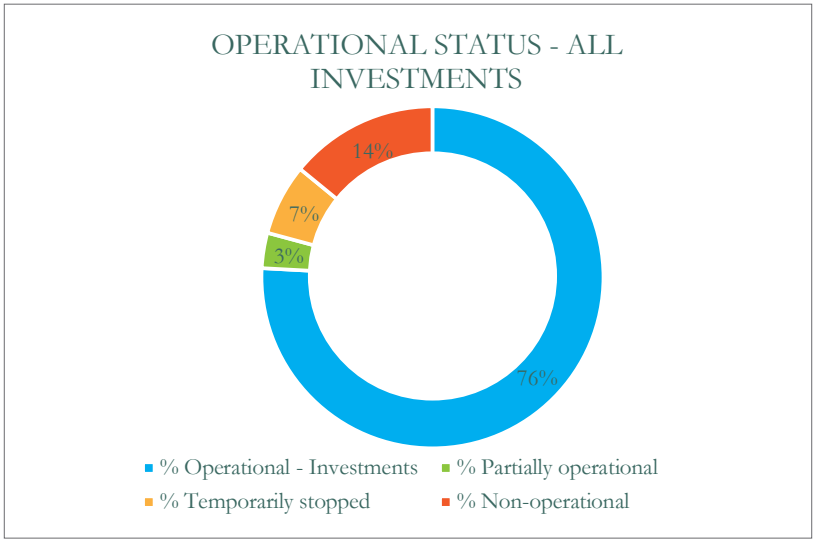


Figure 7. Operational status of all investments funded by WSTF during 2013 – 2018.

[1]An investment was considered operational if it was fully operating and in use at the time of visit; temporarily stopped if the structure was functional but for example the water source was temporarily dry, partially operational if some of the investment was operating while some components were not, and non-operational if the investment was completely non-functional, it was not being operated or used or the water source permanently dry.

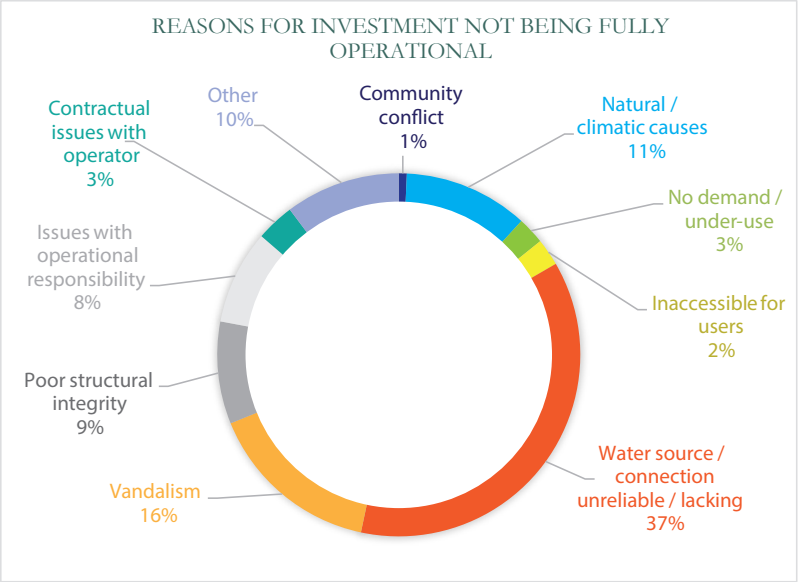


Figure 8. Reasons for investments not being fully operational.

Urban Investments were found to have the most operational investments with 79% of its investments being operational (Figure 9). The Water Resources Investments had 78%, Rural Investments had 72% and the RBF investments had 65% operational investments.

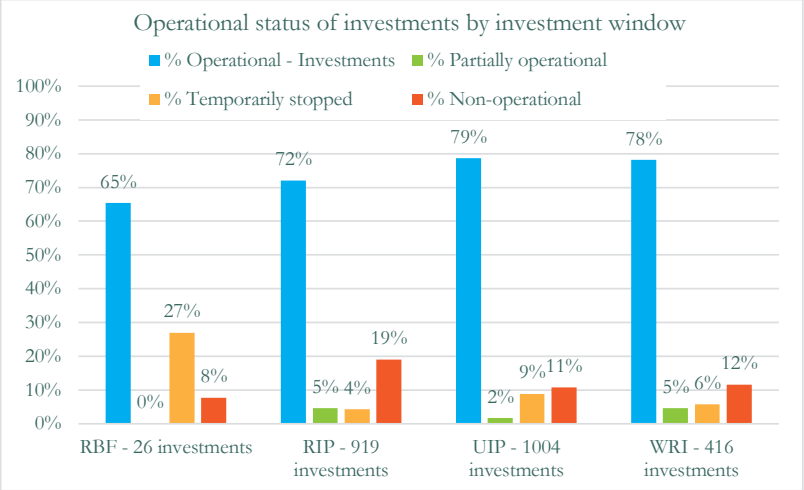


Figure 9. Operational status by investment window: RBF (Results Based Financing), RIP (Rural Investment Programme), UIP (Urban Investment Programme), WRI (Water Resources Investments).

When comparing investment categories, sanitation category was the most successful one with 85% of investments operational at the time of visit, whereas 72% of water supply investments and 77% of water resources investments were found to be operational (Figure 10). This could be attributed to the fact that the sanitation projects are commonly VIP latrines, which are technically simpler to maintain.

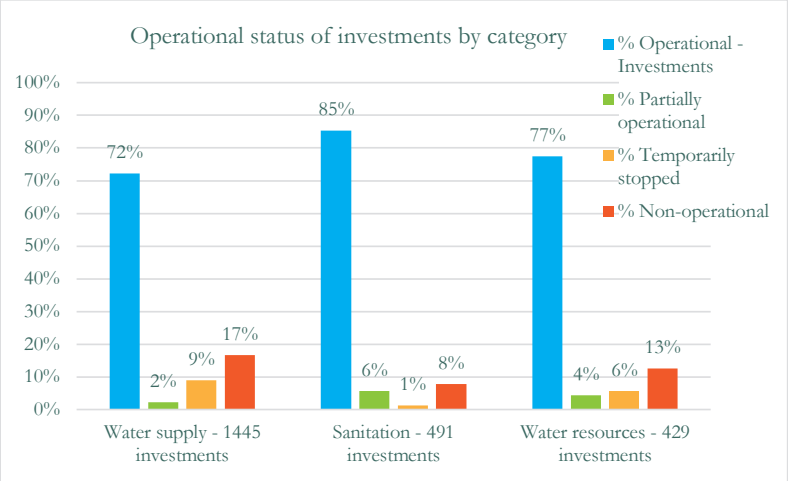


Figure 10. Operational status by investment category.

3.3.1 Programmes

The performance of the individual programmes in terms of operational status are presented in Figure 11, for both the projects as well as the individual investments.

The Community Project Cycle (CPC) programme had 6 projects monitored, where only one project was found to be fully operational. The other projects were either partially operational, temporarily stopped and one non-operational. The projects were funded either in 2013/14 or 2014/15, which partially explains the lower than average performance in comparison to the other programmes. However, 69% of the individual investments were found to be operational. The difference can be explained partially by the projects also including individual sanitation components, which were not dependent on the operational status of the rest of the schemes. Therefore in some cases the individual investments can be operational even when the overall project is not.

The Drought Emergency Response Programme (DERP) performed better than average with 89% of the projects operational and 78% operational of the investments. All the projects for this programme were funded in 2017/18 and majority of the investments were intakes or storage tanks.

The International Fund for Agricultural Development (IFAD) Programme performed very well, with 98% of projects found operational overall, and 91% of the individual investments fully operational. Most of the investments were either rainwater harvesting tanks (138 No.) or tree planting (38 No.), which had an operational status of 92% and 95%, respectively. This demonstrates, that while there is generally a low success rate for rainwater harvesting tanks and tree planting across the country, in the Mount Kenya region there is a high potential to succeed with the investments if implemented by a well performing Water Resource Users Association (WRUA) or a Community Forest Association (CFA), as the technologies are more appropriate for that specific climate.

The Joint Six Programme (J6P) performed quite well in terms operational status. 84% of projects and 75% of investments were found operational. For J6P, 49 projects were monitored, of which 22 were under sanitation category, 6 were under water resources and 21 were under water supply. These included 91 sanitation investments, 93 water resources investments and 295 water supply investments. 89% of the sanitation investments were found to be operational, while 61% of the water resources investments and 75% of the water supply investments were operational at the time of visit. The water supply investments included for example: 74 consumer meters (sampled), of which 77% were operational; 65 pipelines, of which 83% were operational, and; 50 water kiosks, of which 66% were operational. What is notable is that the success rate of the water resources investments is so much lower for J6P than for IFAD, 61% vs. 91%. This could be resulting from a stricter appraisal process and implementation follow-up for IFAD water resources projects than for the J6P water resources projects.

Both of the two monitored Kenya Water and Sanitation Programme (KWSP) projects were found to be operational, and so were all the 11 investments. One of the projects was a water supply project, Kinyagi Water & Sanitation Project in Muranga, and one a water resources project, Itetani WRUA in Makueni county.

The Medium-Term Arid and Semi-Arid (ASAL) Programme (MTAP) I (funded 2012-2014) performed better than the MTAP II programme (funded 2014-2016). 70% of the 154 MTAP I projects and 70% of the 324 MTAP I investments were found operational, while 60% of the 48 MTAP II projects and 52% of the 191 MTAP II investments were found operational. Majority (63%) of the MTAP I investments were under sanitation, with an operational status of 78%, while water supply investments had an overall operational status of 55%. 65% of the water supply investments for MTAP I were storage tanks (65 No.) or plastic moulded tanks (14 No.).

For MTAP II, 36% of the investments were under water supply category, 30% under sanitation and 34% under water resources. The MTAP II programme had 57 monitored sanitation investments, of which 84% were operational. These were either community or institutional sanitation facilities, all VIP latrines. Out of the 65 monitored water resources investments under the MTAP II programme, only 40% were found fully operational. Of the water resources investments 38 were rainwater harvesting tanks, of which only 12 were found to be operational. Finally, 69 of the MTAP II investments were under water supply category, of which 36% were operational. Most of these were either water kiosks (14 No.) or animal troughs (16 No.), of which 43% and 25% were operational, respectively.

All the three monitored Output Based Aid (OBA) projects were found to be operational, while only 65% of the 26 investments were operational at the time of visit. This is mostly attributable to the fact that only 3 out of the 9 water kiosks were operational at the time of visit, as they were having either insufficient or lacking water source in Nol Turesh project in Makueni county.

The Upscaling Basic Sanitation for the Urban Poor (UBSUP) was one of the best performing programmes in WSTF, with 95% of the projects (22 in total) and 93% of the investments (122 in total) found operational at the time of visit. 95% of the pour flush toilets and 96% of the cistern flush toilets were working at the time of visit. Four (4) out of the six (6) Decentralized Treatment Facilities (DTFs) are also working.

84 projects and 889 investments were monitored under the Urban Projects Concept (UPC) programme. 73% of the projects and 77% of the individual investments were found to be operational at the time of visit. The UPC projects are implemented through established Water Service Providers (WSPs). These included 872 investments under water supply as well as 17 Public Sanitation Facilities (PSFs). Of the 17 PSFs, 14 were found to be operational at the time of visit. The monitored water supply investments included for example: 338 consumer meters (sampled), of which 74% were operational; 164 water kiosks, of which 80% were operational; 111 pipelines of which 77% were operational; 84 individual connections (sampled), of which 74% were operational, and; 51 yard taps, of which 69% were operational at the time of visit.

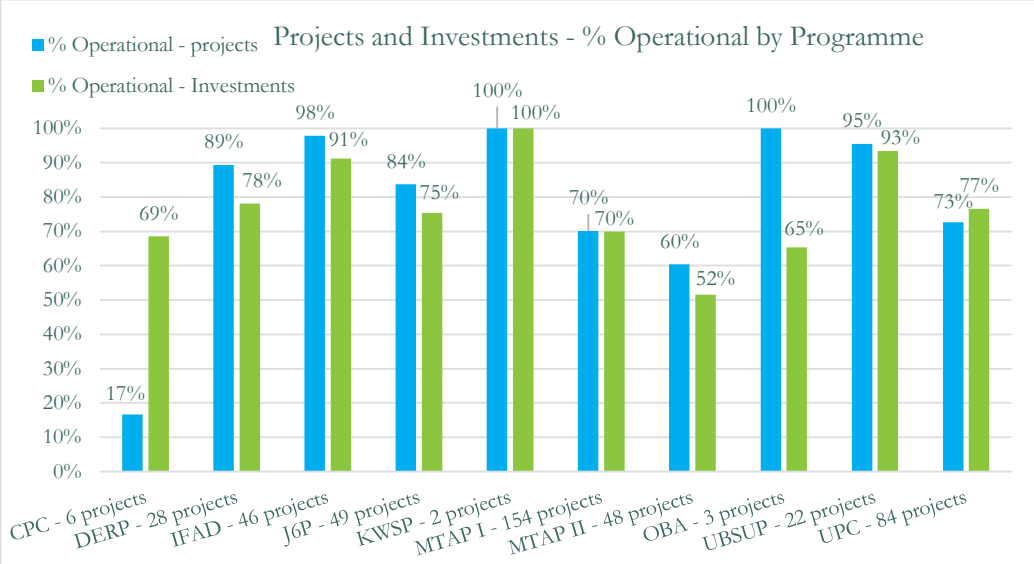


Figure 11. Operational status by programme: CPC (Community Project Cycle), DERP (Drought Emergency Response Programme), IFAD (International Fund for Agricultural Development), J6P (Joint Six Programme), KWSP (Kenya Water and Sanitation Programme), MTAP I and II (Medium-Term Arid and Semi-Arid (ASAL) Programme), OBA (Output Based Aid), UBSUP (Upscaling Basic Sanitation for the Urban Poor) and UPC (Urban Projects Concept).

3.3.2 Water supply investments

61% of the monitored 1,458 water supply investments were in the category of distribution systems, including water kiosks, yard taps, animal troughs and consumer meters (Figure 12). Other common investment types were pipelines (14% of total number) and storage tanks (10% of total number). 72% of all the water supply investments were found to be operational (Figure 13), against the institutional target of 95%.

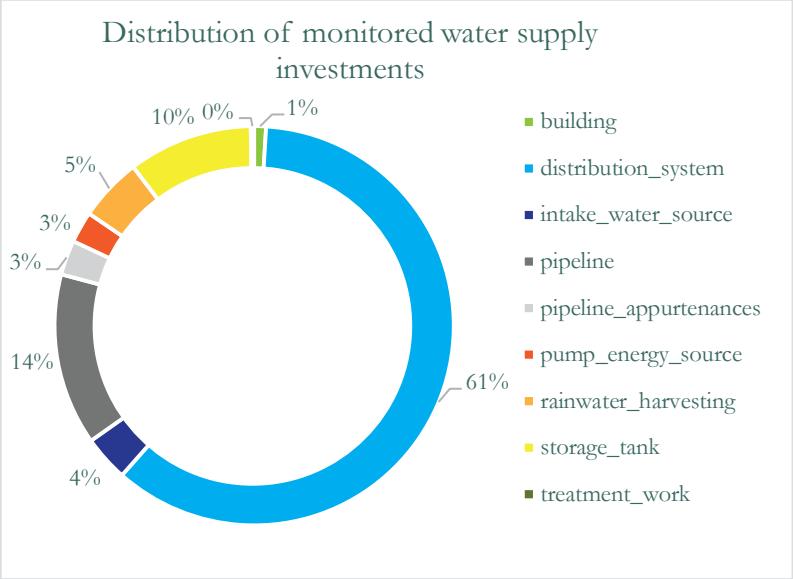


Figure 12. Distribution of monitored water supply investments.

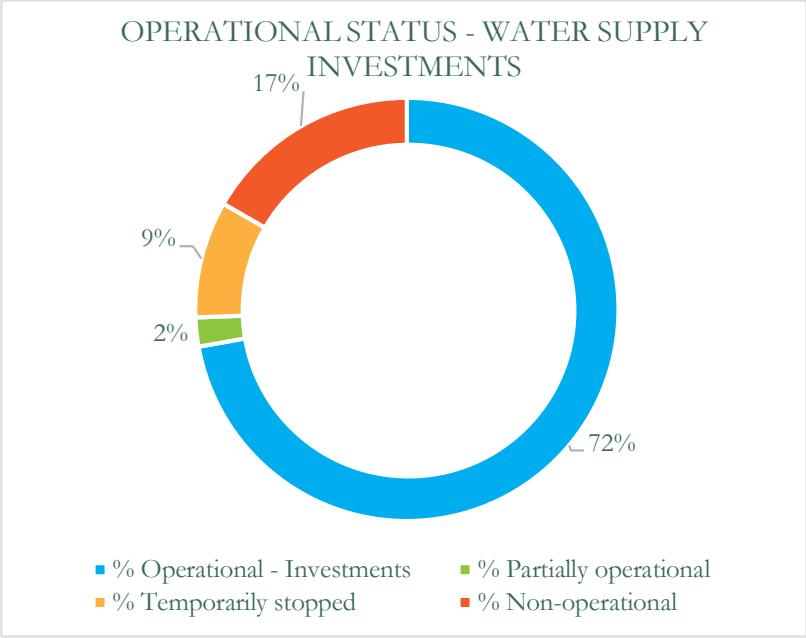


Figure 13. Operational status of water supply investments.

The pipeline appurtenances were found to be the most commonly operational among the water supply investments classes, followed by pipelines and pumps/energy sources (Figure 14). The lowest success rates were with treatment works (only 2 investments monitored) and buildings, such as offices, laboratories, pump houses and fencing (50%) as well as rainwater harvesting structures (53%).

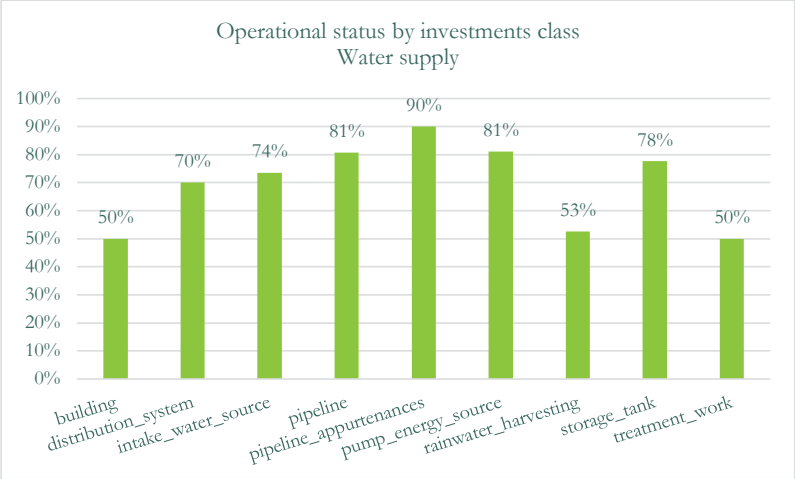


Figure 14. Operational status by water supply investment class.

Of the individual investments types (Figure 15), the springs were found to be the most operational, 100% of 10 investments visited. Also sectional steel tanks (93% operational of 29 monitored investments) (pictorial in Figure 86 in Annex 5), valve chambers (90% operational of 40 monitored investments), bulk meters (87% operational of 30 monitored investments), consumer meters (83% operational of monitored 412 investments) and masonry tanks (78% operational of monitored 73 investments) (pictorial in Figure 87 in Annex 5) had a higher than average success rate in terms of operational status.

Meanwhile, only 2 of the monitored 17 animal troughs were fully operational at the time of visit. A common issue, as shown in the pictorial in Figure 89 in Annex 5, is that the animal troughs are missing water connections to the water source (e.g. water pan), and therefore would require to be filled with buckets, which is not a practical design. Also water kiosks had a high failure rate, as only 53% of the 257 monitored investments were fully operational (Pictorial in Figure 88 in Annex 5). This is most likely related to the fact that the water kiosks are seen as more of a short-term option prior to provision of individual connections, (operational status of 71% for sampled connections). Plastic moulded tanks and rainwater harvesting tanks did not generally succeed well, with 56% of 32 investments and 55% of 66 investments being fully operational at the time of visit, respectively. Finally, also yard taps had a high failure rate as only 59% were found to be fully operational of the total number of 54 monitored ones, most likely as they are seen more like temporary solutions, like water kiosks (Pictorial in Figure 90 in Annex 5).

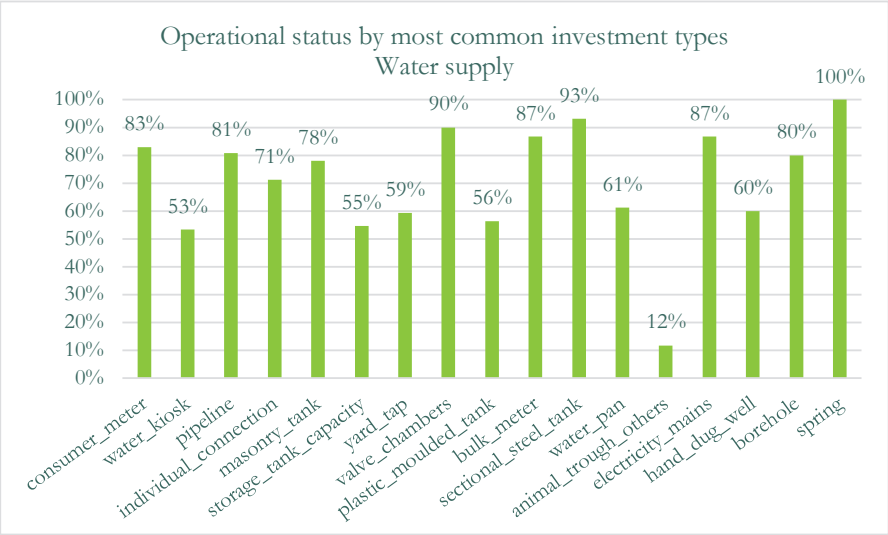


Figure 15. Operational Status by most common water supply investment types.

3.3.3 Sanitation investments

66% of the monitored 502 sanitation investments were institutional sanitation facilities in schools, hospitals and other institutions (Figure 16). The second most visited sanitation projects were the household sanitation projects, 113 in total. 85% of all the sanitation projects were operational, which was higher on average than water supply and water resources, likely due to the fact that most sanitation projects require low maintenance costs compared to the water projects (Figure 17).

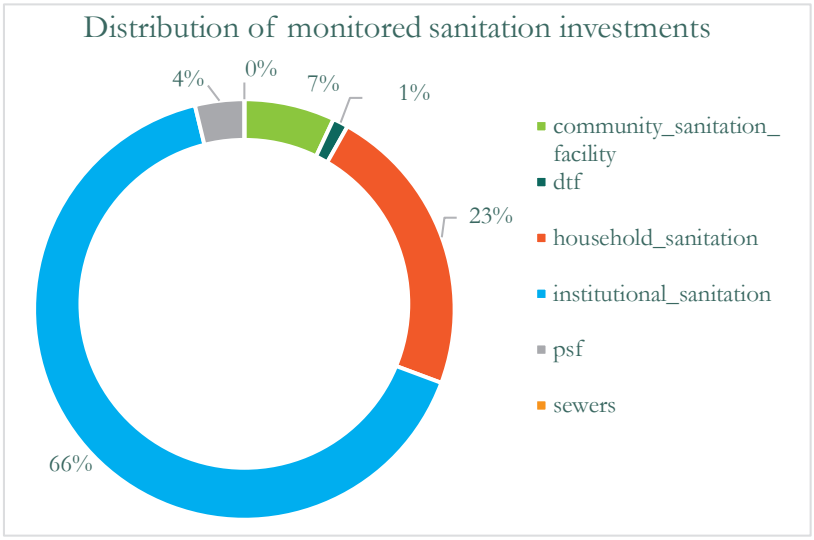


Figure 16. Distribution of monitored sanitation investments.

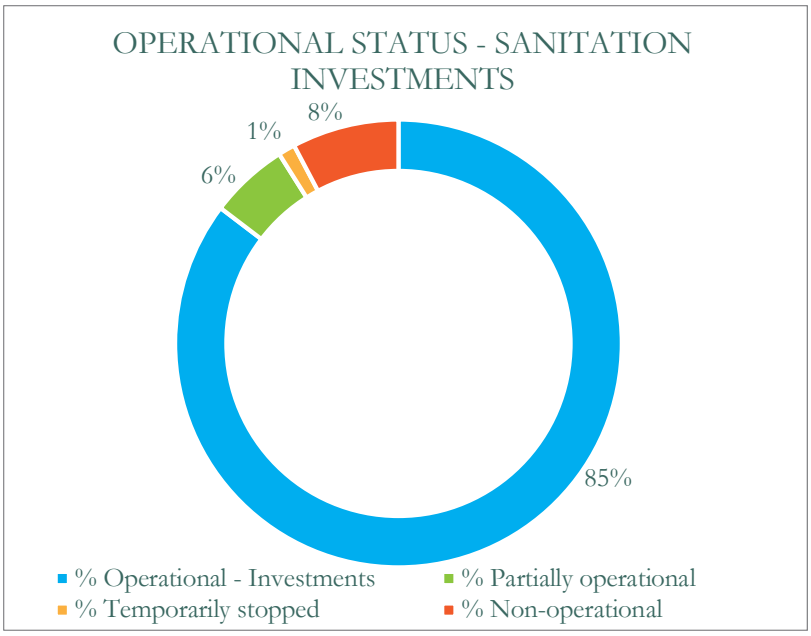


Figure 17. Operational status of sanitation investments.

The household sanitation investments had the highest success rate of 96% being operational. Meanwhile, 67% of the DTF projects were found to be operational. This can be attributed to the complexity of the operations of the DTF compared to the household sanitation (Figure 18). Pictorials for institutional sanitation facilities, household sanitation facilities and PSFs are presented in Figures 94-96 in Annex 5.

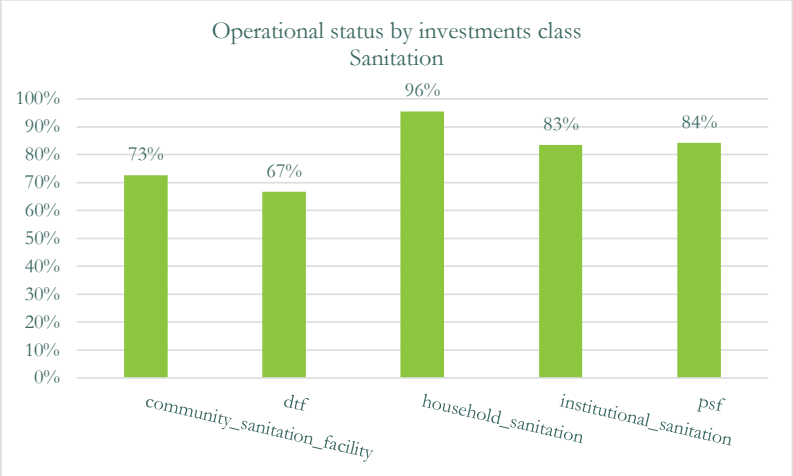


Figure 18. Operational status by sanitation investment class.

3.3.4 Water resources investments

Water resources management and catchment protection measures are a crucial part of ensuring the long-term sustainability of the watersheds, and also to secure a sustainable water source for the water supply projects. The water resources management structures comprised most of the 429 water resources investments monitored, altogether 65% (Figure 19). These include the rainwater harvesting structures, such as pans, dams, djabias and tanks, as well as spring protection and livestock troughs. The second biggest group was the catchment management structures, such as tree planting, wetland rehabilitation, check dams, gabions, opening of malkas, waste disposal pits, riparian pegging, energy saving jikos, fire breaks, installation of early warning systems, pruning and grass strips. These constituted 32% of the monitored investments. Finally, both regulation (common intakes, self-regulating weirs, bulk meters) and livelihood activities covered 2% of the monitored investments.

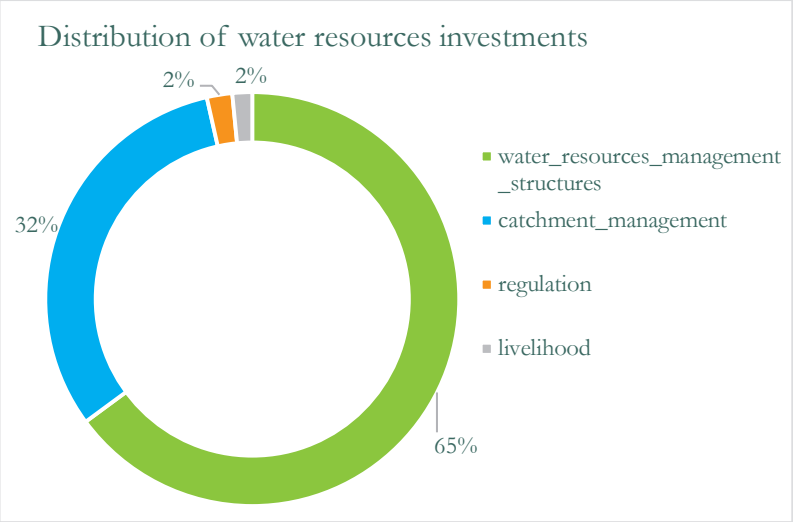


Figure 19. Distribution of the water resources investments.

77% of all the water Resources Investments were found to be operational (Figure 20) with regulation structures having the highest success rate of 89 % being fully operational, and livelihood activities the lowest, with 71% being fully operational at the time of visit (Figure 21).

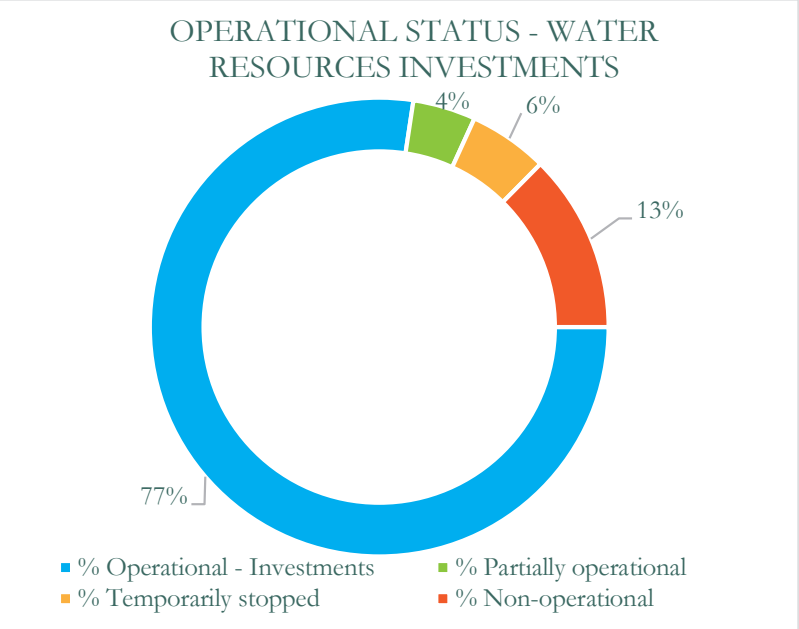


Figure 20. Operational Status of the water resources investments.

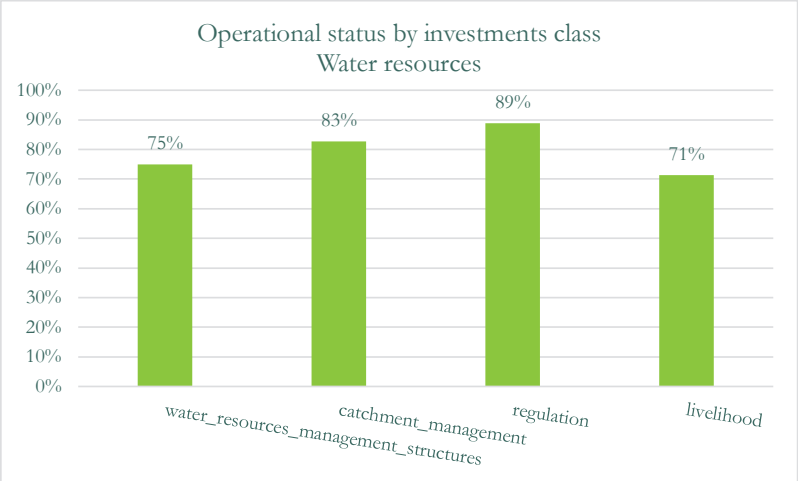


Figure 21. Operational status by water resources investment class.

Of the water resources investment types, the most successful ones have been the spring protection measures, with 91% found to be operational of the 32 monitored ones. Figure 97 in Annex 5 presents a pictorial of the springs monitored under the water supply and water resources investment windows. Tree planting nurseries were 89% fully operational of the 19 monitored investments (Pictorial in Figure 98 in Annex 5), tree planting transplanted with 85% fully operational of the 52 monitored ones and bulk meters with 88% operational of the 8 monitored investments (Figure 22).

The least successful investments have been the rehabilitated water pans, of which only three (3) out of the eight (8) monitored investments were fully operational at the time of visit (Pictorial in Figure 99 in Annex 5). A common challenge with water pans, both under water supply and water resources investments, have been issues with designs.

75% of the rain water harvesting tanks were found operational, however, the success rates have largely depended on the location of the tanks (Pictorial in Figure 100 in Annex 5). Rainwater harvesting tanks were captured both under water supply and water resources investments. The rain water harvesting tanks were the least operational mostly in the Arid and Semi-Arid Areas (ASALs). Under both the water supply and water resources categories, only 19% of the 54 monitored RWH tanks were found operational in the ASALs, against the operational status of 82% for 244 monitored tanks in the other areas. The low success rate in the ASALs is mostly due to the lack of reliable rainfall in the areas, therefore the tanks can be easily blown away by the harsh winds experienced in the region. In future, such investments should be reconsidered or redesigned to suit the ASAL areas.

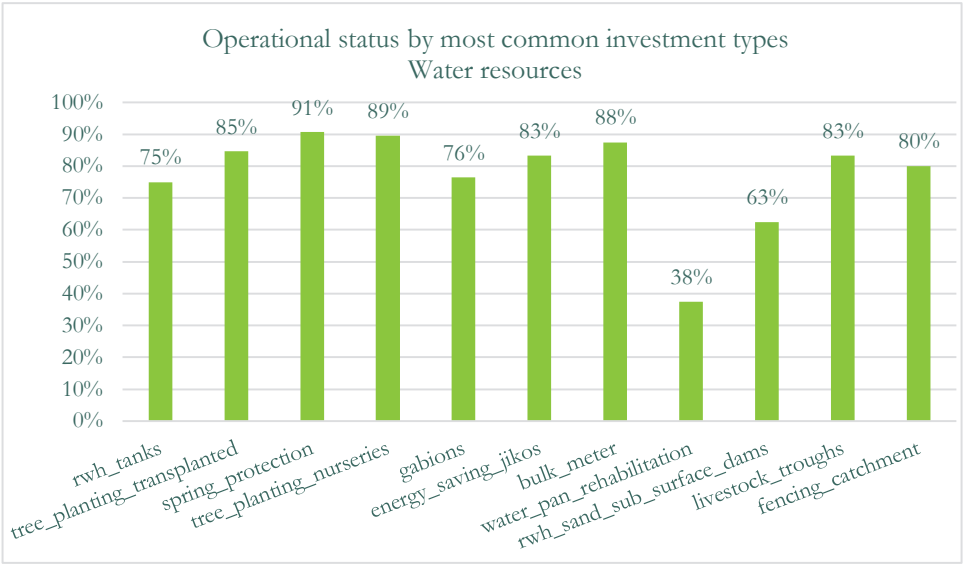


Figure 22. Operational Status by most common water resources investment types.

3.4 Technical Verification of the Schemes

This chapter looks at the technical and physical aspects of the monitored projects, with a focus on the following:

- Technical quality of the schemes;
- Branding;
- Perceived water quality and quantity at intakes, storage tanks, distribution systems and water resources management structures, and;
- Hygiene levels and hand washing at sanitation facilities.

3.4.1 Technical quality of schemes

The JAOME 2018 exercise assessed four parameters for the technical quality of the schemes. These were: (1) Condition; (2) Quality of works; (3) Need of repair, and (4) Reliability of all the investments. 68% of the monitored investments were in good condition while 71% of the investments had good quality of works, which results in only 17% of the investments in need of repairs. 60% of all the investments were found to be regularly reliable, 25% seasonal, 3% erratic and 13% rarely reliable or unreliable (Figure 23).

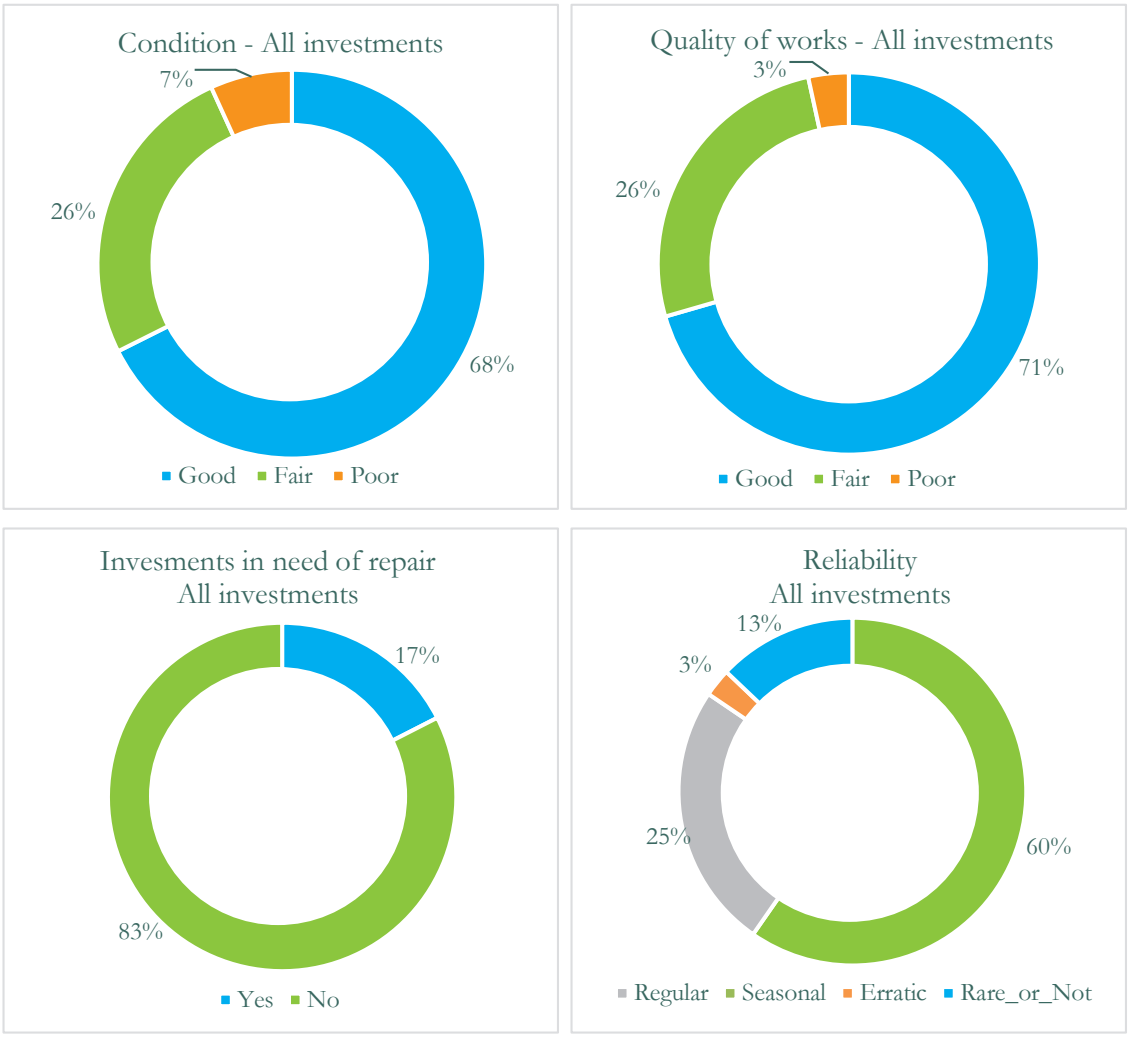


Figure 23. Condition, Quality of works, Need of repair and Reliability of all monitored investments 2018.

3.4.1.1 Technical condition

When comparing the different investment windows (RBF, RIP, UIP, WRI), the urban and the water resources have been the most successful ones in terms of condition (Figure 24). The success of the water resources investments could be resulting from the fact that 71% of the monitored investments were completed in 2017/18,

and had therefore been operational less than a year. Also, 63% of the water resources investments are under the IFAD programme, which has performed well for the water resources investments, in comparison to other programmes. The better success rate in technical quality for urban investments is linked to the implementation partners being the more established WSPs instead of communities or rural Water Utilities (WUs).

Notable is that when comparing the different investment categories, the sanitation facilities had the poorest condition (Figure 25), though they were most commonly operational (Figure 10). This could be to do with the fact, that the facilities can remain operational even if the condition is not of high standard. Meanwhile, if a pipeline or a tank is in poor condition, for instance leaking, most likely it is also non-operational.

DERP, IFAD, J6P and KWSP investments monitored were most commonly in good condition compared to the other programmes, with 81%, 86%, 78% and 91% found in good condition (Figure 26). Meanwhile, the CPC programme had only 48% of the projects in good condition, the MTAP I 51% and MTAP II 54%.

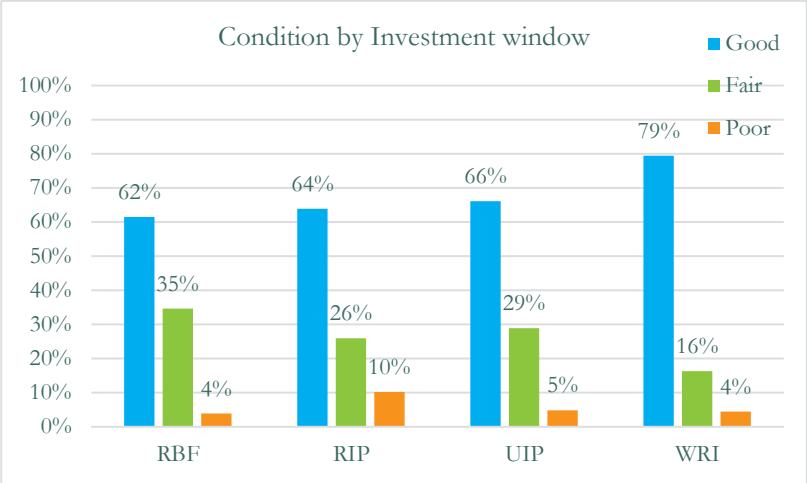


Figure 24. Condition of investments by investment window.

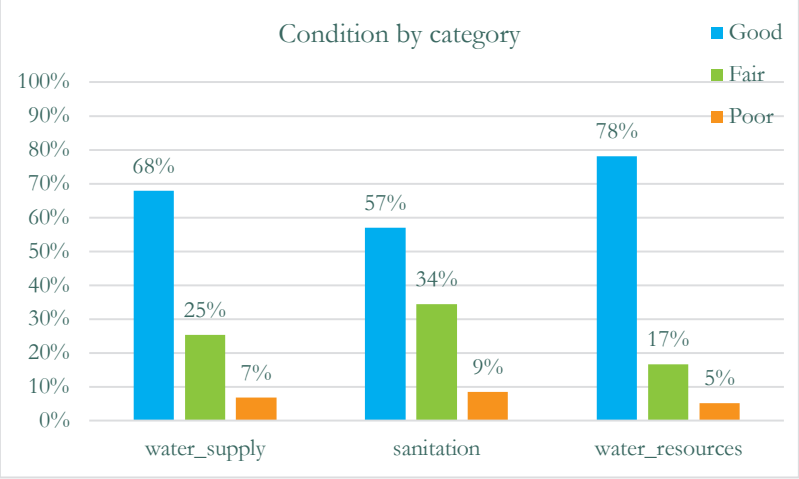


Figure 25. Condition of investments by category.

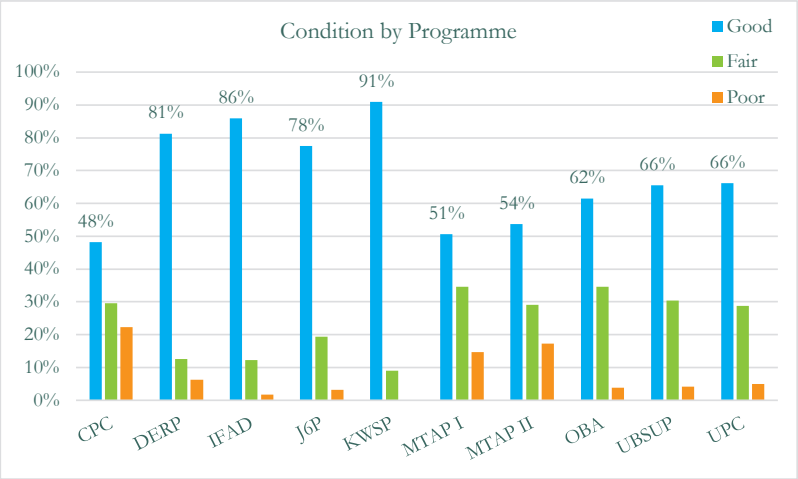


Figure 26. Condition of investments by programme.

3.4.2 Quality of works

The RBF investments had the highest quality of works (Figure 27), along with the investments under the OBA programme (Figure 29). While this makes sense in terms of the approach of the programme, where the funding is loan-based and targeting well established WSPs, it is in contradiction with the slightly poorer condition of the investments (Figure 24).

If comparing the different investment categories, the quality of works was higher for water resources investments and lower for sanitation, similarly to the condition of facilities (Figure 28).

Of the programmes, the best quality of works were found to be with DERP, IFAD, J6P, KWSP and OBA (Figure 29). The lowest quality of works was encountered with MTAP I and MTAP II.

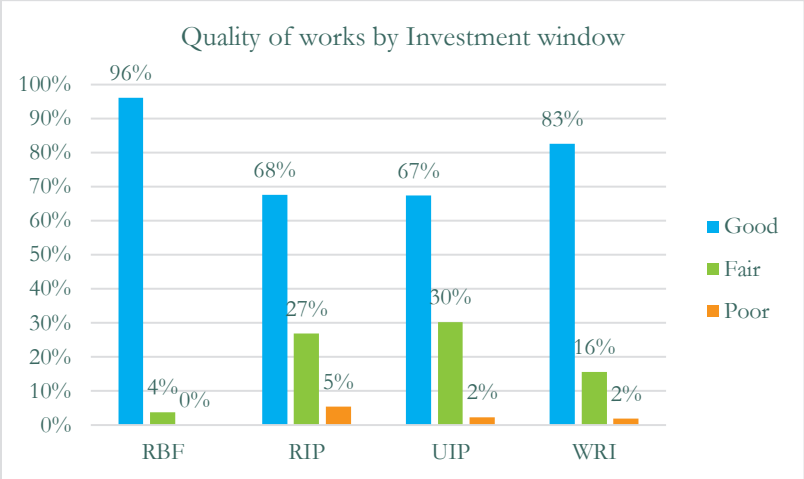


Figure 27. Quality of works by Investment window.

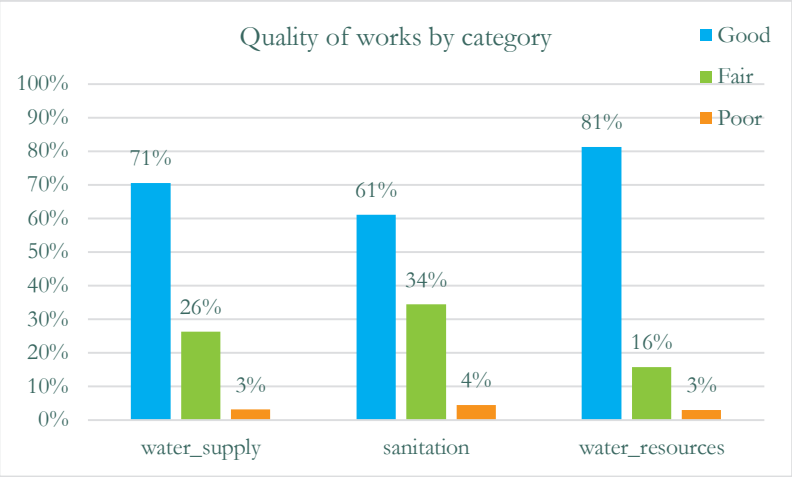


Figure 28. Quality of works by investment category.

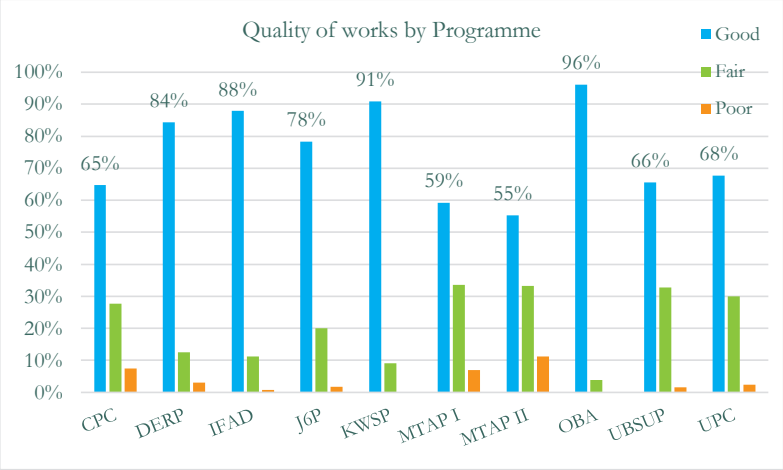


Figure 29. Quality of works by Programme.

3.4.2.1 Investments in need of repair

28% of rural investments, 15% of water resources investments, 9% of urban investments and 0% of RBF investments are in need of repair (Figure 30). The sanitation investments most commonly require repairs (Figure 31). These are mostly sanitation investments in the ASAL areas that are usually affected by the strong winds experienced and are poorly maintained. Of the programmes monitored, CPC, MTAP I and MTAP II had the highest percentages of investments in need of repair, 44%, 43% and 39%, respectively (Figure 32).

In contrary to a common misconception, follow-up and responsibility on repairs are however not with WSTF but with the implementing partners, as the WSTF has no budget for repairs and once the projects have been finalized, they are handed over to the institutions, Community Based Organisations (CBOs), WUs, WSPs, WRUAs or CFAs. In reality though the situation is often so that the owner of the facility lacks funds to make repairs. For example with school sanitation, when a facility starts being in poor condition, it is abandoned, even if it would have required simple repairs, such as change of doors. Lack of ownership on the care of the facilities as well as no collection of funds for maintenance from users leads to a low level of sustainability in some cases.

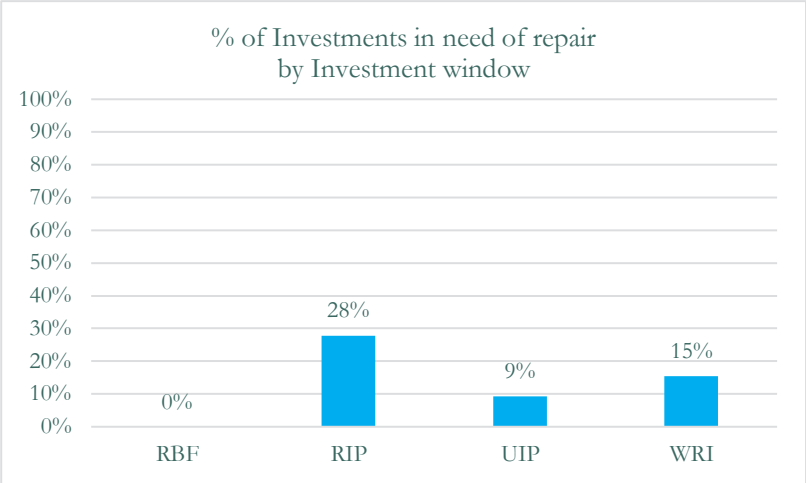


Figure 30. % of investments in need of repair by investment window.

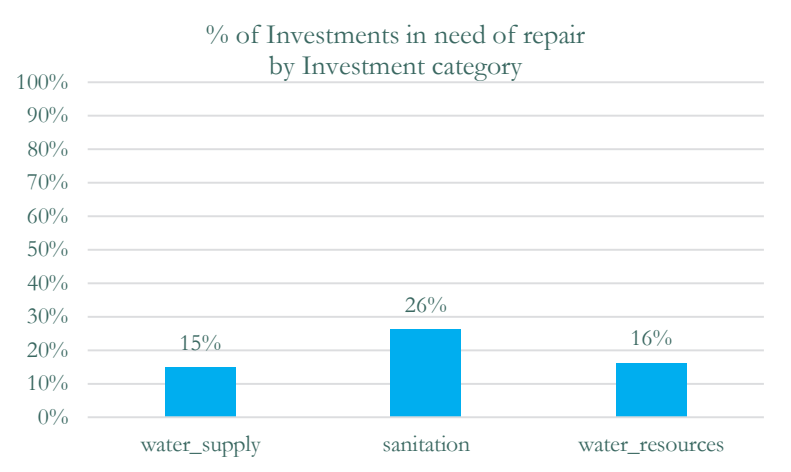


Figure 31. % of investments in need of repair by investment category.

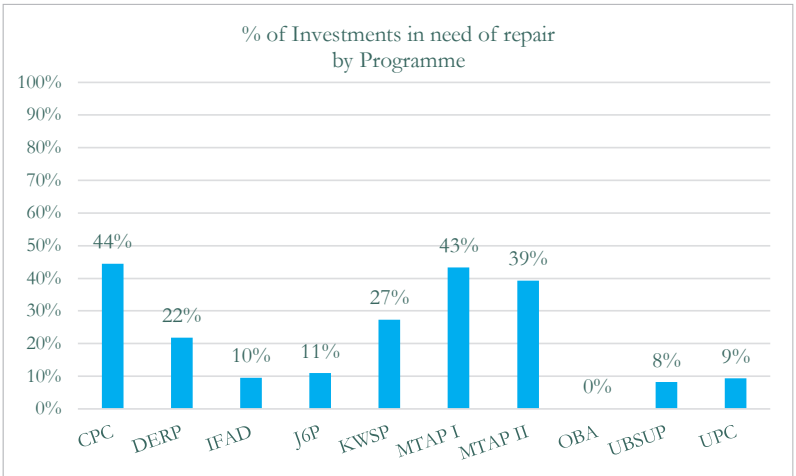


Figure 32. % of investments in need of repair by programme.

3.4.3 Branding

60% of the 1,782 investments monitored were branded with 41% of the investments branding in good condition. The question on branding was targeted to all relevant investments excluding: connections, meters, riparian pegging, energy saving jikos, fire breaks, installation of early warning systems, pruning, grass strips.

The Rural Investment had the most branded projects compared to the other investment windows, however the water resources investments had the highest percentage with branding in good condition (Figure 33).

The KWSP had most of the projects branded compared with other programmes, however the IFAD programme had the most projects with branding in good condition when compared to the rest (Figure 34). What is notable however is that new projects, such as J6P, DERP and OBA had a fairly low level of branding, despite having been completed in the previous one or two years. Overall, WSTF should check that the branding of projects has been done before issuing the completion certificates to projects.

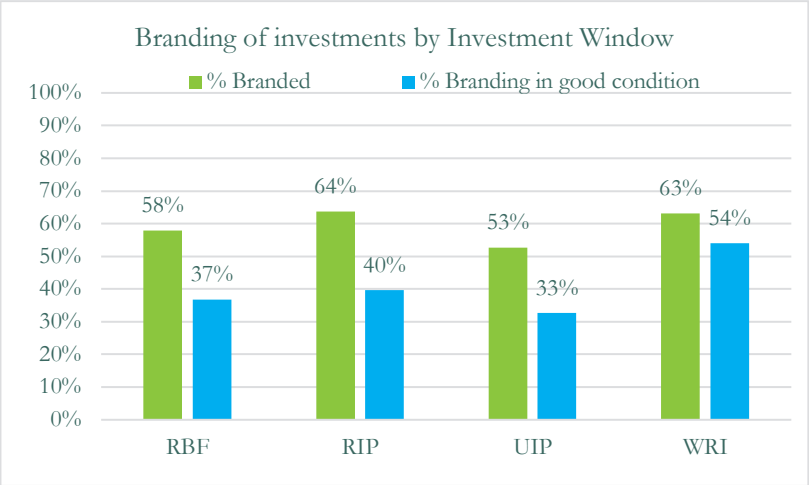


Figure 33. Branding of the Investments by Investments window.

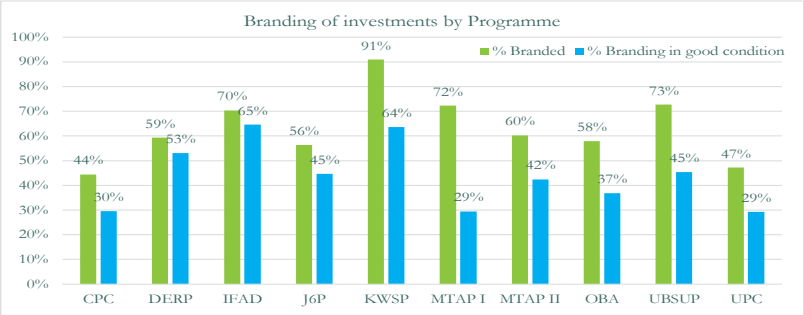


Figure 34. Branding of the investments by Programme.

Figure 34. Branding of the investments by Programme.

3.4.4 Water quality and quantity

The JAOME 2018 exercise assessed the water quantity and quality of the water distribution systems, the water sources/intakes, storage tanks and the water resources management structures. In 51% of the investments the water quantity was found to be either abundant and enough among the cases encountered (Figure 35), which is a slight increase from the previous exercise in 2017, when it was 46%. 12% of the investments were permanently dry, which is also an improvement from the previous exercise, when it was 23%. In 70% of the investments the water quality was either good or very good, with only 1% having poor quality water.

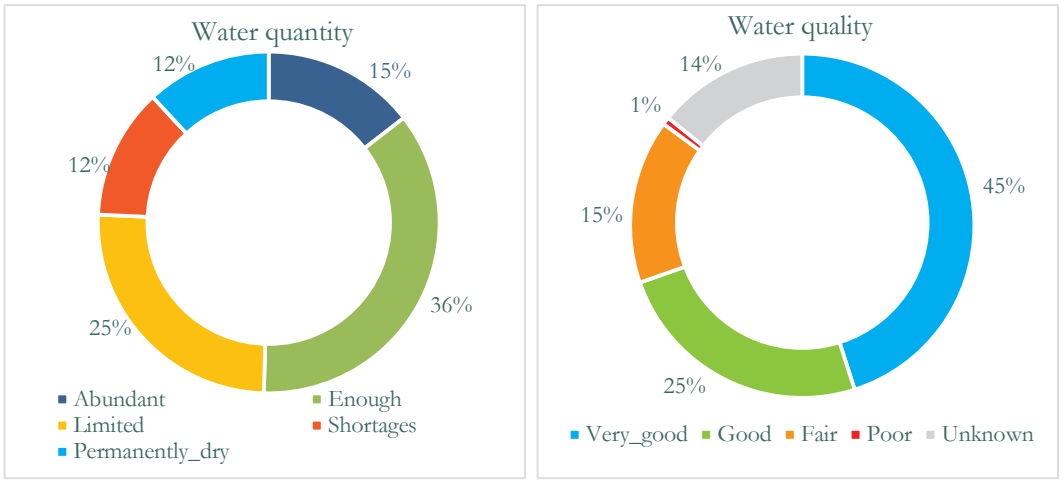


Figure 35. Water quantity and quality as observed at the time of visit.

Generally, water quantity appears to be a bigger issue than water quality (Figure 36). There is no clear geographical pattern for water quantity, though generally it was found more commonly abundant or enough in Central and Western Kenya. This is linked to the rainfall patterns, where particularly Northern Kenyan counties record very low measures of annual precipitation. Also quality was generally better in Central, Western and South-Eastern regions, whereas especially in the North-Eastern regions the quality is poorer.

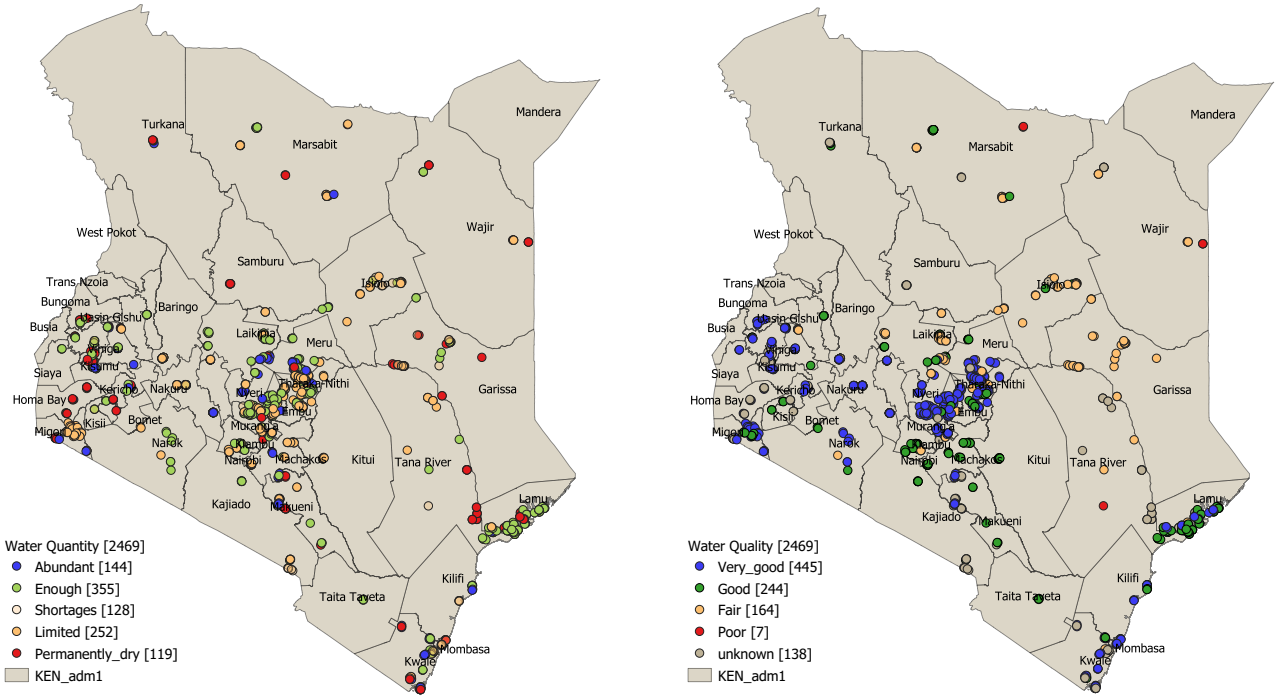


Figure 36. Water Quality and Quantity of the water points as observed by the enumerator

3.4.5 Sanitation facilities

Three key parameters were observed specifically regarding the quality of the sanitation facilities were: (1) Hygiene levels; (2) Availability of handwashing facilities, and; (3) Distribution of HIV materials (Figure 37). 83% of the sanitation projects had good and fair hygiene levels with the Urban investments having better hygiene levels than the Rural Investments (Figure 38). The Public Sanitation Facilities (PSF) had the best hygiene levels and handwashing facilities. This may be mostly attributed to the better management of the PSFs because the facilities are for commercial purposes (Figure 39).

However, of importance to note is that only 10% of the facilities had HIV/Hygiene material distributed and only 17% had handwashing facilities. The lack of handwashing facilities may be due to lack of a reliable source or a water connection in the sanitation facility or design issues.

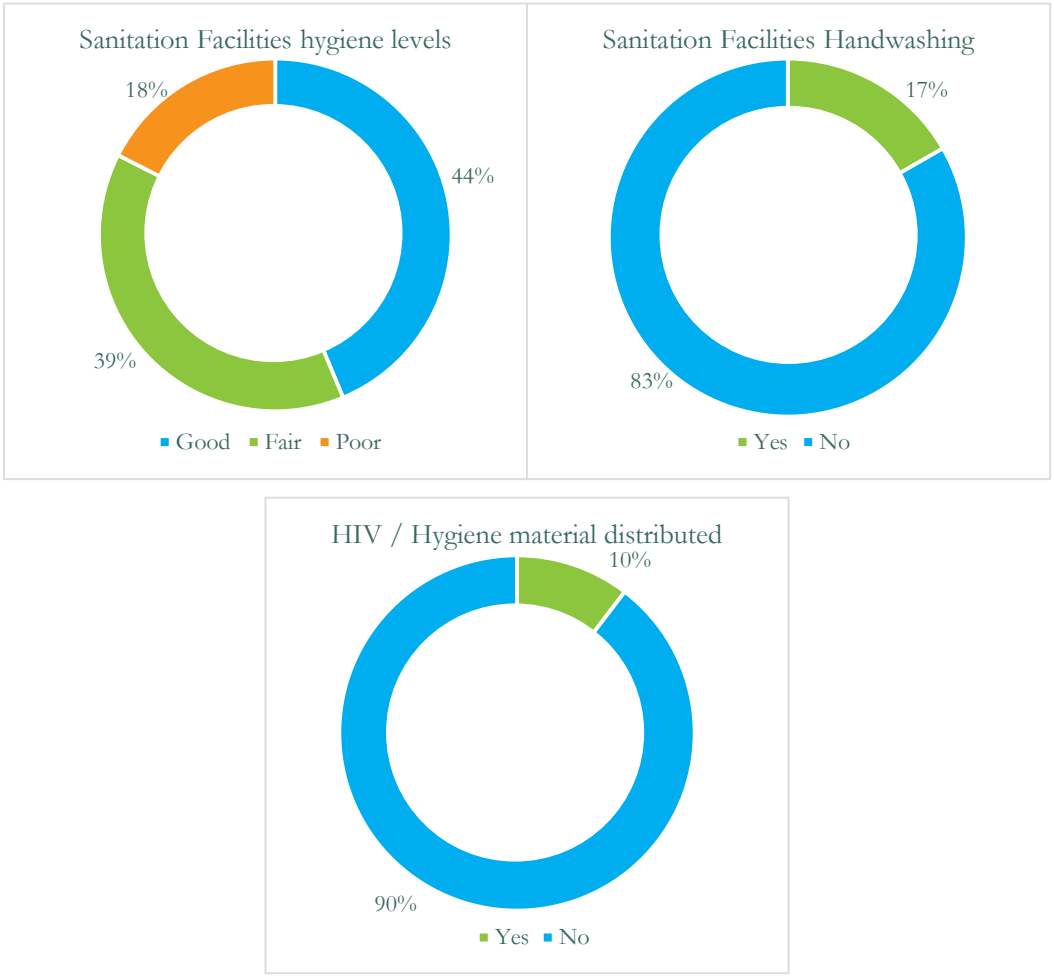


Figure 37. The three key parameters for the quality of the sanitation facilities: (1) Hygiene levels; (2) Availability of handwashing facilities, and; (3) Distribution of HIV&Hygiene materials.

When comparing the rural and urban sanitation investments, it is shows that the urban sanitation facilities had better hygiene levels and more often provided handwashing facilities (Figure 38). This is because the urban sanitation projects are commonly PSFs, which have a clear operation and maintenance structure, with regular revenue collection. The rural facilities are mostly school or community sanitation facilities, which can have challenges of maintenance, leading to lower hygiene levels.

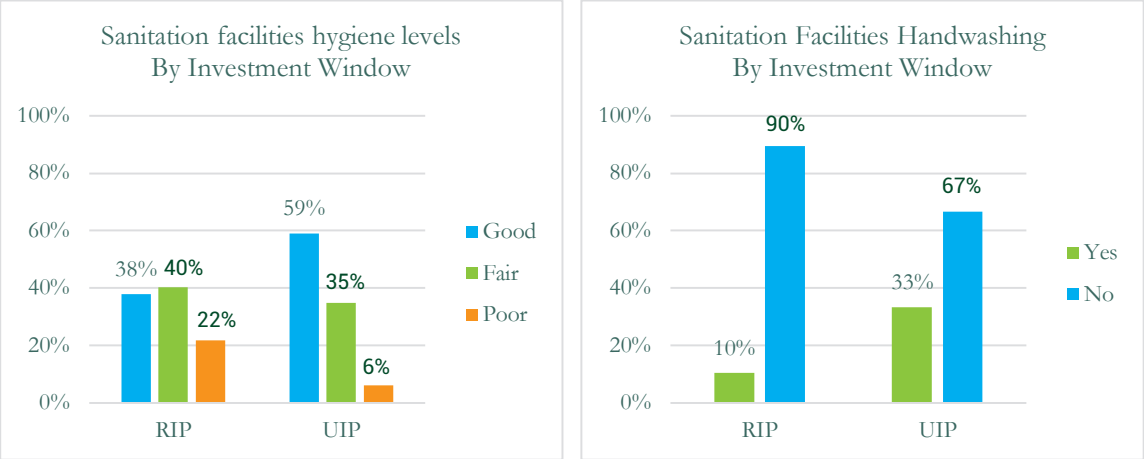


Figure 38. Hygiene levels and handwashing facilities in sanitation facilities of rural and urban programmes.

In general, as seen in Figures 39 and 40, hygiene levels were found to be better in the PSFs and the household sanitation facilities, where also the handwashing facilities are commonly provided. The lowest hygiene levels were found at institutional sanitation facilities, which is a great concern as the schools and health centers are key places for promoting public health. Also, the approach of providing hand washing facilities in schools needs to be re-thought as currently the schools are provided with a rainwater harvesting structure with a tap, however these structures were commonly found not operational on the ground due to various reasons, from lack of rain, the tanks missing or the tanks not being connected to the gutters. Providing handwashing facilities in schools should be paid much more attention to, ensuring that the school has a water connection, identifying an appropriate siting for the hand washing unit and ensuring that it is a permanent structure.

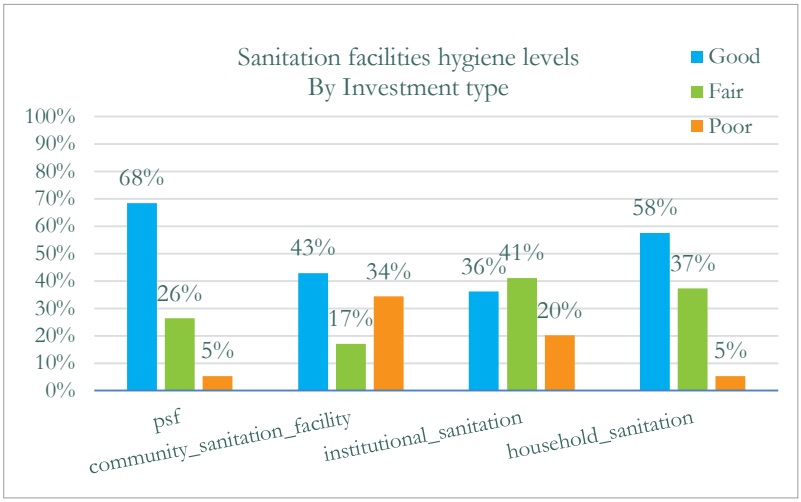


Figure 39. Sanitation facilities' hygiene levels by Investment Types.

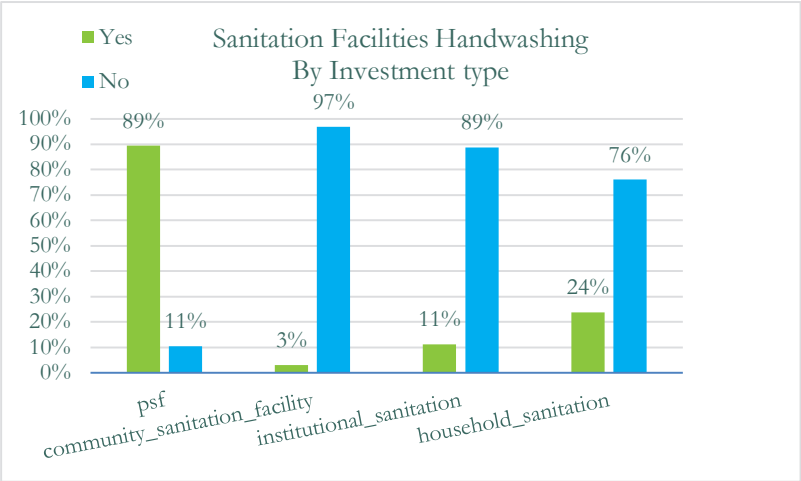


Figure 40. Handwashing availability at the sanitation facilities by Investment Types.

3.5 Revenue collection

Revenue collection is a key aspect for enhancing the sustainability of investments and it was therefore selected as the main indicator for the Sustainability Index. The question on revenue collection was asked both for the entire projects as well as for separate investments where revenue was expected to be collected.

The question was asked for all projects without consideration of the type of project in question, whereas the question was asked only on the types of the investments which were specifically expected to collect revenue. For water supply, the revenue collection question was asked for animal troughs, stand pipes, water kiosks and other communal water points. For sanitation category, the revenue collection question was asked for DTFs and PSFs. For water resources, the revenue collection question was asked for energy saving jikos, bee hives, fish ponds, animal troughs, djabias, rainwater harvesting pans, sand and sub surface dams, rainwater harvesting tanks, spring protection and tree nurseries. Figure 41 presents the percentage of investments where the revenue collection question is asked. The percentage is highest for water resources component (72%), as the types of investments where the revenue collection is asked are many, and cover a large part of the investments. The percentage is lowest for rural sanitation (1%), where most of the investments are school sanitation, and therefore do not expect to collect revenue.

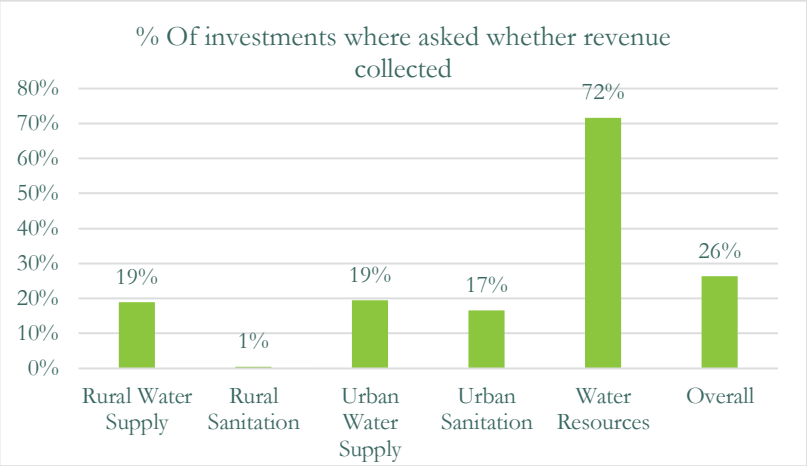


Figure 41. % of investments where asked whether revenue collected for different investment windows.

Overall, 35% of projects and 31% of investments where revenue collection was expected were actually collecting revenue (Figure 42). The more active revenue collection occurred in the RBF and urban investment windows, while the lowest was found in water resources investments.

For RBF there is a large difference between the percentages of projects collecting revenue (100%) versus of investments collecting revenue (33%). This results from the fact that in one of the projects six out of the eight water kiosks do not collect revenue while the projects as a whole do collect revenue, even when some of the project components do not.

Also the water resources window has a lot higher percentage of revenue collection for projects than for investments. This can be explained by the fact that possibly the projects reported that they collect revenue from registration and other membership fees, not necessary from the investments. Further, the revenue collection question was asked for investments such as energy saving jikos (12 No.) and rainwater harvesting tanks (228 No.), which do not actually commonly collect revenue. If these types of investments are excluded from the revenue collection indicator, the percentage for water resources investments collecting revenue rises to 16%.

The higher revenue collection percentage for RBF and urban investments windows is closely linked with them being operated and managed by established WSPs, while water resources investment are run by WRUAs, which are community initiatives that may lack the mentality of income generation. A key objective for the sustainability of WRUAs would be to ensure that if livelihood activities are supported, they are accompanied with a sound business plan that ensures income generation for the association.

When investment categories are compared (Figure 43), the highest percentage of projects collecting revenue was under water supply, and the lowest was under sanitation. The low percentage of sanitation projects collecting revenue results from a large percentage of school sanitation projects which generally do not collect revenue. The sanitation investments that are expected collect revenue are public sanitation facilities and decentralized treatment facilities which generally generate income, therefore resulting in 80% revenue collection rate for sanitation.

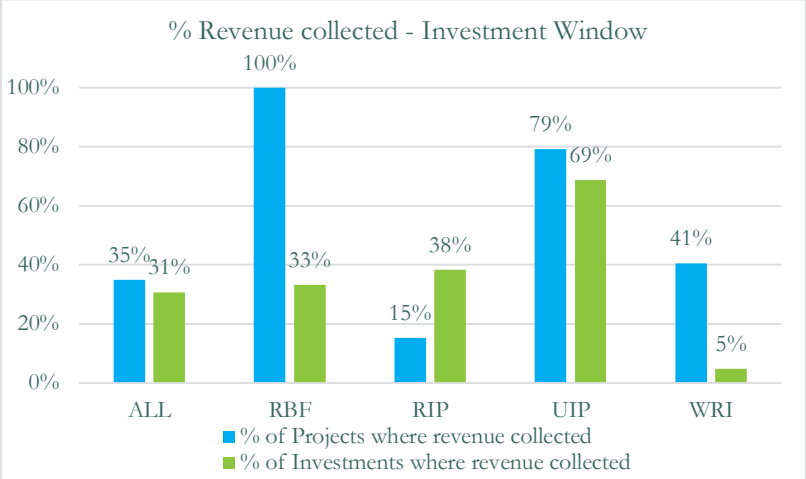


Figure 42. Revenue collection by investment window for projects and investments separately.

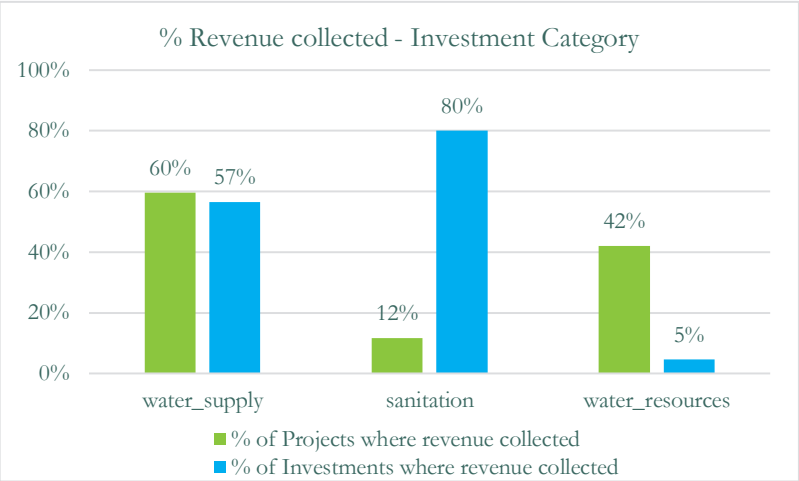


Figure 43. Revenue collection by investment category for projects and investments separately.

Figure 44 presents the percentage of investments and projects collecting revenue for the programmes. The highest percentages for revenue collection are for the urban and RBF programmes (OBA, UBSUP and UPC). For most of the programmes the percentage of revenue collection was higher for the projects than the individual investments, the only exception with MTAP I and UBSUP. For MTAP I, 79% of the projects are sanitation projects for institutional or communal sanitation facilities, which are not expected to collect revenue. Out of the 324 investments monitored under MTAP I, only 18 investments were expected to collect revenue, of which 10 were water kiosks, 6 were animal troughs, one was a water pan and one a RWH tank.

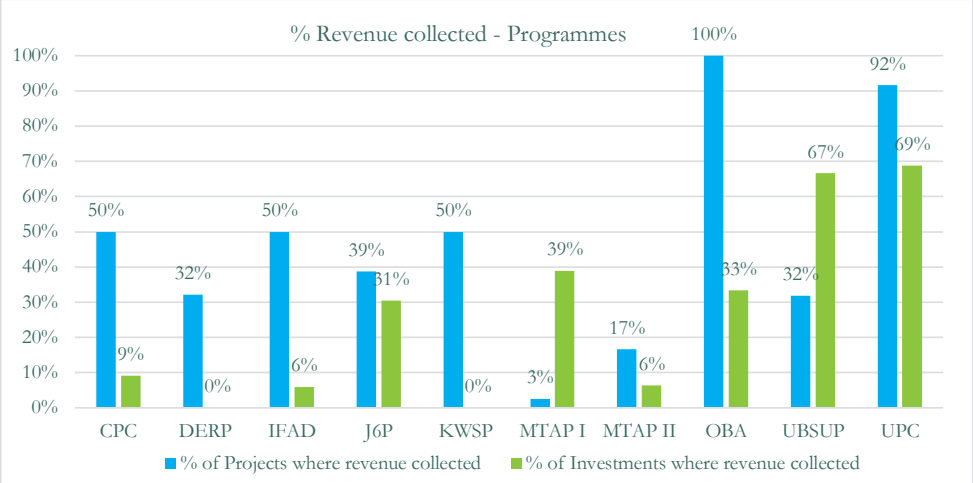


Figure 44. Revenue collection by programme for projects and investments separately.

Revenue was collected in 57% of water supply investments, with 0% of animal troughs (20 investments), 33% of stand pipes (3 investments) and 61% of water kiosks (257 investments) (Figure 45).

For sanitation investments 80% collected revenue, with 67% of Decentralised Treatments Facilities (DTFs) (6 investments) and 84% of PSFs (19 investments) (Figure 46). The DTFs are expected to collect revenue on the discharge from the exhausters as they bring the sludge to be treated. Another potential revenue stream for the DTFs would be the by-products for the use of farming, but this has not yet been realized in the 6 DTFs monitored.

For water resources investments, the revenue question was asked for tree planting, energy saving jikos, water resources management structures (RWH pans, dams, djabias, tanks, spring protection and livestock troughs) and livelihood activities (Figure 47). From the livelihood activities, 50% of bee hives (4 investments) and 33% of fish ponds (3 investments) collect revenue. For tree nurseries, 42% of investments were found to be collecting revenue 19 investments). Meanwhile, none of the rainwater harvesting structures were found to be collecting revenue. A lot of more capacity building support is required to have the WRUAs to start generating income with the activities listed in Figure 47.

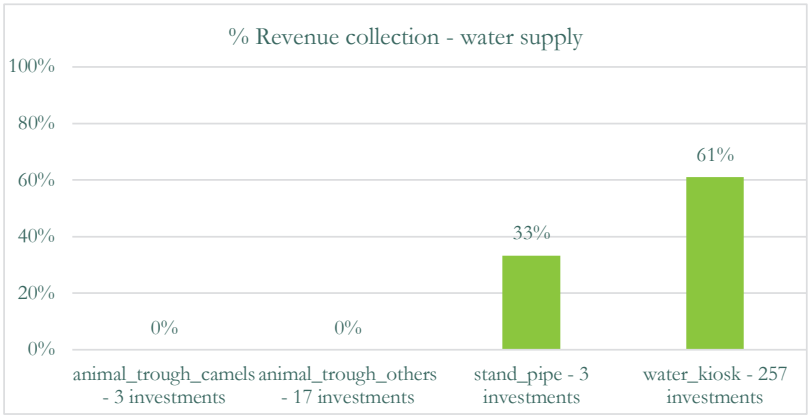


Figure 45. Revenue collection by water supply investment types.

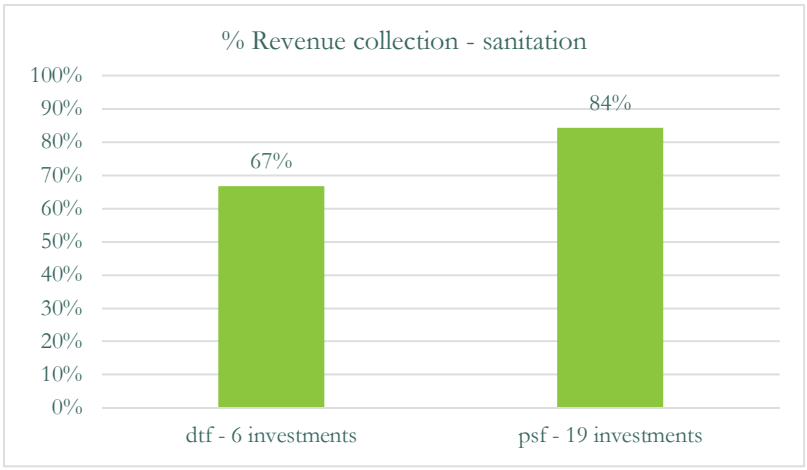


Figure 46. Revenue collection by sanitation investment types.

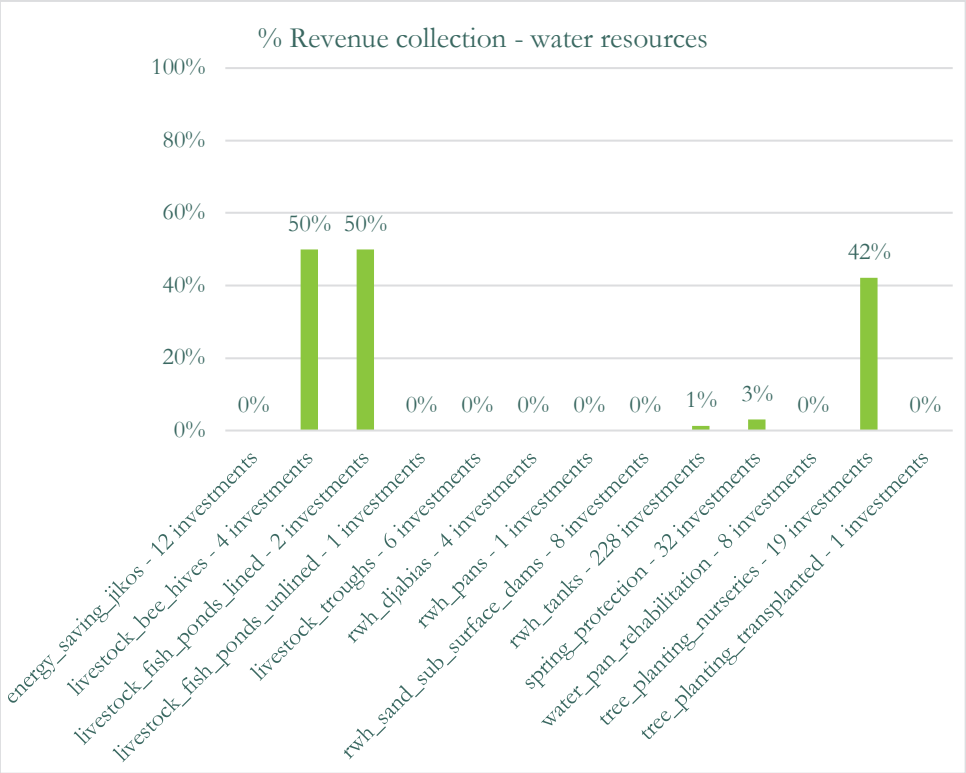


Figure 47. Revenue collection by water resources investment types.

3.6 Beneficiaries

The data for beneficiaries was collected on specific investments including distribution systems (water kiosks, stand pipes, yard taps, other communal water points, individual connections, industrial connections and institutional connections) and sanitation (institutional sanitation, community sanitation, household sanitation and PSFs). The beneficiary data was also collected for the overall projects. It should be noted that the beneficiaries are estimated by the enumerators on the ground, and the integrity of the data depends on the ability of the enumerator to interrogate the information on each project/investment accurately.

When looking at access points and household sanitation facilities, according to the data collected, the percentage of female beneficiaries are approximately 50% across all investments (Table 5). The generally higher percentage of female beneficiaries for water kiosks and yard taps can be connected to the fact that women are commonly those that look after the water supply and management in the households, and are thus the ones to collect water from the access points. On household level (individual connections and household sanitation), the whole household is seen as a beneficiary, corresponding to approximately 50% of male and female beneficiaries. The percentage of minors as beneficiaries generally ranges between 6% (PSFs) and 45% (distribution systems) of total number of beneficiaries. The exception is the institutional sanitation, which includes mostly schools, where the percentage of minors is as high as 90% of the total number of beneficiaries.

The average beneficiaries per investment are also presented in Table 5. Generally it was found that the kiosks and yard taps serve approximately 1,100-1,300 beneficiaries per investment, though it should be noted that this may vary largely between the rural and the urban contexts. On average, there were 16 beneficiaries for individual connections and 8 per household sanitation door. The 16 beneficiaries per connection seems fairly exaggerated, unless almost all connections are shared by 2-3 families. Based on the estimates from the ground, each institutional sanitation door had 71 beneficiaries on average, though the actual number should be 25-30 pupils per door. The PSFs had an average of approximately 7,000 beneficiaries, which is a likely to be an exaggerated figure, as the PSFs are more likely to serve approximately 450-600 beneficiaries per day. Two PSF projects, one in Taita Taveta and another in Kiambu were claimed to have 60,000-84,000 beneficiaries, which is completely inaccurate, and were therefore removed from the analysis.

Table 5. Number of beneficiaries per investment type.

Investment type:	No of investments	Beneficiaries per investment	Total number of beneficiaries	Female beneficiaries	Minors below Age 18
Water kiosk	257	1295	332908	236215	103490
Yard tap	54	1078	58210	40913	26986
Individual connection	94	16	1546	830	671
Household sanitation	113	8	3347	1633	1164
Institutional sanitation	329	71	68320	32072	61458
Community sanitation facility	35	873	30562	13653	5764
PSF	19	6766	128545	39880	7306

Figure 48 presents the beneficiary number for all the projects per county, separately for sanitation, water supply and water resources projects. As a measure of data cleaning, the projects with estimated beneficiaries of above 100,000 were removed, as they were considered unrealistic estimates for the sizes of projects in question.

The counties with highest numbers of beneficiaries were Muranga with 135,000 beneficiaries from 15 monitored projects, Garissa with 110,000 beneficiaries from 47 monitored projects, Kirinyaga with 104,000 beneficiaries from 12 projects and Lamu with 82,000 beneficiaries from 66 projects. The largest number of beneficiaries were most commonly estimated to be with the water resources projects, as the beneficiary numbers are more difficult to estimate for example for activities such as tree planting or installation of early warning systems, and therefore the entire estimated population of the sub-catchment may have been written down as the beneficiary number.

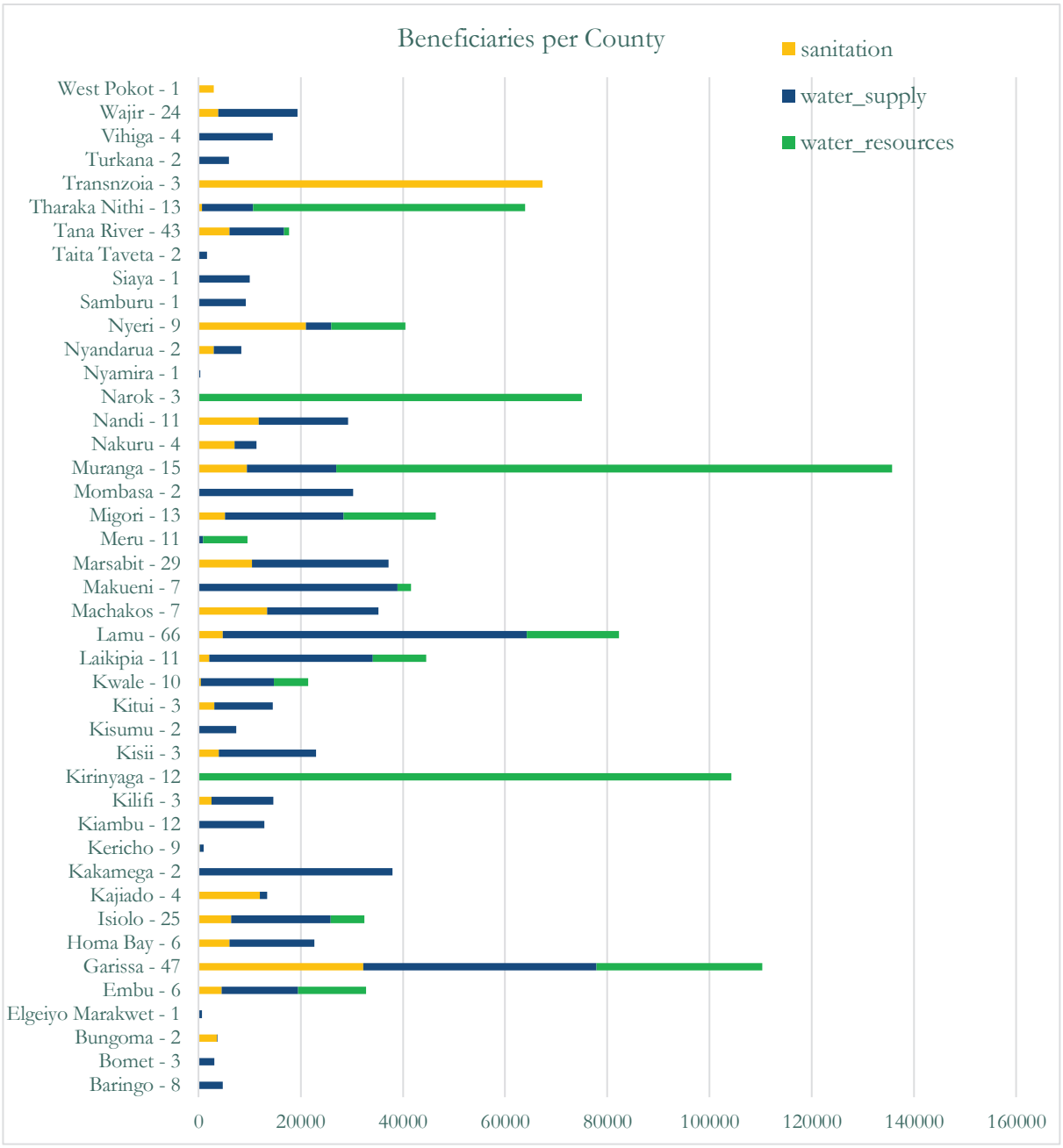


Figure 48. Beneficiaries per County separately for sanitation, water supply and water resources projects. The number indicated after the county name is the number of projects monitored in the county.

3.7 Cross-cutting issues

3.7.1 Gender Equality and Social Inclusion

The Gender Equality and Social Inclusion (GESI) aspects for the investments are captured by three main parameters, namely;

1. Dis-aggregated data for number of beneficiaries (specific to access points and household sanitation);
2. Whether or not the design of the facility is provisional to people with disability / gender / age (specific to water kiosks, yard taps and sanitation facilities), and;
3. Whether or not the operations responsibility of an investment is also allocated for Youth, Men, Women or the Disabled.

The dis-aggregated data for number of beneficiaries was presented in the previous chapter.

The design of facilities should facilitate equitable access and use for women, men, minors and those with disabilities. The technical designs for sanitation facilities should reflect the needs of women and men and should address their specific needs and concerns. These concerns include siting of facilities, safety, security, health, hygiene, privacy and convenience. The sanitation facility should also respond to female biological needs such as menstrual hygiene management (MHM) that impact the health and mobility of women. While poor design can affect everyone, they are groups of people who are more vulnerable than others and they include persons with physical challenges, pregnant women, children, the elderly and the sick.

Also water collection falls directly on women and children and therefore the technical designs for water kiosks should meet their needs. Any water supply intervention must respond to the need to free up time that those who collect water spend on water collection activities for other productive tasks as well as guarantee security of the women and children. Any sanitation technology or water collection point thus must be assessed from the perspectives of gender equality and inclusivity. These aspects were covered during the training of the enumerators to ensure the collection of accurate data, so that the enumerators are aware of the aspects that they need to look out for to evaluate whether or not a facility is provisional to disability/gender/age. It should be noted though that no guidelines were given to the enumerators on how to evaluate whether or not a facility is provisional to gender, age or disability, and should be done in JAOME 2019.

For JAOME 2018, 33% of the 9 RBF investments, 73% of the 442 rural investments and 61% of the 349 urban investments were considered provisional to gender (Figure 49). Considering the needs of children and elderly, the respective figures were 33%, 61% and 60%. What is notable though is that majority of the technical designs do not take into consideration the needs of the people with disabilities. When comparing different investment types, the PSFs seemed to be designed especially well in terms of the needs of people of different ages, of gender, and of disabilities.

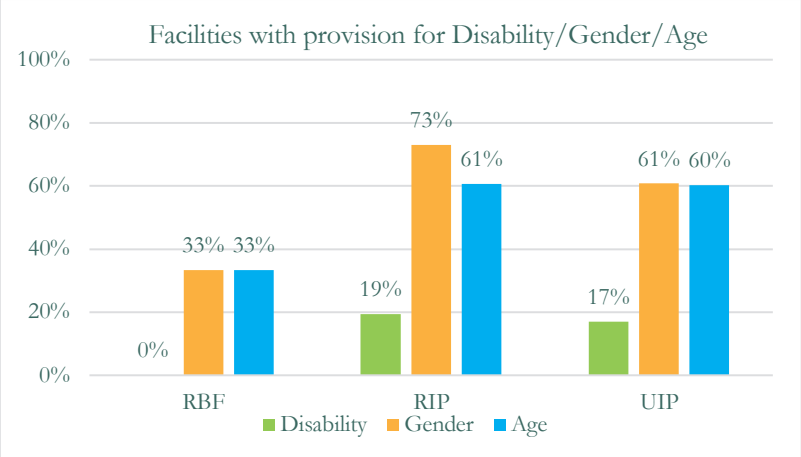


Figure 49. % of facilities having provision for disability/gender/age by investment window.

Figures 50 and 51 present the same data for distribution systems and sanitation facilities respectively. The monitored distribution systems were: 3 No. stand pipes, 257 No. water kiosks, 54 No. yard taps and 1 No. communal water point. The data shows that the water kiosks are more commonly provisional to gender and age than to people with disabilities.

For sanitation facilities the monitored investments included 19 No. PSFs, 33 No. community sanitation facilities, 113 No. household sanitation and 320 No. institutional sanitation. The facilities were more commonly provisional to disability/age/gender in cases of PSFs, which have been carefully designed to take the accessibility and usability into consideration. This is not the case often for households and institutions. Especially the institutional sanitation should not be considered for funding without a design that ensures that the facilities are appropriate to use for all patients, in case of health centers, or all pupils, in case of schools.

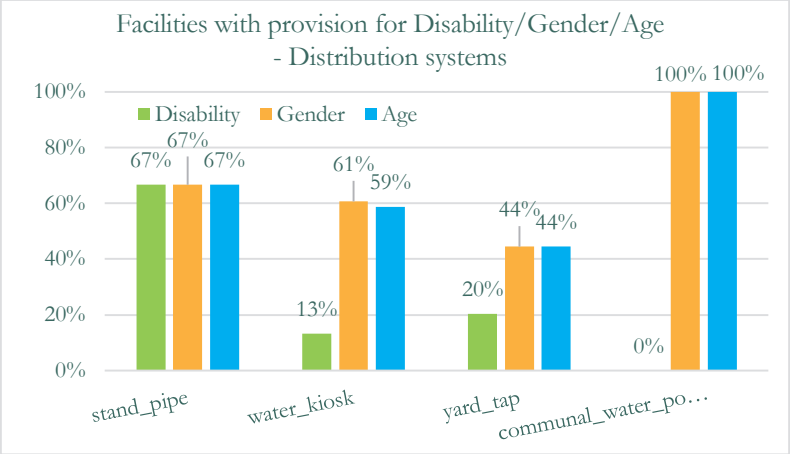


Figure 50. % of facilities having provision for disability/gender/age by investment type – Distribution systems.

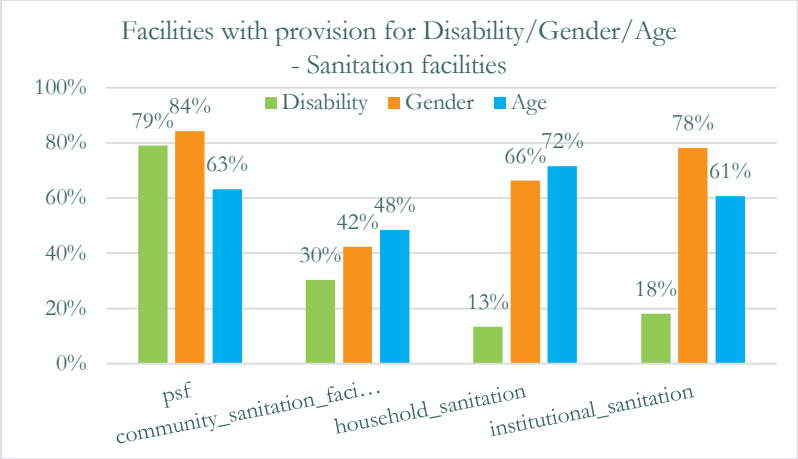


Figure 51. % of facilities having provision for disability/gender/age by investment type – Sanitation facilities.

The third parameter for assessing the aspects of GESI was the question of primary operations responsibility. Figure 52 shows that generally it is more common for men to have the operations responsibility for RBF investments, and for women in rural and urban investments. It is very rare to have youth or disabled included in the running of water supply or sanitation investments.

When looking at key investment types, women are more often primarily responsible for the running of water kiosks (61%) and PSFs (53%) than men (Figure 53). DTFs are primarily run my men (67%).

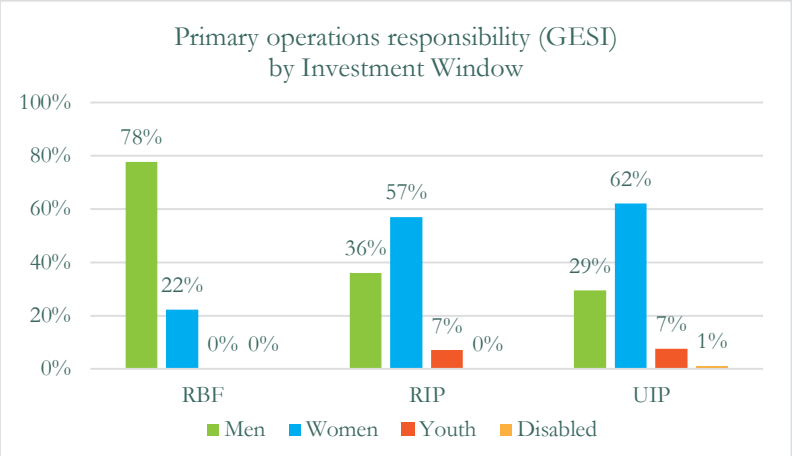


Figure 52. Primary operations responsibility (GESI) by investment window.

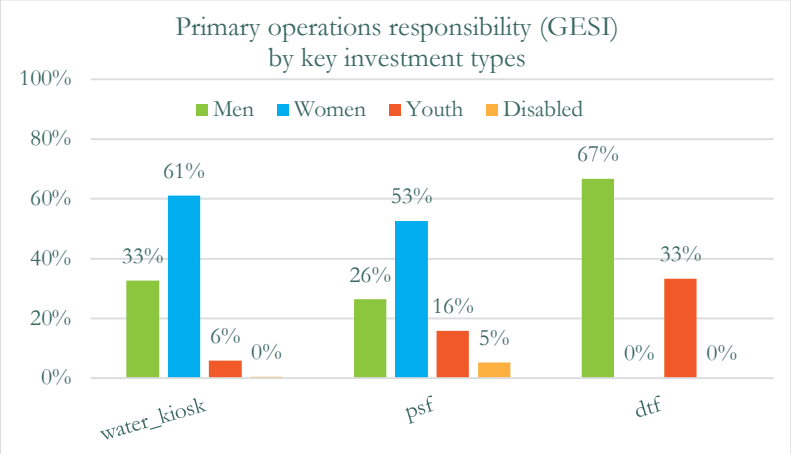


Figure 53. Primary operations responsibility (GESI) by key investment types.

Figure 54 shows that the facilities are more commonly operational if primarily run by youth, followed by women and men. Only two investments were primarily ran by people with disabilities. An investment being primarily run by youth or women improved the rate by revenue collection (Figure 55). These two parameters are key for the calculation of the SI.

The positive impact on the sustainability score from involvement of women in operational tasks goes hand in hand with a common perception that involving women in water and sanitation projects increases their sustainability as the knowledge base increases. As the Fund strives to provide an increased focus on enhancing gender and social equity and human rights based approaches in the overall programme design, there should also be a target to capacitate women, members of youth and people with disabilities in the running and management of the schemes.

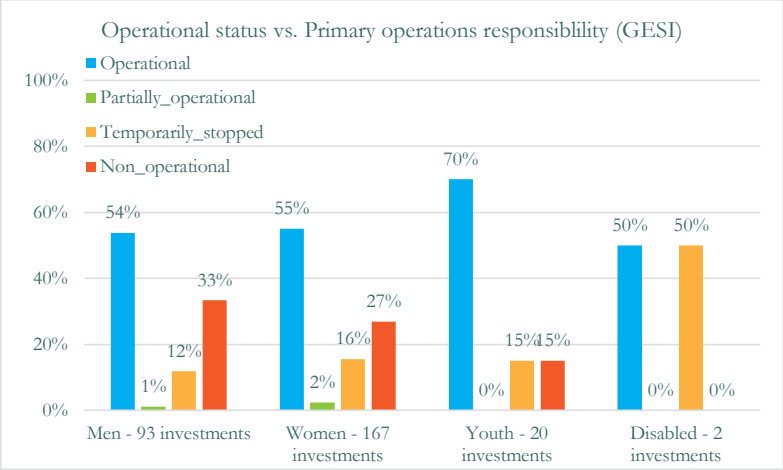


Figure 54. Operational status vs. Primary operations responsibility (GESI).

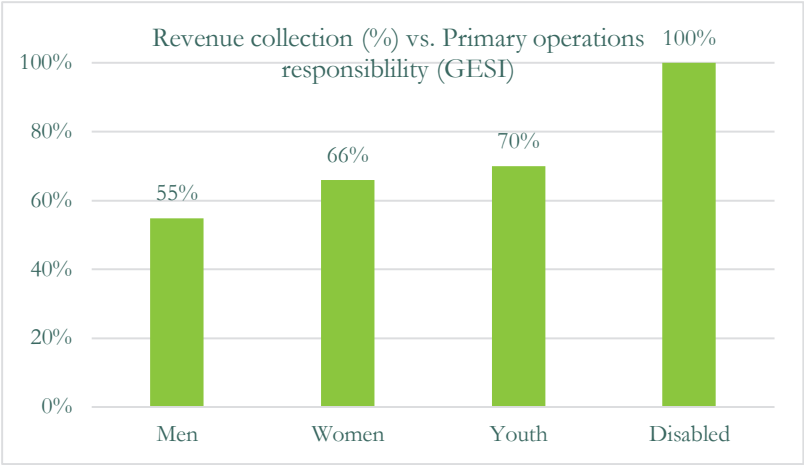


Figure 55. Revenue collection (%) vs. Primary operations responsibility (GESI).

3.7.2 Governance and management of projects

43% of the 443 projects were managed by a Board of Directors, 37% by a committee, 15% by a managing director (MD), followed by employees (2%) and volunteers (2%) (Figure 56). Management by Board of Directors seems to improve the operational status, in comparison to a committee and an MD. Surprisingly, the rate of revenue collection seems to follow an opposite pattern (Figure 57).

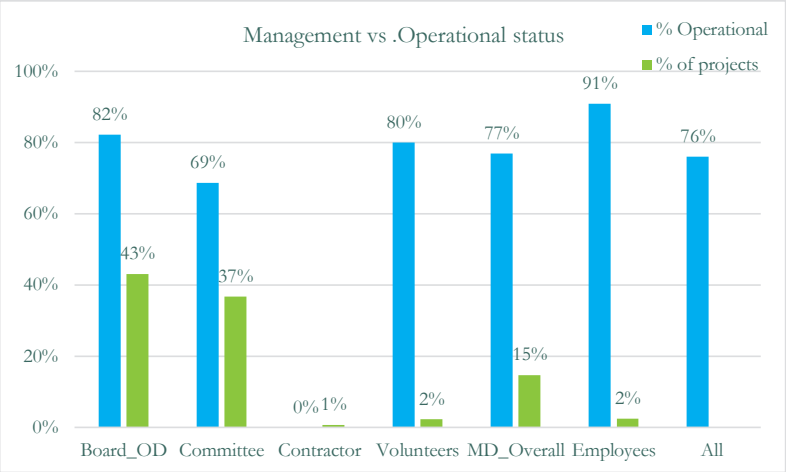


Figure 56. Management of projects vs. operational status.

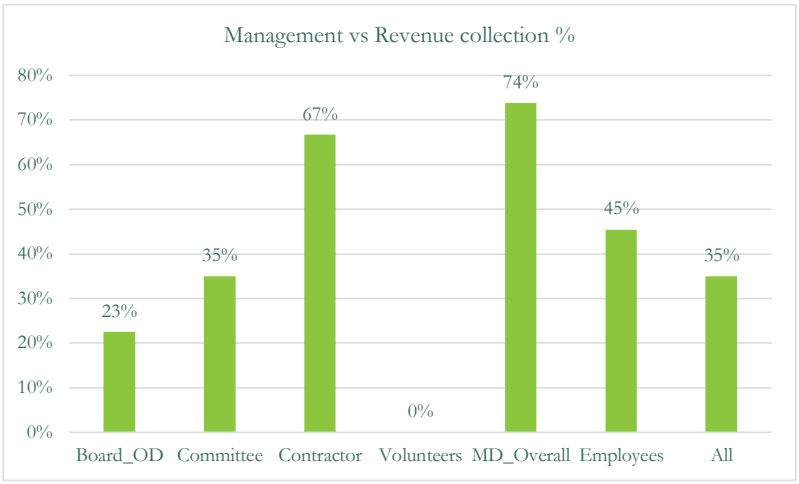


Figure 57. Management of projects vs. revenue collection %.

The projects are mostly maintained by a committee (28% of projects), the WSP/WU/WRUA/CFA (21% of projects), the users (17%), the national government (10%) or employees (6%) (Figure 58). If comparison is made to the with the operational status vs. maintenance responsibility of a facility, there seems to be a slightly better success rate with WSPs/WUs running the projects. Also projects managed by users seem to contribute to a better operational status. Projects maintained by WSP/WU/WRUA/CFA or employees generally collect more revenue (Figure 59).

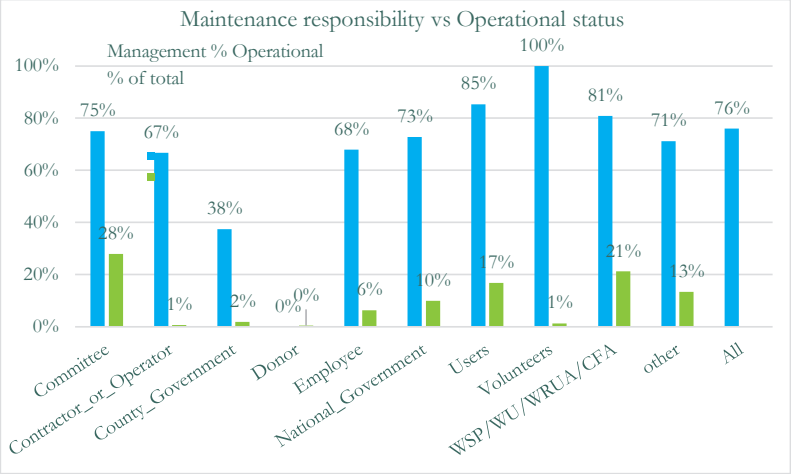


Figure 58. Maintenance responsibility vs operational status.

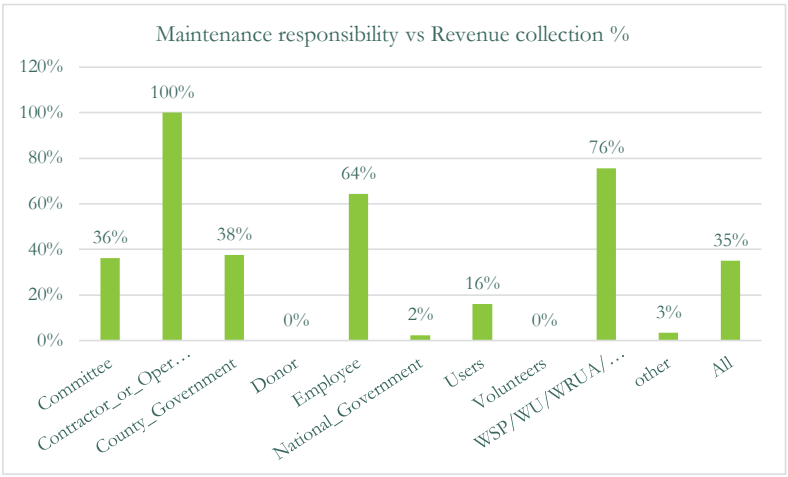


Figure 59. Maintenance responsibility vs. Revenue collection %.

4

SUSTAINABILITY OF THE PROJECTS

The sustainability index (SI) was developed as a key performance metric to facilitate assessment and monitoring of sustainability of investments. This index was established already for the JAOME 2016, and has been calculated each year as a key quantitative performance measure to facilitate the assessment and monitoring of sustainability of investments to support progress evaluation over time and the development of appropriate response measures. For the purposes of the assessment, sustainability was defined as the ability of an investment to realize the objectives within 5 years of operation.

The Sustainability Index score is between 0 - 100%, with 100% depicting a high sustainability rate of the investments. The highest weight (50%) was allocated to revenue collection based on the fact that without revenue collection, the investment does not have long term sustainability. Functionality, i.e. the operational status, is a key attribute to describe the status of the services and was allocated the weight of 25%. The age and survival rate of the investment was allocated a weight of 15%. The condition of an investment was allocated a smaller weight (10%) since the condition is, while important, less essential for the usability and sustainability of the facility. The four indicators that contribute to the sustainability index are:

1. **Revenue Collection:** % of investments collecting revenue (weight 50%);
2. **Operational Status:** % of investments operational (weight 25%);
3. **Age-Survival:** % of over two-year old investments still fully operational (weight 15%), and;
4. **Good Condition:** % of investments in good condition (weight 10%).

In this section the sustainability index is presented for the counties, by programme and by key investment types. In addition, a comparison is made to the 2016 and 2017 JAOME findings.

4.1 County Sustainability Index

The County Sustainability Index (CSI) is calculated using the four indicators described above and in Section 2.6.1. The CSI ranks all the counties based on the composite index calculated for all the monitored investments (Rural, Urban, Water Resources and RBF) in each county (Figure 60). Figures 61-63 present the CSI for the Urban and RBF, Rural and Water Resources separately.

The results for the CSI show that there is a large variance in terms of the sustainability of investments across the counties. Figure 60 below shows the ranking for all the Counties with more than 10 monitored investments, giving the highest score for Transnzoia (97%), Elgeiyo Marakwet (94%), Nyandarua (91%), Kericho (91%) and Kitui (91%). Counties with less than 10 monitored investments were excluded from the analysis as the sample was considered too small to be representative for a comparison with other counties. In all the 12 top performing counties all the projects were funded through the urban investment window. The highest ranking county with other projects outside of the urban investment window was Nandi with an overall CSI of 76%.

The five lowest ranking counties were Samburu (0% CSI with 16 monitored investments), Nyamira (14% CSI with 11 investments), Wajir (26% CSI with 54 investments), Narok (27% CSI with 23 investments) and Garissa (27% CSI with 85 investments). Samburu has 16 urban investments under one project, the Milimani-Lporos Area Water Project, which was found fully non-operational due to the system requiring a pump from the county. Nyamira had 11 investments from one project, Ikonge Water Project, which was found non-operational. Wajir had 24 water supply and sanitation projects with altogether 54 investments under the MTAP I and MTAP II programmes, where none of the water supply investments were found collecting revenue. Narok had 3 water resources projects with altogether 23 investments with no revenue collection. Finally Garissa had 51 monitored projects with 85 investments with a mixture of sanitation, water supply and water resources projects. The common issues in the county were low operational status and no revenue collection.

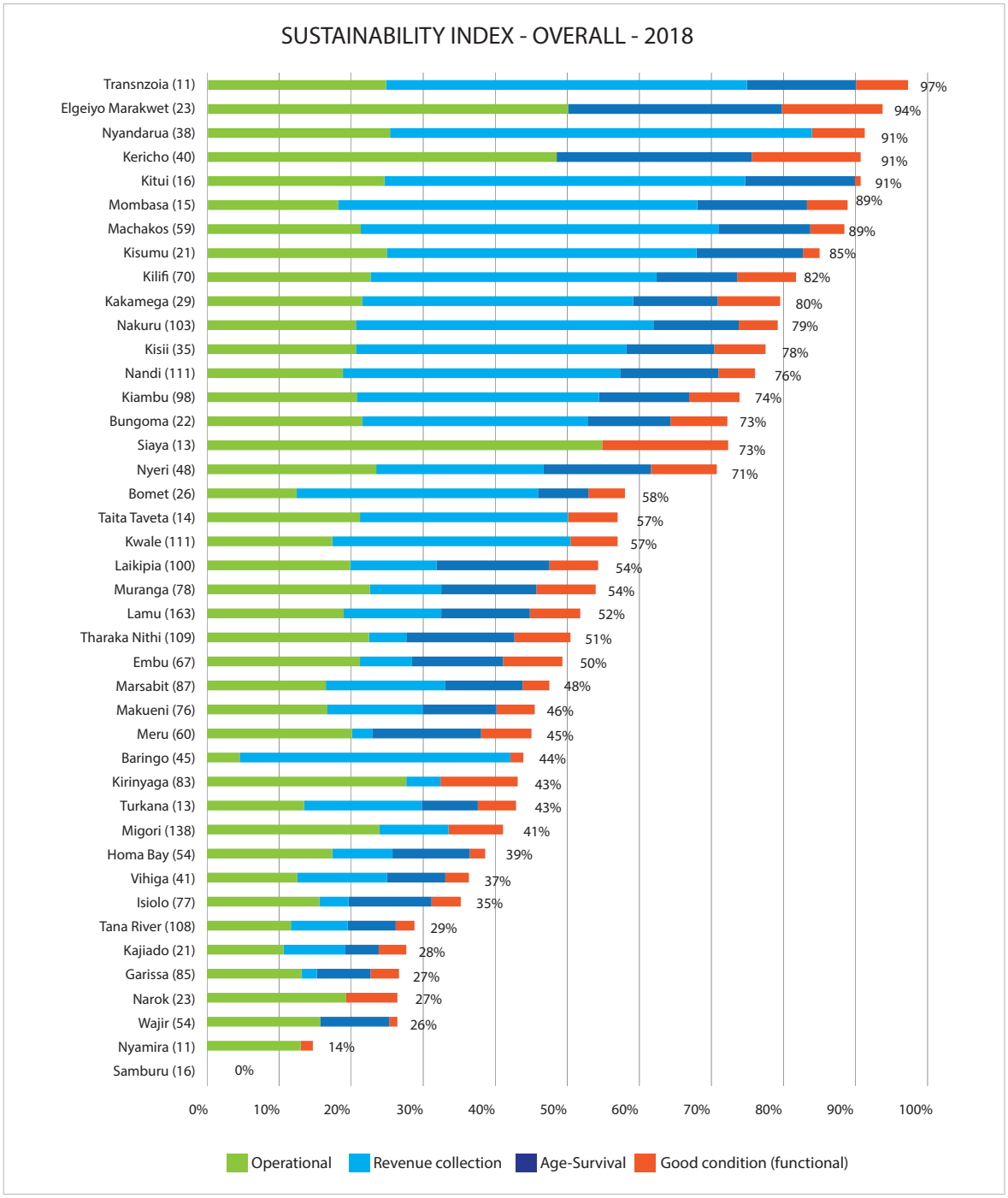


Figure 60. County sustainability index (CSI) 2018 for counties with a sample size of above 10 investments (number in brackets indicates the number of sampled investments in each county).

Figures 61 - 63 present the results for the CSI separately for each investment window, for the UIP and RBF, the RIP, and the WRI, respectively.

The top four performers based on the sustainability criteria for Urban investments were Nyeri (100%), Isiolo (99%) and Tharaka Nithi together with Meru (both 98%). All of these Counties reached a score of 98% or above with 100% revenue collection rate. Counties with less than 10 monitored investments were excluded from the analysis.

The best performers for Rural projects were Tharaka Nithi (97%), Laikipia (94%) and Nandi (76%). All of these Counties reached a score of 76% or above, with two above 94%. Counties with less than 10 monitored investments were excluded from the analysis, leaving 14 Counties to be scored with the CSI under rural investments.

Finally, for Water Resources Investments the best performing counties were Nyeri (54%), Kirinyaga (43%) and Muranga (40%). All of these Counties reached a score of 40% or above. Again, counties with less than 10 monitored investments were excluded from the analysis, leaving 14 Counties to be scored with the CSI.

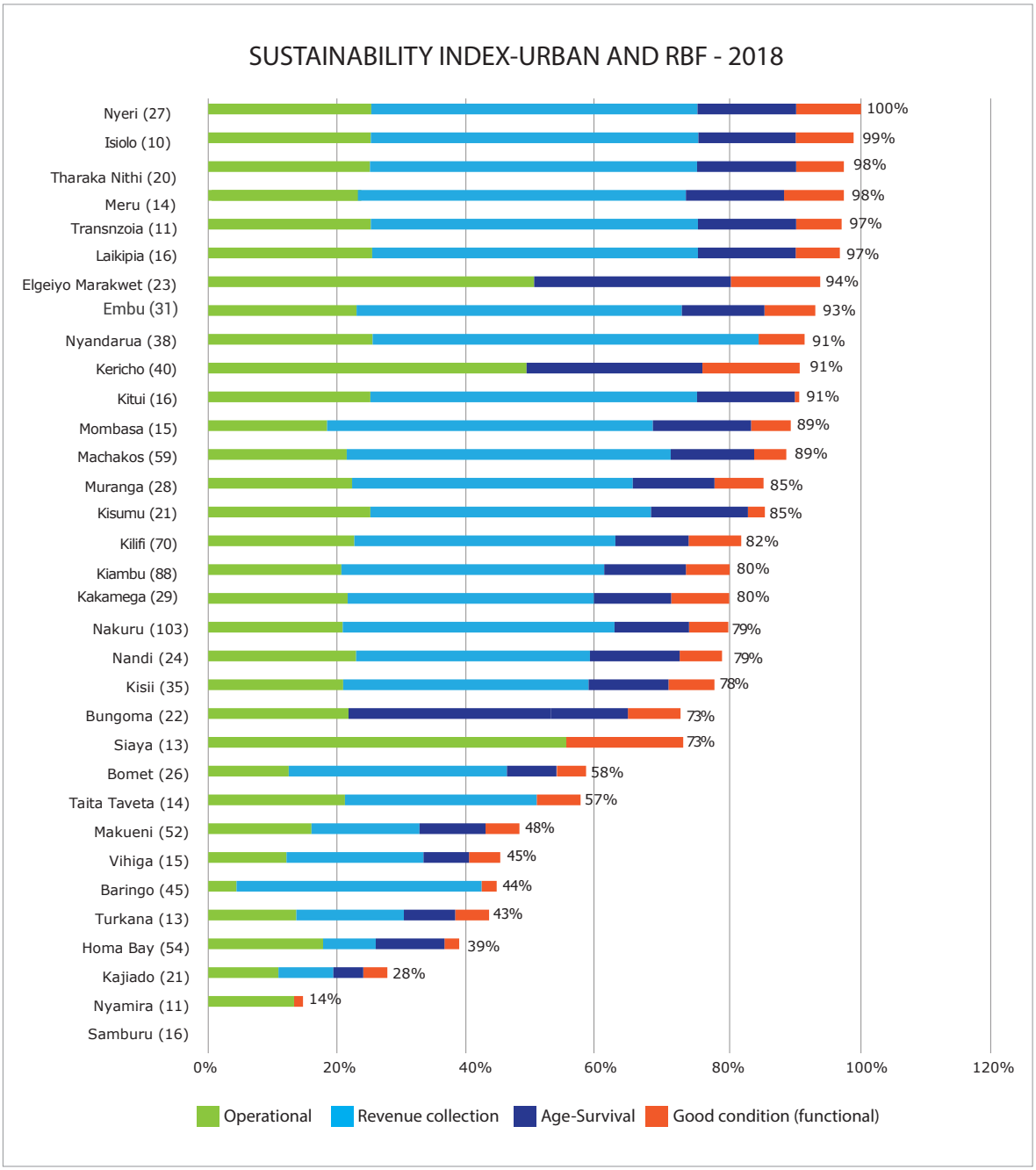


Figure 61. County sustainability index (CSI) 2018 for UIP and the RBF for counties with a sample size of above 10 investments (number in brackets indicates the number of sampled investments in each county).

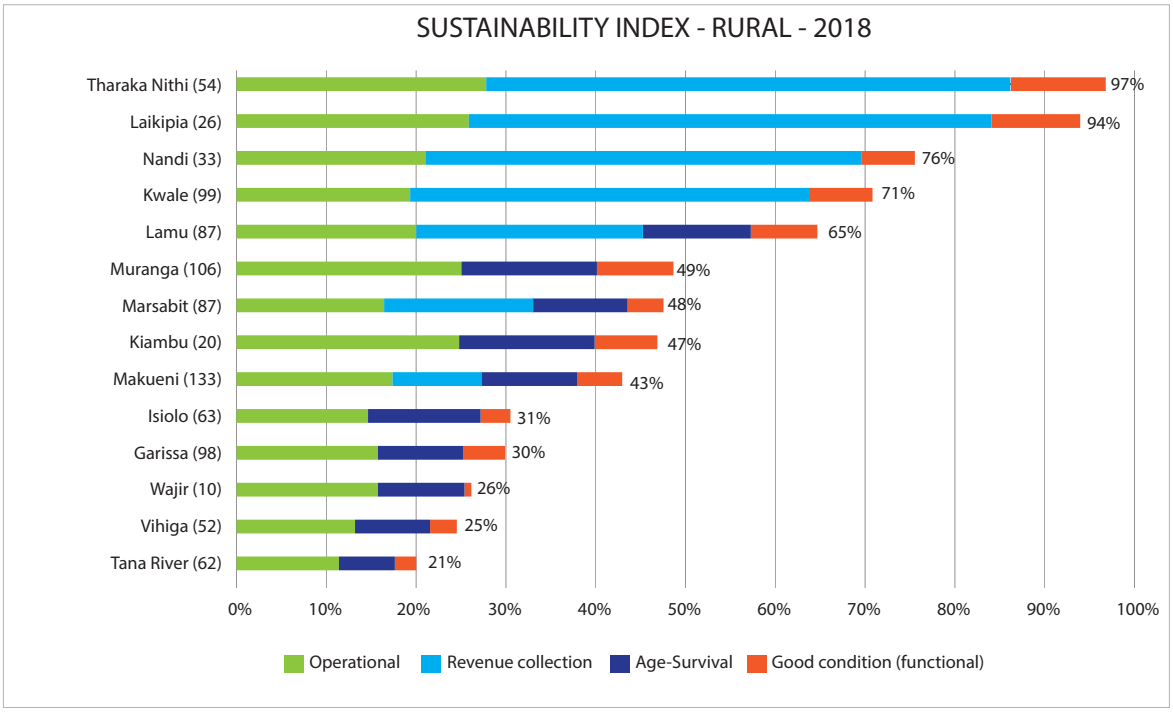


Figure 62. County sustainability index (CSI) 2018 for RIP for counties with a sample size of above 10 investments (number in brackets indicates the number of sampled investments in each county).

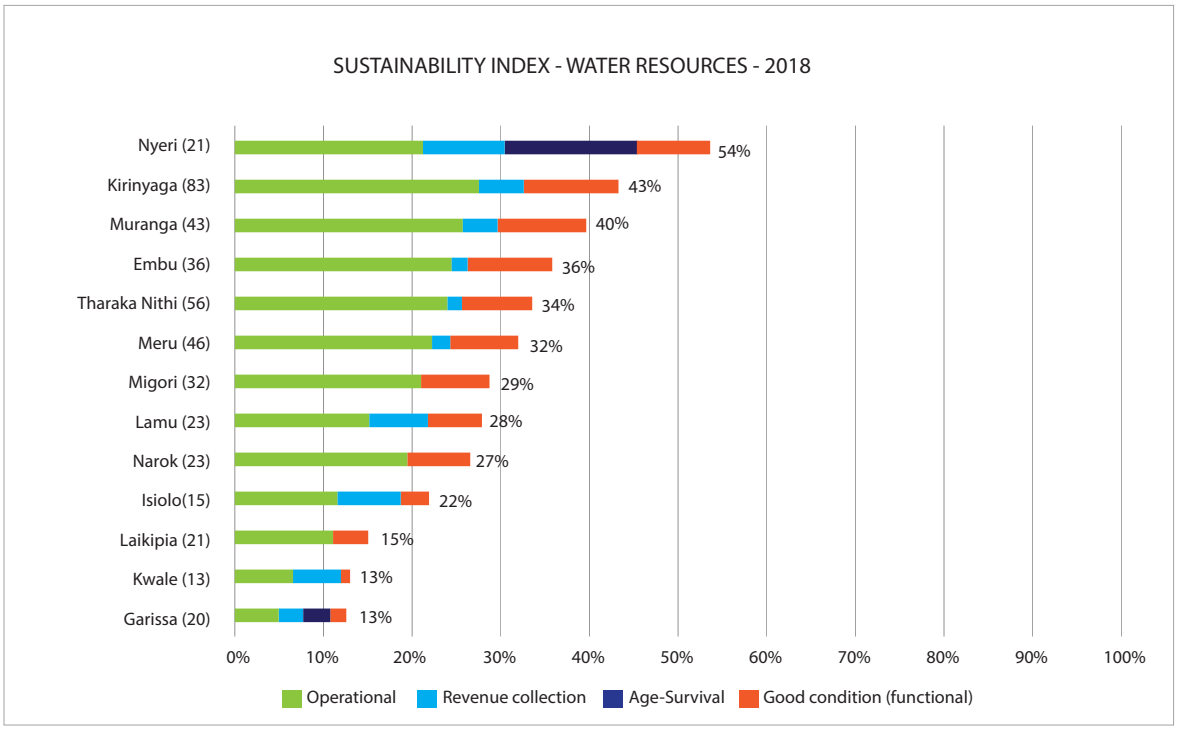


Figure 63. County sustainability index (CSI) 2018 for WRI for counties with a sample size of above 10 investments (number in brackets indicates the number of sampled investments in each county).

It should be noted that while the SI can be used as indicative of the sustainability of investments in counties, it cannot be used as the sole indicator to determine future investments, as the nature of the projects determine performance of the county, together with other factors such as the governance of the county and the capacity of the implementing partner, whether it's a CBO, WU, WSP, WRUA or CFA.

4.1.1 County Flagging on the Basis of the Sustainability Index

The JAOME 2018 among other objectives sought to assess the level of sustainability of investments as well as flag the Counties that would be determined as having low levels of sustainability. In addition to the County level assessments, the National Level average was assessed and any County with an index of less than 70% of the National Average is red flagged. Only counties with more than 10 investments monitored were included in the comparison.

While some comparison can be carried out in terms of the CSI scores, some reservation to the interpretation of the results should be granted. There is a clear difference between the performance of counties which had more urban projects and those which had more rural projects, the former generally performing better than the latter. The CSI thus depends largely on the type of investments that are monitored that specific year. However, counties performing consistently well or poorly based on the SI helps in the consideration for future WSTF support, but observing this requires a long-term and systematic monitoring.

The National Average sustainability index was 50% and based on the predetermined criteria (any County with an index of less than 70% of the National Average), 70% of the National Average was 35%, essentially meaning that the classification would be as follows:

*Table 6. Performance criteria for County Flagging. *CSI= Aggregate total of each County*

Performance Criteria	Flagging categories	Flagging status
A county with an SI above 80% of the National Average; *CSI≥80%	A county with an SI above 40%	Green
A county with an SI between 71% and 79% of the National Average; 70%>*CSI<80%	A county with an SI between 35% and 40%	Yellow
A county with an SI below 70% of the National Average; *CSI<70%	A county with an SI below 35%	Red

Based on the classification of the flagging system presented in the table above, the counties were ranked as presented in Table 7, which also shows the change in the ranking since 2017. Out of the top 10 performing counties, six were amongst the top performing counties also in 2017, these were: Elgeiyo Marakwet, Nyandarua, Kericho, Kisumu, Kilifi and Kakamega. Out of the red flagged counties, only Wajir has been red flagged in two consecutive years.

To improve the sustainability of the projects, WSTF in appraising and determining future investments would ideally require the Counties' and specific projects to implement sustainability improvement measures before or during contract awards. This would ensure that future investments are sustainable and reported outcomes and impacts are realised and enjoyed for a long time.

Table 7. County Flagging on the Basis of the Sustainability Index.

Ranking of Counties based on CSI 2018	Ranking of Counties based on CSI 2017	Ranking of Counties based on CSI 2016	Flagging status
1. Transnzoia 2. Elgeiyo Marakwet 3. Nyandarua 4. Kericho 5. Kitui 6. Mombasa 7. Machakos 8. Kisumu 9. Kilifi 10. Kakamega 11. Nakuru 12. Kisii 13. Nandi 14. Kiambu 15. Bungoma 16. Siaya 17. Nyeri 18. Bomet 19. Taita Taveta 20. Kwale 21. Laikipia 22. Muranga 23. Lamu 24. Tharaka Nithi 25. Embu 26. Marsabit 27. Makueni 28. Meru 29. Baringo 30. Kirinyaga 31. Turkana 32. Migori	1. Nyandarua 2. Migori 3. Turkana 4. Kakamega 5. Kisumu 6. Narok 7. Elgeyo Marakwet 8. Kilifi 9. Siaya 10. Kericho 11. Machakos 12. Tharaka Nithi 13. Kiambu 14. Nyeri 15. Kajiado 16. Uasin Gishu 17. Makueni 18. Muranga 19. Kitui 20. Laikipia 21. Embu 22. Bungoma 23. Isiolo 24. Lamu 25. Homa Bay 26. Nakuru 27. Tana River	1. Mombasa 2. Kericho 3. Nandi 4. Embu 5. Nyandarua 6. Kakamega 7. Kitui 8. Busia 9. Machakos 10. Kiambu 11. Bomet 12. Homa Bay 13. Uasin Gishu 14. Nyeri 15. Muranga 16. Kajiado 17. Laikipia 18. Kisumu 19. Kilifi 20. Tharaka Nithi 21. Siaya 22. Kisii 23. Transnzoia 24. Makueni 25. Samburu 26. Isiolo 27. Marsabit 28. West Pokot 29. Vihiga 30. Lamu 31. Wajir	Green
33. Homa Bay 34. Vihiga 35. Isiolo	28. Vihiga 29. Kisii 30. Garissa 31. Baringo	32. Turkana 33. Baringo 34. Nakuru	Yellow

36.	Tana River	32.	Wajir	40.	Garissa	Red
37.	Kajiado	33.	Kirinyaga	41.	Tana River	
38.	Garissa	34.	Marsabit	42.	Bungoma	
39.	Narok	35.	Mombasa	43.	Meru	
40.	Wajir	36.	Meru	44.	Elgeyo Marakwet	
41.	Nyamira			45.	Mandera	
42.	Samburu			46.	Narok	

4.2 Sustainability Index by Investment Window

The SI for the visited 1037 urban and RBF investments in JAOME 2018 was found to be 70%, with a slight reduction of 1% from year 2017, when the SI was 71% (Figure 64). The revenue collection rate remained the same, whereas the operational status and age-survival were slightly improved. Meanwhile, the percentage of investments in good condition reduced by 13% from the previous year. This may be resulting from the fact that there was a lower percentage of new investments under the urban and RBF investments, resulting in a slight deterioration in condition.

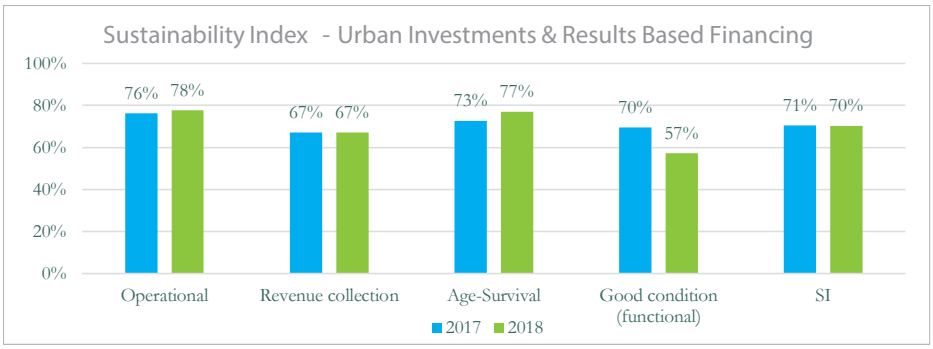


Figure 64. Sustainability Index for urban investments and Results Based Financing.

The SI for the visited 937 rural investments in JAOME 2018 was found to be 52%, with a significant improvement from year 2017, when the SI for rural investments was 45% (Figure 65). The improvement is largely attributable to the improved operational status of the investments, but all SI indicators for rural investments saw an increase since 2017. The revenue collection indicator was found to be 38%, which is almost the same as the previous year. In terms of functionality, the indicator was 71%, which is a significant improvement from 2017, when it was 56%. The investments were found to be surviving past 2 years as fully operational were 66%, with an improvement of 10%. Finally, the indicator score for good condition was 53%, also with an improvement of 15%. The overall increase in the SI is likely attributable to the large number of new investments monitored under the rural programme, such as Joint 6 Programme and Drought Emergency Programme, both of which had been implemented in 2017/18.

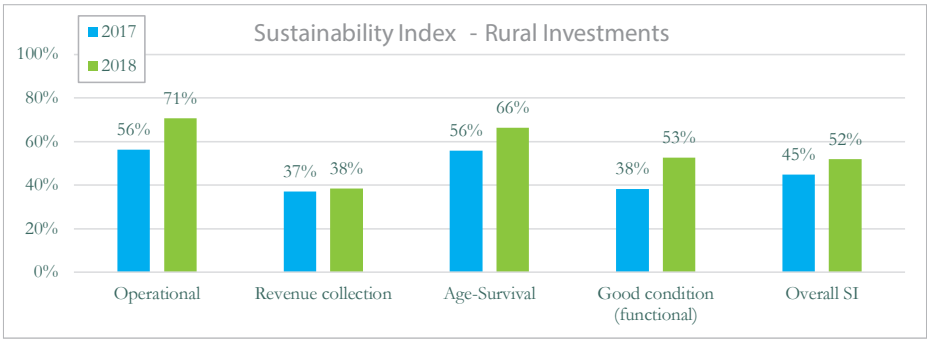


Figure 65. Sustainability Index for rural investments.

The SI for visited 439 water resources investments in JAOME 2018 was found to be 33%, with an improvement from year 2017, when the SI for water resources investments was 31% (Figure 66). The revenue collection indicator was found to be as low as 5%, which is almost the same as in 2017. In terms of functionality, the indicator was 74%, with a significant improvement from 2017. The investments were found to be surviving past 2 years as fully operational were 38%, with a reduction of 21% from 2017. This may indicate that the water resources investments do not have a high survival rate with increasing age. Finally, the indicator score for good condition was 68% with a significant increase of 22% from 2017. The increase in operational status and condition may result from a large increase of new investments monitored under the IFAD programme.

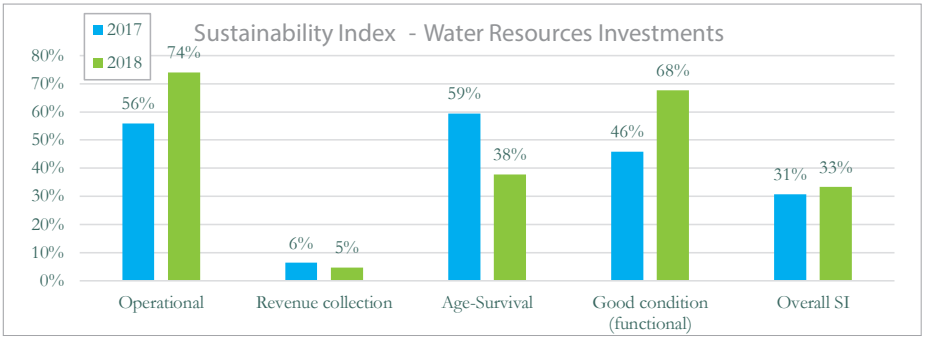
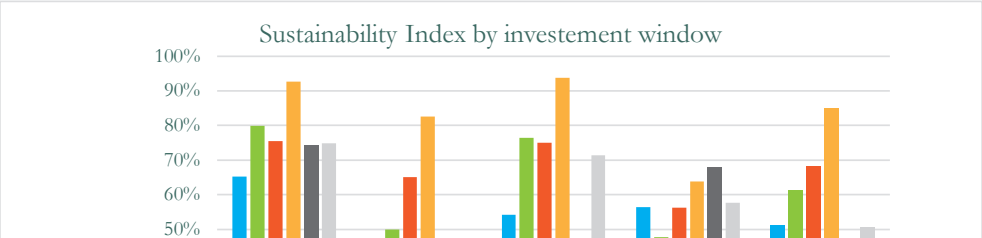


Figure 66. Sustainability Index for Water Resources Investments.

The results show (Figure 67) that the rural investments scored 51% for water supply and 61% for sanitation. Water resources scored 33%. Urban investments reached a higher success rate of SI with 68% for water supply and 85% for sanitation. The performance difference between urban and rural projects is largely related to revenue collection, the primary indicator selected for sustainability, which is higher for urban investments. Similar to the findings in JAOME 2017&2016, the urban investments, due to their connection to the established WSPs, collect revenue leading to a consistently higher SI. This points to the need to build a strong culture of revenue collection for the upcoming rural Water Utilities (WUs).



	Operational	Revenue collection	Age-Survival	Good condition (functional)	SI
Rural Water Supply	65%	42%	54%	56%	51%
Rural Sanitation	80%	50%	76%	48%	61%
Urban Water Supply	76%	65%	75%	56%	68%
Urban Sanitation	93%	83%	94%	64%	85%
Water Resources	74%	5%	38%	68%	33%
Overall	75%	31%	71%	58%	51%

Figure 67. The Sustainability Index (SI) and its four indicators for RIP Water Supply, RIP Sanitation, WRI, UIP Water Supply and UIP Sanitation. The indicators contributing to the SI are the following: Functionality (=facility is operational at the time of visit) of the investment (25%), Revenue Collection (Weight 50%), Age and Survival (operational) rate of an investment (Weight 15%), Condition of an Investment (that is also operational) (10%).

4.3 Sustainability Index by Programme

The Sustainability Index was calculated for each programme separately, presented in Figure 68. The results show that the overall Sustainability Index calculated for all the programmes together was 50%, with DERP (Drought Emergency Response Programme), OBA (Output Based Aid), UBSUP (Upscaling Basic Sanitation for the Urban Poor) and UPC (Urban Projects Concept) scoring higher than average. IFAD (International Fund for Agricultural Development), J6P (Joint Six Programme), KWSP (Kenya Water and Sanitation Programme) and MTAP I (Medium-Term Arid and Semi-Arid (ASAL) Programme) scored approximately 50%, and CPC (Community Project Cycle) and MTAP II well below the average. Next we go through each programme's results in more detail.

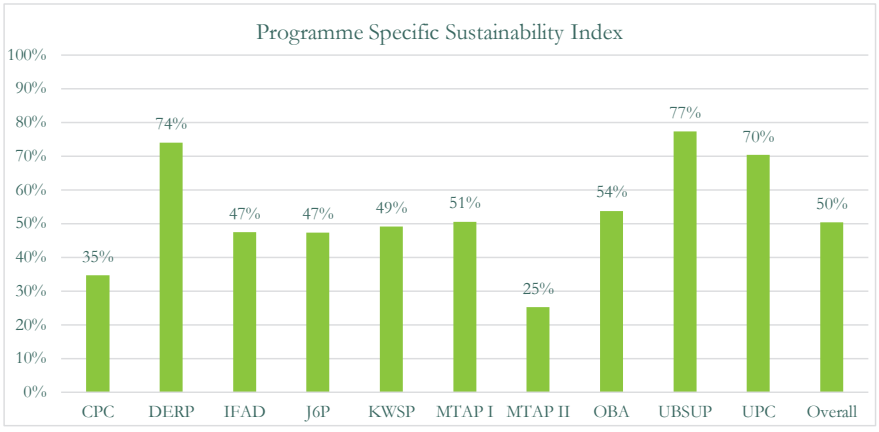


Figure 68. Programme specific Sustainability Index scoring.

4.3.1 Community Project Cycle

The CPC programme scored 35% for the SI, and below average on the Sustainability Index across all the indicators (Figure 69). All the investments were more than 2 years old (funded in 2013/14 or 2014/15), and most of them visited the last time as part of JAOME. The sample included 6 projects in total with altogether 57 investments. Most of the investments were under water supply and sanitation, and two under water resources. The only water resources project visited under the programme was Enoosupukia, with 10 No. spring protection funded, out of which only one was found on the ground.

65% of the investments were found operational at the time of visit, with reasons such as leakages, investments not having been completed, road construction or natural calamities causing the investments not to be fully operational. Of the 10 communal water points, only 1 was collecting revenue to the project (Nthunguni Watsan Project), which reduces the sustainability score significantly.

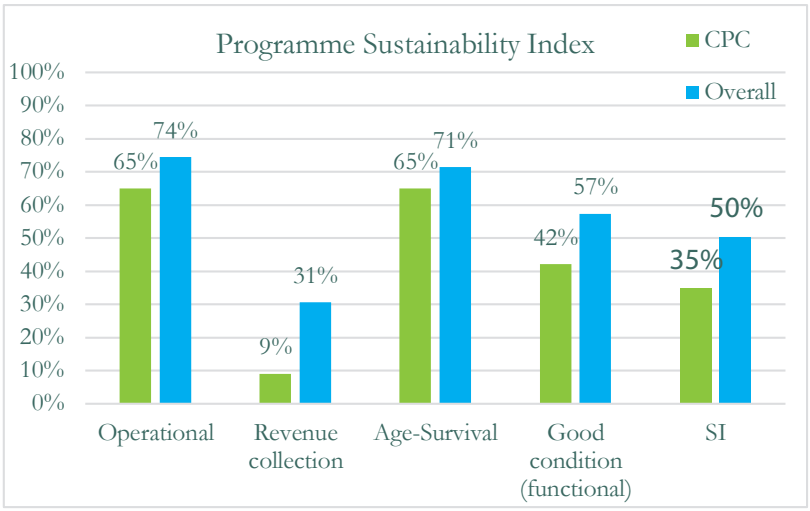


Figure 69. Sustainability Index for the CPC vs. overall results.

4.3.2 Drought Emergency Response Programme

The DERP programme scored 74% for the SI, with above average on operational status and condition of investments (Figure 70). As all the investments monitored were less than 2 years old since the program was funded in 2017/18, and with no investments expected to collect revenue, the calculation of the SI followed adjusted weighting (Operational - 71% and Good condition – 29%). The sample included 26 projects in total with altogether 33 investments. Almost all the investments were under water supply with only one under water resources. A majority of the investments were intakes (21 in total), including 5 boreholes, 7 hand dug wells, and 9 water pans.

76% of the investments were found operational at the time of visit, with reasons such siltation or broken pumps causing the investments not to be fully operational. 70% of the investments were found to be in good condition.

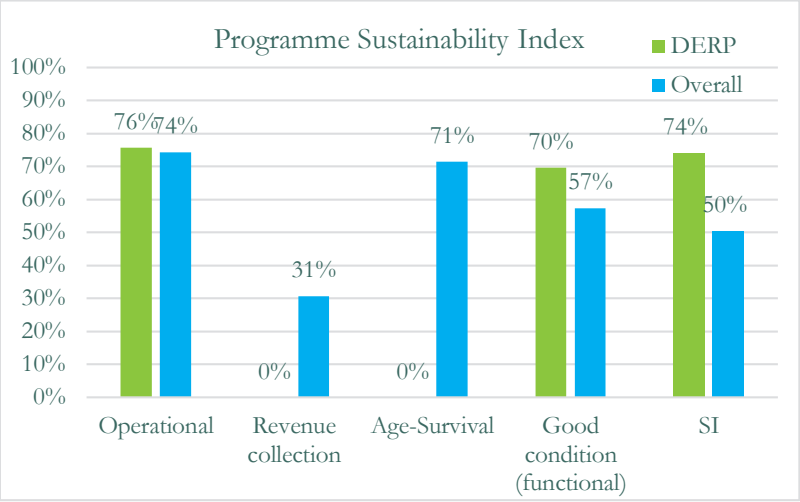


Figure 70. Sustainability Index for the DERP vs. overall results.

4.3.3 International Fund for Agricultural Development

The IFAD programme scored 47% for the SI, with above average on operational status, age-survival rate (meaning the percentage of investments older than 2 years that are still operational) and condition of investments (Figure 71). The sample included 48 projects in total with altogether 280 investments. All the investments monitored were under water resources category, with the following break-down:

Table 8. Break-down of monitored investments for IFAD and their operational status.

Investment type	No monitored	% Operational
RWH tanks	138	92%
Gabions	6	100%
Spring protection	29	93%
Fencing pan	1	100%
Livestock - fish ponds lined	2	100%
Pruning	2	100%
Tree planting- transplanted	38	95%
Energy saving jikos	12	83%
Fire breaks	1	100%
Livestock – fish ponds unlined	1	0%
Installation of early warning systems	4	100%
Riparian pegging	16	13%
Tree planting - nurseries	15	80%
Wetland rehabilitation	1	0%
Water pan rehabilitation	5	60%
Weir self-regulating	1	100%
Bulk meter	8	88%

86% of the investments were found operational at the time of visit (Figure 71), with Table 8 giving the details on the operational status for each investment type monitored. The more successful investment types have been rainwater harvesting tanks (92%), gabions (100% - 6 investments), spring protection (93%), tree planting (95%), and installation of early warning systems (100% - 4 investments). The less successful ones have been riparian pegging (13% success rate) and water pan rehabilitation (60% - 5 investments).

What lowers the SI scoring for IFAD is the revenue collection indicator, which scored 6%. This is common for water resources investments, as WRUAs and CFAs do not commonly collect revenue for their investments. The revenue collection question was asked for all livelihoods, tree nurseries, energy saving jikos and all water resources management structures (RWH pans, RWH dams, RWH djabias, RWH sand/sub-surface dams, RWH tanks, springs, livestock troughs, water pans). As especially the water resources management structures do not generally collect revenue (e.g. RWH tanks at schools), the indicator score is significantly lowered for water resources projects. The investments found collecting revenue were the tree nurseries in 8 CFAs (Chogoria, Njukiiri, Njukiini, Muringato, Kangaita, Castle, Kimakia and Karua Hills). Meanwhile, none of the WRUAs were collecting revenue for the same activity.

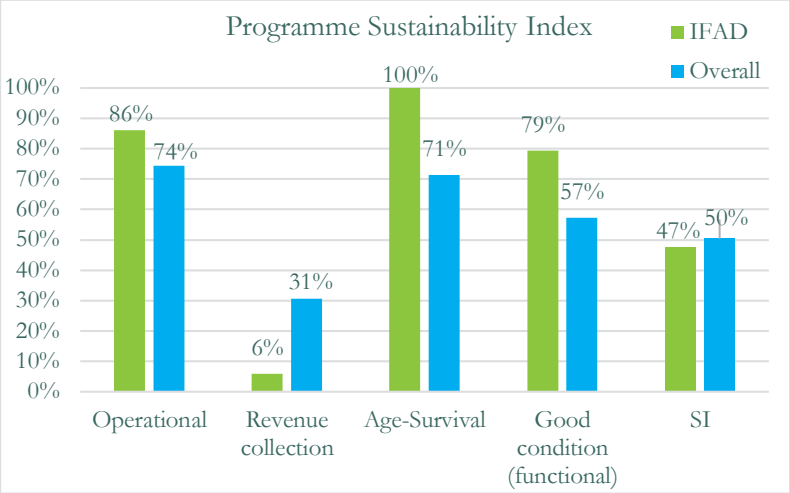


Figure 71. Sustainability Index for the IFAD vs. overall results.

4.3.4 Joint Six Programme

The J6P programme scored 47% for the SI, with close to average scoring across all the indicators in comparison to the average of all the other programmes (Figure 72). As all the investments monitored were less than 2 years old since the first projects were completed in 2017/18, the calculation of the SI followed an adjusted weighting (Operational - 29%, Revenue collection – 59%, Good condition – 12%). The sample included 52 projects in total with altogether 479 investments. 295 investment were under water supply, 91 under sanitation and 93 under water resources category.

75% of the investments were found operational at the time of visit (Figure 72), 76% of water supply, 89% of sanitation and 63% of water resources. The revenue collection was found to be 31%, lowering the SI score, as this is an important indicator for describing the sustainability of a project. Of the 50 monitored water kiosks, 34 were collecting revenue. The only PSF in Kathwana center was also collecting with an estimated annual income of 11,520 KES. What lowers the score the most is the lack of revenue collection in the water resources investments (RWH tanks, sand and sub-service tanks, djabias and springs).

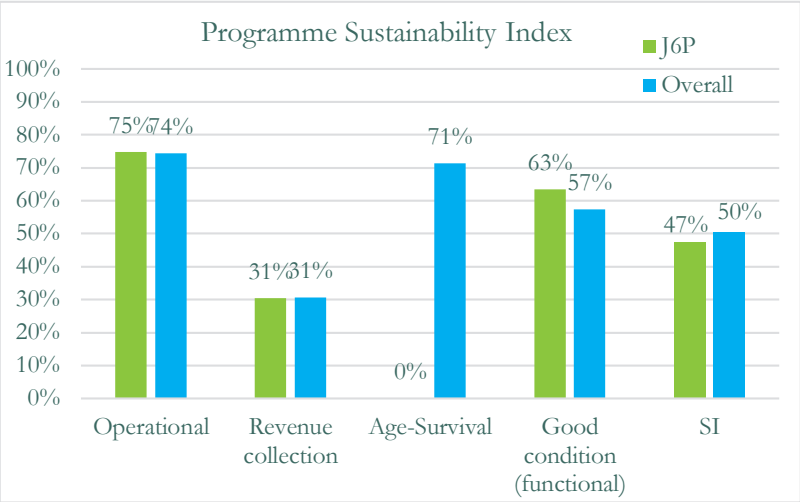


Figure 72. Sustainability Index for the J6P vs. overall results.

4.3.5 Kenya Water and Sanitation Programme

The KWSP programme scored 49% for the SI (Figure 73). All the investments were more than 2 years old (funded in 2013/14 or 2014/15), and mostly to be visited the last time as part of JAOME. The sample included 2 projects in total with altogether 11 investments, one project under water resources (Iterani) and one under water supply and sanitation (Kinyagi Water & Sanitation Project). 100% of the investments were found operational at the time of visit, while none were collecting revenue.

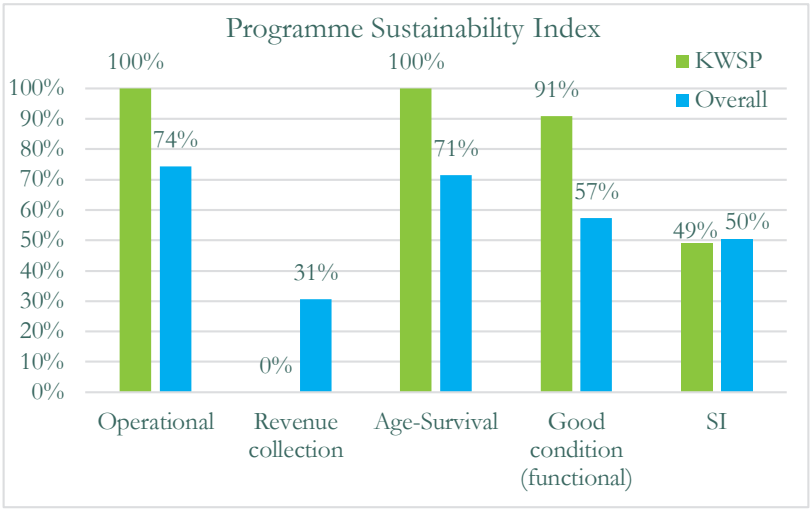


Figure 73. Sustainability Index for the KWSP vs. overall results.

4.3.6 Medium-Term Arid and Semi-Arid (ASAL) Programme (MTAP I)

The MTAP I programme scored 51% for the SI, with close to average scoring across all the indicators in comparison to the average of all the other programmes (Figure 74). The sample included 153 projects in total with altogether 324 investments. 113 investment were under water supply, 203 under sanitation and 8 under water resources category.

67% of the investments were found operational at the time of visit (Figure 74), 54% of water supply, 75% of sanitation and 63% of water resources. The revenue collection was found to be 39%, lowering the SI score, as this is an important indicator for describing the sustainability of a project. Of the 10 monitored water kiosks, 7 were collecting revenue. There was no revenue collection in the water resources investments (RWH tanks, water pan and livestock troughs).

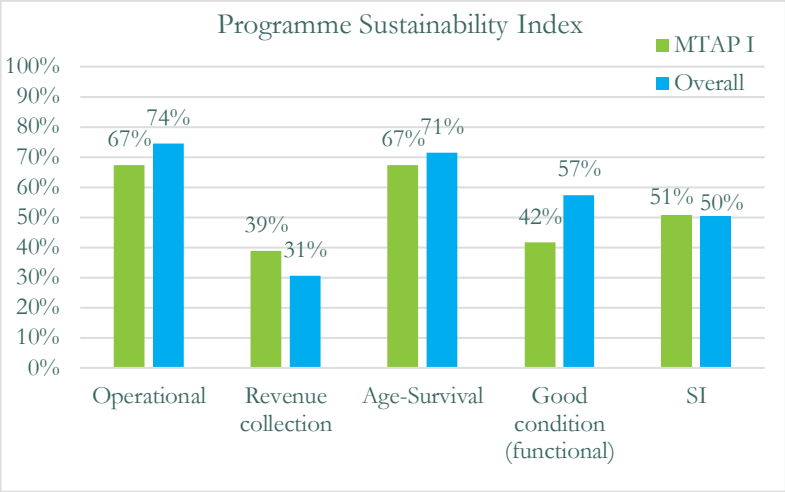


Figure 74. Sustainability Index for the MTAP I vs. overall results.

4.3.7 Medium-Term Arid and Semi-Arid (ASAL) Programme (MTAP II)

The MTAP II programme scored 25% for the SI, with lower than average scoring across all the indicators in comparison to the average of all the other programmes (Figure 75). The sample included 51 projects in total with altogether 191 investments. 69 investment were under water supply, 57 under sanitation and 65 under water resources category.

50% of the investments were found operational at the time of visit (Figure 75), 36% of water supply, 81% of sanitation and 38% of water resources. The revenue collection was found to be 6%, lowering the SI score significantly. Under water supply, of the 19 monitored animal troughs, none were collecting revenue and of the 14 monitored water kiosks, 3 were collecting revenue. There was no revenue collection in the water resources investments apart from two bee hive investments. The revenue question was asked for RWH pans, RWH tanks, RWH sand/sub surface dams, RWH djabias, water pans, bee hives and livestock troughs.

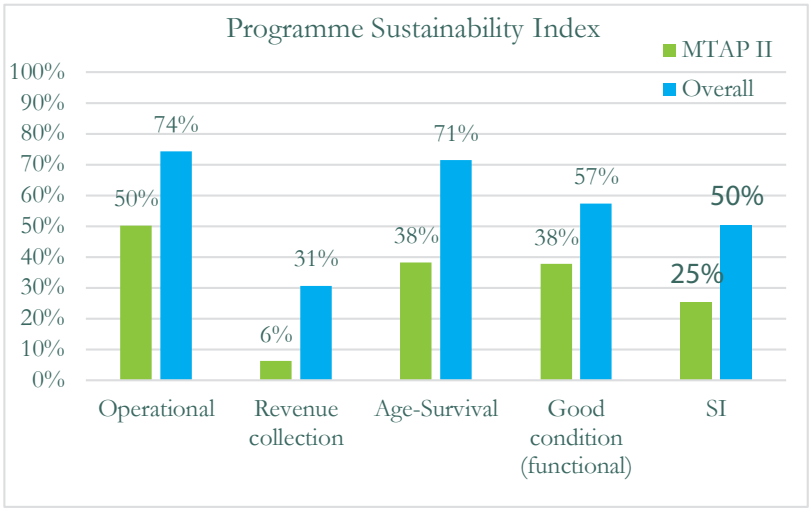


Figure 75. Sustainability Index for the MTAP II vs. overall results.

4.3.8 Output Based Aid

The OBA programme scored 54% for the SI, with lower than average scoring across three of the indicators in comparison to the average of all the other programmes (Figure 76). The sample included 3 projects in total with altogether 26 investments, all of which under the water supply category.

65% of the investments were found operational at the time of visit (Figure 76). The investments that were temporarily stopped or non-operational were all under the Nol Turesh project in Makueni county, all due to an unreliable or lacking water connection. The revenue collection was found to be 33%, lowering the SI score. Only 58% of the investments were found to be in good condition.

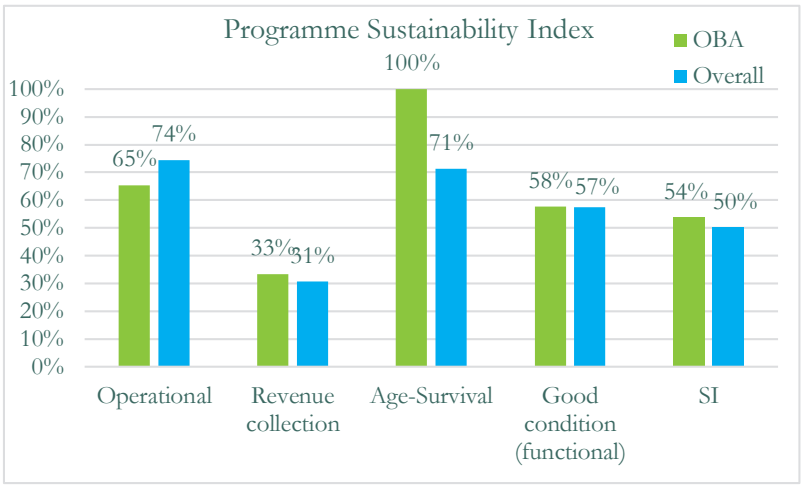


Figure 76. Sustainability Index for the OBA vs. overall results

4.3.9 Upscaling Basic Sanitation for the Urban Poor

The UBSUP programme scored 77% for the SI, highest of all the programmes, with higher than average scoring across all the indicators in comparison to the average of all the other programmes (Figure 77). The sample included 22 projects in total with altogether 122 investments, all of which under the sanitation category.

93% of the investments were found operational at the time of visit (Figure 77). The revenue collection was found to be 67%, though this only included the 6 DTFs as the household sanitation is not expected to collect revenue. 62% of the investments were found to be in good condition.

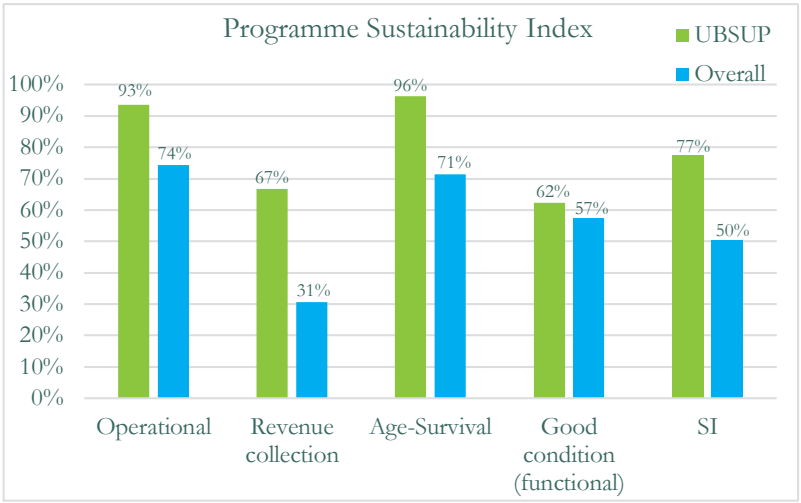


Figure 77. Sustainability Index for the UBSUP vs. overall results.

4.3.10 Urban Projects Concept

The UPC programme scored 70% for the SI with higher than average scoring across three out of four indicators in comparison to the average of all the other programmes (Figure 78). The sample included 84 projects in total with altogether 889 investments. Of the 889 investments, 872 were under water supply and the other 17 were PSFs. Table 9 shows the breakdown of the monitored investments with their operational status. The lowest operational status was with water kiosks (55%), whereas individual connections seemed to have a higher success rate.

Table 9. Break-down of monitored investments for UPC and their operational status.

Investment type	No monitored	% Operational
Pipeline	111	82%
PSF	17	82%
Pump / energy source	7	100%
Storage tank	61	89%
Pipeline appurtenances	34	88%
Treatment works	1	100%
Intake / water source	1	100%
Distribution systems:	657	73%
Water kiosk	164	55%
Consumer meter	338	82%
Individual connection	84	74%
Yard tap	51	63%
Bulk meter	18	72%
Communal water point	1	100%
Stand pipe	1	100%

76% of the investments were found operational at the time of visit (Figure 78). The revenue collection was found to be 69%, which is significantly higher than the average. 56% of the investments were found to be in good condition, which was slightly lower than average.

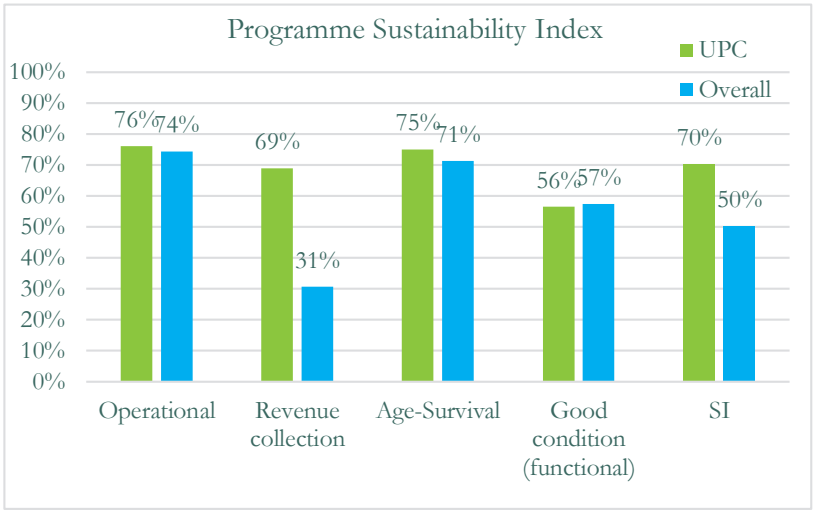


Figure 78. Sustainability Index for the UPC vs. overall results.

4.4 Sustainability Index by Investment class

4.4.1 Sustainability Index for rural investments

The SI for rural water supply investments is 51% and sanitation investments 61% (Tables 10-11). For rural investments the revenue collection question was asked only for distribution systems (water kiosks, yard taps and stand pipes), and was found to be only 42%. Pipelines and pipeline appurtenances showed the highest operational status (78% and 86%, respectively), while the buildings (50%) and treatment works (33%) had the lowest operational status. Pipelines and pumps/energy sources were found to be most commonly in good condition.

Table 10. Sustainability Index of water supply by rural investment classes.

Investment TYPE	Tot No of investments	Functional	Revenue collection	Age-survival (operational after 2 years)	Good Condition	SI
Building	14	50%		50%	43%	49%
Distribution system	209	61%	42%	32%	54%	47%
Intake / water source	53	72%		62%	53%	65%
Pipeline	85	78%		64%	67%	72%
Pipeline appurtenances	7	86%			43%	73%
Pump / Energy source	30	77%		69%	67%	72%
Rainwater harvesting	75	52%		52%	48%	51%
Storage tank	82	68%		69%	62%	67%
Treatment works	3	33%			33%	33%
Water supply ALL	**558**	**65%**	**42%**	**54%**	**56%**	**51%**

The rural sanitation schemes have mostly focused on school sanitation, where there is no expected revenue collection and therefore the indicator does not exist for rural sanitation. Of the institutional sanitation, 81% was found to be fully functional, and 49% in good condition.

Table 11. Sustainability Index of sanitation by rural investment classes.

Investment TYPE	Tot No of investments	Functional	Revenue collection	Age-survival (operational after 2 years)	Good Condition	SI
Community sanitation facility	33	67%		62%	39%	60%
Institutional sanitation	329	81%		77%	49%	73%
PSF	2	100%	50%	100%	50%	70%
Sanitation ALL	**364**	**80%**	**50%**	**76%**	**48%**	**61%**

4.4.2 Sustainability Index for urban investments

The sustainability index for the urban investment types is generally higher than for the rural investments with average score of 68% for water supply and 85% for sanitation investments (Tables 12-13). The more successful investment types are pumps, storage tanks, household sanitation and public sanitation schemes. Distribution systems and DTFs scored the lowest.

Table 12. Sustainability Index of water supply by urban investment classes.

Investment TYPE	Tot No of investments	Functional	Revenue collection	Age-survival (operational after 2 years)	Good Condition	SI
Distribution system	674	72%	65%	60%	53%	65%
Intake / water source	1	100%			100%	100%
Pipeline	118	83%		60%	70%	74%
Pipeline appurtenances	34	88%		71%	50%	75%
Pump/ energy source	7	100%		71%	71%	86%
Storage tank	64	88%		71%	70%	79%
Treatment works	1	100%			0%	71%
Water supply ALL	**899**	**76%**	**65%**	**75%**	**56%**	**68%**

Table 13. Sustainability Index of sanitation by urban investment classes.

Investment TYPE	Tot No of investments	Functional	Revenue collection	Age-survival (operational after 2 years)	Good Condition	SI
Community sanitation facility	2	100%			100%	100%
DTF	6	67%	67%	67%	50%	65%
Household sanitation	113	96%		98%	63%	90%
PSF	17	82%	88%	67%	71%	82%
Sanitation ALL	**138**	**93%**	**83%**	**94%**	**64%**	**85%**

4.4.3 Sustainability Index for water resources investments

The water resources investments performed slightly lower with a 33% sustainability score (Table 14). The water resources schemes are commonly related to catchment conservation and thus do not collect revenue which leads to a lower sustainability score. Some investments, which currently do not collect any revenue, would have a potential to do so, such as water pans and djabias, livelihood activities and tree nurseries.

Table 14. Sustainability Index of water resources investment classes.

Investment TYPE	Tot No of investments	Functional	Revenue collection	Age-survival (operational after 2 years)	Good Condition	SI
Water resources management structures	281	75%	1%	29%	70%	31%
Catchment management	141	71%	25%	57%	61%	45%
Regulation	9	89%			89%	89%
Livelihood	7	71%	43%	100%	71%	61%
Water resources ALL	**438**	**74%**	**5%**	**38%**	**68%**	**33%**

4.5 Comparison to JAOME 2016 and 2017 - key investment types

This section compares the SI for key investment types for JAOME 2016, 2017 and 2018, namely:

1. Water kiosks
2. Water meters
3. Yard taps
4. RWH tanks
5. Spring protection
6. Institutional sanitation
7. PSFs.

In 2016, 335 No. water kiosks were monitored, in 2017 there were 284 No. and in 2018 there were 257 No. The percentage of water kiosks under the urban investments of the total number monitored were 72% in 2016, 85% in 2017 and 67% in 2018. For water kiosks the data for 2017 and 2018 seem to follow largely the same pattern, though with a slight reduction in condition from 2017 to 2018 (Figure 79). In 2016, the indicators scored higher than the following years, which is contrary to the fact that the 2016 sample included more kiosks over 2 years old than the following years.

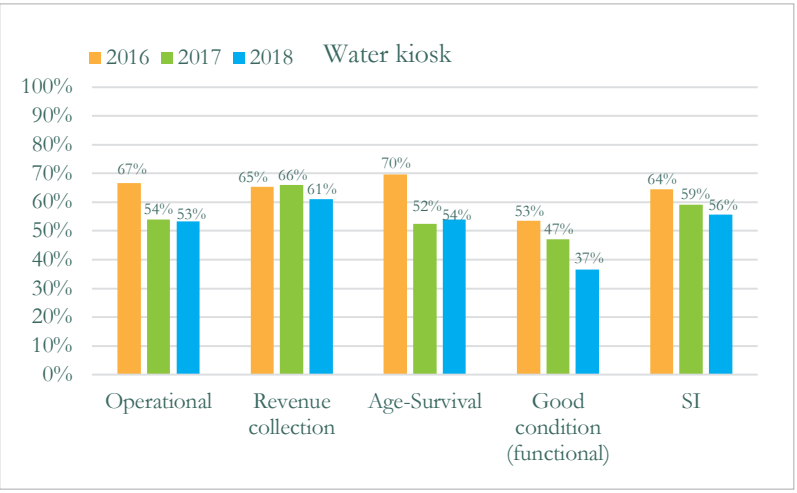


Figure 79. Sustainability index for water kiosks.

The JAOME monitored 162 No. consumer meters in 2016 (all under urban investments), 252 No. in 2017(all under urban investments) and 414 No. in 2018 (82% under urban investments). For consumer meters the indicator scores seem to have a general downward trend (Figure 80). In 2017, it was decided that the revenue collection question is removed for consumer meters.

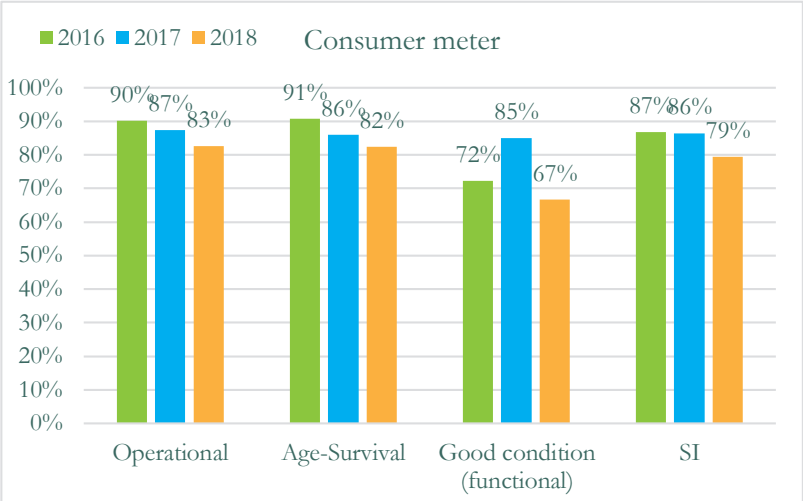


Figure 80. Sustainability index for consumer meters.

The JAOME monitored 160 No. yard taps in 2016 (98% under urban investments), 101 No. in 2017 (99% under urban investments) and 54 No. in 2018 (94% under urban investments). For yard taps the indicators seem to be following the same pattern in all the years (Figure 81). In 2018, it was decided that the revenue collection question is removed for yard taps.

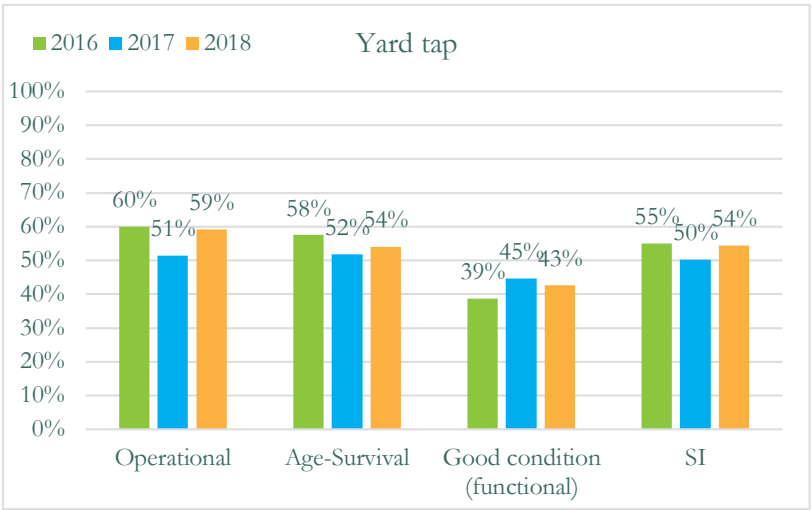


Figure 81. Sustainability index for yard taps.

In 2016, 152 No. RWH tanks were monitored, in 2017 131 No. and in 2018 233 No. For RWH tanks, the indicators for operational status and for condition were significantly lower in 2017 than in the previous year, however scored higher again in 2018 (Figure 82). However, only 24% of the RWH tanks that were older than 2 years old were still operational in 2018.

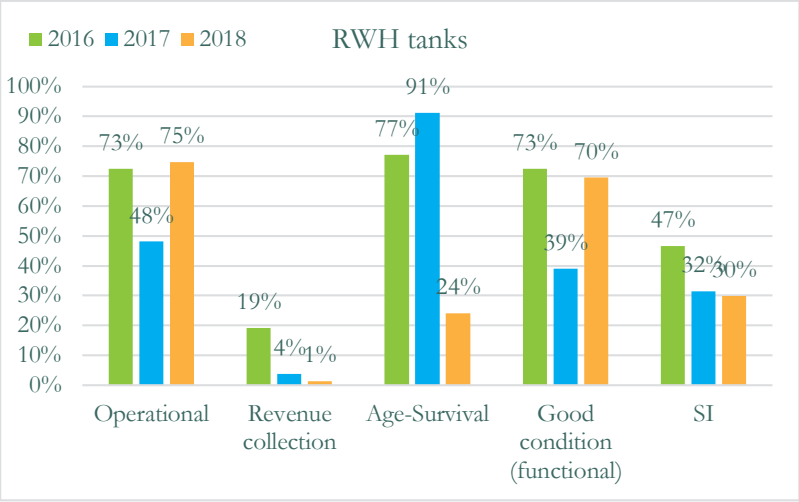


Figure 82. Sustainability index for RWH tanks.

The JAOME monitored 38 No. spring protection in 2016, 27 No. in 2017 and 33 No. in 2018. For spring protection, the indicators for operational status and for condition are showing a slight upward trend, and so did the SI score (Figure 83).

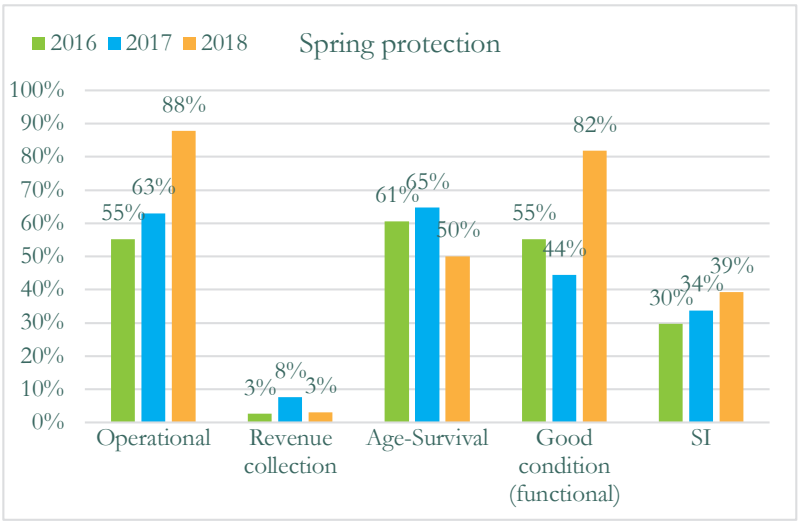


Figure 83. Sustainability index for spring protection.

In 2016, 482 No. institutional sanitation facilities were monitored, in 2017 there were 162 No. and in 2018 there were 329 No. For institutional sanitation, the index score is showing an improvement through the years (Figure 85). However, it should be noted that in 2016 the calculation of the SI score assumed that revenue should be collected for school sanitation, but this assumption was since removed as invalid.

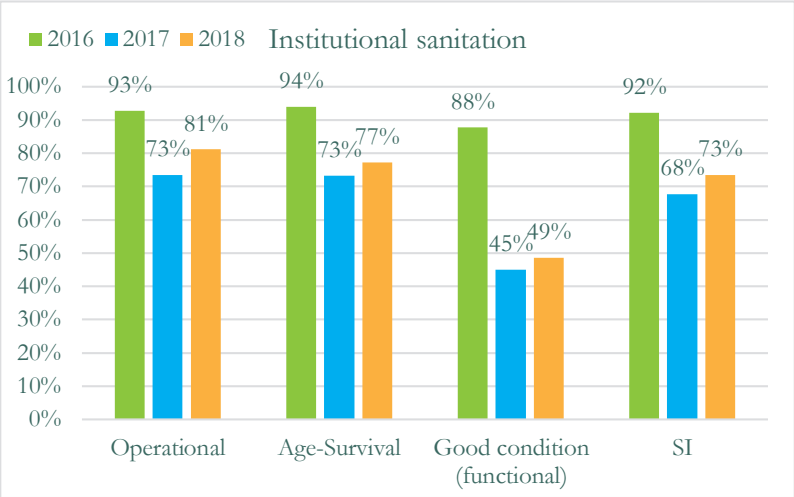


Figure 84. Sustainability index for institutional sanitation.

The JAOME monitored 13 No. public sanitation facilities in 2016[2], 24 No. in 2017 and 19 No. in 2018. For public sanitation, the indicator scores are showing a slight reduction through the years (Figure 86).

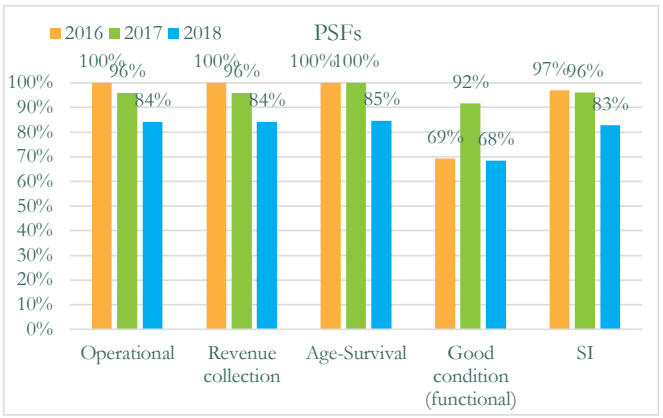


Figure 85. Sustainability index for PSFs.

[2]Note: The indicator values in JAOME 2017 report for JAOME 2016 data for PSFs were based on both rural and urban PSFs, whereas the rural ones were re-categorised as community sanitation facilities. This increased the indicator scores for 2016 data on PSFs in this report, in comparison to the JAOME 2017 report.

5

CHALLENGES EXPERIENCED DURING THE STUDY

5.1 Locating/Accessing projects on the ground

Locating of sampled projects in the Counties did not present a major challenge except where there were no CRMs. The CRMs had clear understand of the actual location of most of the projects and investments. In addition, the guides who are mainly officials or members of the project committees proved quite useful in assisting the teams to locate the investments and hence saving time

However, some sampled projects were difficult to locate owing to terrain changes and developments that may have occurred since last visit. Some of these included construction of new buildings, diversion of access roads and demolitions among other factors.

In projects where the management committees had changed over time posed the challenge of key informants as the new committees had varied information on the projects, especially where similar interventions were undertaken by other partners in the same locality. The turnover/unavailability of the implementing partner agents/employees who understand the projects contributed to delay in locating projects/investments.

Locating some sampled projects which were not georeferenced posed the challenge to the teams as there were varied routes to the sites depending on whom one asked for direction, this made the teams to lose out on time.

Some sampled investments were difficulty to access as their locations were either in islands, swampy areas, dense forests, or had potential of interaction with wildlife especially CFA investments which could not be accessed due to charging elephants.

5.2 Logistical Support

Inadequate transport logistics during the field work hampered the flow of the exercise. As initially planned, each cluster was allocated a vehicle however, some cluster teams grew bigger in order to achieve the targeted sample. This led to sharing of vehicles among cluster sub-teams sometimes leading to hiring and requests from other partner institutions which further delayed the exercise resulting to time wasting and inconveniences.

5.3 Technical challenges

Despite the review of the data collection tools and successful installation, some of the phones had challenges in loading the geographic position coordinates with the required level of accuracy, as such there was time lost between one investments to the next. The variance in the preloaded project briefs and actual investment made tended to slow the process as verification was sought on changes of scope.

The investment/project form questions requiring mathematical calculations caused further delay during the process as some informants did not have project information thus affecting the quality of the data. Some data on revenue was not accurate because of lack of information/verification of information provided was a challenge

There was delay in submission of data due to possible server over load in the evenings and early morning when most teams were submitting the investment/projects data. In some instances, the WaSHMIS Application experienced technical hitches especially freezing of the app thus causing further delay in data collection.

The other challenge was obtaining the right information on investments especially pipelines, particularly the length and diameter as well as pipeline route as nearly all are not marked.

5.4 Time and distance constraints

The sample was good and well distributed across the counties. Nevertheless, the distance between projects versus time allocated was not well planned. The team had a big challenge to meet deadlines. WRUA projects have to be allocated more time especially if all the facilities are to be visited and not sampled.

The time allocated to cover the projects in ASAL areas was not enough considering the harsh conditions, logistics, long distances, poor telephone and road networks and geographical conditions of the area.

5.5 Insecurity

Since some projects/investments are in counties faced with insecurity challenges, the teams had to consult the respective local security agents before commencing the JAOME exercise. The volatility of such areas not only made it difficult in planning of projects/investment visits but also strained the teams in terms of achievement of targets. Projects/investments in insecure areas were not fully monitored as safety of the teams was paramount.

5.6 Weather Conditions

The exercise was conducted during the long dry season when it was very hot. This slowed down the exercise as the energy levels of the teams was negatively impacted. This also led to frequent tyre-bursts especially in ASAL areas that experienced high temperatures as high as 350C. Some project areas were only accessible by boats and due to changing tides, some to and from journeys to projects were necessary and were very time consuming.

6

LESSONS LEARNED

6.1 Process preparation

There is need to have a permanent committee for the purpose of preparing the JAOME process. However, the Planning, Monitoring and Evaluation department should continue with the coordination role. It is important to have the JAOME roadmap, workplan, budget and training plans prepared at least 3 months in advance and adequate budget procured on time. The preparation process should involve the key program officers so as to ensure inclusion of eligible projects in the both the sampling frame as well as in the WaSHMIS database. Adequate time should be provided for counter checking the sampled projects list to ensure that they are all within the inclusion/exclusion criteria and for verification of the investments by the CRMs.

Verification should be done based on the previous JAOME output and recommendations and/or comments.

6.2 Preparations for the JAOME

The cluster teams prepared a field route plans before starting the monitoring exercise. The plans assisted the teams by ensuring a logical itinerary and coverage of all projects within the stipulated time frame. The field plan and time allocation to clusters can be more practical and feasible if a clear analysis of actual investments on the ground is undertaken and other factors especially average distances between investments and terrain evaluated in advance with the support of the CRMs.

There is also need for involvement/consultation with CRMs during JAOME planning process. In cases of new CRMs, one on one practical sessions are recommended and particularly where the CRMs are expected to undertake data collection on their own.

Team composition should be based on individual strengths and a technical person should be in each of the teams. This will make interpretation of project components and infrastructure easy. The entire JAOME team should be able to make judgement on each of the investments and arrive at a collective consensus on the functionality of projects.

6.3 Data collection and submission

The current data collection tool has so far proved to be appropriate and user friendly. However, the tool requires further review so as to minimize collection of data that does not contribute to the final reporting. In addition, questions on water kiosks and household sanitation facilities need to be reviewed as it has proven to be difficult to obtain segregated data on gender.

6.4 Data Screening and Verification

Data collected during the exercise should undergo through thorough screening and verification before the actual submission. Verification by team leaders has proven to be productive in clearing and eliminating anomalies and providing clarity on missing gaps or inconsistencies.

6.5 Analysis and reporting

The analysis of the data has proven to be time consuming in each year of the exercise. As a result, the team has made it a process requirement of the JAOME dashboard to have data analysis charts and graphs that can readily be integrated into the narrative reports.

The dashboard will have public access as well as restricted access wherein users will be required to log into the dashboard to download data for updating or manipulation.

It has been more efficient to split the report into sections to be prepared by different members of the team to fasten the process as well as enhance the quality of the report. In addition, the fund has collaborated with a consultant for the design and publication of the JAOME reports. The publication requirements ensure an additional round of review which has been of great help in improving the appearance and readability of the reports.

7

CONCLUSIONS AND RECOMMENDATIONS

This section makes recommendations based on the lessons learned on the JAOME 2018, specifically on the approach and what kind of updates the technical components require. Furthermore, it makes recommendations on the investments based on the collected data in order to inform future investment planning and priorities.

7.1 Design of the operational monitoring exercise

7.1.1 JAOME approach

A critical review of the JAOME approach should be conducted now after conducting the exercise in three consecutive years. The first and the original approach of conducting the exercise, which has now been deployed three times (JAOME 2016-2018), has involved almost the entire WSTF institution in an intensive two- to three-week exercise. In this approach the majority of the WSTF staff has been divided into seven or eight clusters with senior staff as team leaders. The junior staff have been divided into two teams in each cluster, with the first team on the first week and the second team on the second week, with seven or eight teams in the field simultaneously, as described in Section 2.4.2. However, this has led to high costs, a lot of detailed field planning and also involving non-technical staff members in the exercise, despite its technical nature, compromising the quality of the data.

An optional (and recommended) approach of conducting the exercise is that the data collection period will be continuous and the projects will be visited throughout the year or a period of some months. This would be done following a data collection timeline clearly indicated in a workplan prepared by the M&E department based on the completion anniversaries of the sampled projects. The data would be collected by the CRMs in addition to their other tasks in their workplans. Also the field interns in six J6P counties could be mobilised alongside the CRMs. If WSTF staff are also to support the data collection, only technical staff should be part of the exercise. The workplan should allow some flexibility so the data collection can be conducted on the side of other tasks. This approach will reduce the time pressure of the exercise and optimize the limited resources of the institution. Once the data collection has been completed, as usual, the data will be analysed in the annual operations report, which will show trends and give indicators on the general operational status of the projects.

This alternative approach requires some early planning as ideally the data collection should start instantly after the final completion year, i.e. the completion year of the youngest projects, has ended. This would mean that the JAOME 2019 data collection for projects completed during financial years 2014/15 – 2018/19 should have ideally been promptly planned in July 2019, and carried out up to December by the CRMs. Executing this second approach would also require someone from WSTF to closely follow the implementation of the workplans and checking the progress of the data collection against the agreed timelines.

7.1.2 Budgeting of JAOME

In order to ensure the sustainability of the JAOME, the budget should be secured as part of the annual institutional activities, thus reducing the dependency on the donor funds for carrying out the exercise. This would require entrenching a clear Treasury budget line to finance the JAOME on an annual basis. This would increase the institutional ownership of the exercise, and make it part of the annual activities, independent of the donor funding.

7.1.3 Sampling

For two years in a row, the M&E department has decided to draw a sample from all completed projects to be monitored during JAOME, instead of visiting all the projects every year. This approach ensures that WSTF is able to conduct the operations monitoring exercise annually with its existing resources and without major additional costs. The sampling is drawn so that each project is visited three (3) times in a period of five (5) years after completion. This approach has yielded positive results, since it has made the task more manageable while giving a good representation of counties, programmes and types of investments.

In addition to the sampling approach, it is recommended that the previous years' data is carefully reviewed by the team when planning the next JAOME exercise. Especially the already collapsed investments that are permanently non-operational should not visited repeatedly.

7.1.4 Planning and quality control

The operational planning of the monitoring is the base for the general success and quality of JAOME. Therefore, the data collection, analysis and reporting should be planned thoroughly and a timeline should be put in place annually. The workplan consists of several activities, defined by output and linked to a person responsible. To assure a smooth implementation of the data collection exercise, the communication between the WSTF and the CRMs (primary data collectors) is of utmost importance. The following activities should be seamlessly incorporated to the preparation and planning of the next exercise:

- The sampled projects within a county should be shared with the CRMs well in advance for actual detailed planning and communication to relevant stakeholders
- The security intelligence information should be obtained well in advance from all relevant departments
- The budget allocation for each county should reflect the distances, logistical conditions and security factors, allowing realistic timelines for data collection
- All projects that had a change of scope of works should be updated in the App
- Data and feedback from previous JAOME should be shared with the data collection teams to prepare for feedback on the ground

For quality control, a team should be assigned to be charge of checking the quality of the incoming data. The quality checked data can then be submitted to the online platform in a timely manner by the M&E department, on a weekly or monthly basis in case of continuous data collection. A predefined analysis template will ensure that the data is being processed in an efficient and safe manner.

7.1.5 Timeliness of reporting

A task team should be formed to report on the JAOME results on a timely manner. Once the submitted data has been cleaned, and the data has been analysed using the analysis template, the team should be given a period of 1-2 weeks to fully concentrate to produce the report. WSTF should have a specific month of the year when the annual report is to be published, so that the other sector partners know when to expect the WSTF annual JAOME report, similar to the WASREB impact report. This would also create internal pressure and priority to report on the JAOME on a timely manner, which has been a challenge previously.

7.1.6 Follow-up of projects

The follow-up on issues should happen on two levels:

1. While the data will be used for the JAOME report at the end of a financial year, any acute technical, financial, operational or social issues that require intervention, should be addressed immediately. This requires clear internal procedures and responsibilities in order to ensure immediate action and follow-up from the head office. A robust system should be developed where the monitoring data systems (future System Integration Project, SIP) and the quality assurance system QPulse are integrated to allow a person appointed to enter an issue to QPulse raised in JAOME and assign a person to take action on that issue.
2. Longer-term action based on decisions on the managerial level. Here the outcomes and impacts of investments are evaluated over time to allow lessons to be learned on what has worked and been successful and what not, and thereby informing future investment planning. This also ensures better controls on future funding, for example by determining the better and poorer performing utilities or counties. To facilitate such decisions, the WSTF should organise a management level meeting on an annual basis so the findings from the operations monitoring can be discussed and possible adjustments to the investment policy can be made.

In addition, if remedial actions have been suggested in the JAOME 2018 for projects that were monitored and found to be non-operational, they should be given priority in JAOME 2019 to find out if they have been taken into consideration to make them operational.

7.2 Sustainability of the Investments

Based on the collected data it was possible to establish the operational/functional status of the funded investments. Against the WSTF target of 95% of investments being operational after five years of commissioning, 72% of rural investments, 78% of water resources investments, 79% of urban investments and 65% of RBF investments were found to be fully operational for the period under review. This corresponds to as many as 571 out of the total of 2,413 monitored investments being non-operational, temporarily stopped or only partially functioning. However, there has been improvement since the previous years, as the overall operational status was 76% for JAOME 2018, from the 73% in JAOME 2016 and 69% in JAOME 2017.

The three most common and easily identifiable reasons for non-operational status for investments were found to be the water source being unreliable or lacking (45% of non-operational investments), vandalism (19%), or natural/climatic causes, such as drought (14%). The most common issue of water source not being reliable is often related to issues such as inappropriate technologies, faulty or inadequate designs, poor project implementation and non-adherence to approved designs. To address these issues, a more vigorous appraisal process is recommended for all projects, both at the desk and the field level. The appraisal process should scrutinize the technical designs as well as the feasibility and relevance of the proposed activities in addressing the water demand (in case of water supply), the status of the catchment (in case of water resources projects) or the need or suitable technology for sanitation services in the project area.

WSTF has already taken the necessary steps in strengthening the implementation process and ensuring improved quality of works and timely technical support by hiring resident engineers in all active project counties. This is expected to improve the sustainability of the projects as there is more quality control of materials and workmanship throughout the project implementation phase.

In addition to proper planning and implementation of projects, the sustainability of projects is affected by the way they are managed and operated after completion. Though the JAOME does not look at in-depth into the factors such as project governance and management, it is common that poor or non-existence of proper management and governance systems, especially in case of unestablished rural utilities, is a significant contributor to low performance and low sustainability of the projects. Revenue collection was found to be only 33% for RBF investments, 38% for rural investments, 69% for urban investments and 5% for water resources investments. Revenue collection is the basis of ensuring that the utilities and other implementation partners have sufficient funds for maintaining the funded infrastructure.

In general, more attention needs to be paid to revenue collection efficiency and reduction of Non-Revenue Water (NRW). It is thus recommended that in the implementation of the new programmes, institutionalisation of revenue collection as a sustainability measure will be required as part of the overall project design. In case of water supply projects, the utilities should have a proven record of billing and collecting revenue prior to funding. If the utility requires support in billing systems or keeping financial records, such measures should be incorporated in the project design. For water resources, if there are livelihood activities funded, they should have a clear plan for how to collect revenue from the activity and what proportion of this will be brought back to the WRUA/CFA to sustain or further fund its activities. As stated by the findings from previous JAOMEs, for water resources investments the inability to generate revenue streams even through the livelihood components continues to be a factor hindering the sustainability of the WRI funding, an issue which needs to be revisited in the programme design.

For water supply, the least sustainable investment types were water kiosks (53% fully operational), plastic moulded tanks (53% fully operational), water pans (61% fully operational) and animal troughs (12% fully operational). The general challenge with water kiosks is that they are seen as a temporary solution prior to each plot getting an individual connection, making them redundant after a certain period of time. The plastic tanks generally had issues of being vulnerable to vandalism or climatic factors, such as strong winds, if not installed properly, or lacking connections to gutters, inlet pipes or taps. The water pans had commonly an issue of being heavily silted. Finally, the animal troughs were most commonly non-operational as they were missing a water connection either as the design was inadequate or was not followed during implementation.

The sanitation investments were again found to be more successful than other investment categories in terms

of sustainability, both in rural and in urban contexts. 96% of the household sanitation facilities funded through the UBSUP concept were found to be operational, which is showing significant impact on the improvement of the sanitation levels of the urban poor. 84% of PSFs were operational with high level of demand and active revenue collection, in line with previous year's findings. A persistent issue (also identified in the JAOME 2016 and 2017) with sanitation facilities remains to be the lack of handwashing facilities, especially in schools. In order to ensure the provision of hand washing facilities for institutional sanitation, the budgets and contracts should ensure that these designs are incorporated as part of the sanitation projects, along with a reliable source of water, as a minimum standard.

The operational status of rain water harvesting tanks was again identified as a key implementation challenge, especially in ASAL counties. The overall operational status of the rainwater harvesting tanks was 75%, but when only the MTAP I and II were assessed, excluding tanks under the J6P and IFAD programmes, the operational status dropped to 36%. The JAOME 2016, 2017 and 2018 all thus recommend that appropriate technologies and investments should be made for each region.

A key indicator for JAOME is the County Sustainability Index (CSI). This has been designed to measure the sustainability of projects with four (4) indicators, including operational status, revenue collection, condition and age-survival rate. The index is also used to rank the counties to give an indication of the best and worst performing ones. It is meant to motivate the counties to take charge in fulfilling their mandate in providing sustainable and reliable water and sanitation services as set in the Water Act 2016.

In JAOME 2018, the three (3) best performing counties for urban projects were Nyeri, Isiolo and Tharaka Nithi, all with a score of almost 100%. The worst three performing counties for urban projects were Samburu, Nyamira and Kajiado (below 30% sustainability score). If looking at rural projects, the counties succeeding with above 90% were Tharaka Nithi and Laikipia, and the lowest were Tana River, Vihiga, Wajir and Garissa, all below 30% score. For water resources, the highest sustainability score was achieved by Nyeri, Kirinyaga and Muranga counties (all above 40%), and the lowest by Garissa, Kwale and Laikipia (all below 15% score). If the counties repeatedly perform poorly in the sustainability ranking, the types of projects and investments that are funded in those counties should be carefully evaluated for their feasibility and relevance. Also, in line with JAOME findings from previous years, improving the sustainability of investments especially in the counties with low SI score requires customized service delivery, operations and maintenance models which should be identified and promoted through the capacity building component.

7.3 Way Forward

The following points are recommended as the way forward in view of preparing for the JAOME 2019, and to take full advantage of the data and lesson learned from the previous exercises:

Planning: More support should be sourced from the CRMs in the planning phase. Once the project sample has been drawn, it should be sent to the CRMs well in advance for their input and advice. The detailed field plan should be drawn up fully informed by the logistical and security conditions of each county so that the plan is accurate and realistic.

Budgeting: Dependency on donor funds for carrying out the exercise should be reduced by entrenching a Treasury budget line for financing the exercise on an annual basis.

Data collection: The JAOME data collection process needs to be streamlined to ensure that the team sizes and compositions are optimized for cost-effectiveness together with sufficient technical expertise in each team. The roles of CRMs and field interns should be increased so that, where possible, some of the counties could be fully monitored by the field staff in the interest of reducing the budget of the exercise. The exercise needs to be accommodated with sufficient logistical support so that the data collection can be done effectively and without unnecessary delays. The enumerators should have familiarised with the previous years' data on the projects they are to visit for full preparedness of feedback and issues to be addressed. If the data shows that a particular investment is permanently collapsed, there is no need to have further visits to the same investment.

Data analysis and reporting: A task force for data cleaning, analysis and reporting should be set-up so that the reporting and follow-up can be done on a timely manner. To improve the visibility of the important exercise,

an annual release month of WSTF Sustainability Report should be set. This would create the expectation of the report to the sector partners and DPs, and ensure the much-deserved attention to the report as one of the annual key sector publications.

Follow-up on acute technical, financial, operational or social issues raised during JAOME should be addressed by WSTF and CRMs on a timely manner, where possible and to the extent of their capacity. Where needed, the implementing partner or the county should be alerted to possible issues found on the ground.

Lessons learned: Consistent failures in terms of design flaws, inadequacies and errors should be addressed on the management level in order to inform future programme designs and investment decisions. The same applies to highlighting the successes experienced in programmes.

Use of JAOME data: WSTF, the DPs and the implementing partners should aim to fully take advantage of the extensive data and information that has been collected through three consecutive JAOME years. The data can be used to check on the operational status of specific projects after completion, or more broadly, it can be used to document best practices regarding the successful investment types and programmes for the benefit of future project and programme design.

Data access: Currently the data is analysed by the WSTF using a set Excel template. This limits the access to the data to only those that have the specific interest to the data, but does not make it attractive and easy to view for the general public. WSTF has engaged a consultant to create a public dashboard embedded in the institutional website for all the previous and future JAOME data. This is a key step in increasing transparency, accountability and encourage sustainability.

8

ANNEXES

Annex 1: General Form Data Structure

Page	Comments
Filtering Details	Swipe left for more questions
1. Name of enumerator (1) 2. Select a County (1) 3. Select Name of Constituency (in the background) 4. Select Name of Investment window (RIP, UIP, WRI, RBF) (1) 5. Project name (1) 6. Project Brief 7. Year of completion (in the background) 8. Programme (in the background) if RIP = (MTAP I, MTAP II, KWSP, J6P) if UIP = (UPC,UBSUP) if WRI = (IFAD, J6P, MTAP) if RBF = (AOD, OBA) 9. Funding source (in the background) 10. Category (Water supply, Sanitation, Water resources) (1)	Questions in this section are Mandatory. These are preloaded data. Select one option (1) Select more than one option (M) Text field (T) Numeric field (N) Radio button (R)
General Information	
1. Name of Informant (T) 2. Position of Informant (Official, Committee, User, Caretaker) (1) 3. Phone number of informant (N) 4. Is the overall project operational at the time of visit? (Operational, Partially operational, Temporarily stopped, Non-operational) (1) 1. If Non-operational, how long has project been non-operational (months) (N) 5. Does the project serve the intended target group? (Yes/No) (1) 6. Target Beneficiaries (of Project) 1. Total no. of people incl. children (N) 2. No. of livestock (N) 7. In case of Water resources: Catchment area (km2) (N) 8. In case of Water resources: Does the WRUA/CFA have a copy of the SCAMP/PFMP? (1)	Questions in this section are Mandatory. Select one option (1) Select more than one option (M) Text field (T) Numeric field (N) Radio button (R)

Financial and Management Information	
1. Total cost (Ksh) of project as per contract (incl. community contribution) (N) 2. Local Contribution (Labour, Cash, Materials, Land, None) (M) 3. Value of local contribution (Ksh) (N) 4. Governance/Management (Board OD, Board of Management, Committee, MD-Overall, Employees, Volunteers, Contractor) (1) 5. Registration Status (Self Help Group, CBO, Society, Company, Institutional, Other) (1) 6. Records are kept: (Regularly, Irregularly, Not kept) (1) 7. Strategic Plan: (Yes/No) (1) 8. Operations and maintenance (O&M) responsibility (Employee, Committee, Volunteers, Users, Contractor / Operator, Individual, Group, WSP/WU/WRUA/CFA, County Government, National Government, Donor, Other, specify) (1) • Total number of people responsible for O&M (N) • Number of women responsible for O&M (N) 9. O&M cost, approx. annual (Ksh) (N) 10. Does the project collect revenue? (Yes/No) 11. In case of Water supply: Average water tariff (ksh/m3) (N) 12. In case of Sanitation: Sanitation charges? (yes/no) 13. In case of Sanitation: Average sanitation tariff (ksh/use) (N) 14. Project income, ave. annual (Ksh) (N) 15. Operation cost coverage =income/ cost*100 (0.00%)	Questions in this section are Mandatory. Select one option (1) Select more than one option (M) Text field (T) Numeric field (N) Radio button (R)
Photo	
Take a Photo of project office	Section is mandatory. Please Take a good picture
GPS Location	
Take GPS location of project office NB: Wait till it indicates the accuracy is at least 5m, then click on 'Record Location	Click on 'Record Location' button You can Replace location if it is not accurate by clicking Replace location tab
Finalise Form	
Give the particular form entry a name: Reason: You will visit several project offices and later on you may need to make some edits on a particular entry. It is easier to get it if you had unique name for the entries. If sure of answers (No edits and ready for online submission), Please check the 'Mark form as finalized' button.	By default if gives the particular entry, the name of the data collection form i.e "WSTF General Project' Please change that to the name of the project you have been collecting data on.
Mark form as finalized button: Comes in when you want to 'send' the forms to the server, unless a form is marked as 'finalized' it will not appear in the 'Send Finalized Form' list when you need to submit your collected data.	Click 'Save Form and exit'

Annex 2: JAOME Infrastructure Data Structure – Investment Types

Category	Investment class	Type
	Intakes/ Water sources	Weir - River Intake
		Lake intake
		Water pan
		Dam
		Borehole
		Hand dug well
		Sand dam
		Sub-surface dam
		Spring Protection
	Pumps/energy sources	Hand pump
		Solar pumping system
		Hydram
		Wind mill
		Electricity mains
		Generating set
		Diesel pump
	Treatment works	Chlorination unit
		Chemical dosing unit
		Composite filtration unit
		Conventional treatment works
		Slow sand filtration
		Waste water recycling
		Desalination of salty water
	Pipelines	UPVC-Unplasticised polyvinyl chloride
		HDPE-High density polyethelene
		PPR-polypropylene random-copolymer
		GI-Galvanised iron
		DI-Ductile iron
		Unknown
	Pipeline appurtenances	Valve chambers
	Storage tanks	Masonry tank
		Elevated concrete tank
		Reinforced concrete tank
		Sectional steel tank
		Plastic moulded tank
		Ferrocement tank
		Djabia
		Berkad
	Distribution system	Water kiosk
		Communal Water Point (open)
		Stand pipes
		Yard taps
		Individual connections
		Institutional connections
		Industrial connections

		Animal Trough (cattle, donkeys, sheep, goats)	
		Animal Trough (camels)	
		Consumer meters	
		Bulk meters	
	Rainwater Harvesting (from Roofs)	Roof catchment	
		Gutters	
		Storage tank	
	Building	Office	
		Laboratory	
		Pump house	
		Fencing	
	Public sanitation	Regular	Pit latrine
			VIP latrine
			Cistern flush (squatting)
			Cistern flush (seat)
			UDDT (dry toilets)
		Mini	Pit latrine
			VIP latrine
			Pour flush
			Cistern flush (squatting)
			Cistern flush (seat)
			UDDT (dry toilets)
	Institutional Sanitation	Pit latrine	
		VIP latrine	
		Pour flush	
		Cistern flush (squatting)	
		Cistern flush (seat)	
		UDDT (dry toilets)	
	Community sanitation facility	Pit latrine	
		VIP latrine	
		Pour flush	
		Cistern flush (squatting)	
		Cistern flush (seat)	
		UDDT (dry toilets)	
	Household sanitation	Pit latrine	
		VIP latrine	
		Pour flush	
		Cistern flush (squatting)	
		Cistern flush (seat)	
		UDDT (dry toilets)	
	DTFs	DTF	
		DTF Enpure Hybrid	
	Sewers	Municipal sewer	
	Regulation	Common intake	
		Weir self-regulating	

		Bulk Meter
	Catchment Management	Check dams
		Tree planting - Nurseries
		Tree planting - Transplanted
		Gabions
		Fencing of a pan
		Opening of Malkas
		Waste disposal pits
		Riparian pegging
		Energy saving jikos
		Fire breaks
		Installation of early warning systems
		Pruning
		Grass strips
	Water Resources Management Structures	RWH Pans
		RWH Dams
		RWH Djabias
		RWH Sand/sub-surface dams
		Spring protection
		RWH Tanks
		Livestock troughs
		Water pan rehabilitation
	Livelihood	Livestock (Bee hives)
		Livestock (Fish ponds-lined)
		Livestock (Fish ponds-unlined)
		Livestock (Dairy goats)
		Livestock (Poultry)
		Horticulture (Drip kit)
		Horticulture (Greenhouse)
		Horticulture (Greenhouse+drip kit)

Annex 3: Division of Teams for the Operations Monitoring Exercise

ANNEX 1: JAOME 2018 FIELD PLAN															
CLUSTERS	CLUSTER 1		CLUSTER 2		CLUSTER 3		CLUSTER 4		CLUSTER 5		CLUSTER 6		CLUSTER 7		
		Projects	County	Projects	County	Projects	County	Projects	County	Projects	County	Projects	County	Projects	Total
COUNTIES IN CLUSTER	Lamu	73	Nairobi	2	Wajir	24	Isiolo	25	Meru	11	Kericho	4	West Pokot	1	
			Kiambu	13	Garissa	69	Marsabit	29	Tharaka Nithi	22	Bomet	3	Transnzoia	4	
			Kajiado	3	Tana river	46	Samburu	1	Embu	9	Nyamira	1	Nandi	11	
			Machakos	8			Laikipia	13	Kirin-yaga	12	Kisii	3	Elgeyo Marakwet	1	
			Makueni	8					Nyeri	11	Homa bay	5	Baringo	3	
			Kitui	4					Mu-rang'a	17	Migori	11	Nakuru	6	
			Taita Taveta	2							Kisumu	2	Nyandarua	2	
			Mombasa	2							Siaya	1	Narok	3	
			Kwale	11							Bungoma	2	Turkana	2	
			Kilifi	4							Kakamega	2			
											Vihiga	4			
TOTAL PROJECTS	Total	73		57		139		68		82		38		33	490

PROJECTS								
	URBAN	1	41	2	5	18	25	22	114
	RBF	0	1	0	0	2	0	0	3
	WATER RESOURCES	3	2	5	3	52	2	4	71
	RURAL	69	13	132	60	10	11	7	302
	TOTAL	73	57	139	68	82	38	33	490

Annex 4: JAOME Training Programme

Activity - Topic	Duration in minutes
Registration	10
Keynote address.	10
Remarks by CMIP	10
Roles and responsibilities different actors	10
Tea break	20
Technical aspects of investments	45
Installation of the Joint monitoring App.	10
Walk through the operations monitoring tools (practical)	60
Sample and sampling	10
Operations field plans and logistics	20
Discussions of cluster Itinerary in groups	40
Cross cutting issues (security, remunerations, transport & T.A support) - plenary	30
Discussions, questions and answers	15
Closure	

Annex 5: Selected photos from JAOME 2018

Figure 86. Sectional steel tanks. A) Indian Burzar Water Project, UPC FY 2014/15, Kiambu county; B) Boji Garas Community water & sanitation project, MTAPII FY 2016/17, Wajir county; C) Katheri Nyariginu water project, J6P FY 2017/18, Laikipia county; D) Kanamkemer Solar Water Project, UPC FY 2016/17, Turkana county.

Figure 87. Masonry tanks. A) Timau Water Project, UPC FY 2016/17, Meru county; B) Gotu, Boji Dera, MTAP II FY 2016/17, Isiolo county; C) Kinyagi Water & Sanitation Project, KWSP FY 2013/14, Muranga county; D) Kegonga Water Project, J6P FY 2017/18, Migori county; E) Nol Turesh Water project, OBA FY 2016/17, Makueni county; F) Kimng'oror Water Users association, J6P FY 2017/18, Nandi county; G) Ndula Water & Sanitation Project, CPC FY 2014/15, Kiambu county; H) Riabai And Kihingo Water Project, UPC FY 2013/14, Kiambu county; I) Galasa Water project, MTAP I FY 2014/15, Marsabit county.

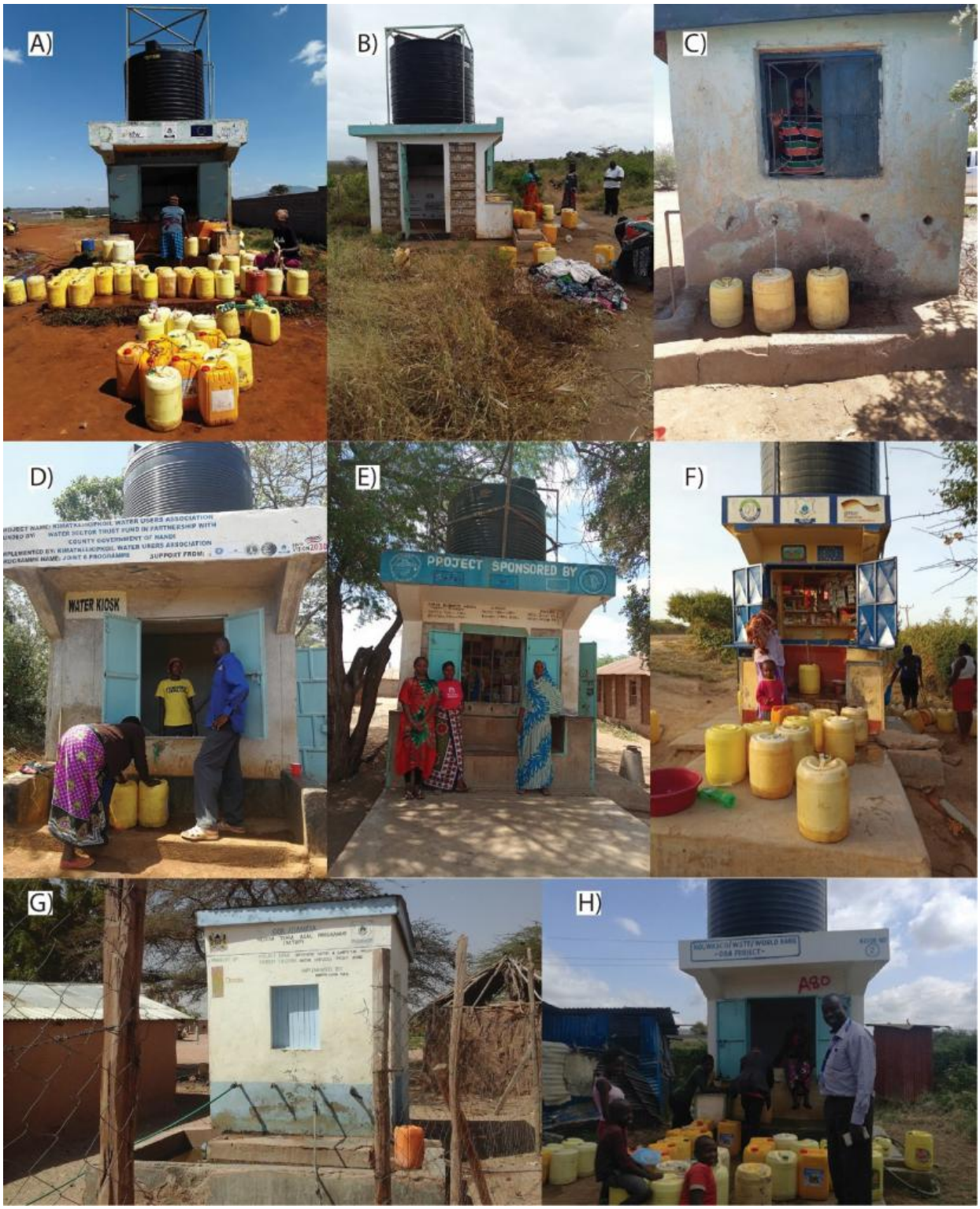


Figure 88. Water kiosks. A) Mwana-Wikio Water Project, UPC FY 2013/14, Kiambu county; B) Taru Gatsakuleni Water Project, J6P FY 2017/18, Kwale county; C) Boji Garas Community water & sanitation project, MTAP II FY 2016/17, Wajir county; D) Kimatkei/Kipkoil Water project, J6P FY 2017/18, Nandi county; E) Kibuyu-Mikunduni Water Project, UPC FY 2013/14, Tana River county; F) Siakago Township Water Project, UPC FY 2013/14, Embu county; G) North Horr Water project, MTAP I FY 2014/15, Marsabit county; H)Nol Turesh water project, OBA FY 2016/17, Makueni county.

Figure 89. Animal troughs. A) Dhida Community Water project, MTAP II FY 2015/16, Tana River county. B) Gotu, Boji Dera, MTAP II FY 2016/17, Isiolo county; C) Gotu, Boji Dera, MTAP II FY 2016/17, Isiolo county; D) Nairobi Area Community Watsan Project, MTAP II FY 2016/17, Lamu county; E) Ingirir Gumi Gayo water & sanitation project, MTAP II FY 2016/17,Wajir county; F) Buna community water & sanitation project, MTAP II FY 2016/17,Wajir county; G) Galasa Water project, MTAP I FY 2014/15, Marsabit county; H) North Horr Water project, MTAP I FY 2014/15, Marsabit county.

Figure 90. Yard taps. A) Nyagacho, Satellite & Chebocho Water Project, UPC FY 2016/17, Kericho county; B) Indian Burzar Water Project; UPC FY 2014/15, Kiambu county; C) Rockline Water Project, UPC FY 2014/15, Kiambu county; D) Malindi Informal Settlements Water Project, UPC FY 2013/14, Kilifi county; E) Luisukut Water Project, J6P FY 2017/18, Laikipia county; F) Sirimon Self Help Water Project, J6P FY 2017/18, Laikipia county; G) Nyasanda Ugunja Water Project, UPC FY 2016/17, Siaya county.

Figure 91. Individual connections. A) Indian Burzar Water Project, UPC FY 2014/15, Kiambu county; B) Mairo Inya Water Project, UPC FY 2016/17, Nyandarua county; C) Nyagacho, Satellite & Chebocho Water Project, UPC FY 2016/17, Kericho county; D) Iten Keriobangi Water Project, UPC FY 2013/14, Elgeiyo Marakwet county; E) Kapngetuny Showground Water Project, UPC 2013/14, Nandi county; F) Cheptil dam Water Users association, J6P FY 2017/18, Nandi county; G) Katheri Nyariginu water project, J6P FY 2017/18, Laikipia county; H) Kiwanja Ndege/Industrial Area Water Project, UPC FY 2016/17, Nakuru county; I) Kapngetuny Showground Water Project, UPC 2013/14, Nandi county.

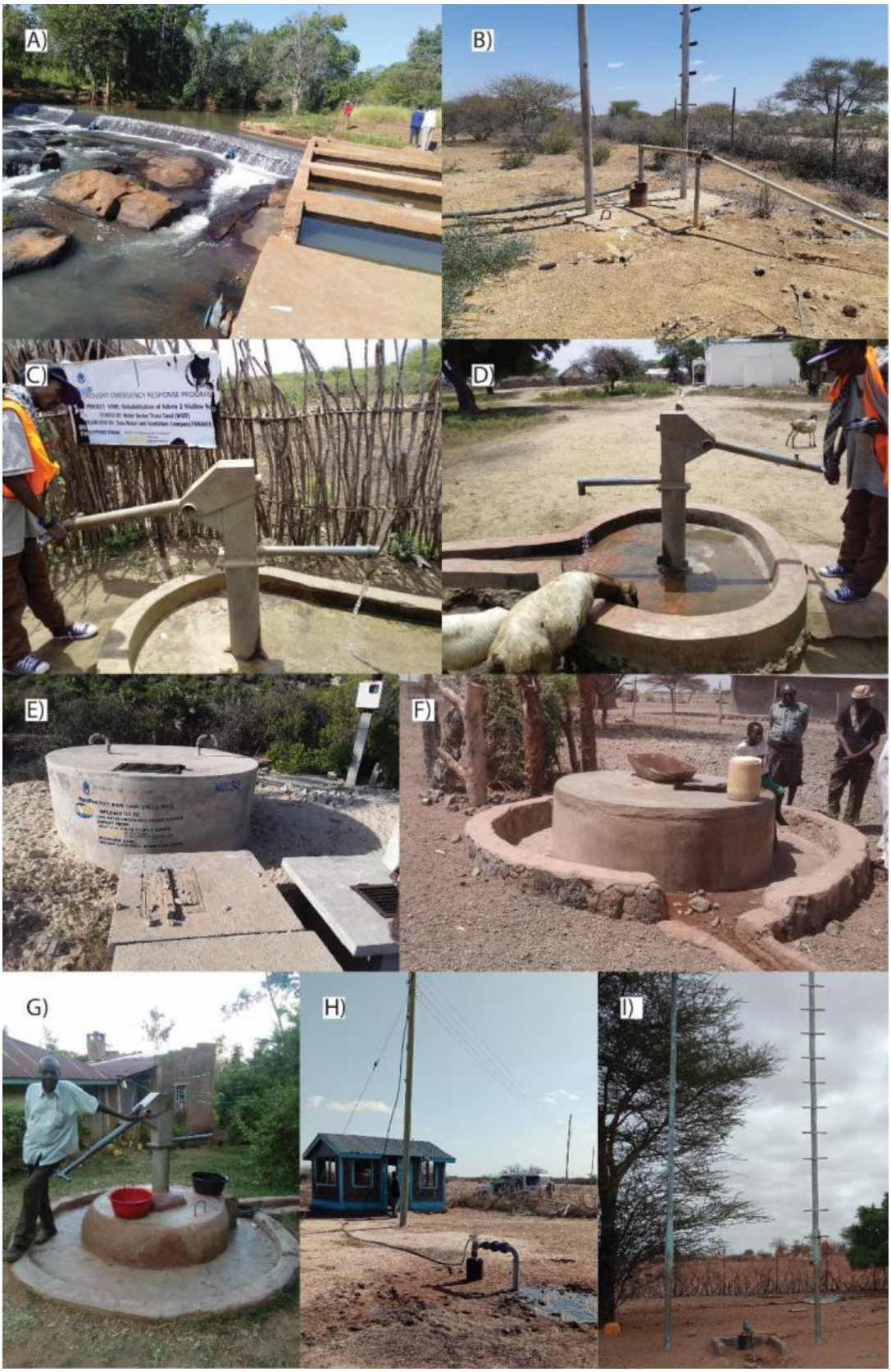


Figure 92. Intakes. A) River intake, Kathwana Water Project, J6P FY 2017/18, Tharaka Nithi county. B) Borehole, Boji Garas Community water & sanitation project, MTAP II FY 2016/17, Wajir county. C)-D) Hand dug well, Rehabilitation of Ndura(1), Ndura(2), Handaraku and Marava shallow wells, DERP FY 2017/18, Tana River county. E) Lamu Dunes Well 2no., DERP FY 2017/18, Lamu county. F) Rehabilitated shallow well, Galasa Water project. MTAP I FY 2014/15, Marsabit county; G) Hand dug well, Jepkoyai Water Project, CPC FY 2013/14, Vihiga county. H) Skanska Boreholes, DERP FY 2017/18, Garissa county. I) Bahuri Boreholes, DERP FY 2017/18, Garissa county.

Figure 93. Pumps and Energy sources. A)-C) Hand pumps and solar panels, Galasa Water project, MTAP I FY 2014/15, Marsabit county; D) Solar panels, Nyakona Water Users Association project, J6P FY 2017/18, Migori county; E) Electric pump, Uriri/Bware Water & Sanitation Project, J6P FY 2017/18, Migori county; F) Non-operational hand pump, Galasa Water project, MTAP I FY 2014/15, Marsabit county; G) Electric pump, Kimng'oror Water Users association, J6P FY 2017/18, Nandi county.

Figure 94. Institutional sanitation. A) Ghamano Primary School, MTAP I FY 2013/14, Tana River county; B) Kathwana Sanitation, J6P FY 2017/18, Tharaka Nithi county; C) Kimatkei/Kipkoil Sanitation, J6P FY 2017/18, Nandi county; D) Lelmokwo Sanitation project, J6P FY 2017/18, Nandi county; E) Kathwana Sanitation, J6P FY 2017/18, Tharaka Nithi county; F) Longopito primary school, MTAP II FY 2016/17, Isiolo county; G) Ramole Primary School. MTAP I FY 2014/15, Marsabit county; H) Najah Primary School, MTAP I FY 2013/14, Garissa county.

Figure 95. UBSUP Household sanitation. A) Nzoia Kitale Household Sanitation Project Phase I, FY 2015/16, Transnzoia county; B) Kericho Household Sanitation Project Phase II, FY 2017/18, Kericho county; C) Nzoia Kitale Household Sanitation Project Phase II, FY 2015/16, Transnzoia county; D) Machakos Kathemboni Household Sanitation Project Phase II, FY 2017/18, Machakos county; E) Gusii Household Sanitation Project, FY 2015/16, Kisii county; F) Nakuru Household Sanitation Project Phase II, FY 2017/18, Nakuru county; G) Gusii Household Sanitation Project, FY 2015/16, Kisii county; H) DTF, Ol Kalou Household Sanitation Project, FY 2017/18, Nyandarua county.

Figure 96. Public Sanitation Facilities (PSFs). A) Makutano/Kilimambogo Public Toilet Project, UPC FY 2013/14, Kiambu county; B) Kitale 6th Call Water Project, UPC FY 2014/15, Transnzoia county; C) Litein Sanitation Project, UPC FY2014/15, Bomet county; D) Whisper Park & Bondeni Sanitation Projects, UPC FY 2014/15, Nyeri county; E) Kathwana Sanitation project, J6P FY 2017/18, Tharaka Nithi county; F) Kapsabet Recreation Park Public Sanitation Project, UPC 2013/14, Nandi county.

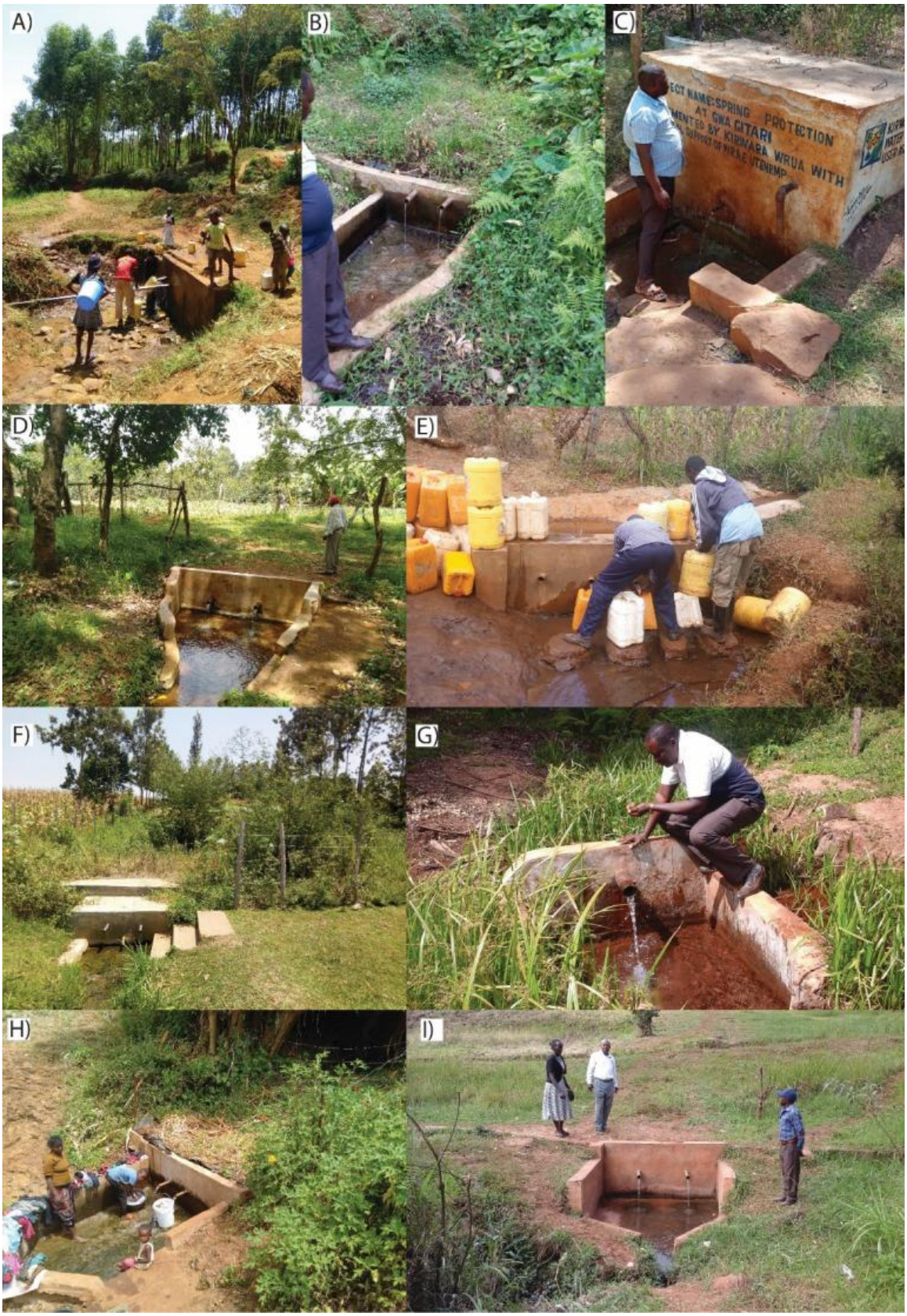


Figure 97. Spring protection. A) Mungoma Water Project, CPC FY 2013/14, Vihiga County; B) Upper Rupingazi WRUA, IFAD FY 2016/17, Embu county; C) Kirwara WRUA. IFAD FY 2017/18, Kirinyaga county; D) Upper Rupingazi WRUA, IFAD 2016/17, Embu county; E) North Mathioya WRUA, IFAD FY 2017/18, Muranga county; F) Korondo Nyasare WRUA, J6P FY 2017/18, Migori county; G) Upper Rupingazi WRUA, IFAD FY 2016/17, Embu county; H) Kiwe WRUA, IFAD, FY 2017/18, Kirinyaga county; I) Kayahwe WRUA, IFAD FY 2017/18, Muranga county.

Figure 98. Tree nurseries. A) Castle CFA, IFAD FY 2016/17, Kirinyaga county; B) Njukiiri CFA, IFAD FY 2016/17, Embu county; C) Njukiini CFA, IFAD FY 2016/17, Kirinyaga county; D) North Mara WRUA, IFAD FY 2017/18, Tharaka Nithi county; E) Kangaita CFA, IFAD FY 2016/17, Kirinyaga county.

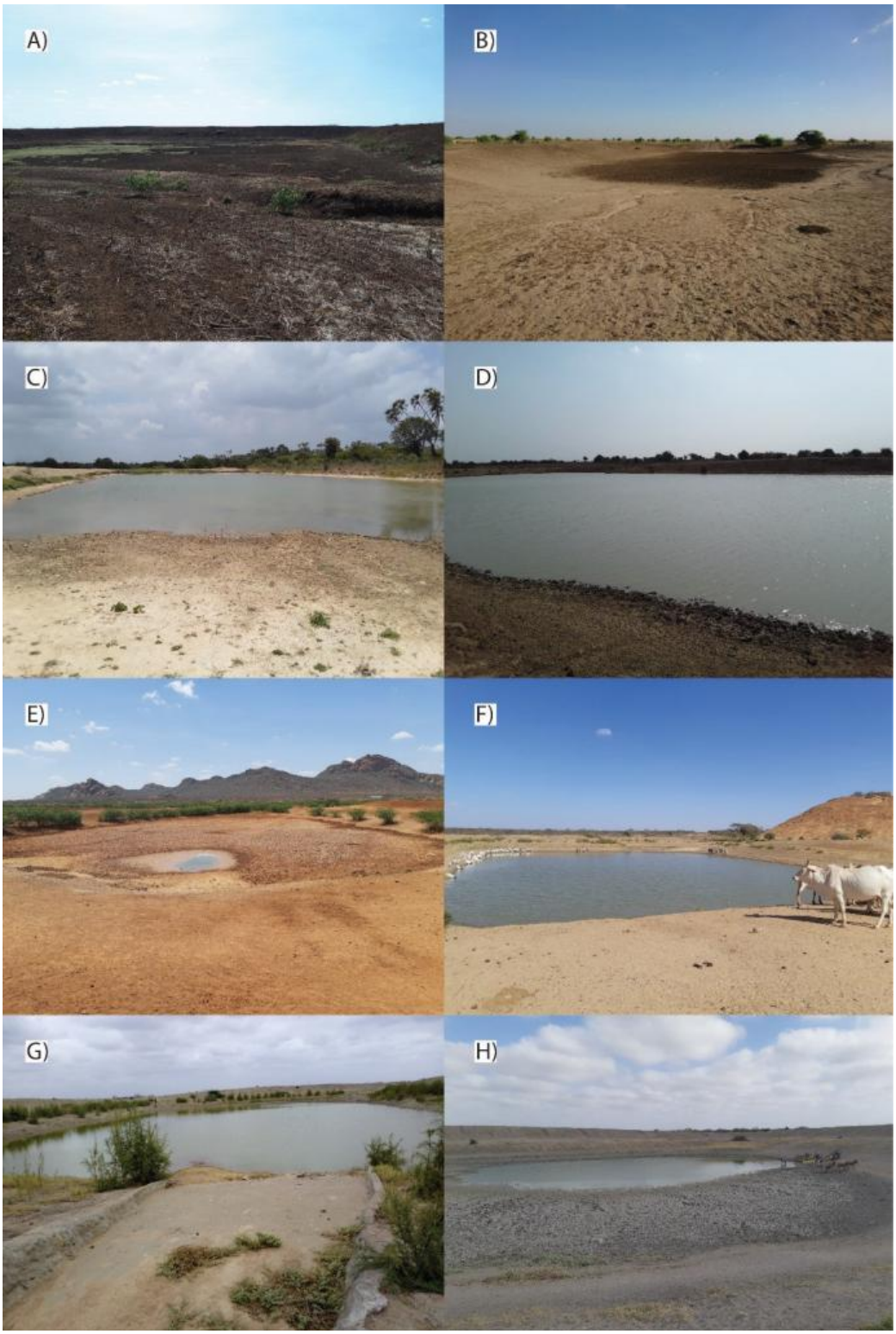


Figure 99. Water pans. A) Funan Qumbi water & sanitation project, MTAP II FY 2016/17, Marsabit county; B) Sericho water & sanitation project, MTAP II FY 2016/17, Isiolo county; C) Nairobi Area Community Watsan Project, MTAP II FY 2016/17, Lamu county; D) Dide Waride Water Pan, DERP FY 2017/18, Lamu county; E) Buna community water & sanitation project, MTAP II FY 2016/17, Wajir county; F) Ingirir Gumi Gayo water & sanitation project, MTAP II FY 2016/17, Wajir county; G) Rehabilitation of Bulto mulitu water pan, DERP FY 2017/18, Tana River county; H) Handaki community water & sanitation project, MTAP II FY 2016/17, Wajir county.

Figure 100. Rainwater harvesting tanks. A) Middle Kathita WRUA, IFAD FY 2017/18, Meru county; B) Lower Oyani WRUA, J6PFY 2017/18, Migori county; C) Balambala primary School, MTAP I FY 2013/14, Tana River county; D) Adele Primary School,MTAP I FY 2013/14, Tana River county; E) Kagaka WRUA, IFAD FY 2017/18, Tharaka Nithi county; F) Kithino WRUA, IFAD FY 2017/18, Meru county; G) Marembo Primary School, MTAP I FY 2014/15, Tana River county.

Figure 101. Sand dams. A) Al-Amin Moju Project, MTAP II FY 2015/16, Tana River county. B)-D) Loisukut WRUA, J6P FY 2017/18, Laikipia county. E) Kasha WRUA, MTAP II FY 2015/16, Garissa County. F) Al-Amin Moju Project, MTAP II FY 2015/16, Tana River county.

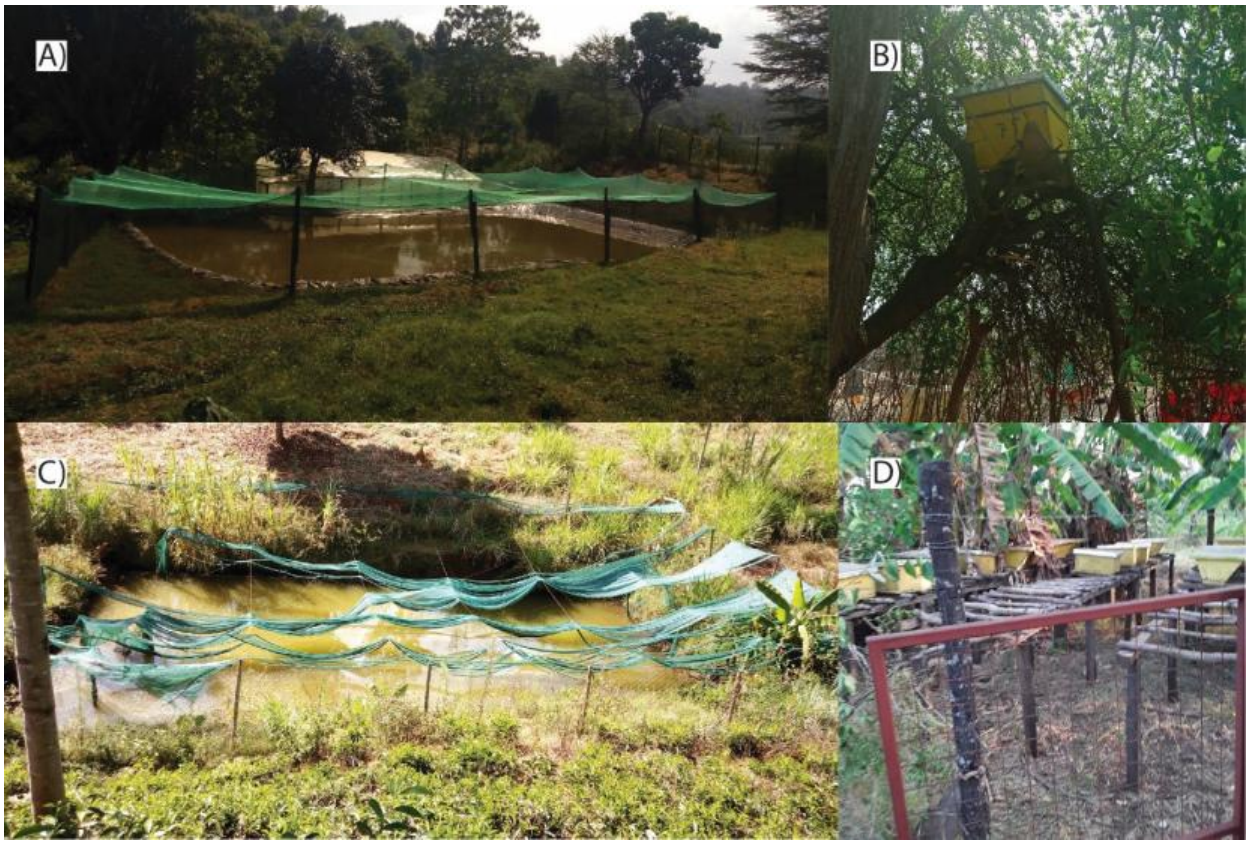


Figure 102. Livelihoods. Fish pond, Muringato WRUA, IFAD FY 2017/18, Nyeri county. B) Bee hive, Kasha WRUA, MTAP II FY 2015/16, Garissa county. C) Fish pond, South Mathioya WRUA, IFAD FY 2017/18, Muranga county. D) Bee hives, Witu WRUA, MTAP II FY 2016/17, Lamu county.

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