

Bomet County Water, Sanitation and Hygiene Masterplan

Roadmap Towards Universal Access

For

WASH Services

2022-2050





TABLE OF CONTENTS

<i>DEFINITION OF TERMS</i>	<i>viii</i>
<i>FOREWORD</i>	<i>xiii</i>
<i>PREFACE</i>	<i>xiv</i>
<i>ACKNOWLEDGEMENTS</i>	<i>xv</i>
<i>EXECUTIVE SUMMARY</i>	<i>xvi</i>
<i>CHAPTER ONE</i>	<i>1</i>
<i>1. INTRODUCTION AND BACKGROUND</i>	<i>1</i>
<i>1.1 Introduction</i>	<i>1</i>
<i>1.2 Objectives of the Water and Sanitation Masterplan</i>	<i>2</i>
<i>1.3 The Master Planning Process - Jan 2020 - June 2022</i>	<i>2</i>
<i>1.4 Background Information on Bomet County</i>	<i>4</i>
<i>1.4.1 Location and Size</i>	<i>4</i>
<i>1.4.2 Administrative Boundaries</i>	<i>5</i>
<i>1.4.3 Population</i>	<i>5</i>
<i>1.4.4 Education and Health Institutions</i>	<i>5</i>
<i>1.4.5 Public Administrative and Rehabilitation Institutions</i>	<i>7</i>
<i>1.4.6 Commercial Enterprises</i>	<i>8</i>
<i>1.4.7 Economic Context</i>	<i>8</i>
<i>1.4.8 Energy Sources</i>	<i>8</i>
<i>1.4.9 Geography</i>	<i>9</i>
<i>1.4.9.1 Surface Water</i>	<i>9</i>
<i>1.4.9.2 Rivers</i>	<i>9</i>
<i>1.4.9.3 Springs</i>	<i>10</i>
<i>1.4.9.4 Water Pans</i>	<i>10</i>
<i>1.4.9.5 Ground Water Potential</i>	<i>11</i>
<i>1.5 Climate Change Risk/Vulnerability Assessment</i>	<i>12</i>
<i>CHAPTER TWO</i>	<i>13</i>



2	<i>BASELINE ASSESSMENT OF WASH ACCESS</i>	13
2.1.1	<i>WASH Access Across Bomet County - Overview</i>	13
2.1.2	<i>Water Services</i>	13
2.1.2.1	<i>Infrastructure</i>	13
2.1.3	<i>Monitoring and Evaluation</i>	15
2.1.4	<i>Sanitation and Hygiene</i>	15
2.1.5	<i>Community Sanitation</i>	16
2.1.6	<i>Infrastructure Development</i>	16
2.1.7	<i>Infrastructure Management</i>	17
2.2	<i>Sotik Sub-County Data Collection - A Deep Dive</i>	18
2.2.1	<i>Sotik Sub-county - Water Results</i>	20
2.2.2	<i>Sotik Sub-county - Water Point Survey</i>	21
2.2.3	<i>Sotik Sub-county - Spring Protection</i>	22
2.2.4	<i>Sotik Sub-county - Sanitation Survey</i>	23
2.2.5	<i>Sotik Sub-county - Hygiene Survey</i>	26
2.2.6	<i>Sotik Sub-county - Menstrual Health</i>	28
2.2.7	<i>Sotik Sub county - WASH in Institutions - Water Supply in Schools</i>	29
2.2.8	<i>Sotik Sub county - WASH in Institutions - Sanitation in Schools</i>	30
2.2.9	<i>Sotik Sub county - WASH in Institutions - Latrine Emptying in Schools</i>	30
2.2.10	<i>Sotik Sub county - WASH in Institutions -Hygiene in Schools</i>	31
2.2.11	<i>Sotik Sub county - WASH in Institutions - Health Facilities</i>	32
2.2.12	<i>Sotik Sub county - Key Conclusions from Survey Results</i>	33
	<i>CHAPTER THREE</i>	34
3	<i>STRATEGIC ROADMAP TO UNIVERSAL WASH ACCESS</i>	34
3.1	<i>Outcomes from January 2022 Workshop</i>	34
3.2	<i>Public Consultation</i>	39
3.2.1	<i>Water</i>	39
3.2.2	<i>Sanitation</i>	39
3.2.3	<i>Hygiene</i>	40
3.2.4	<i>Menstrual Health</i>	40



3.3	<i>Water Integrity Network Report</i>	41
3.4	<i>Targets for achieving universal access</i>	42
3.4.1	<i>Targets for Basic WASH Access</i>	42
3.4.2	<i>Roadmap to Universal Access</i>	42
3.4.3	<i>Current state of WASH access (2022)</i>	43
	CHAPTER FOUR	49
4	STRATEGIC INTERVENTIONS REQUIRED TO ACHIEVE UNIVERSAL ACCESS	49
4.1	<i>Projects Required to implement Recommendations</i>	51
	CHAPTER FIVE	53
5	COSTING THE MASTERPLAN	53
5.1	<i>Methodology</i>	53
5.2	<i>Costing of Water Services</i>	54
5.3	<i>Costing of Sanitation Services</i>	56
5.4	<i>Costing of Institutional WASH Services</i>	60
	CHAPTER FIVE	61
6	FINANCING THE MASTERPLAN	61
6.1	<i>Financing Options</i>	61
6.2	<i>Government Financing</i>	61
6.3	<i>External Funding</i>	61
6.4	<i>Private Sector Involvement and Donor Funding</i>	62
	REFERENCES	63



LIST OF TABLES

Table 1 Administrative zones in Bomet County	5
Table 2 Population Density and Distribution by Sub-County	5
Table 3 Education Statistics for Bomet County	7
Table 4 Statistics for Health Facilities.....	7
Table 5 Household income in Bomet County.....	8
Table 6 Comparison of County-wide water access data with data from Sotik sub-county survey.....	19
Table 7 Water access by type of water source.....	20
Table 8 Water Points in Sotik sub-county	21
Table 9 Sanitation facilities in Sotik sub-county.....	23
Table 10 Building Block scores for water and sanitation.....	35
Table 11 WASH Action Plan from Workshops held on 17-18th January 2022	38
Table 12 Bomet County water infrastructure capital investment costs	54
Table 13 Yearly progress towards Universal Water Access.....	55
Table 14 Bomet County sanitation infrastructure capital investment costs.....	57
Table 15 Yearly progress towards Universal Sanitation Access	58
Table 16 Bomet County Institutional WASH Service costs.....	60
Table 17 Bomet County Direct Support cost.....	60
Table 18 Total Cost of implementing the WASH Masterplan	61



LIST OF FIGURES

Figure 1 Overview of District-wide planning process	3
Figure 2 Map of Bomet County	4
Figure 3 Percentage of population by education attainment by Ward.....	6
Figure 4 Map of Major Rivers within Bomet County (Source: WWF).....	10
Figure 5 Springs and Water Pans within Bomet County.....	11
Figure 6 Map of Bomet County Water schemes	15
Figure 7 Cost of pit emptying by exhaustion method	17
Figure 8 Shit Flow diagram of Bomet County.....	18
Figure 9 Distribution of responses on rungs of JMP water supply ladder.....	21
Figure 10 JMP water supply distribution for all sub-wards in Sotik. Chart size refers to number of respondents from each sub-ward.	22
Figure 11 Distribution of responses on rungs of JMP sanitation ladder	24
Figure 12 JMP sanitation access distribution for all sub-wards in Sotik. Chart size refers to number of respondents from each sub-ward	25
Figure 13 Distribution of responses on rungs of JMP hygiene ladder.....	26
Figure 14 JMP hygiene distribution for all sub-wards in Sotik. Chart size refers to the number of respondents from each sub-ward.	27
Figure 15 Responses to menstrual practice needs scale questions	28
Figure 16 Water sources used by schools	29
Figure 17 Water access in schools.....	29
Figure 18 Sanitation access in schools.....	30
Figure 19 Number of VIP latrines in schools.....	31
Figure 20 School hygiene access	32
Figure 21 State of toilets in health facilities	32
Figure 22 Current state of WASH Access. Each coloured bar represents the population percentage of different rungs of the water and sanitation ladders.	43
Figure 23 Roadmap Phase 1. Each coloured bar represents the population percentage of different rungs of the water and sanitation ladders.	44
Figure 24 Roadmap Phase 2. Each coloured bar represents the population percentage of different rungs of the water and sanitation ladders.	45
Figure 25 Roadmap Phase 3. Each coloured bar represents the population percentage of different rungs of the water and sanitation ladders.	46
Figure 26 Roadmap Phase 4. Each coloured bar represents the population percentage of different rungs of the water and sanitation ladders.	47
Figure 27 Roadmap for Universal WASH Access in Bomet County.....	48
Figure 28 Interventions required to achieve the objectives of the Masterplan	52
Figure 29 Cost of Water delivery 2022-2050.....	56
Figure 30 Cost of Sanitation delivery 2022-2050	58



LIST OF ABBREVIATIONS AND ACRONYMS

ASDSP	Agricultural Sector Development Support Programme
BOMWASCO	Bomet Water and Sanitation Company
CDTF	Community Development Trust Fund
CECM	County Executive Committee Member
CHV	Community Health Volunteer
CIDP	County Integrated Development Plan
CLTS	Community Led Total Sanitation
CRA	Climate Risk Assessment
CSO	Civil Society Organisation
ECDE	Early Childhood Development Education Centres
GOK	Government of Kenya
JMP	Joint Monitoring Program
KES	Kenyan Shillings
MH	Menstrual Health
MHM	Menstrual Hygiene Management
NG-CDF	National Government -Constituency Development Fund
OD	Open Defecation
ODF	Open Defecation Free
PRSP	Poverty Reduction Strategy Paper
RWH	Rainwater Harvesting
SDG	Sustainable Development Goal
UNFCCC	United Nations Framework Convention on Climate Change
UNICEF	United Nations International Children's Emergency Fund
VIP	Ventilated Improved Pit Latrine
VTC	Vocational Training Centres
WASH	Water, Sanitation and Hygiene
WASREB	Water Services Regulatory Board
WHO	World Health Organisation
WSP	Water Service Provider
WSTF	Water Sector Trust Fund
WWDA	Water Works Development Agencies
WRA	Water Regulatory Authority
WWF	Worldwide Fund for Nature
WT	Water Tribunal
NWWSA	National Water Harvesting & Storage Authority
KNBS	Kenya National Bureau of Statistics



DEFINITION OF TERMS

Aquifer: An underground geological formation containing water that supplies water for wells and springs such as water-bearing permeable rock, rock fractures, or unconsolidated materials.

Basic sanitation: This refers to access to, and the use of, excreta and wastewater facilities to ensure a clean and healthy environment within the household level and any other living environment.

Borehole: a deep, narrow hole drilled in the ground to locate water

Climate change: a change in global or regional climate patterns attributed largely to the increased levels of atmospheric carbon dioxide produced by the use of fossil fuels

Commercial enterprise: means any entity formed for conduct of lawful business including, but not limited to, a sole proprietorship, partnership, holding company, joint venture, corporation, business trust, or other entity which may be publicly or privately owned

Enabling environment: This comprises laws, policies, financial instruments, formal organizations, community organizations and partnerships which together support and promote needed changes in hygiene practices and access to technology

Environmental sanitation: The control of environmental factors that form a link in disease transmission and have an impact on human health. It constitutes a wide range of interventions designed to create and maintain an environment conducive to human health; reduce people's exposure to diseases by providing a clean environment in which to live; and measures to break the cycle of diseases. This includes sanitation (defined as the infrastructure and services required for the safe management of human excreta) but also includes hygienic management and/or disposal of human and animal excreta, refuse, and wastewater, solid waste management, water and wastewater treatment, industrial waste treatment, drainage of surface water and sullage, washing facilities for personal and domestic hygiene, food safety, housing and workplace sanitation, control of disease vectors and air pollution control. Sanitation involves appropriate behaviours as well as the availability of suitable facilities, which work together to form a hygienic environment.

Excreta: Faeces and urine.

Faecal sludge: Faecal sludge is the solid or settled contents of pit latrines and septic tanks. Faecal sludge differs from sludge produced in municipal wastewater treatment plants. The physical, chemical and biological qualities of faecal sludge are influenced by the duration of storage, temperature, intrusion of ground water or surface water in septic tanks or pits, performance of septic tanks, and tank emptying technology and pattern.

Food hygiene: Keeping food clean and safe in the entire pre-consumption chain in order to prevent disease.

Gender: Gender entails the social construction of roles and relationships of women and men, including how they cooperate and share work, make decisions, and exercise control in projects and programmes.



Ground water: This refers to water found below ground level in the soil.

Groundwater: The term describing all subsurface water. Well water, in other words. It can be found in aquifers as deep as several miles.

Household: a house and its occupants regarded as a unit

Hydrogeological survey: Hydrological survey is a survey conducted to determine groundwater potential

Hygiene education: An element of hygiene promotion concerned with educating people about how diseases spread; for example, through the unsafe disposal of excreta or by not washing hands with soap after defecation.

Hygiene promotion: A planned and systematic approach to preventing sanitation-related diseases through the widespread adoption of safe hygiene practices. It aims to enable people to take action to prevent or mitigate water, sanitation and hygiene related diseases. It begins with and is built on what local people know, do and want. It entails encouraging people to adopt behaviours that embody safe hygiene practices the form the basis of cleanliness and good health.

Hygiene: The term refers to the set of practices associated with the preservation of good health and healthy living. It consists of behaviours related to the safe management of human excreta, such as hand-washing with soap or the safe disposal of children's faeces. Hygiene as a method of using cleanliness to prevent disease and thus determines how much impact water an infrastructure can have upon health, because it reflects not the construction, but the use, of such facilities. Good hygiene is the practice of keeping oneself and one's surroundings clean, especially in order to prevent illness or the spread of disease. It therefore infers cleanliness relating to good health.

Improved sanitation facility: An improved sanitation facility is one that hygienically separates human excreta from human contact, thus creating barriers to prevent the transmission of diseases. To be effective, the facility must be correctly constructed and properly maintained in a way that confers maximum health benefits to the user.

An improved sanitation facility includes:

- a) Flush/pour flush to piped sewer system, septic tank, and pit latrine.
- b) Ventilated improved pit (VIP) latrine.
- c) Composting toilet.
- d) Urine Diverting Dry Toilet (UDDT)
- e) Cartridge Based Toilets (CBT)
- f) A simple improved pit latrine that has all of the following features:



- The latrine floor is raised, smooth and impervious for it to be easily cleaned. It should leave no cracks. Where there's no slab the floor should slope towards squat hole to facilitate effective draining of water during cleaning.
- The slab is cleanable, raised and impervious.
- There is a well-fitting lid that does not allow flies into the pit.
- The superstructure is offered maximum privacy with a roof to prevent rain from damaging the latrine floor.
- The latrine should be at a distance of at least 40m from water sources and pit depth should be a minimum of 2m above the highest ground water levels.

In urban and peri-urban areas, the facility should be embedded in a functioning sanitation system, where the excreta from the toilet is properly stored, transported, treated, disposed or reused in a manner which is not hazardous to human health and not detrimental to the environment and should not contaminate water sources.

Improved sanitation: Improved sanitation means safe disposal and management of waste to prevent human exposure and environmental hazards. As defined by the Joint Monitoring Programme for water and sanitation of the WHO and UNICEF, it includes connection to public sewer, to septic system, pour-flush latrine, simple pit latrine and ventilated improved pit latrine.

Last-mile connection: describes the end of a pipeline connection to an individual's household or a communal yard tap

On-site sanitation: This refers to the system of sanitation whereby the means of human excreta collection, storage and treatment (where this exists) are contained within the place occupied by the dwelling and its immediate surroundings. Examples are the use of pit latrines and septic tank systems with soak away of liquid waste.

Organic matter: This includes materials which come from animal or vegetable sources. Organic matter generally can be degraded by micro-organisms.

Pit latrine: Latrine with a pit for collection and decomposition of excreta and from which liquid infiltrates into the surrounding soil.

Rainwater harvesting: is the collection and storage of rain from a roof-like surface, rather than allowing it to run off

Raw water: Unfiltered, unsterilized, untreated water from wells or other sources.

Sanitation marketing: The use of marketing techniques to promote the construction and use of sanitation facilities. Sanitation marketing considers the target population as customers. It borrows private sector experience to develop, place and promote an appropriate product: in this case the product is a toilet and excreta disposal system, be it sewerage connection, pit latrine or other mechanism. Critically the facilities must be readily available at an affordable price in the right place.



Sanitation: Sanitation is the hygienic means of preventing human contact from the hazards of waste to promote health and environmental integrity. It is generally used to refer to the provision of facilities and services for the safe disposal of human and faeces and urine. It can also be used to refer to the maintenance of hygienic conditions and healthy environments through services such as garbage collection and wastewater disposal to prevent the transmission of water and sanitation related diseases.

School WASH: This entails a school facility having adequate safe drinking water, adequate and sanitary toilets and urinals to the ratio/proportion of pupils and age cohort, adequate handwashing facilities, properly maintained compound, well-ventilated classrooms and other living facilities including kitchen and dining facilities.

Septic tank: A disposal system for human excreta where the waste from water closets is disposed in an underground tank that allows settlement of sludge and disposes the liquid waste into a subsurface drain. The underground tank collects and treats wastewater by a combination of solids settling and anaerobic digestion. The effluents may be discharged into soak pits or small-bore sewers, and the solids have to be pumped out periodically. Emptying septic tank sludge and final disposal of this septage is a challenge to many countries.

Sewage: Human excreta and wastewater, flushed along a sewer pipe.

Sewerage: A system of sewer pipes, manholes and pumps for the transport of sewage.

Shallow well: is a hole which has been dug, bored, driven or drilled into the ground for the purpose of extracting water. A well is considered to be shallow if it is less than 50 feet deep

Sludge: A mixture of solids and water deposited on the bottom of septic tanks and ponds. The term sewage sludge is generally used to describe residuals from centralised wastewater treatment, while the term septage is used to describe the residuals from septic tanks.

Spring: a point of exit at which groundwater from an aquifer flows out on top of earth's crust and becomes surface water.

Sullage: Domestic dirty water not containing excreta. Sullage is also called grey water.

Surface water: Surface water is the water that is available on land in the form of rivers, ocean, seas, lakes and ponds.

Surface water: water taken directly from a lake, a river or other water bodies

Total sanitation: This is where all people or all community members demand, develop and sustain a totally sanitised, hygienic and healthy environment for themselves (in partnership with drivers and stakeholders) by erecting barriers to prevent the transmission of diseases, primarily from faecal contamination. It is applied at all levels from household, village, sub-county to county levels. Total sanitation is complete eradication of all indiscriminate and unhygienic practices in the disposal of excreta, drainage and litter.



Turbidity: Turbidity is the cloudiness of water caused by a large numbers of individual particles.

Vector: Insect or organism that carries disease from one animal or human to another (such as a mosquito, fly, or bilharzia-infected snail.)

VIP latrine: (Ventilated Improved Pit latrine.) A VIP is a pit latrine with a slab and a ventilation pipe to remove foul smells from the pit and vent them to the air above the superstructure roof line. A fly screen is added to the top of the ventilation pipe to control flies.

Wastewater: The spent or used water from homes, communities, farms and businesses that contain enough harmful material to damage the water's quality. Wastewater includes both domestic sewage and industrial waste from manufacturing sources

Water pan: is a hole or pond dug in the ground, used to collect and store surface runoff from uncultivated grounds or roads

Water treatment: Water treatment is any process that improves the quality of water to make it appropriate for a specific end-use. The end use may be drinking, industrial water supply, irrigation, etc



FOREWORD



The Constitution of Kenya 2010 devolved the water, sanitation and health functions. This gave the counties to plan and implement Water, Sanitation and Hygiene (WASH) services. Despite the gradual achievements in WASH, the County average water access stands at 20% while access to basic sanitation stands at 65% and hygiene practice is still low. A lot, therefore, needs to be done to achieve the sustainable development goal number six (SDG 6) and deliver Agenda 4 as envisioned by the national government. The poor and disadvantaged communities are the most affected, with children and women bearing the burden. The adverse effects of climate change will continue to impact on WASH in the County. Solid waste and wastewater problems are growing rapidly in urban areas as populations grow.

The overall target for Bomet County is to achieve Basic access for all by 2036 for water, and by 2030 for sanitation and hygiene. The trend of basic water and sanitation coverage indicates that Bomet will attain this target but it needs pragmatic vision, operational strategies, strengthened institutional arrangements, adequate resources and stakeholders' collaborative efforts to achieve the national goal of universal sanitation coverage by 2030. Through various strategies with national government and partnership with Dig Deep (Africa) and other partners in WASH, the County has made firm commitments to develop the Water, Sanitation and Hygiene masterplan (WASH).

In order to address the challenges on WASH, the County government in partnership with Dig Deep (Africa) has developed a WASH masterplan as a roadmap in implementation of strategies to mainstream the efforts of concerned stakeholders at various levels. Hence, the MOU with Dig Deep (Africa) and launching of WASH master plan 2022- 2027. The masterplan serves as a commitment by Bomet County and Dig Deep a clear roadmap to deliver the 2030 targets as envisioned by Vision 2030.

A wide range of consultations were carried out with various communities, sub-county, and national level stakeholders to seek feedback and input to develop the Master Plan. The Plan will help the concerned stakeholders in effective planning, budgeting, human resource mobilization, implementation, monitoring and evaluation and follow up of hygiene and sanitation programs and projects. The diverse approaches and modalities will converge to maintain uniformity and standardization in the hygiene and sanitation sector to accelerate the sanitation pace to achieve the County WASH targets.

Appreciation goes to Dig Deep (Africa) who has played a key role to ensure that we deliver this WASH Masterplan.

H.E Prof. Hillary Barchok

GOVERNOR



PREFACE



The development of this first Water, sanitation and Hygiene (WASH) master plan is a result of various studies, consultations and participation of key stakeholders to assess the importance of functioning WASH system at the County level. It is envisaged that this plan shall guide the county Government of Bomet in planning, implementing and managing WASH activities that will produce efficient and quality benchmarks towards achieving its vision. The Water and health sectors are committed to building a comprehensive performance measurement and management system that supports achievement of their objectives. This plan will therefore ensure availability of reliable and relevant WASH data, for use by all WASH players in order to make evidence-based decisions to allocate resources effectively in order to improve the quality of health services in the County. To this end, the departments and other stakeholders concerned will mobilize resources to drive and strengthen Implementation, coordination and overall management to meet the expectation of WASH. The implementation of WASH master plan is one of the efforts to reduce gaps and effects of low-level WASH situation in the community. The main goal of the two sectors is to implement the strategies and intervention measures geared towards improving service delivery, access and utilization of WASH facilities and enhance participation of users. This plan is a positive step in the right direction for better livelihood through better WASH implementation.

This plan is set to provide a platform upon which the residents will derive and enjoy their right to highest attainable standards of sanitation, clean water and healthy environment as guaranteed by the Constitution of Kenya 2010 and hence ultimately, ensure better health, dignity, social well-being and quality of life for all.

Hon. Dr. Joseph Sitonik
CECM - Medical Services and Public Health



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This WASH masterplan is a result of joint efforts, contributions and guidance from Department of Medical services and Public Health, Department of Water, Sanitation, Environment, Natural resources and Climate Change, Dig Deep (Africa), Kenya Red Cross Society, World Vision and Aqua Clara Kenya. We would also like to thank The Waterloo Foundation, an independent grant-making Foundation, for funding the development of this Masterplan.

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Further acknowledgement and thanks go to the following for their active contribution and Support; Patrick Langat - Managing Director-BOMWASCO, Douglas Makora Mokong'u - County Manager Aqua Clara Kenya, Robert Yegon - County Coordinator- Kenya Red Cross Society Bomet.

Special appreciation goes to the following Dig Deep staff: Ben Skelton, Chief Executive Officer, Joe Hook, Programme officer, Justus Tanui- Head of Programmes, Nelly Chepkorir and Nicky Ronoh - Project Officers. We are deeply indebted to Dig Deep (Africa) for providing financial and technical support that made the development of this masterplan possible.

The residents of Bomet County whose active participation and feedback contributed to the success of this WASH Masterplan. It is from the very vibrant and selfless engagements of various stakeholders throughout the county that we have put forth a vision, setting us on a trajectory map that will enable achievement of noble WASH commitments.

Hon. Eng. Peter Tonui

CECM - Water, Sanitation, Environment, Natural Resources and Climate Change



EXECUTIVE SUMMARY

This Masterplan sets out a Roadmap for achieving Universal ‘Basic Access’ to Water, Sanitation and Hygiene (WASH) Services for the residents of Bomet County by 2036 for water, and by 2030 for sanitation and hygiene, whilst at the same time rapidly accelerating access to ‘Safely Managed’ WASH services (as defined by [Sustainable Development Goal 6: Water and Sanitation for All](#)). The development of this plan means that the County Government of Bomet can invest its existing WASH resources much more effectively; will be better able to attract additional WASH resources to the County; and will have increased capacity to coordinate and direct external agencies effectively, further increasing the effectiveness of implementation. By transforming the provision of sustainable clean water, sanitation and good hygiene in the County, this Masterplan will ultimately improve health, education and livelihoods for Bomet residents. This Plan sets the strategic interventions in four phases running from 2022 to 2050 at a cost of USD 398 million.



CHAPTER ONE

1. INTRODUCTION AND BACKGROUND

1.1 Introduction

The Bomet County Water, Sanitation and Hygiene (WASH) Masterplan is devoted to provide towards achieving universal access for WASH services in the entire county. Water, sanitation and hygiene in Bomet county is as a major contribution to the dignity, health, welfare, social well-being and prosperity of all residents. Adequate and quality water is the backbone of good sanitation and hygiene practices. This masterplan on WASH recognizes that healthy and hygienic behaviour and practices begin with the individual. The implementation of the County WASH Masterplan will greatly supply the demand for sanitation, hygiene, food safety, improved housing, use of safe drinking water, waste management, and vector control at the household level, and encourage communities to take responsibility for improving the sanitary conditions of their immediate environment.

As a basic human right, all residents of Bomet should be able to live with dignity in a hygienic and sanitary environment. It is therefore the County Government's aim to ensure that all households and communities understand what constitutes a healthy human environment, and that they adopt attitudes and practices that create and sustain such an environment. It is well known that the need for improved environmental sanitation and hygiene is great but that the available resources are limited, so we acknowledge that conducting 'business as usual' will not enable us to accelerate service delivery.

This WASH Masterplan therefore aims to mobilize all available resources - public and private, community and individual - in pursuit of a healthy environment for all. This plan has been developed by the county government of Bomet in collaboration with Dig Deep (Africa). It articulates County Government's objectives in the Water, Sanitation, Hygiene, natural resources and environment, spelling out Government's commitments to create an appropriate enabling environment to achieve good health. The plan will be useful to all agencies that are, or will be, actively working towards the achievement sustainable development goals.

This plan is guided by The Constitution of Kenya, 2010, The National Water Master Plan 2013- 2030, Water Act 2016, Health Act 2017, Sanitation National Policy 2022, County Act 2012, CIDP 2018-2022, and other related policies, Acts and regulations that provide broad guidelines to both state and non-state actors at all levels to work towards universal access to improved adequate safe water and sanitation leading to improved quality of life for the people of Bomet. The development of County WASH master plan is as a result of extensive participatory stakeholder consultations and validation meetings in the county.



1.2 Objectives of the Water and Sanitation Masterplan

The objective of this WASH Masterplan is to change the scope of what Bomet County is capable of achieving in attempts of addressing Climate Change issues in relation to WASH.

The creation of this plan means that:

- The county government can invest its existing WASH resources much more effectively across the entire county in response to climate change issues due to having a clear vision, increased institutional capacity, and robust assessment and planning processes.
- The county government will be better able to attract additional WASH resources as it will have a robust strategic County Wide Plan for Climate change mitigation and adaptation resource mobilization.
- The county government will enhance resilience and adaptive capacity to climate change for communities in various Sub-Counties in Bomet in order to increase food security and nutrition, environmental management and better health for all.
- All of the above will increase the county's ability to coordinate and direct external agencies effectively, further increasing the effectiveness of implementation.

Through transforming the provision of sustainable clean water, sanitation and good hygiene in the county, this programme will ultimately improve health, education and livelihoods for Bomet's 1 million residents, as well as awareness of the threats of climate change, and resilience to the impacts of climate change.

1.3 The Master Planning Process - Jan 2020 - June 2022

This process has followed the 5 stage model espoused by Agenda for Change in their County-Level Roadmap work. The 5 stages of this process are (Figure 1):

- Visioning
- Institutional Strengthening
- Assessment
- Planning
- Implementation

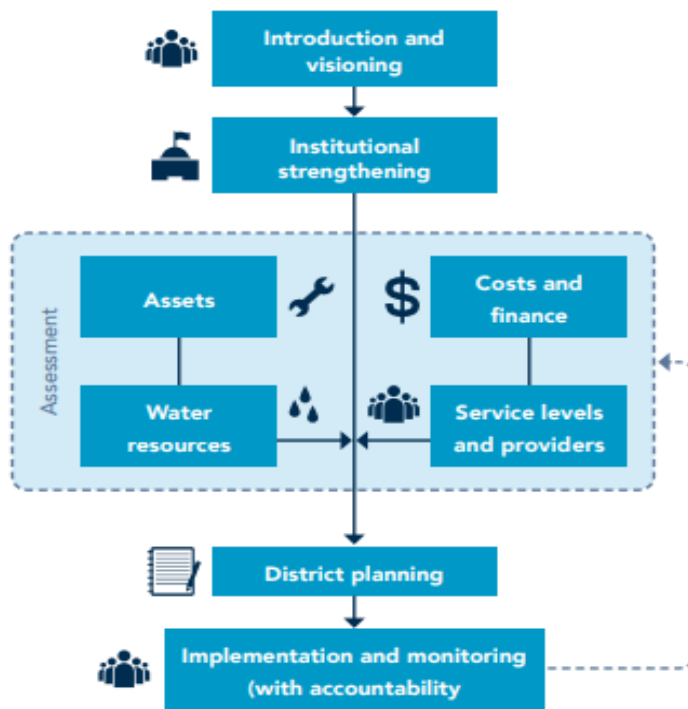


Figure 1 Overview of District-wide planning process

The Bomet County WASH master planning process was initiated in 2020 by Dig Deep in collaboration with the Bomet County Government. This consisted of an initial visioning meeting involving senior staff from the County Government.

Throughout 2020-2021, county staff were engaged in a series of institutional strengthening activities. These included learning trips to Siaya and Marsabit counties to understand the impact of successful interventions in community sanitation and clean water provision, and training of staff to implement public health programmes.

In 2021, Dig Deep performed a series of data collection activities to assess the current state of the WASH system. These were:

- A survey of 13,000 households
- Institutional school and health facility surveys
- Mapping 200 community water points
- Conducting a public consultation comprising 16 community based focus groups

In January 2022 Bomet County Government and Dig Deep conducted a Planning Workshop with the objective of launching the WASH masterplan writing process for Bomet County.

The Masterplan Workshop brought together the County political leaders in the County Assembly, County Executive Committee members, Chief Officers and Directors from Water, Finance and Public Health Departments.

The workshop was an intensive 2-day series of sessions, with the following objectives:



- Identification of areas to strengthen across 9 building blocks of WASH systems
- Building a Strong and Sustainable WASH System in Bomet County
- Ensuring that the WASH Masterplan is published by July 2022 so as to be incorporated in the County Integrated Development plan 2023-2027 as well as Annual Development Plans.

This Masterplan concludes the formal planning phase of the process and sets out a strategic approach to implementation, with the goal of achieving Universal WASH access for all residents of Bomet County by 2030.

1.4 Background Information on Bomet County

The purpose of this section is to set out for the reader the background context of Bomet County relevant to WASH.

1.4.1 Location and Size

Bomet County lies between latitudes $0^{\circ} 29'$ and $1^{\circ} 03'$ south and between longitudes $35^{\circ} 05'$ and $35^{\circ} 35'$ east (GOK, 2013). Bomet county borders Kericho county to the North and North East, Narok county to the South East, South and South West, Nyamira county to the North West and Nakuru county to the East. The county occupies an area of $2,037.4 \text{ km}^2$ (ASDSP, 2014). Figure 2 below shows a map of Bomet County.

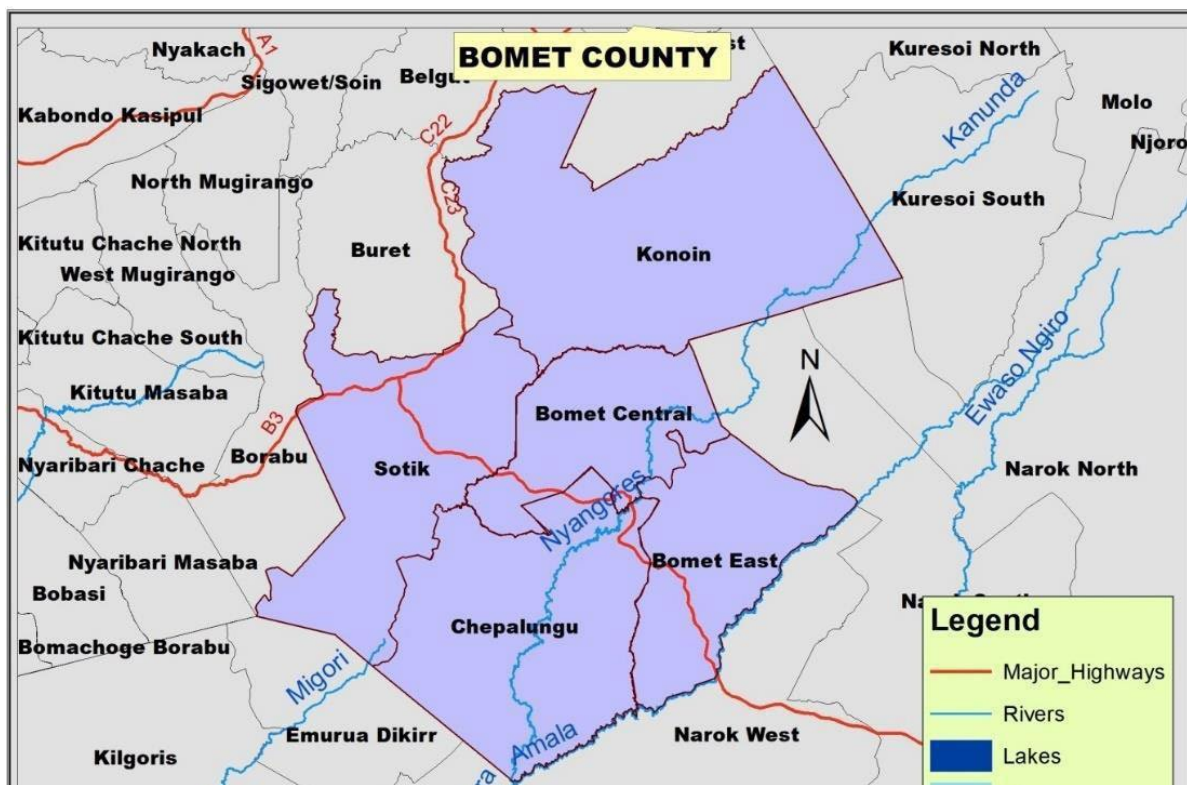


Figure 2 Map of Bomet County



1.4.2 Administrative Boundaries

Sub-County/ Constituency	Wards	Area (km ²)	No. of Locations	No. of Sub- Locations
Bomet Central	Silibwet Township, Singorwet, Ndaraweta, Chesoen and Mutarakwa	266	8	23
Bomet East	Longisa, Kembu, Chemaner, Merigi and Kiprerer	311.3	10	27
Chepalungu	Sigor, Kongasis, Chebunyo, Nyangores and Siongiroi	535.8	15	42
Sotik	Ndanai/Abosi, Kipsonoi, Kapletundo, Chemagel and Rongena/Manaret	479.2	17	36
Konoin	Kimulot, Mogogosiek, Boito, Embomos and Chepchabas	445.1	16	37

Table 1 Administrative zones in Bomet County

The County is divided into five (5) Sub-Counties / Constituencies, 25 wards, 67 locations and 176 sub-locations as shown in Table 1 above. The locations and sub-locations are administrative units of the National Government. Chepalungu Sub-County is the largest in acreage covering an area of 535.8 km², followed by Sotik (479.2 km²), Konoin (445.1 km²) and Bomet East (311.3 km²). Bomet Central is the smallest with an area of 266 km² Table 1.

1.4.3 Population

Sub County	Km ²	2009		2018		2020		2022	
		Pop.	Density	Pop.	Density	Pop.	Density	Pop.	Density
Bomet Central	266	131,527	494	167,702	630	177,006	665	186,826	702
Bomet East	311.3	122,273	393	155,903	501	164,552	529	173,681	558
Sotik	479.2	167,214	349	213,204	445	225,032	470	237,517	496
Konoin	445.1	139,040	312	177,281	398	187,116	420	197,497	444
Chepalungu	539.8	163,759	303	208,799	387	220,383	408	232,609	431
Total	2037.4	723,813	355	922,888	453	974,089	478	1,028,130	505

Table 2 Population Density and Distribution by Sub-County

Source: Bomet County CIDP (2018-2022)

1.4.4 Education and Health Institutions

Nineteen percent (19%) of residents have a secondary level of education or above. Bomet Central constituency has the highest share of residents with a secondary level of education or above at 22%. This is 8 percentage points above Chepalungu constituency, which has the lowest share of residents with a secondary level of education or above. Bomet Central constituency is 3 percentage points above the county average. Silibwet ward has the highest share of residents with a secondary level of education



or above at 28%. This is twice Chebunyo ward, which has the lowest share of residents with a secondary level of education or above. Silibwet ward is 9 percentage points above the county average.

Some 64% of Bomet County residents have a primary level of education only. Chepalungu constituency has the highest share of residents with a primary level of education only at 67%. This is 5 percentage points above Sotik constituency with the lowest share of residents with a primary level of education only. Chepalungu constituency is 3 percentage points above the county average. Nyangores ward has the highest share of residents with a primary level of education only at 69%. This is 11 percentage points above Silibwet Township ward, which has the lowest share of residents with a primary level of education only. Nyangores ward is 5 percentage points above the county average.

Seventeen percent (17%) of County residents have no formal education. Chepalungu constituency has the highest share of residents with no formal education at 19%. This is 4 percentage points above Konoin constituency, which has the lowest share of residents with no formal education. Chepalungu constituency is 2 percentage points above the county average. Three wards, Chebunyo, Chemaner and Ndanai/Abosi, have the highest percentage of residents with no formal education at 21% each. This is 9 percentage points above Chepchabas ward, which has the lowest percentage of residents with no formal education. Chebunyo, Chemaner and Ndanai/Abosi are 4 percentage points above the county average. Figure 2.2 shows percentage of population by education attainment by ward.

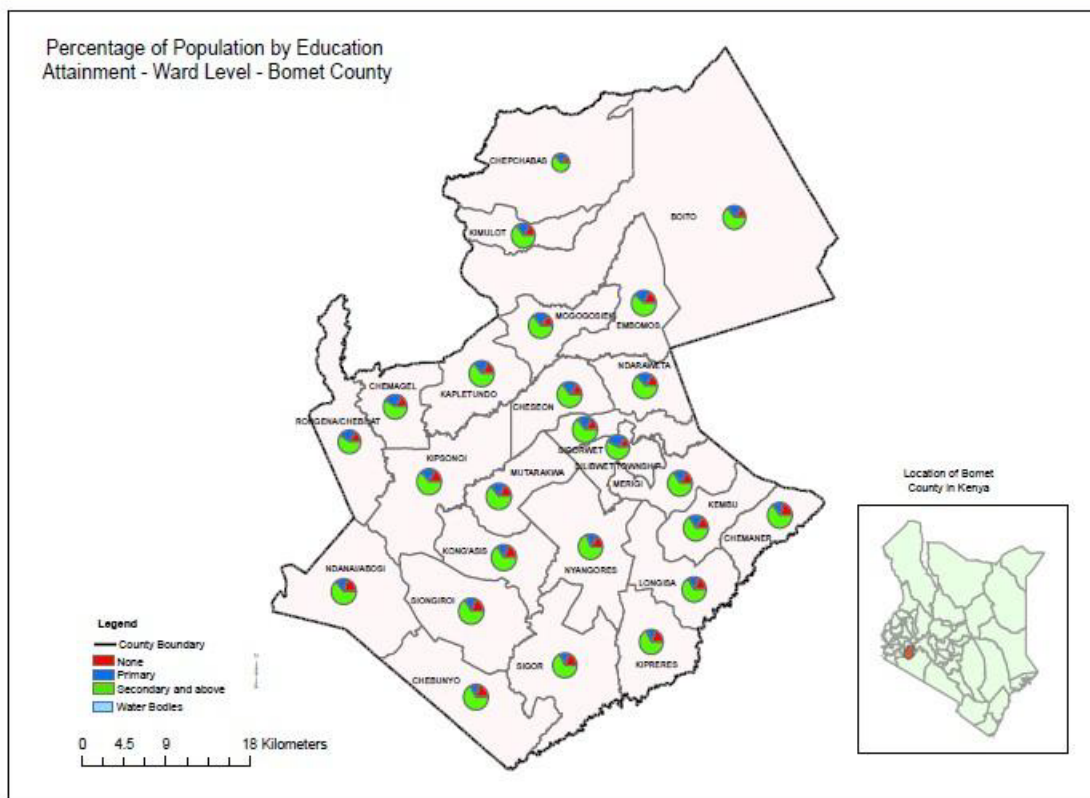


Figure 3 Percentage of population by education attainment by Ward



Table 3 presents the number of various educational institutions within the County and their enrolment levels as at 2017. The expansion of these institutions and increase in pupils' enrolment will be informed by the increasing population growth in the County.

Category	Number of Institutions	Students Enrolment
Early Childhood Development Education Centres (ECDE)	1,221	66,738
Primary	992	418,374 ¹
Special Needs Education	5	128
Secondary	271	123,425 ²
Adult and continuing Education	120	1,686
Vocational Training Centres (VTCs)	17	1,872 ³
Total	2,626	5,505,268

Table 3 Education Statistics for Bomet County

Source: Bomet County Integrated Development Plan, 2018-2022

The number of health facilities within the County are two hundred and seven (207) according to records provided from Department of Medical Services and Public Health. These facilities are categorized into hospitals, health canter and dispensaries. The number of people attending these health facilities will increase proportionately to the increasing population growth. A summary of the existing number of health facilities and their statistics are summarized in Table 4 below.

Sub County	Dispensaries	Health Centres	Hospitals	Bed Capacity	Average outpatient per Month	Average Inpatient per Month
Konoin	36	5	1	126	20,687	38
Bomet Central	35	5	2	364	17,384	634
Sotik	41	6	2	156	31,673	619
Chepalungu	40	4	2	36	22,484	192
Bomet East	19	7	2	362	19,204	396
Total	171	27	9	1,044	111,432	1,879

Table 4 Statistics for Health Facilities

Source: Health Department, Bomet County Government

1.4.5 Public Administrative and Rehabilitation Institutions

The key institutions of importance with regard to water supply and sewerage coverage include rehabilitation or correctional institution (prison), public administrative institutions and commercial



institutions. There are two national prisons within the County, with the main one located in Bomet Town. Currently the number of prisoners are two hundred and forty (240) and one hundred and ten (110) staff. It is assumed that that the number of prisoners will grow at a rate similar to the general national population growth rate of 2.7% per annum.

The County Government of Bomet has offices in Bomet Town and Sub- County Offices. Similarly, County Commissioners offices, house quite a number of government offices at county headquarters, Sub Counties and at location levels. Each Sub- County station has an average of 200 officers. The officers range from County Government staff, Central Government staff, Judicial Service officers and Police Service officers.

1.4.6 Commercial Enterprises

Commercial enterprises within Bomet County range from hotels, milk coolers, restaurants and lodgings, bars, salons and barber shops, butcheries and slaughter houses, petrol station and car wash, market places and public toilets. The industries are mainly tea processing industries, a milk processing industry and a flour milling plant. Other proposed industries include potato processing plant, Jua Kali sheds and light industries.

1.4.7 Economic Context

A plurality of households (30.9%) earn a monthly income of between Kshs. 10,001-20,000. There are also a significant proportion of people (29.8%) whose income falls between Kshs. 5001-10,000 per month, making these groups on modest incomes a majority of the total population (Table 5).

Monthly Household Income	N	%
< 1000	4	.5%
1001-5000	101	12.6%
5001-10000	238	29.8%
10001-20000	247	30.9%
20001-30000	88	11.0%
30001-40000	45	5.6%
40001-50000	23	2.9%
50001 and Above	54	6.8%
Total	800	100.0%

Table 5 Household income in Bomet County

1.4.8 Energy Sources

Less than 1% of residents in Bomet County use liquefied petroleum gas (LPG), and 2% use paraffin. Ninety-two percent (92%) use firewood and 5% use charcoal.

Chepalungu constituency has the highest level of firewood use at 97%. This is 9% above Bomet Central constituency, which has the lowest share. Chepalungu constituency is about 5% above the



county average. Two wards, Mutarakwa and Kongasis, have the highest level of firewood use in Bomet County at 98% each. This is 34% above Silibwet Township ward, which has the lowest share. Mutarakwa and Kongasis are 6% above the county average.

Bomet Central constituency has the highest level of charcoal use in Bomet County at 9%. This is 6 percentages above Chepalungu constituency, which has the lowest share. Bomet Central constituency is 4% points above the county average. Silibwet Township ward has the highest level of charcoal use in Bomet County at 28%. This is 27 percentage points more than Chepchabas ward, which has the lowest share. Silibwet Township is 23 percentage points

1.4.9 Geography

1.4.9.1 Surface Water

Bomet County is a high rainfall area with annual average totals of approximately 1,500mm of rainfall. This makes rain water harvesting a potentially reliable source for a water supply. Many households rely on roof catchments as their source of water though not exclusively as there are dry seasons of the year when roof catchment becomes unreliable. They therefore, use other combination of sources like shallow wells, springs and streams.

1.4.9.2 Rivers

Bomet County has several permanent rivers running within and through its boundary. The major rivers include Amalo River, which flows along the southern boundary of the County, Nyangores River which flows from South-western Mau Forest, and proceeds southwards through Tenwek, Bomet town and joins Amala River to form Mara River, and Kipsonoi River, which flows along the boundary with Bureti. It eventually flows into Lake Victoria. Kiptiget/Tebenik River flows along the northern boundary of the County. Sisei and Kagawet Rivers are seasonal. Figure 3 Map of Major Rivers within Bomet County (Source: WWF) is a map of major rivers within Bomet County.

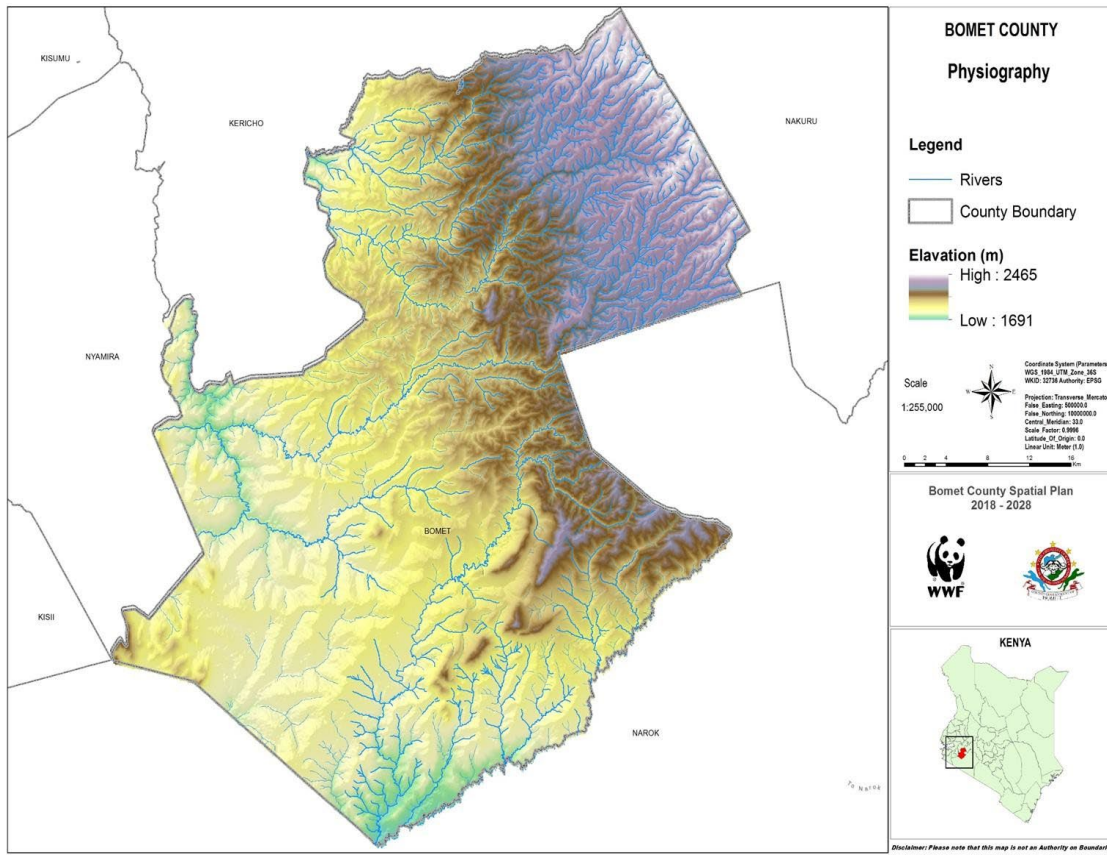


Figure 4 Map of Major Rivers within Bomet County (Source: WWF)

1.4.9.3 Springs

Bomet County is characterised by numerous springs which are mainly used as a source of drinking water for human and livestock. The County has made substantial efforts in protecting some major springs.

1.4.9.4 Water Pans

Water pans are also a major source of water for both domestic and livestock in Bomet County. However, towards the Vision 2030 goal of access to safe drinking water for all, no population is expected to fetch water directly from a water pan for drinking since it does not meet safety standards recommended by World Health Organisation (WHO). Water pans are however a great source of drinking water for livestock and irrigation and should therefore be protected.



1.4.9.5 Ground Water Potential

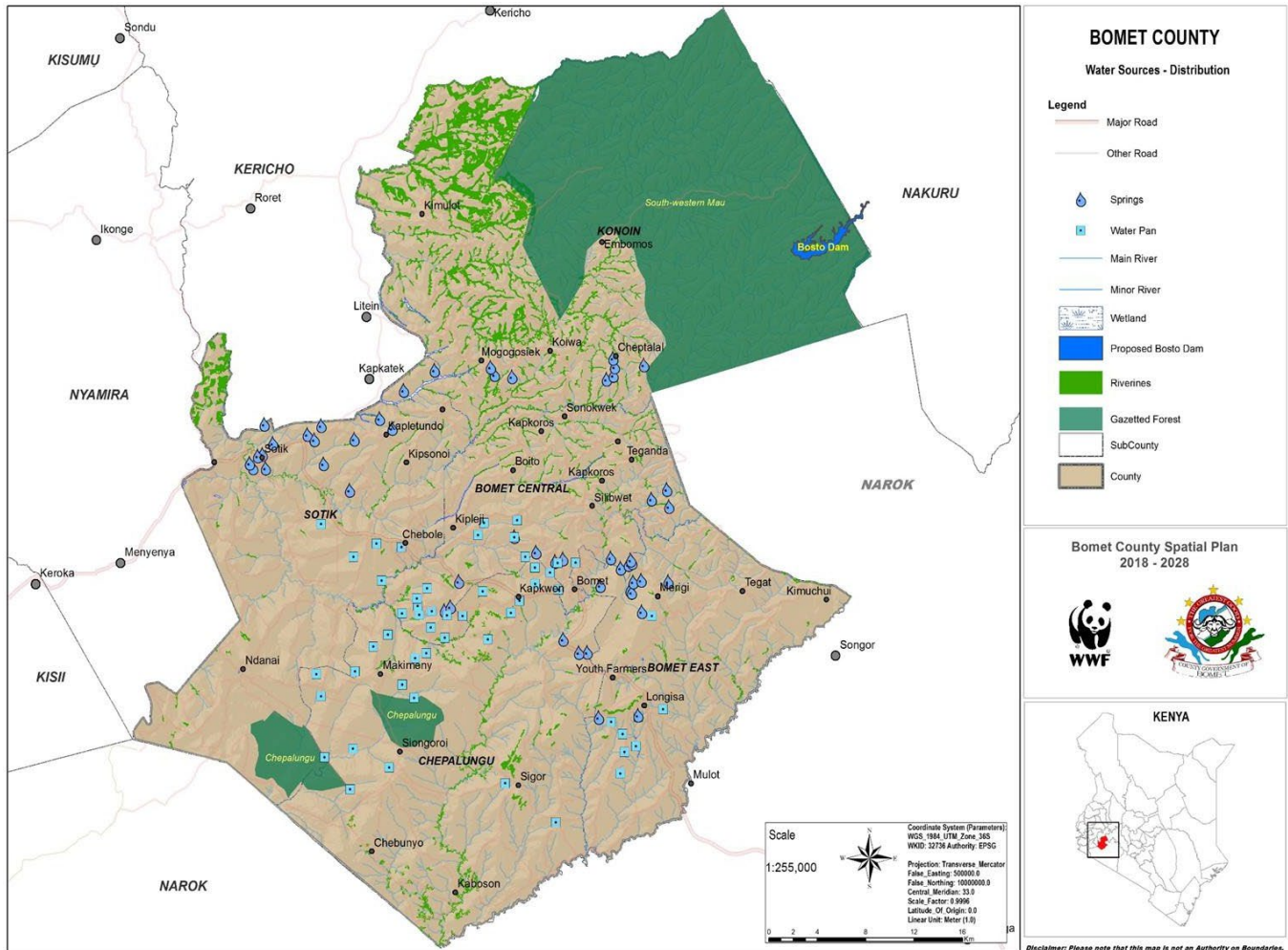


Figure 5 Springs and Water Pans within Bomet County

Previous hydrogeological studies have revealed that the Northern part of the County does not have good ground water potential. Borehole yield for the Northern and Central parts of the County have very low and unreliable yields. At the same time, the ground water resources in the Southern part has high levels of fluoride. Consequently, most of the domestic water sources in Bomet County are springs and shallow well in the Northern part where as the Southern parts are mostly served by small pans (Figure 4).

In many areas of Kenya, groundwater is used to for domestic, commercial and industrial demand. Groundwater, particularly from shallow aquifers, offers a reliable and cost effective potential source of water for rural communities in Bomet County, where relatively sparse populations make piped water supplies infeasible. However, dwellers obtain groundwater through boreholes and shallow wells, as well more or less protected water springs, all of which cannot ensure that minimum water quality standards are met.



Due to economic constraints, treatment of water after abstraction is likely overlooked, thus to be directly usable, groundwater must be of drinkable quality, or requiring minor inexpensive treatment. In order to develop long-term sustainable groundwater policies in southwest Kenya, it is thus necessary to assess the distribution of groundwater resources for potable use, and conduct risk-based analysis of the water quality related health impacts in Bomet County.

1.5 Climate Change Risk/Vulnerability Assessment

Bomet economy is highly dependent on the Natural Resource Base, and thus is highly vulnerable to climate variability and change(s). Rising temperatures and changing rainfall patterns, resulting in increased frequency and intensity of extreme weather events such as droughts and flooding, threaten the sustainability of the county's development. In order to safeguard sustainable development, the County has developed Climate Change Policy to provide a clear and concise articulation of overall response priorities to climate variability and change. The Directorate of Environment and Natural Resources has developed a Climate Risk Assessment (CRA) Report that profiles vulnerability of the county in terms of climate change which is linked to the WASH programme.

The County has shown commitment to protect the climate system for the benefit of the present and future generations by supporting the United Nations Framework Convention on Climate Change (UNFCCC) process, and contributing to regional and National climate change initiatives.

Climate change adversely impacts key sectors that are important to the economy and society: Environment, Water and Forestry; Agriculture, Livestock and Fisheries; Trade; Extractive industries; Energy; Physical Infrastructure; Tourism; and Health. The CRA therefore elaborated high, medium and low risk areas. This will leverage mobilization of resources from partners, donors and national governments towards efforts to combat climate change. In addition, it will enhance adaptive capacity and build resilience to climate variability and change, while promoting a low carbon development pathway. Adaptive capacity is key to improving socio-economic characteristics of communities, households and industry as it includes adjustments in behaviour, resources and technologies, and is a necessary condition for design and implementation of effective adaptation strategies in WASH master plan.



CHAPTER TWO

2 BASELINE ASSESSMENT OF WASH ACCESS

The purpose of this Chapter is to set out current WASH access levels across Bomet County. Gaps in data that need to be filled as part of the implementation of this Masterplan are also highlighted.

2.1.1 WASH Access Across Bomet County - Overview



Improved sources of water comprise protected spring, protected well, borehole, piped into dwelling, piped and rain water collection while unimproved sources include pond, dam, lake, stream/river, unprotected spring, unprotected well, jabia, water vendor and others that makes the residents too vulnerable to climate change threats in all seasons. In Bomet County, 17% of residents use improved sources of water, with the rest relying on unimproved and unreliable water sources especially in extreme weather conditions. There is no significant gender differential in use of improved sources with 24% of male headed households and 22% of female headed households using it.

Konoin constituency has the highest share of residents using improved sources of water at 42%, which is three times Chepalungu constituency, which has the lowest share of residents using improved sources of water. Konoin constituency is 18 percentage points above the county average. Chepchabas ward has the highest share of residents using improved sources of water at 90%. That is 15 times Chebunyo ward, which has the lowest share using improved sources of water. Chepchabas ward is 67 percentage points above the county average.

2.1.2 Water Services

2.1.2.1 Infrastructure

The water supply schemes managed by the Bomet Water and Sanitation Company Ltd (BOMWASCO) are Itare, Sotik, Bomet, Longisa, Sigor, Chepalungu, Kamureito, Yaganek, Mogombet, Sergutiet, Kapcheluch and Ndanai water supply schemes.

Most of the existing water supplies in Bomet County are pumping-based schemes. The operations and maintenance costs are very high hence the schemes are not self-sustainable. The County Government has to supplement the revenue from the schemes to make water affordable to the people. A summary of general data on the existing water supply schemes in Bomet County are presented in Table 6 below.



Table 2.1 Water schemes in Bomet County

Scheme	Year Started	Supply Area (km ²)	Population served	Design Capacity (m ³ /day)	Current Output (m ³ /day)	Pumping/ Gravity	Revenue (KSh./ month)	Operational Costs	Cost of Power
Itare	1983	460	236,364	12,000	10,000	P	2,100,000	4,691,633	3,205,570
Sotik	1950s	60	26,932	1,200	900	P	595,204	567,636	264,886
Bomet	1950s	40	4,200	1,200	700	P	2,509,598	1,027,930	404,982
Longisa	1998	72	14,737	1,200	300	P	18,627	186,556	113,063
Sigor	1979	207	29,490	1,200	800	P	60,644	351,379	239,218
Chepalungu	1974	410	48,673	1,200	1,000	P	79,492	653,634	309,262
Ndanai	1999	24	12,096	480	300	P	9,248	156,353	93,894
Sergutiet	2012	10	1,500		200	P	35,000	70,000	-
Kamureito	2012	15	5,000	1,200	400	P		165,000	
		1,483	413,530	20,160	14,400		5,372,813	7,933,121	4,630,875

There are also several community water projects in various stages of completion funded mainly by the County Government, CDF, Community Development Trust Fund (CDTF), national institutions such as Water Service Trust Fund (WSTF) and State department of water, and other development partners such as African Development Bank (AfDB). These include Tinet, Segutiet, Nyagombe, Taboino, Cheptalal, Tegat, Chebang'ang, Chepchabas, Aonet and Kaptebeng'wet projects.



Based on the survey results from Sotik sub-county, where 35% of respondents had access to Basic water supply, and setting aside the areas where piped water systems are available or in development, there is a need for approximately 470 new community water points to be established. These water points will be a mixture of spring protections, and borehole projects (Figure 5 Map of Water schemes).

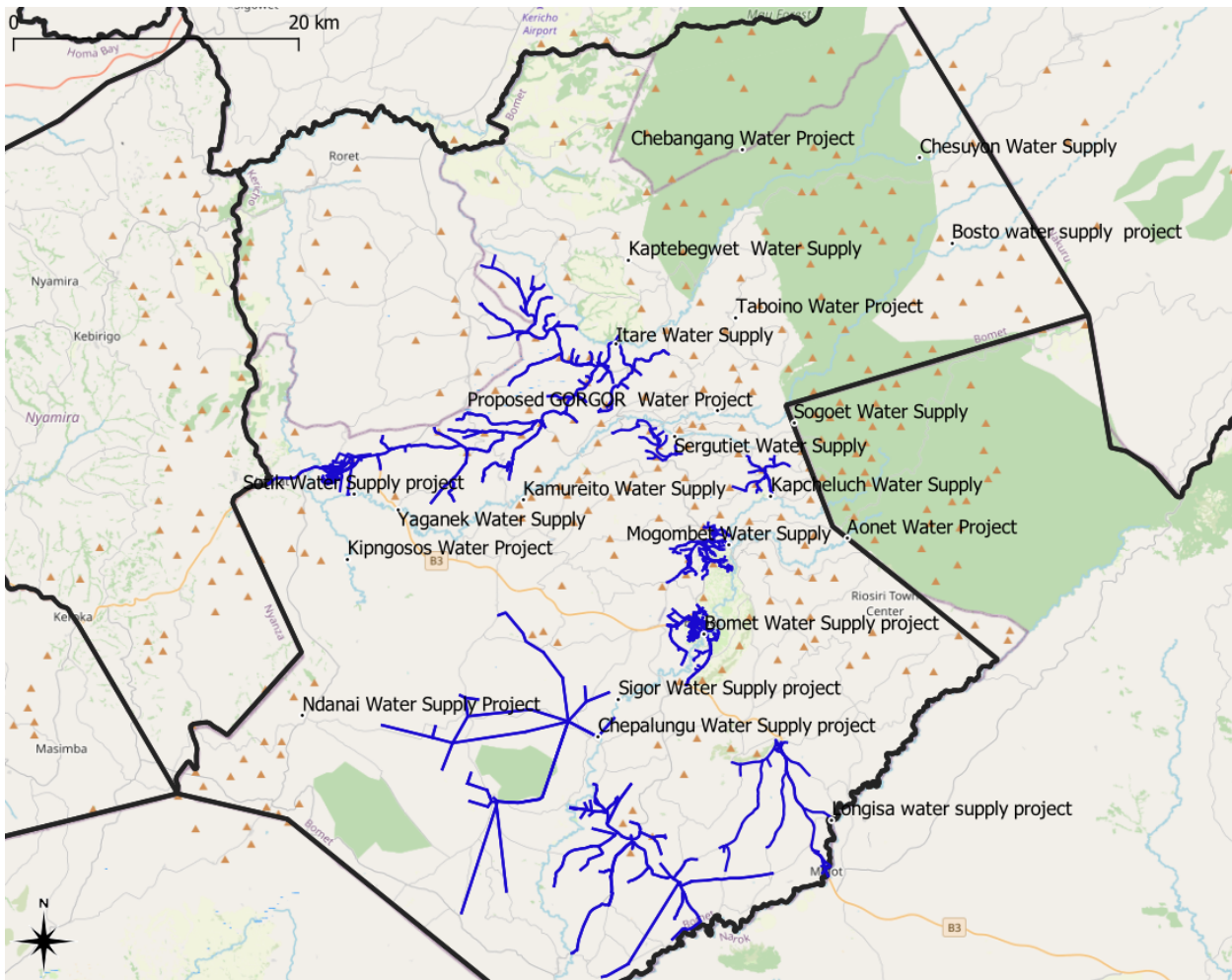


Figure 6 Map of Bomet County Water schemes

2.1.3 Monitoring and Evaluation

The Bomet County Water Masterplan (2019) has stressed the importance of good data collection for managing water infrastructure, and highlighted that the mapping of all water connections was essential for developing a coherent plan. This should be pursued as a priority, and design of new and existing water schemes should be performed using water modelling software (eg EPANET). This can not only improve the efficiency of design, but help to reduce operational costs, especially high electricity costs associated with pumping.

2.1.4 Sanitation and Hygiene

Sixty-eight percent (68%) of residents in Bomet county use improved sanitation, while the rest use unimproved sanitation. Use of improved sanitation is slightly higher in male headed households at 69% as compared with female headed households at 66%. Konoin constituency has the highest share of residents using improved sanitation at 79%. That is 16 percentage points above Chepalungu constituency, which has the lowest share using improved sanitation. Konoin constituency is 11 percentage points above the county average. Chepchabas ward has the highest share of residents using



improved sanitation at 98%. That is twice Sigor ward, which has the lowest share of residents using improved sanitation. Chepchabas ward is 30 percentage points above the county average.

2.1.5 Community Sanitation

Currently one ward (Ndanai-Abosi) has been declared Open Defecation Free in Bomet County. This has been achieved by an intensive investment in community engagement in villages in Ndanai-Abosi, following the four stage CLTS process below.

Staff work with each community to conduct their own appraisal of OD and take action to become ODF. Every village will undergo four stages of CLTS implementation (pre-triggering, triggering, post-triggering and scaling up), in line with best practice.

Pre-triggering

- Expenditure on meetings held with representative community cross-section
- Training key members of staff in Public Health roles to build capacity to implement the project

Triggering

- Public Health officials visit villages and hold community consultation
- Villages develop an action plan to achieve ODF

Post-triggering

- Public Health officials and volunteers provide ongoing support and engagement with communities
- National certifiers visit successful villages to confirm ODF status
- Villages are certified ODF with a celebration ceremony

Scaling up

- Community members given additional behaviour change training
- Local entrepreneurs supported in setting up sanitation marketing businesses
- Artisans trained to construct more permanent masonry toilets

Communities are encouraged to change their behaviour by visiting the dirtiest and filthiest areas in their neighbourhoods. Appraising and analysing their practices will evoke strong emotions such as shock and shame.

2.1.6 Infrastructure Development

There is currently only one sewerage scheme in Bomet County in Bomet town. The 2019 Bomet Water Masterplan details plans for the development of a sewerage scheme in Sotik town, as well as non-sewer systems in Longisa, Sigor, Mulot, Ndanai, Mogogosiek, Siongiroi, Merigi, Silibwet, Chebunyo



and Koiwa. These schemes are important both for providing sanitation solutions for residents of these towns, and also providing a hub for more remote areas surrounding these centres to dispose of sewage sludge from pit exhaustion

2.1.7 Infrastructure Management

Faecal sludge management will be an emerging issue as an increasing number of households install latrines or other sanitation facilities that store faecal sludge, rather than releasing it into the environment. Two solutions to this are either the construction of septic tanks, and other infrastructure which can deal with faecal sludge on site, or of the establishment of a more affordable system for exhausting faecal sludge. In practice, both of these measures needs to be developed. In particular, institutions such as schools and health facilities need affordable options for safe disposal of faecal sludge.

The costs of truck exhaustion are currently Kshs. 3,000, plus Kshs. 120/km from the treatment works, with an additional 35% administration costs for both fees. There are two trucks, which both have a capacity of 9,000 litres. Exhaustion within the city of Bomet costs a flat Kshs. 5,000 (Figure 6 Cost of pit emptying by exhaustion method).

The cost of manual emptying is likely to be variable, but based on one reported instance, where a volume of 5.6m³ was extracted and buried for a fee of Kshs. 12,000, the cost can be estimated. Manual emptying is highly undesirable, as well as being illegal. However, without viable alternatives this likely will be the practice of many individuals and organisations.

Investing in more diverse options for liquid waste disposal will offset the developing issues with faecal contamination of water resources as more residents get access to improved sanitation.

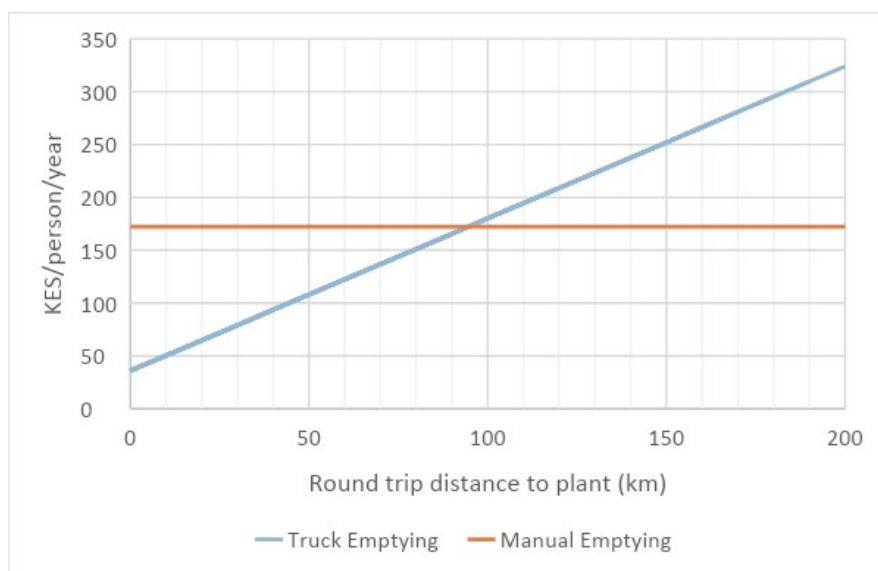
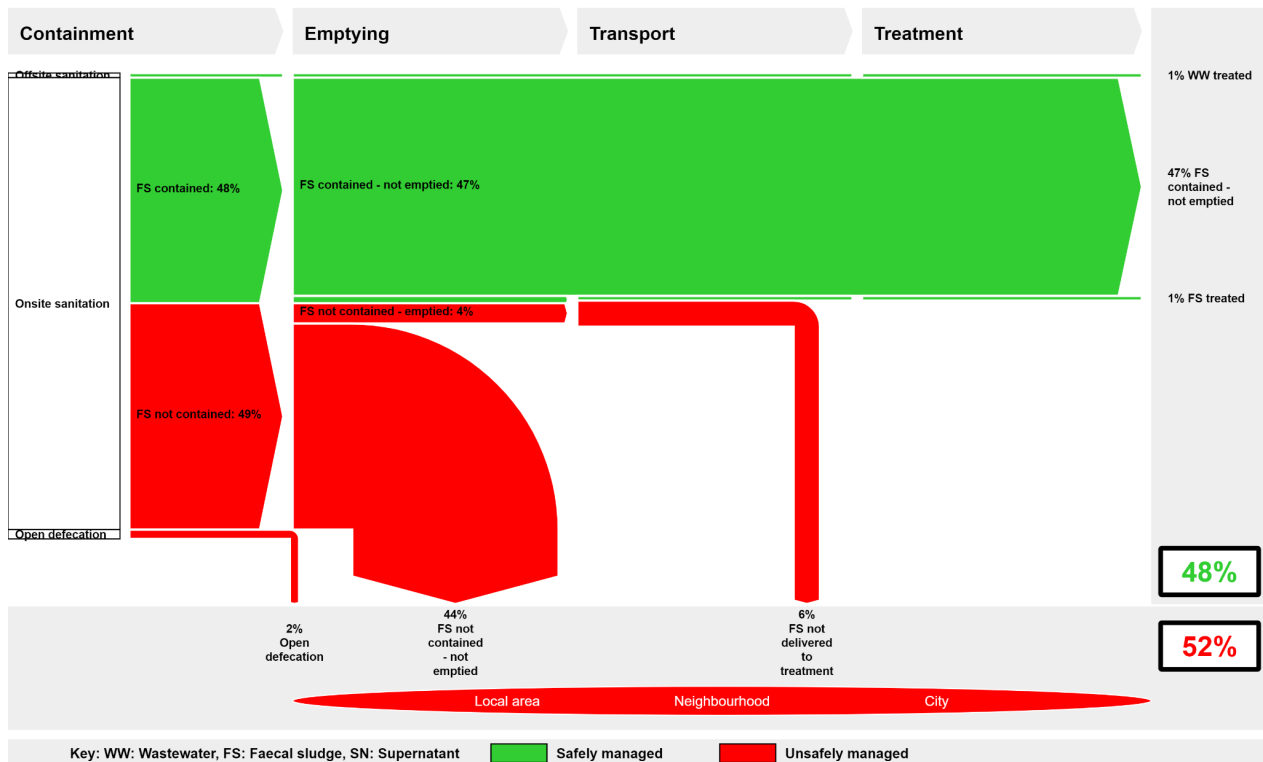


Figure 7 Cost of pit emptying by exhaustion method



Septic sludge of privately-owned septic tanks and soak-away pits is removed by Bomwasco or private firms operating on call. Bomwasco owns two sludge exhauster trucks but generally are unreliable just as the privately-owned. There is little control over the disposal of septic sludge. Treatment works do not have any special provisions for accepting septic wastes.



The SFD Promotion Initiative recommends preparation of a report on the city context, the analysis carried out and data sources used to produce this graphic. Full details on how to create an SFD Report are available at: sfd.susana.org

Figure 8 Shit Flow diagram of Bomet County

Figure 7 Shit Flow diagram of Bomet County shows a shit-flow diagram of the destination of waste from domestic sanitation facilities in the county. Due to the prevalence of pit latrines without any containment much of the shit created is not safely stored and has the potential to contaminate water bodies.

2.2 Sotik Sub-County Data Collection - A Deep Dive

In 2021 Dig Deep performed a series of surveys of WASH access for households, schools and health facilities in Sotik sub-county. Additionally, they compiled an inventory of community water points, including springs, boreholes water pans, rivers, and wells.

Table 7 below shows a comparison of county-wide water access statistics versus those gathered from the Sotik sub-county survey. The largest difference is between surface water, and unprotected wells, although this may be down to categorisation of water pans as surface water in the county wide-survey, and wells in the sub-county survey. Other data show good agreement, and in general Sotik can be considered representative of WASH access in the county as a whole.



Households by main source of drinking water				
Bomet County	Percentage	Sotik sub-county	Percentage	Percentage difference
Improved				
Piped into dwelling	8.9	Piped water into dwelling	0.42	8.48
Piped into yard/plot	6.4	Piped water to yard / plot	2.91	3.49
Public tap/standpipe	0.9	Public tap / standpipe	0.83	0.07
Tubewell/borehole with pump	0	Tubewell / borehole	2.32	2.32
Protected well	0.6	Protected dug well	1.69	1.09
Protected spring	0.6	Protected spring	5.25	4.65
Rainwater collection	10	Rainwater collection	14.38	4.38
Bottled water	0.4	Bottled water	0.08	0.32
Unimproved				
Unprotected well	3	Unprotected dug well	16.63	13.63
Unprotected spring	23.4	Unprotected spring	28.65	5.25
Tanker/truck	0	Tanker-truck	0.27	0.27
Cart with small tank/drum	0.2	Cart with small tank / drum	0.81	0.61
Bicycles with buckets	0.1	Bicycles with buckets	0	0.1
Surface water	44.9	Surface water	25.41	19.49

Table 6 Comparison of County-wide water access data with data from Sotik sub-county survey

The Sotik sub-county Household Survey was conducted by Dig Deep between March and May 2021. Sotik sub-county is a constituency with a population of 228,000 in Bomet County (total population circa 1 million people). In total, 13,031 households were surveyed, with a variety of questions asked covering demography, water access, sanitation status, and hygiene and menstrual health perspectives. A survey of water points was also undertaken, and 200 water points identified within the sub-county. Responses to both surveys were recorded using the mWater platform, and houses were located using GPS to allow spatial analysis of the results. Surveys were performed by a team of 44 enumerators, who were hired from a pool of recent graduates in the local area.

It will be vital in developing this Masterplan to extend the data collection across the remaining four sub-counties in Bomet. Although the data collected here is indicative of WASH access in the county overall, a more complete picture will allow targeted and specific interventions to be planned with greater accuracy.

The sub-county consists of 43 sub-wards, and the sampling rate was designed to give representative results from each sub-ward individually. The confidence level was 95% within a 5% error range, and



it was conservatively assumed that $P=0.05$, as the large range of questions meant that a tailored probability estimate was impracticable.

2.2.1 Sotik Sub-county - Water Results

The four main types of water supply used in Sotik, as identified by the survey, were springs (36%), surface water (24%), wells (18%) and rainwater harvesting (14%). Other types of water supply were much less common, and include tubewells/boreholes (3%), and piped water supply (3%). These data are shown in Table 3. It can also be noted that the majority of sources are unprotected. For instance, 83% of respondents using springs reported that these were unprotected, and 94% of respondents using wells reported that they were unprotected (Table 8).

Water Source	No. Respondents	Percentage
Protected spring	676	6%
Unprotected spring	3490	30%
Tanker-truck	35	0%
Piped water to yard / plot	380	3%
Rainwater collection	1688	14%
Tubewell / borehole	297	3%
Surface water	2827	24%
Protected dug well	155	1%
Unprotected dug well	1937	16%
Public tap / standpipe	91	1%
Piped water into dwelling	53	0%
Cart with small tank / drum	97	1%
Other (please specify)	24	0%
Bottled water	13	0%

Table 7 Water access by type of water source

The WHO/UNICEF Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP) has standardised indicators that allow responses to be categorised into ‘rungs’ on service ladders for water, sanitation and hygiene. The rungs for water supply are surface water, unimproved, limited, basic, and safely managed. Surface water refers to water taken directly from a lake, river or other water body; unimproved refers to unimproved wells or springs; limited refers to an improved source that requires a greater than 30-minute collection time; basic refers to an improved source with a collection time under 30 minutes, and safely managed refers to a pathogen free source that is located on the user’s premises. Figure 8 shows the distribution of responses on each rung of the water supply ladder. The plurality of responses (35%) are from unimproved sources, indicating the high proportion of people using wells and springs, but the distribution reflects the raw responses on primary water sources in its heterogeneity. Figure 9 shows the breakdown of water service level across all sub-wards in Sotik sub-county. Whilst there is still a mix of responses, some areas show a much higher prevalence of basic or better access to water sources. This is due mainly to the location of protected springs, and in the north of the sub-county, piped water supply to urban populations.

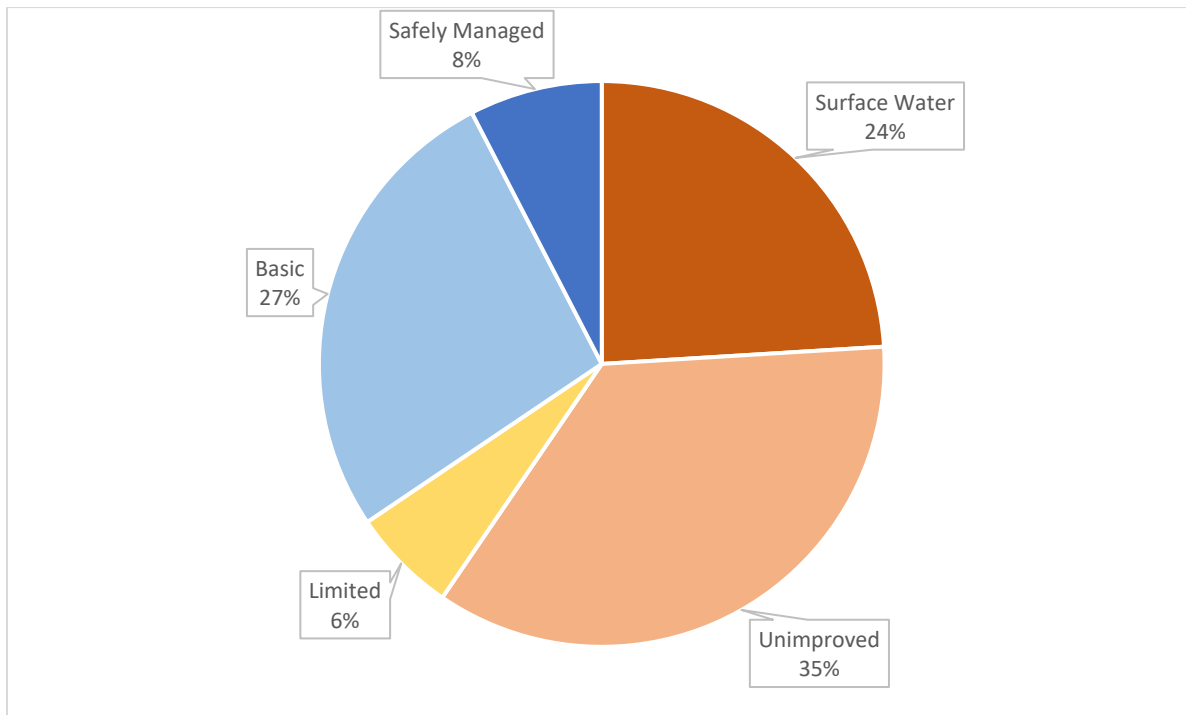


Figure 9 Distribution of responses on rungs of JMP water supply ladder

This data allows us to target our responses more effectively. By focussing attention on the most poorly served populations, and by improving existing water sources we can use resources more efficiently than otherwise. For example, the relatively low cost of protecting springs and wells could represent an achievable way of lifting a majority of residents up to the level of basic water supply.

2.2.2 Sotik Sub-county - Water Point Survey

Data was collected on 225 water points in Sotik sub-county (Table 9). Although this is not an exhaustive list, and will need adding to in the future, it nevertheless represents a substantial proportion of the water resources commonly used by residents. Table 2 shows the breakdown of water points by type. Just over half (55%) of the water points surveyed were springs. Water pans/dams are the next most common type of water source with 55 identified water points, and rivers/streams, shallow wells and boreholes are less common.

Water point	Frequency	Unprotected	Protected
Borehole	3	0	3
River/stream	28	22	6
Shallow well	14	13	1
Spring	125	106	19
Water pan or dam	55	45	10
Total	225	186	39

Table 8 Water Points in Sotik sub-county



2.2.3 Sotik Sub-county - Spring Protection

Among all survey respondents, 36% identified springs as their primary source of drinking water, more than any other single source. However, 91% of households using springs as a primary source identified the spring as unprotected. This represents an opportunity for basic water access to be affordably provided to almost one third of the population of Sotik sub-county by spring protection activities alone, or approximately 9,000 households. This could be done by the protection of 74 springs identified in the survey as unprotected, which have reliable GPS location. If all unprotected springs are included, the potential of spring protection would be even greater, and provide greater resilience to drought conditions.

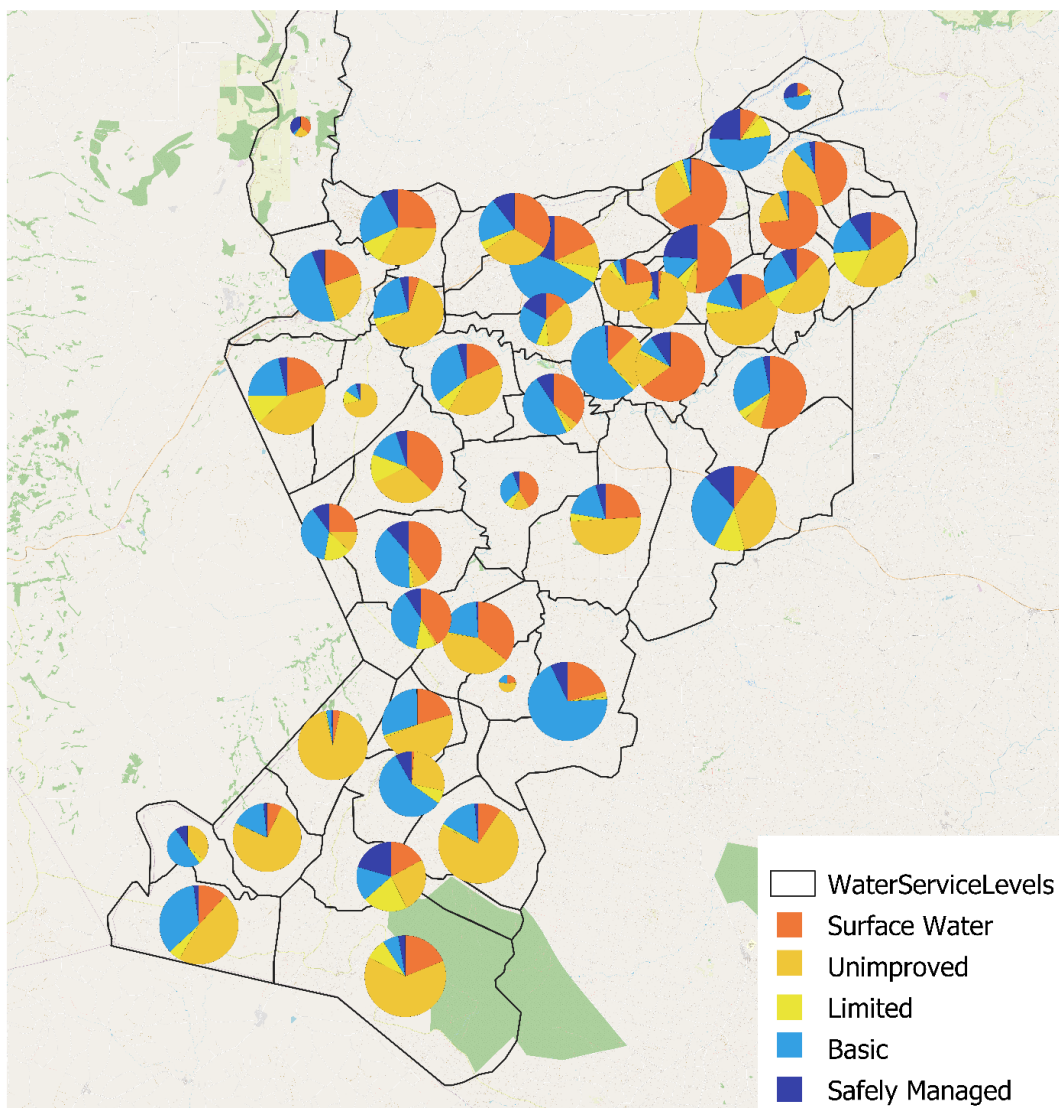


Figure 10 JMP water supply distribution for all sub-wards in Sotik. Chart size refers to number of respondents from each sub-ward.



2.2.4 Sotik Sub-county - Sanitation Survey

There is considerably more homogeneity among responses concerning sanitation facilities than among water source responses (Table 10). The overwhelming majority (94%) of respondents identified a pit latrine as their main facility. This breaks down between pit latrines with a slab (46%), pit latrines without a slab (41%) and ventilated improved pit latrines (7%) as seen in Table 2. There are low numbers identifying using hanging toilets (2%), flush toilets (1%) and no facility (2%). It is important to note that while the response rate for no facility is lower than we have recorded elsewhere, particularly during our CLTS baseline activities, it does not include those households who have no facility on their plot, but use a toilet in a neighbouring household. If these responses are included, the proportion rises to 6%.

Sanitation facility	No. Respondents	Percentage
Pit latrine with slab	4665	41%
Pit latrine without slab	5211	46%
Ventilated improved pit latrine (VIP)	841	7%
No facilities or bush or field	241	2%
Hanging toilet / hanging latrine	208	2%
Composting toilet	14	0%
Bucket	2	0%
Flush / pour flush	93	1%
Other (please specify)	8	0%

Table 9 Sanitation facilities in Sotik sub-county

The JMP service ladder rungs for sanitation are open defecation, unimproved, limited, basic, and safely managed. Open defecation refers to evacuation of faeces in an open space; unimproved refers to the use of pit latrines without a slab, or hanging latrines; limited refers to improved facilities shared among multiple households; basic refers to improved facilities that are not shared; and safely managed refers to an improved facility that is not shared, and has provision for safe waste disposal. Figure 10 shows the distribution of responses within Sotik sub-county. The low proportion (7%) of people with sanitation access classified as limited represents the low rate of shared facilities among respondents.

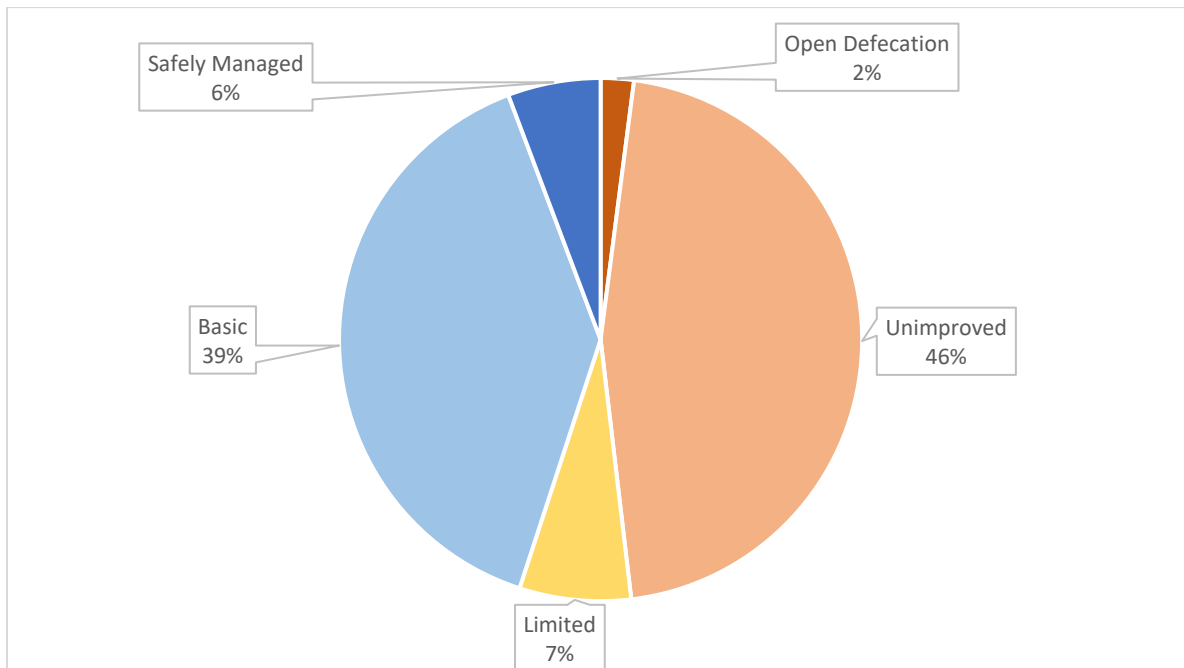


Figure 11 Distribution of responses on rungs of JMP sanitation ladder

When considering the spatial distribution across the sub-county, some significant variability in access can be seen. In particular, the penetration of safely managed sanitation facilities is much higher in the north of the sub-county, particularly around Sotik town (Figure 11). This is explained both by the presence of a municipal sewer system, and by the greater incidence of ventilated improved pit latrines that are emptied regularly. It should be noted that these options are not available to the majority of residents in the sub-county. However, there are possibilities to improve the conditions of households with lower access both through CLTS, and enhancing supply chains for upgrades to existing pit latrines, e.g. slabs or pit lining.

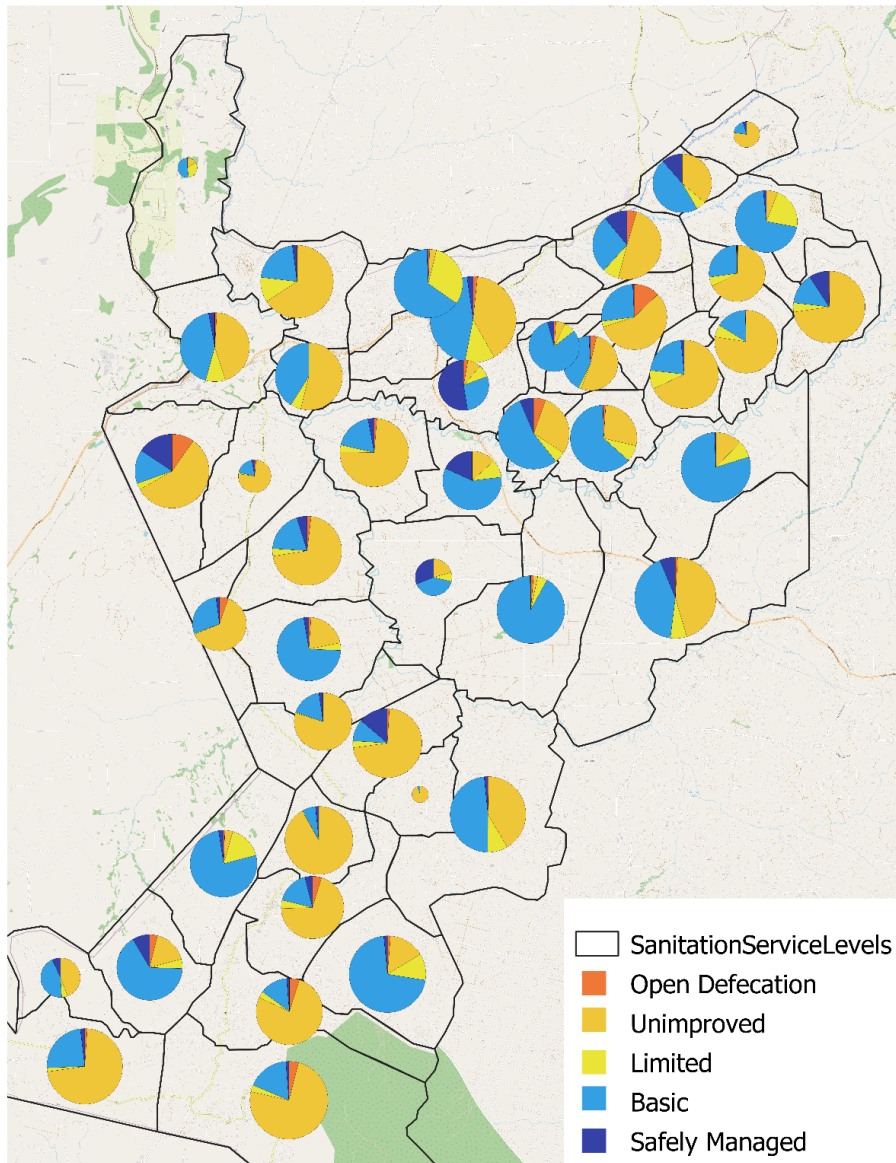


Figure 12 JMP sanitation access distribution for all sub-wards in Sotik. Chart size refers to number of respondents from each sub-ward



2.2.5 Sotik Sub-county - Hygiene Survey

The JMP service ladder rungs for hygiene are no facility, limited, and basic. No facility refers to a lack of both water and soap for handwashing in a household; limited refers to the presence of water for handwashing but the absence of soap; and basic refers to the presence of both water and soap for handwashing in a household. The overall results in Figure 12 show a mix of responses, with no facility being the most common (64%), followed by basic (37%) and limited (17%). However, there is a clear demarcation between responses in different sub-wards (Figure 13). The south and west of the sub-county have considerably lower hygiene status than the north and east, with the relative proportions with no facility to basic levels effectively inverted between these regions. This indicates that there are clearly learning possibilities between sub-wards that could be taken advantage of to help quickly improve hygiene status.

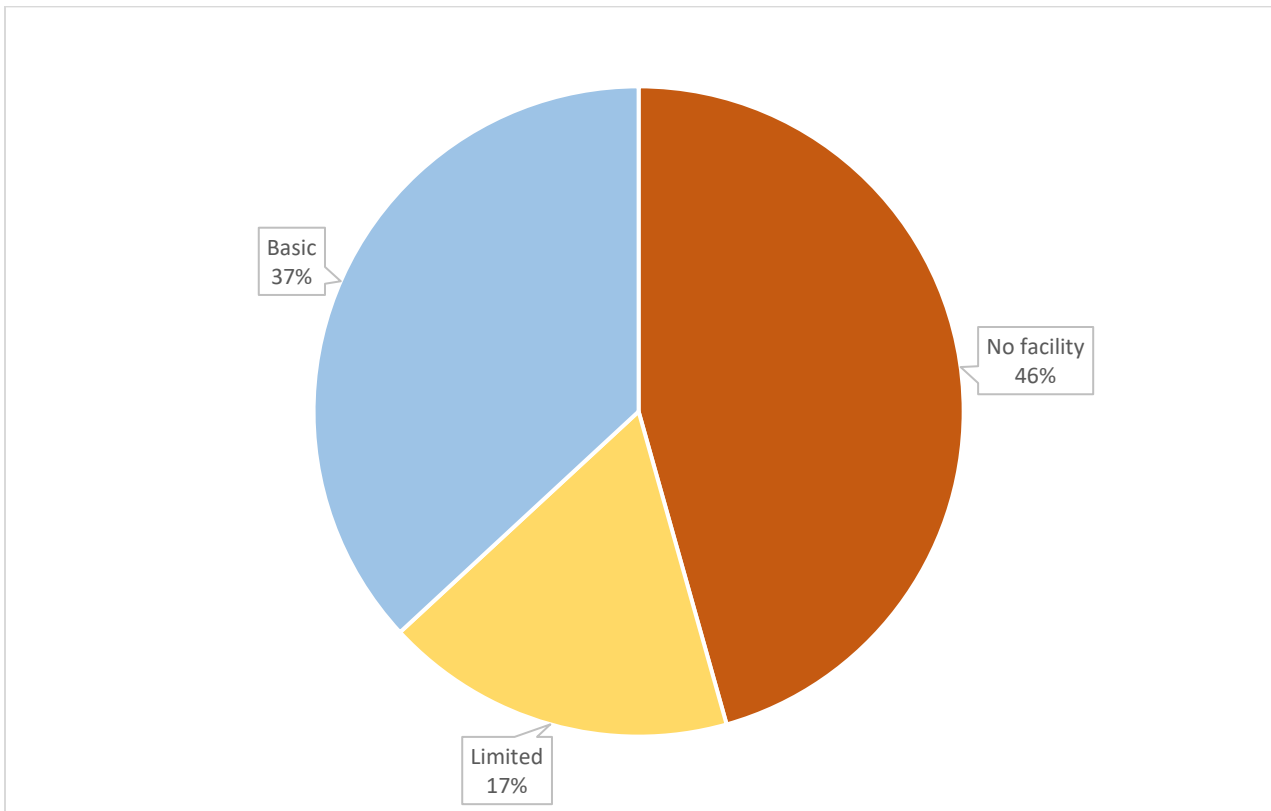


Figure 13 Distribution of responses on rungs of JMP hygiene ladder

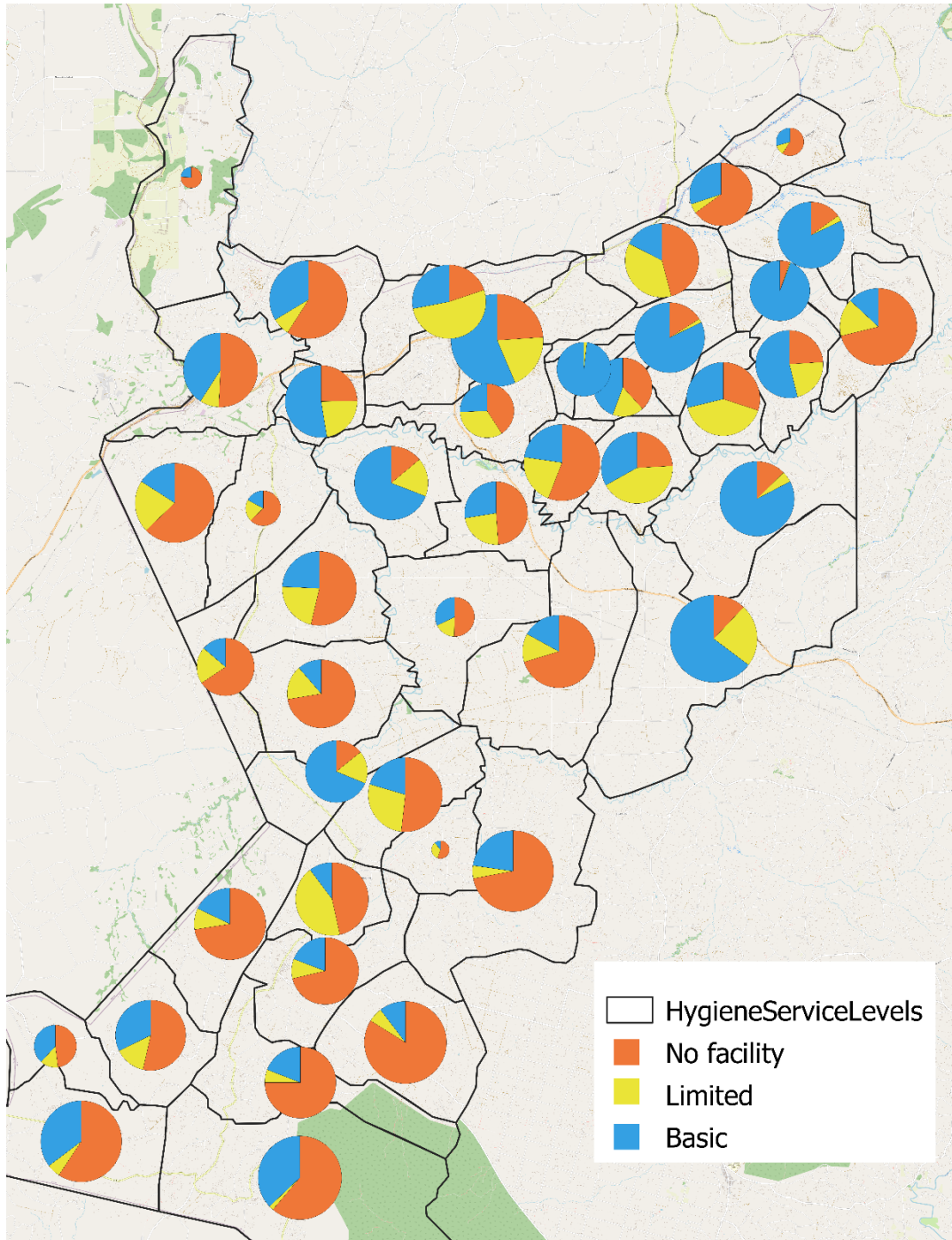


Figure 14 JMP hygiene distribution for all sub-wards in Sotik. Chart size refers to the number of respondents from each sub-ward.



2.2.6 Sotik Sub-county - Menstrual Health

The survey incorporated a selection of questions from the Menstrual Practice Needs Scale, which is a tool developed to better understand a respondent’s perceptions of their comfort, satisfaction, adequacy and reliability during their menstrual period. 5% of respondents, limited to women over the age of 18, were asked these questions (Figure 14). The subset of questions chosen reflect the experiences which relate to the respondent’s interaction with the public sphere to some extent, and as such could be affected by changes to public WASH policy. With 648 total responses, this is the largest survey of this type that has been carried out to our knowledge, and further analysis will likely lead to invaluable findings. The finding that as many as 25% of women surveyed feared that they would be harmed while changing their menstrual materials is certainly cause for concern, and needs urgently addressing in our WASH plan.

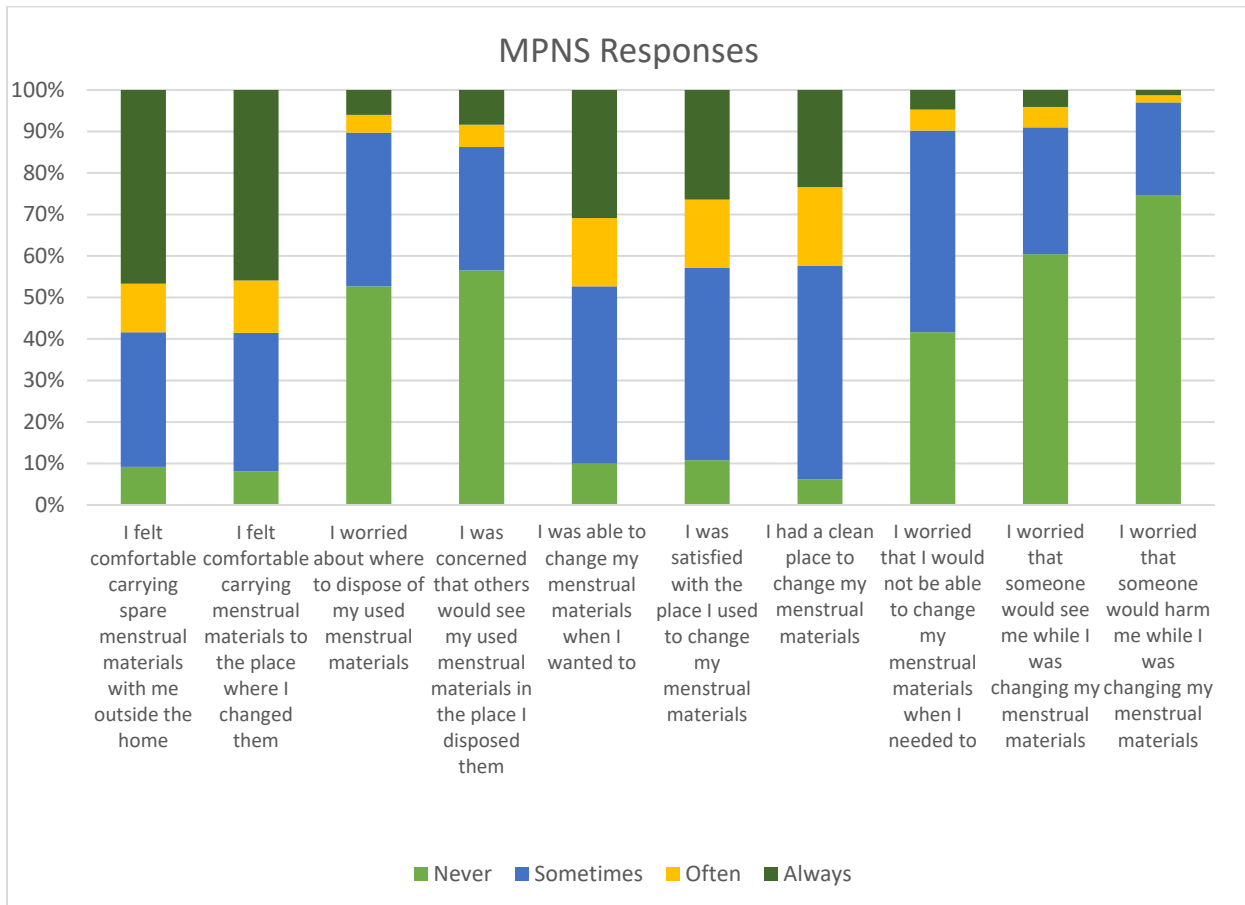


Figure 15 Responses to menstrual practice needs scale questions



2.2.7 Sotik Sub county - WASH in Institutions - Water Supply in Schools

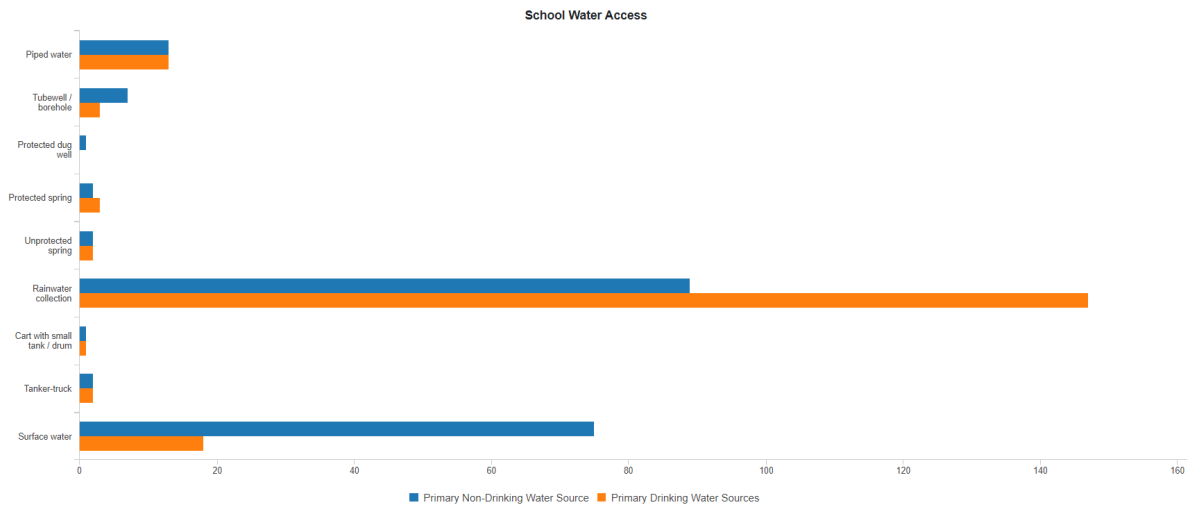


Figure 16 Water sources used by schools

The main source of drinking water for schools is overwhelmingly rainwater collection (Figure 15). Seventy-four percent (74%) of schools use rainwater harvesting for drinking water use and 45% of schools use rainwater harvesting for non-drinking uses. However, much of this access is unreliable. Either due to lack of storage capacity, or lack of rooftop catchment area, only 15% of schools have Basic water access (Figure 16). This means that clean water is available when needed throughout the year. For day schools, where the drinking water requirements for students are small (approximately two litres per day), this can be easily remedied by simple investment in improvements to existing rainwater harvesting capacity within schools. There is also a significant number of schools (17%) with No Service, that is, no access to improved sanitation facilities. This is of course a priority for remedying.

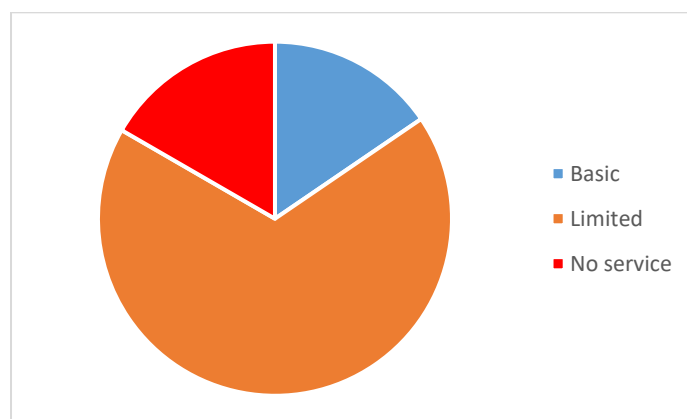


Figure 17 Water access in schools



2.2.8 Sotik Sub county - WASH in Institutions - Sanitation in Schools

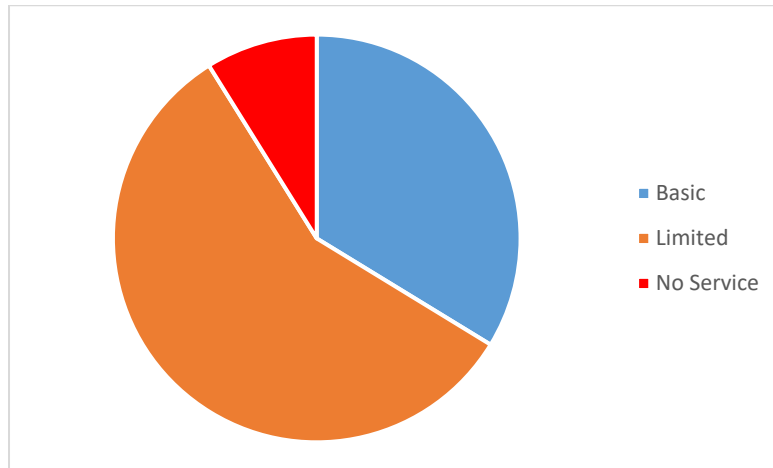


Figure 18 Sanitation access in schools

Of the schools surveyed, 34% had access to Basic sanitation, meaning improved facilities which are single-sex and usable. Fifty seven percent (57%) had access to Limited sanitation facilities, meaning that the toilets were either not single-sex or not fully functional, and 9% had no access to improved sanitation (Figure 17).

2.2.9 Sotik Sub county - WASH in Institutions - Latrine Emptying in Schools

The overall number of schools that have emptied their latrines is low: only 7.5% of schools in Sotik sub-county have ever done so. However, 80% of these schools (12/15) are those with VIP latrines, while schools with VIP latrines only represent 60% of the total population. The expansion of VIP latrines to more schools will lead to more demand for an effective faecal sludge management strategy (Figure 18).

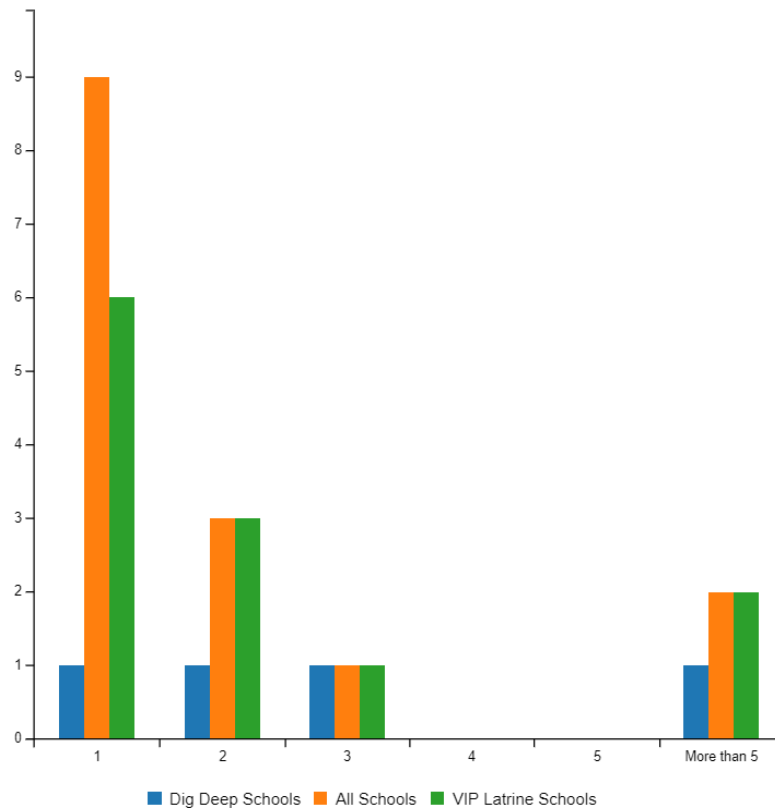


Figure 19 Number of VIP latrines in schools

2.2.10 Sotik Sub county - WASH in Institutions -Hygiene in Schools

Of the schools surveyed (n=198) 16% had Basic hygiene access as defined by the JMP ladders (Figure 19). This means that there is soap and water available at all handwashing facilities. Fifty-one percent (51%) had Limited hygiene access, meaning that all handwashing facilities had access to soap, but not all had access to water. The remaining 34% had No Service, meaning water was not available next to sanitation facilities and food preparation areas. This demonstrates the need for a more formal integration of hygiene education into the curriculum, and the provision for dedicated staff to check that soap and water is available for handwashing, facilities are kept clean, and students receive adequate instruction.

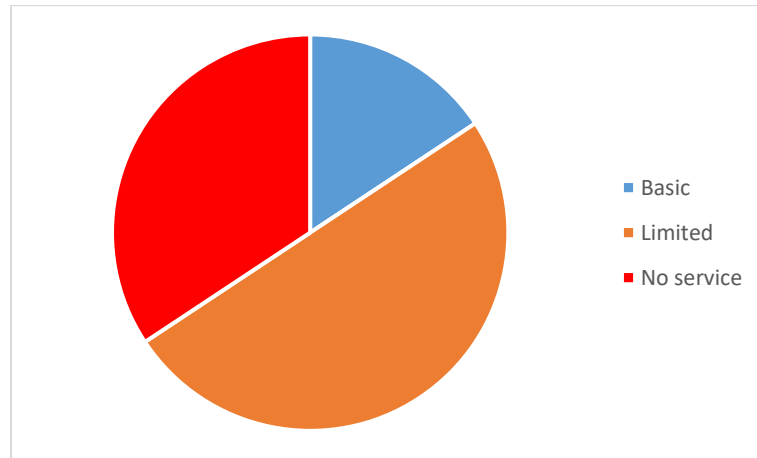


Figure 20 School hygiene access

2.2.11 Sotik Sub county - WASH in Institutions - Health Facilities

Of the 35 health facilities surveyed, 86% had a pit latrine with a slab, and 91% had a clean water supply from rooftop rainwater harvesting (Figure 20). Only 10 of the 35 facilities had gender-separated toilet facilities, and only 1 had menstrual hygiene facilities. There were no toilets in the sample that had access for people with limited mobility. Given the nature of people needing to use these facilities, a clear policy on improving these services is a priority.

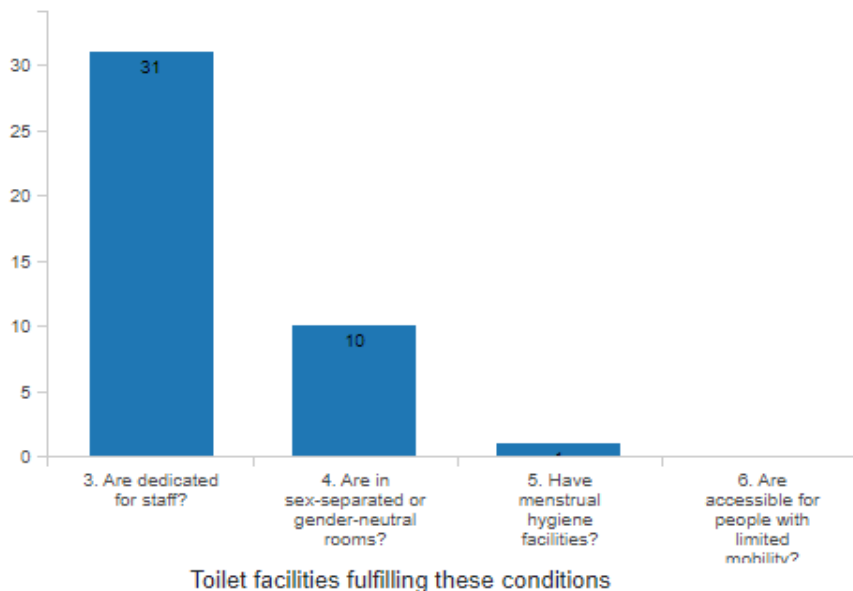


Figure 21 State of toilets in health facilities



2.2.12 Sotik Sub county - Key Conclusions from Survey Results

1. The variability of access across the sub-county, and the correlation between WASH indicators suggests that our WASH approaches should be tailored to specific circumstances. In some areas spring protection will most likely be the most cost-effective way of expanding improved water access, where elsewhere treatment of surface water resources may be necessary.
2. There exist real opportunities within the sub-county to make substantial progress towards better access, and to move towards accomplishing SDG6. The stark differences in handwashing facilities is a good example of this. Dig Deep have also conducted a water point survey, which has identified and described all known water points in the sub-county. This will help to verify the data we have collected, highlight any discrepancies between datasets which merit further investigation, and to design a strategic plan in collaboration with Bomet County Government to address the WASH needs identified in this survey. This survey is a baseline appraisal of WASH access in Sotik sub-county, and Dig Deep hopes to update this data at regular intervals to track progress towards our goal for universal WASH access.



CHAPTER THREE

3 STRATEGIC ROADMAP TO UNIVERSAL WASH ACCESS

This section explores the strengths and gaps in the WASH system in Bomet and sets out a strategy for strengthening the system with the aim of achieving universal access.

The first part takes three sources to produce a picture of the strengths and gaps of the existing WASH system. These are a collaborative workshop held in January 2022 with county staff and officials as part of the master planning process; the results from a public consultation held in 2021; and the findings from a report by the Water Integrity Network.

The second part then sets out targets for achieving universal WASH access, the roadmap for getting there and specific strategic recommendations.

3.1 Outcomes from January 2022 Workshop

The first day of this workshop involved participants collaboratively ranking a series of statements related to each of these building blocks for both water and sanitation. Attendees for the workshop were as follows:

1. Hon. Dr. Joseph K Sitonik, County Executive Committee Member, Department of Medical Services and Public Health, County Government of Bomet
2. Hon. Peter K Tonui, County Executive Committee Member, Department of Water, Sanitation, Environment, Natural Resources and Climate Change, County Government of Bomet
3. Hon. Andrew Sigei, County Executive Committee Member, Department of Finance, Economic Planning and ICT, County Government of Bomet
4. Hon. Haron Kirui, Chairperson for Budgeting and Planning, County Assembly of Bomet
5. Hon. Leonard Kirui, Chairperson for Health, County Assembly of Bomet
6. Zaddy Chepkorir Chumo, Chief Officer Public Health and Sanitation, Department of Medical Services and Public Health, County Government of Bomet
7. Philemon Ruto, Chief Officer Water, Directorate of Water and Irrigation, County Government of Bomet
8. Benard Cheruiyot, Chief Officer Finance, Department of Finance, Economic Planning and ICT, County Government of Bomet
9. Chelangat Gladys, WASH Coordinator Bomet County
10. Beatrice Chebet, Director Water, Department of Water and Environmental Services, County Government of Bomet
11. Ronald Kipngeno, Director Budget, Department of Finance, Economic Planning and ICT, County Government of Bomet
12. Micah Koech, Director Public Health and Sanitation, Department of Medical Services and Public Health, County Government of Bomet
13. Patrick Langat, Managing Director, BOMWASCO



14. Douglas Makora Mokong’u, Country Manager, AquaClara Kenya
15. Robert Yegon, County Manager, Kenya Red Cross Society
16. Justus Tanui, Country manager, Dig Deep (Africa)
17. Nelly Chepkorir, Programme Officer, Dig Deep (Africa)
18. Nicky Ronoh, Programme Officer, Dig Deep (Africa)

Each statement was scored from 1-5, with the combined scores shown in Table 11

Building Block	Water Score	Sanitation Score
Institutions	2.8	1.8
Policy & legislation	2.3	2.0
Planning	2.6	2.0
Finance	3.5	3.0
Regulation & accountability	4.5	4.0
Monitoring	3.5	2.5
Infrastructure (development)	3.0	3.3
Infrastructure (management)	2.3	1.5
Water resource management	2.8	3.6
Learning & adaptation	3.2	3.0

Table 10 Building Block scores for water and sanitation

These scores are not indicative of any objective metric. They are not comparable to a similar exercise undertaken in another county for example, as differences in framing could lead to wildly different scores, but they do give a sense of where participants felt were areas of strength, and areas of relative weakness. Qualitative feedback was also given for the exercise. Feedback included comments such as that: “Accountability mechanisms are there for formal water services. Not for citizens within informal supply”, “there is a lack of equity for the physically challenged (in sanitation infrastructure)”, and “Asset inventories for water and sanitation need updating.” These sessions have highlighted a variety of specific issues with the efficient and effective operation of WASH services. In addition to specific issues, a subset of broader systemic gaps have been identified, which cut across several or all building blocks. These issues were used to produce an Action Plan on the second day.

The key learning outcomes from planning meetings were as follows:

1. Lack of resources is endemic, it affects every aspect of WASH, and a Masterplan can help to solve this.

To some extent this is stating the obvious. Per capita spend on WASH services in Bomet County is approximately \$4, at least an order of magnitude below the required amount for building and maintaining safely managed systems and services. The lack of financial resources is without doubt the most significant barrier to long term WASH system improvements. While there is no magic bullet solution to this, the creation of a WASH Masterplan can be effective to some extent both in mitigating the drawbacks of financial shortfall, and in leveraging more funding.

2. No single voice or decision making authority for sanitation



The responsibility for delivering sanitation services is split between the Department of Water and Environmental Services (planning and construction of physical infrastructure), the Bomet Water and Sanitation Company (operation and maintenance of infrastructure), and the Department of Medical services and Public Health (delivery of sanitation related “software” including hygiene education and Community Led Total Sanitation). In addition to this the Department of Education has a mandate over school sanitation, meaning that there are at least four public bodies with some responsibility for the provision of sanitation access in the county, and no final authority with a coordinating role.

In response to this delegates of the workshop set out plans to create a dedicated sanitation directorate under the Department of Water. This body will have consolidated roles and a separate budget allocation.

3. Lack of communication and collaboration between bodies

There was a general appreciation that individual bodies responsible for water, sanitation and hygiene access did not have enough communication between each other. To ameliorate this, the county WASH Hub which was established as part of the process of institutional strengthening in 2021 will be expanded to encompass a broader remit and have increased staffing.

The WASH Hub is a tool to aid the implementation of a Systems Strengthening Approach in Bomet County to ensure that all WASH systems within the County are complementing each other.

Purpose of the WASH Hub:

- To coordinate integrated water, sanitation and hygiene projects within the County
- To be a repository of data regarding water, sanitation and hygiene services in the county, so these can be made available to all relevant parties
- To use all available data to assist in long-term planning activities
- To continue to monitor and analyse the level of water, sanitation and hygiene services in the county, and use this information as an advocacy tool
- To inform WASH practitioners about the current level of service in the county, and any other information useful for the performance of their roles
- To plan teaching and learning activities for WASH practitioners in the county where such activities have been identified as beneficial

Expanded resources for the WASH Hub:

- Two (2) employees, one provided and paid for by the Bomet County Department of Medical Services and Public Health, and one provided and paid for by Dig Deep.
- Database of Household and Institutional WASH access in the County, to be provided by Surveys carried out by Dig Deep.



- Maps of WASH access in the County
- Database of water sources and infrastructure assets in the County provided by the Department of Water

3. Under-prioritisation of maintenance budgets versus capital expenditure

There was a consistent narrative that within the administration it was harder to get political buy-in for funding maintenance of existing assets. There is no standard inclusion of maintenance budgets during handover of projects from the Department of Water, Sanitation, Natural Resources, Climate Change and Environment to BOMWASCO upon completion of the construction phase of projects, which is unsustainable in the long-term, especially as the number of existing projects increases. As part of the Master Planning process, it has been agreed that dedicated maintenance budgets for both water and sanitation infrastructure will be created. A full list of the actions determined on day 2 of the workshop is detailed below (Table 12)



WASH Action Plan from Workshops held on 17-18th January 2022

Area to Strengthen	Actions (short and long-term)	Outcomes	Interested Parties	Responsible Person	Timescale (short-term)
Sanitation service delivery models not in place	Introduce private models for exhaustion Build decentralised waste disposal sites Utilise new technologies for waste disposal	Sites identified and funds allocated Increased participation by private sector, possibly supported by subsidy	Department of Water -to look at new technologies Department of Public Health	CECM Water	Meet as a group to allocate sites for decentralised waste disposal, and finalise designs within 2 weeks .
Regulations are not customized for waste collection/disposal	Develop/domesticate regulations customised to Bomet/harmonize regulations between departments	Have clear regulations in place	Department of Water Department of Public Health Bomwasco	CECM Water CECM Medical services and Public Health	2 weeks to compare/combine existing regulations
Fragmented responsibilities for sanitation	Create dedicated sanitation directorate with consolidated roles and adequate budgetary allocation Expand WASH Hub to perform a coordinating role	Consolidated budget easier to fund	Departments of Public health , Water , Education, Urban planning, Finance NGO partners	CECM Medical services and Public Health	Create budgets for directorate and WASH hub expansion by early April
Negative attitudes to waste disposal	Sensitization and advocacy campaigns for each sub-county to get citizens on board	Buy in and participation by citizens	Department of Water Department of Public Health	CECM Medical services and Public Health	Immediately , include waste disposal sensitization in other campaigns
Weak enforcement for sanitation	Second staff to Bomwasco/complete enactment of Bomet environmental health bill	Increased capacity for staff on sanitation enforcement	Department of Water Bomwasco	Department of Administration Department of Public Health Bomwasco	environmental health bill passed to County Assembly, signed off in 1 month Bomwasco to prepare secondment schedule in 1 month
Some data for water access unavailable	Use data from KNBS, Ministry of Water, incorporate data from Dig Deep, survey to fill in gaps, standardise reporting system	Improve planning for new water projects	Departments of Water Department of Public Health Bomwasco , Communities ICT department (for mapping surveys)	Department of Water , Department of Public Health Dig Deep	meeting in 1 week to initiate plan for organised data collection
Asset inventories for water need updating	Ongoing updating activities by Bomwasco, together with DoW	Quantify Asset value of existing assets, and identify gaps, estimates for Total life-cycle cost (Opex) Combine asset map with survey results	Bomwasco Department of Water Department of Finance Department of Public Health (for mapping resource)	MD Bomwasco CECM Water CECM Finance Dig Deep	Finish Asset inventory within 4 weeks . Meet in 1 week to discuss integration of asset maps with other data.
Not enough resource for maintenance budgets	Introduce new dedicated budget line for maintenance	increase sustainability of new projects	Department of Water Bomwasco NGO partners	Department of Water Bomwasco	Meeting to agree on maintenance budget for Masterplan in 2 weeks

These actions are aimed towards publishing a comprehensive Masterplan by June 2022

Table 11 WASH Action Plan from Workshops held on 17-18th January 2022



3.2 Public Consultation

Focus Group Discussions were held in 2021 with community participants representing men, women, young people and people with disabilities. In total 16 groups were held, and topics covered Water, Sanitation, hygiene and Menstrual Health. A summary of responses is shown below

3.2.1 Water

- Long distances, unclean water sources and the expense of water are people's main concerns with water supply
- People are also concerned with having to wait a long time in queues to get water, and with the seasonal unreliability of water sources
- Apart from piped water, springs and rainwater harvesting are considered the most desirable sources of water, mainly because people have identified them as cheap and easy to maintain
- Both government and water service provider were considered untrustworthy by some people, while others thought they were doing a good job
- There is no dominant view on how water should be paid for, or who should collect revenue for water provision. However, there is a strong consensus that the government should be ultimately responsible for the task of water provision
- There is also overwhelming consensus that access to clean water is a human right, and should not be denied to anyone
- People strongly agree that water access is unacceptably difficult for people with physical disabilities, and some people suggested that there be financial assistance for these people
- The need for more storage tanks for families was a strong theme throughout the groups
- Education on the importance of clean water was also brought up frequently
- There was consensus that people did not have enough democratic voice in the process of water provision

3.2.2 Sanitation

- Some people exhibit a lack of trust in public health staff, with underfunding being cited as the main reason
- A lack of health education follow-ups was identified as a particular source of frustration
- Whilst there was consensus that schools and public spaces were legitimate spaces for health interventions, many people thought that individuals' homes were not, and if so, suitable for education outreach only.
- Both taxes and tariffs were identified by different people as preferred ways of paying for latrine emptying
- 1000-5000Ksh was the most common price point suggested as an affordable latrine emptying service



- The biggest barrier to people being able to build improved latrines was money, with the unavailability of standardised materials also being mentioned
- Pit latrines of various kinds were the preferred sanitation facility for respondents, with unfamiliarity being cited for other options
- The segregation of male and female toilet facilities, and the better provision for menstrual product disposal facilities were identified as barriers to women having equal access to sanitation. The risk of sexual assault for women was also brought up
- The lack of toilets with handrails and ramps was identified as a key barrier stopping access for people with limited mobility
- It was suggested that the government subsidise toilets, particularly for people living in poverty or with disabilities
- It was also suggested that there be more public/private partnerships

3.2.3 Hygiene

- There was a general understanding amongst respondents about the importance of hygiene, and specifically handwashing
- Germ theory was cited as the cause of disease
- Participants identified, preparing food, before and after meals, after visiting the toilet, shaking hands, changing diapers as times when handwashing was important
- Disability, stress, laziness, lack of water access and poverty were identified as leading causes of poor hygiene
- Open defecation was seen to still be a problem in most communities, despite people having differing views on whether people had been sensitized about the health risks of OD
- Precautions against Covid-19 infection was generally seen as being a factor in improving people's hygiene (practicing handwashing, mask wearing and social distancing)
- Several hygiene myths were identified, particularly around the perceived negative side-effects of vaccines
- There was no consensus on whether the Department of Medical Services and Public Health should prioritise more facilities or improving existing ones
- Similarly, the need for both education and infrastructure investment were prioritised equally
- The women's groups highlighted the need for other household facilities, washing lines and drains to improve hygiene

3.2.4 Menstrual Health

- Lack of finances to buy pads, having to miss work, lack of water, and stigmatization are key barriers identified during menses
- In their childhood most women said that they missed school due to menstruation. There is a consensus that girls today have to deal with less stigma than their mothers. Most



women talk to their daughters, but sons are usually not spoken to about menstruation. This is considered to be a responsibility of schools

- As a result of cultural customs identified including missing to attend church, perform household chores and farming activities.
- There is an impression that education has helped people to be more knowledgeable, but particularly some men are still not aware about menstruation effects
- There is a consensus that the individual should be responsible for accessing MH facilities and knowledge
- The county government is not considered to be particularly involved in support for Menstrual Health hygiene services
- Suggested support mechanisms include providing financial help to women to access sanitary products, upgrade sanitation facilities and provide better MHM education

3.3 Water Integrity Network Report

The Water Integrity Network published a study in 2018 setting some of the issues with accountability and transparency that Counties are dealing with. Some of the most important of these findings were:

- The study found that websites have been created, and some documents are available, but consistent publication and online posting of key planning, budgeting, and reporting documentation are not occurring as required by law. In none of the five counties studied were all documents publicly available, even if available elsewhere.
- Counties were making efforts to improve public participation approaches, especially during planning, although they were not undertaking public participation within stipulated deadlines provided by the 2012 Public Finance Management Act, hindering the potential for incorporating citizen views in planning and budget decisions. Interview evidence with county governments suggests that counties are grappling with this problem, experimenting with how best they engage citizens in budgeting processes. For example, Nakuru first grouped wards but then found that this undermined effective participation, simply because effective participation requires more consultation with smaller groups, closer to the ground. Nakuru has also experimented and made progress by using CSOs as intermediaries to engage citizens. Makueni County has also made progress in effective public participation. The county engages its population annually. The 3,000 county villages each identify a key development project (including water projects); these are then prioritized at ward level, and finally, hundreds are selected and included in the county development budget to be funded by the relevant department
- There is significant evidence that weak technical capacity at county level prevents full implementation of integrity system requirements under the law. This includes insufficient experienced staff for specific functions, such as planning, budgeting and monitoring, internal auditing, and procurement. County governments and WSPs are not able to easily acquire the necessary expertise, contributing to continued reliance on



national institutions, such as the WWDA, for performing county functions, perpetuating the issues discussed on incomplete implementation of the 2016 Water Act.

Based on the findings of the public consultation, and the Water Integrity Network report, it is clear that communication of plans to the public is a key area where improvement is required. This should involve an overhaul of online communications, as well as face to face outreach. In particular, the outputs of this Masterplan should be made available to the public across multiple communication channels.

3.4 Targets for achieving universal access

3.4.1 Targets for Basic WASH Access

The aim is to reach Basic access for all by 2036 for water, and by 2030 for sanitation and hygiene. This means that every resident of the county will have an improved sanitation facility on their premises that meets their needs, a clean and reliable source of water within 1km of their house, and a place to wash their hands with soap and water.

It is important to note that this falls short of Sustainable Development Goal 6 (SDG6) for water and sanitation, which stipulates 1) an improved water source that is accessible on premises, available when needed and free from faecal and priority chemical contamination and 2) use of improved sanitation facilities that are not shared with other households and where excreta are safely disposed of in situ or removed and treated offsite. Due to the current levels of access and investment, the goal of achieving Universal Safely Managed WASH access by 2030 is not feasible for Bomet County without significant external investment. Given this, the Masterplan sets out a Roadmap for achieving Basic Water by 2036 and Sanitation Access by 2030 respectively, while at the same time aiming for significant progress towards SDG6 by 2050, providing safely managed WASH access to all citizens.

3.4.2 Roadmap to Universal Access

The following section details this Masterplan's Roadmap to making progress towards SDG6 by 2050, whilst achieving Basic WASH access for all in Bomet County by 2036. This will be accomplished through a phased series of strategic interventions explained in the following sections. There are four phases, each designed to develop the WASH system towards SDG6. These phases are intended to be a pathway towards further development, while also providing tangible improvements to WASH access in the short term.

There is some overlap between these phases, but they are differentiated from each other in the complexity of the associated interventions. Phase 1 comprises the simplest, and affordable interventions which can reach the most vulnerable, and negatively affected people, and each ensuing phase addresses access higher up the ladders for water and sanitation.



3.4.3 Current state of WASH access (2022)

- This is the current state of water and sanitation infrastructure in the county, shown in terms of the JMP WASH ladders (Figure 21).
- The main immediate challenges as discussed are to:
 - Reduce reliance on unprotected water sources for domestic consumption.
 - Eliminate open defecation,
- The next priority is to:
 - Connect hard to reach areas with clean water.
 - Provide scalable pathways for households to upgrade their sanitation facilities

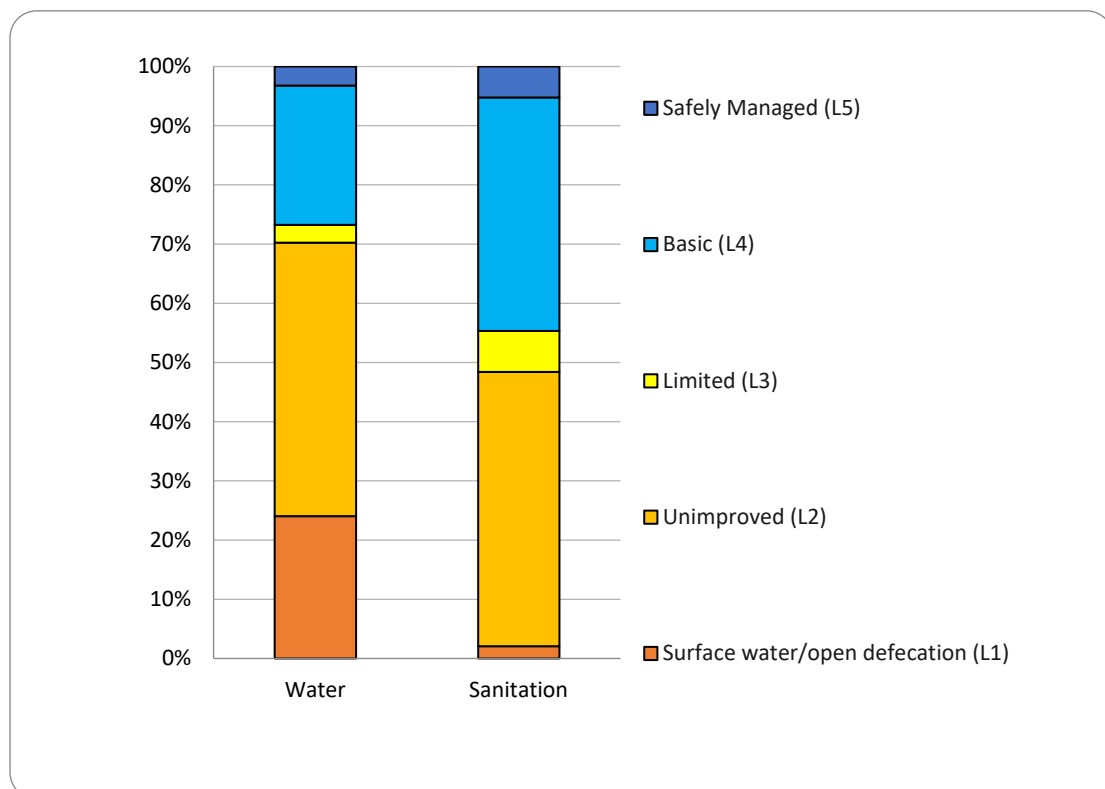


Figure 22 Current state of WASH Access. Each coloured bar represents the population percentage of different rungs of the water and sanitation ladders.



Phase 1 2023-2025: Spring Protection and Community Led Total Sanitation

The first phase of the roadmap is to rapidly increase access to basic water supplies and eliminate open defecation (Figure 22):

- Remove dependence on surface water resources by implementation of community water source protection programmes, in particular by protecting all local **springs**.
- Provide ongoing maintenance and management of protected spring projects
- This will **provide up to 50% of people using unimproved or surface water sources with Basic water access**.
- Eliminate open defecation with a county-wide programme of **CLTS**.
- Undertake digital monitoring of communities, and perform follow-ups to ensure open-defecation status of villages is maintained.
- This will lift the **2-5% of people practising open defecation to the level of unimproved sanitation**

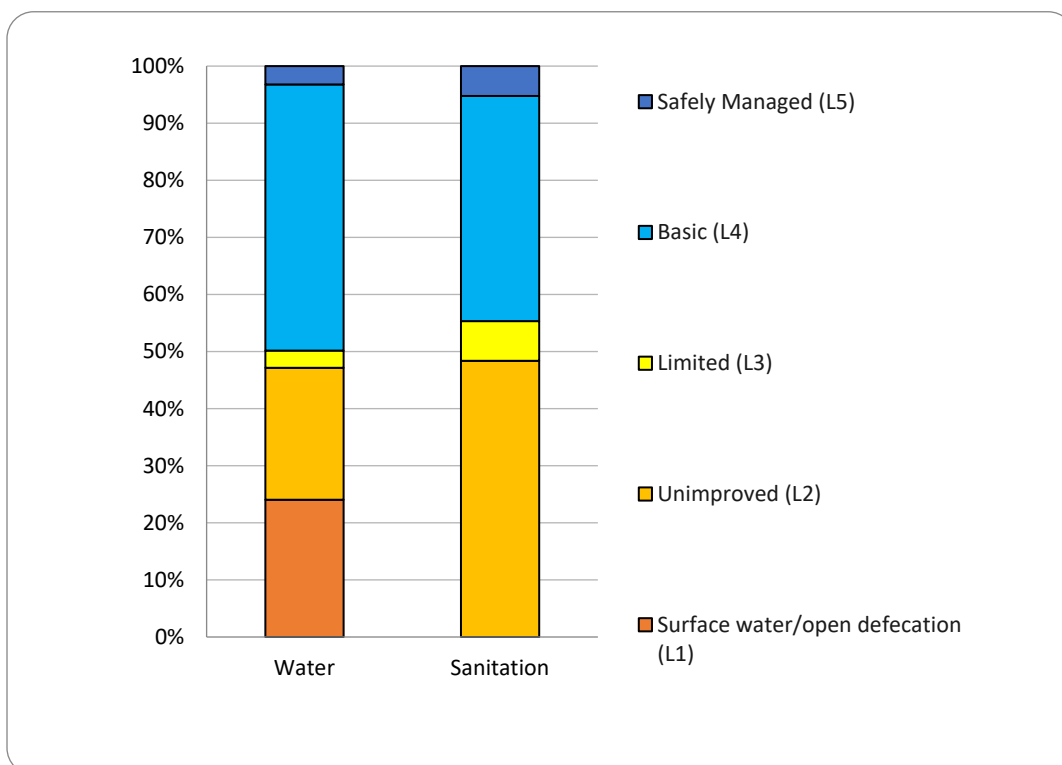


Figure 23 Roadmap Phase 1. Each coloured bar represents the population percentage of different rungs of the water and sanitation ladders.



Phase 2 2023-2027: Community Rainwater Harvesting and Post ODF

The second phase of the roadmap is to provide hard to reach areas with basic water supplies and rapidly increase access to basic sanitation (Figure 23):

- Provide hard-to-reach areas with **community rainwater harvesting**, or boreholes where appropriate.
- This can provide up to a **quarter of the remaining population with Basic water access**.
- Scale-up CLTS across the county with **Post ODF** interventions such as sanitation marketing and training of community artisans.
- This will enable **basic sanitation for the majority of the population with the economic ability** to upgrade their domestic sanitation.

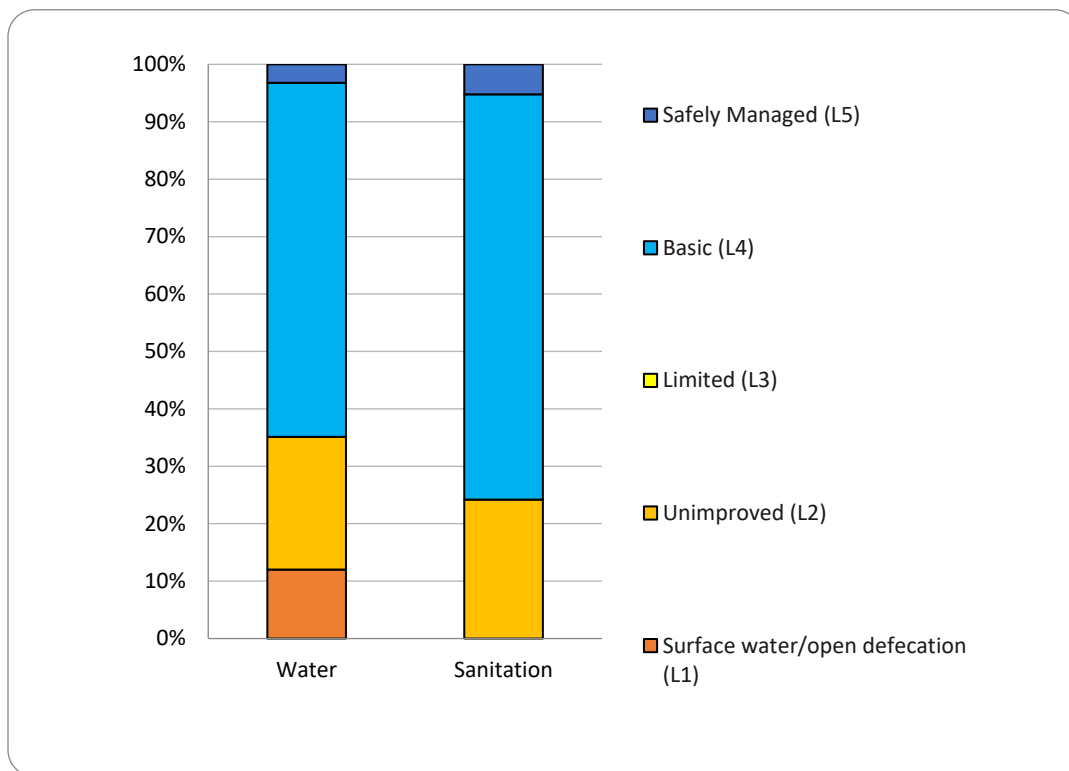


Figure 24 Roadmap Phase 2. Each coloured bar represents the population percentage of different rungs of the water and sanitation ladders.



Phase 3 2025-2030: Public standpipes and Sanitation subsidies

The third phase of the roadmap is to provide basic water supplies to all remaining residents and basic sanitation to all remaining residents (Figure 24):

- Expand and develop existing water supply schemes to provide **standpipes for public access** where community water sources are unavailable.
- This will ensure **Basic water access for all remaining residents**
- Develop a **subsidy scheme** for people who are unable to afford improvements to domestic sanitation due to complex needs (e.g. physical disabilities) or lack of economic means.
- This will ensure **Basic sanitation access for all remaining residents**

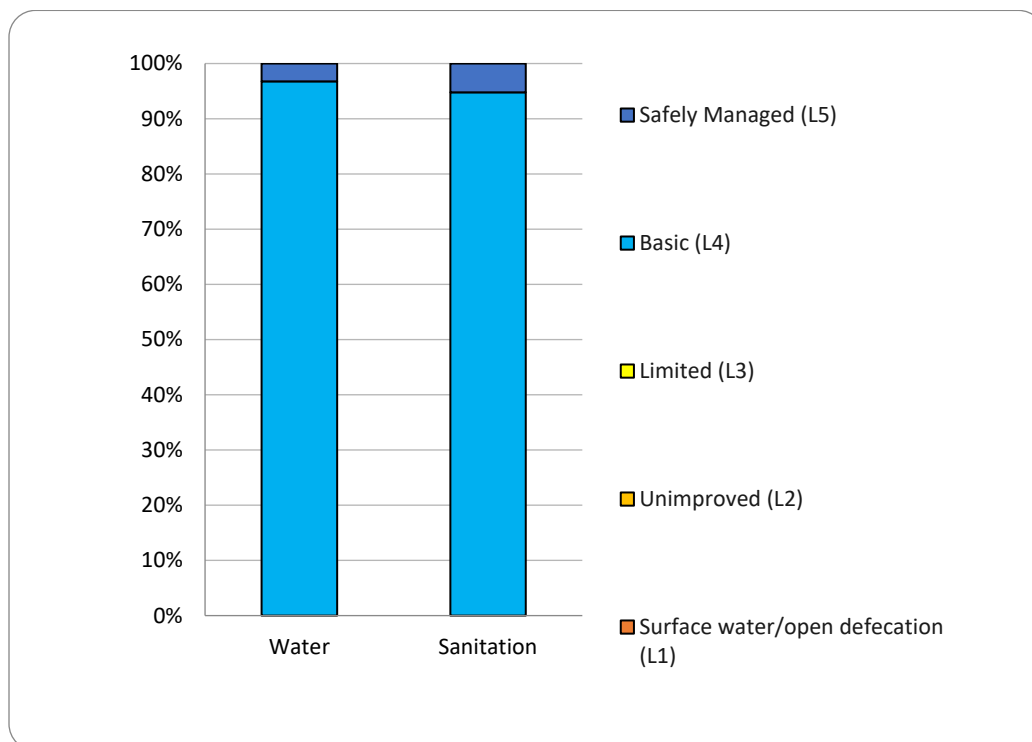


Figure 25 Roadmap Phase 3. Each coloured bar represents the population percentage of different rungs of the water and sanitation ladders.



Phase 4 2030-2050: Last mile connections and Faecal sludge management

The fourth phase of the roadmap is to provide safely managed water and sanitation to all remaining residents (Figure 25):

- After Basic access to water and sanitation has been achieved for everyone, the priority will shift to **providing safely managed water and sanitation services**.
- This will involve the installation of **last-mile connections** to domestic residences.
- To achieve safely managed sanitation, instigate **onsite treatment of faecal sludge** where applicable using septic tanks, development **reticulation networks**, and **pit exhaustion** using tanker trucks.

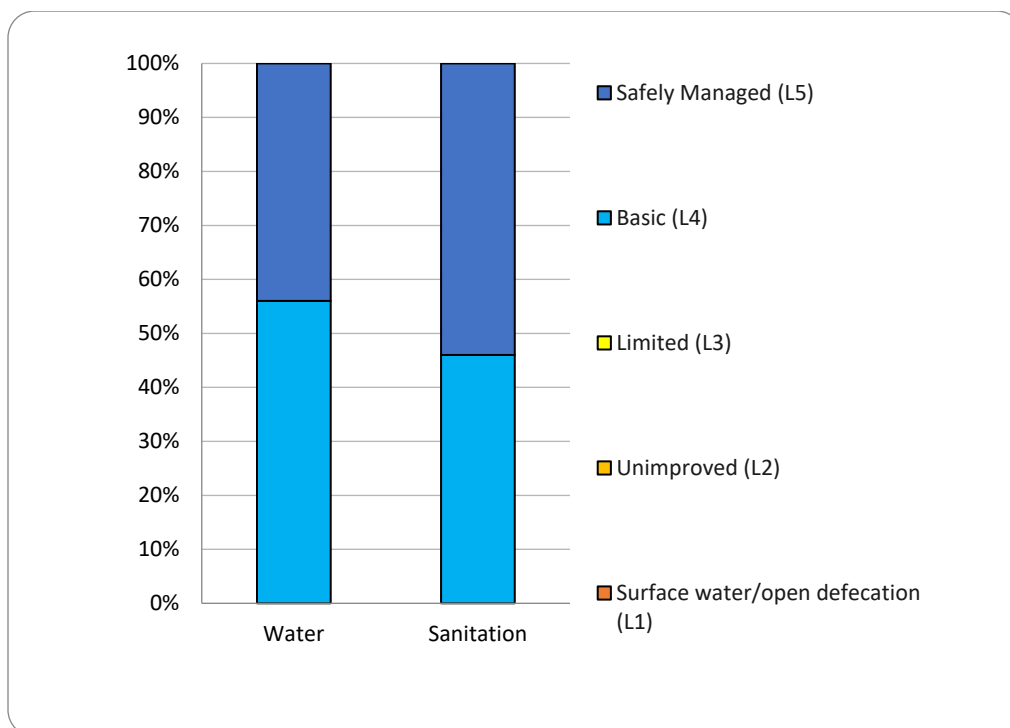
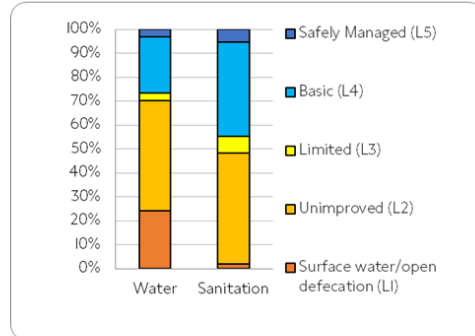


Figure 26 Roadmap Phase 4. Each coloured bar represents the population percentage of different rungs of the water and sanitation ladders.

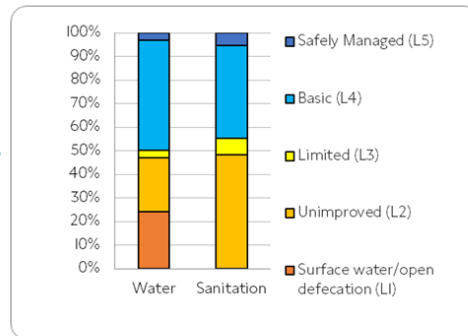


CURRENT STATE OF WASH ACCESS (2022)



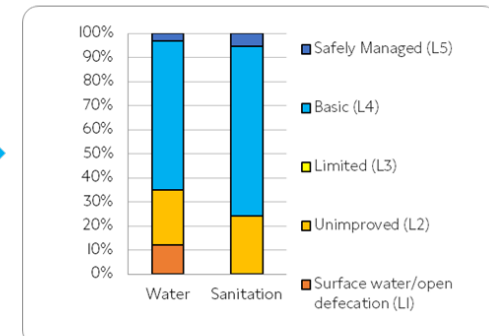
This is the current state of water and sanitation infrastructure in the county, shown in terms of the JMP WASH ladders.

PHASE 1 2023-2025: COMMUNITY LED TOTAL SANITATION AND SPRING PROTECTION



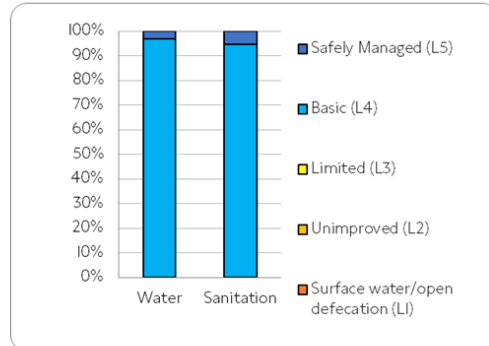
Eliminate open defecation with a county-wide programme of CLTS. Protect local springs to reduce dependence on surface water sources.

PHASE 2 2023-2027 COMMUNITY RAINWATER HARVESTING AND POST ODF



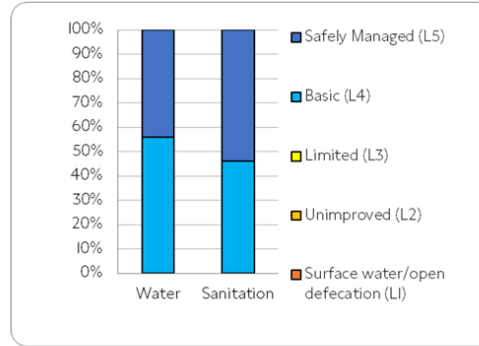
Provide hard-to-reach areas with **community rainwater harvesting**, or boreholes where appropriate. Scale-up CLTS across the county with **Post ODF** interventions.

PHASE 3 2025-2030 PUBLIC STANDPIPES AND SANITATION SUBSIDIES



Expand and develop existing water supply schemes to provide **standpipes for public access**. Develop a **subsidy scheme** where people are unable to afford improvements to domestic sanitation.

PHASE 4 2030-2050 LAST MILE CONNECTIONS AND FECAL SLUDGE MANAGEMENT



Install **last-mile connections** to domestic residences. Develop pit exhaustion capacity

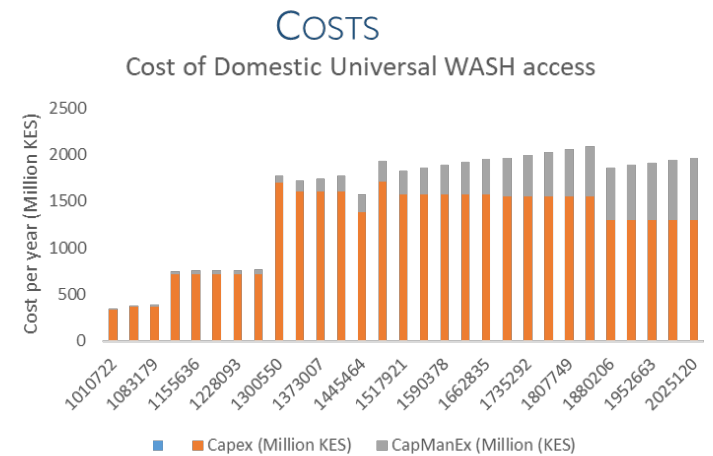


Figure 27 Roadmap for Universal WASH Access in Bomet County



CHAPTER FOUR

4 STRATEGIC INTERVENTIONS REQUIRED TO ACHIEVE UNIVERSAL ACCESS

The following are the 18 strategic interventions needed to strengthen Bomet County's WASH system to achieve universal WASH access set about above:

Water:

1. **Safeguard sustainability of all existing water projects through The Department of Water taking formal ownership of all community water points** - without a handover plan to the water Department to undertake formal management of these water points, the continued operation of these water sources is not sustainable.
2. **Safeguard sustainability of all existing water projects through the department of Water creating a plan and budget for all schemes** - This should include planning the ongoing repair and replacement of all existing schemes should be budgeted for based on the expected lifecycle of infrastructure to minimise disruption due to failure
3. **Improve access to safe water sources in the county by protecting all community springs** - Springs offer a affordable and plentiful option for clean water provision, and protecting springs can quickly reach a large proportion of the rural residents of the County with Basic water access.
4. **Perform an investigation into the availability of groundwater resources in hard-to-reach areas** - Where other water sources are not available boreholes can be a relatively low-cost alternative to treatment of surface water. Exploratory investigation of groundwater availability and quality (with special respect to the presence of fluoride) will be necessary to ascertain the potential of this approach.

Sanitation:

5. **Achieve county wide open Defecation Free (ODF) status through county wide CLTS interventions** - declaring the entire county Open Defecation Free through the county-wide implementation of CLTS, and regular follow-ups by CHVs is an urgent priority.
6. **Once ODF status is achieved in each village, increase percentage (%) of household with basic sanitation access through county wide post-ODF interventions** - initiating an effective Post ODF strategy across the county to strengthen sanitation supply chains, train local craftspeople and follow-up on sanitation and hygiene education at the community level initiated during CLTS will drive continuous improvement in access levels and prevent backsliding to open defecation
7. **Ensure that every household can access basic sanitation through toilet construction subsidies targeted at the poorest and most vulnerable households** - Based on the economic situation of many residents of the county, market-based approaches can only reach the more affluent sections of the population. It will therefore



be necessary to provide support to the remaining households, and to develop a policy which will guarantee fair and equitable provision of services.

- 8. Ensure basic access to sanitation for all schools and health centres through investing in VIP latrines in all institutions** - VIP latrines are necessary to ensure safe disposal of waste from institutional facilities. This investment should utilise designs developed by Dig Deep in Bomet that include extra reinforcement for toilet substructure that protect against collapse in unstable soils, facilities for menstrual hygiene disposal, and SATO® pans installed in toilet apertures to reduce odour.
- 9. Increase access to the transport and treatment of faecal waste services through investment in increasing BOMWASCO'S capacity for pit exhaustion and building wastewater treatment works outside Bomet Town** - The development of sewerage services outside Bomet Town will address the growing need to dispose of water in urban areas as water networks develop. Pit exhaustion services will also be increasingly required as more residents have access to latrines which contain waste.

Hygiene

- 10. Address the WASH needs of women and girls through creating a policy on public gender-separated washrooms and the safe disposal of menstrual products** - The public consultation and survey activities undertaken have highlighted the negative experiences of women interacting with institutional sanitation services. The improvement of these services to be more gender-sensitive is therefore a priority.
- 11. Improve hygiene for the next generation through undertaking periodic hygiene promotion and menstrual health education in schools** - Hygiene promotion and menstrual health education in schools has so far been done on a piecemeal basis. To institutionalise the process of learning, the promotion and education of these issues among students should be made a formal part of the curriculum so these gains are maintained and reinforced.
- 12. Improve hygiene standards in schools and clinics through integrating key performance indicators for hygiene into existing inspection regimes** - As per the precious recommendation, establishing and maintaining hygiene standards in institutions is a major challenge. Inspections and monitoring criteria by health and education authorities will serve to provide a consistent standard for hygiene in these institutions.

Institutional strengthening

- 13. Improve monitoring of WASH through extending the 2021 Sotik survey across the entire county** - Monitoring of water and sanitation access across the county needs to be improved. This can be done through extending the survey already conducted in Sotik sub-county across the four remaining sub-counties of Konoin, Bomet East, Bomet Central and Chepalungu. To entrench the capacity of staff to manage and compile this



data, this should be done by engaging Public Health Officers and Community Health Volunteers to undertake the data collection and management.

- 14. Improve coordination, data sharing and training available amongst all WASH partners through expanding the WASH Hub** - Data on existing and future water schemes should be digitally stored at the WASH Hub, be freely available to all partners, and used to plan efficient design of all WASH intervention. In addition, the WASH Hub should play the key role in facilitating information sharing, coordination and training across all partners working on WASH in the county
- 15. Improve communication with and accountability to the public through creation of public consultation and communication policy** - It has been highlighted in focus group discussions, and through findings of the Water Integrity Network report that public trust and understanding of WASH projects is low. To make this Masterplan successful it is important to get broad democratic buy-in, and to respond to the changing needs of the public.
- 16. Improve governance of sanitation by instituting a Directorate within the Department of Water to govern sanitation** - The fragmentation of roles and responsibilities concerning sanitation within the county has been highlighted as a major challenge to improving sanitation services. Coordination of all these functions under a single directorate will help to solve these problems.
- 17. Hold meetings on a biannual basis to review progress towards the goals of the Masterplan and incorporate changes to the strategic direction of the Roadmap as it becomes necessary.**

Funding

- 18. Increase financing levels for WASH through leveraging this Masterplan** - Substantial finances will need to be found to invest in more infrastructure, capital maintenance costs and operating costs. In particular, there will need to be substantial development of the infrastructure and supporting systems around sanitation.

4.1 Projects Required to implement Recommendations

Figure 27 details a list of the specific interventions required to fulfil the goals of the Masterplan, in line with the strategic objectives set out in the previous section.

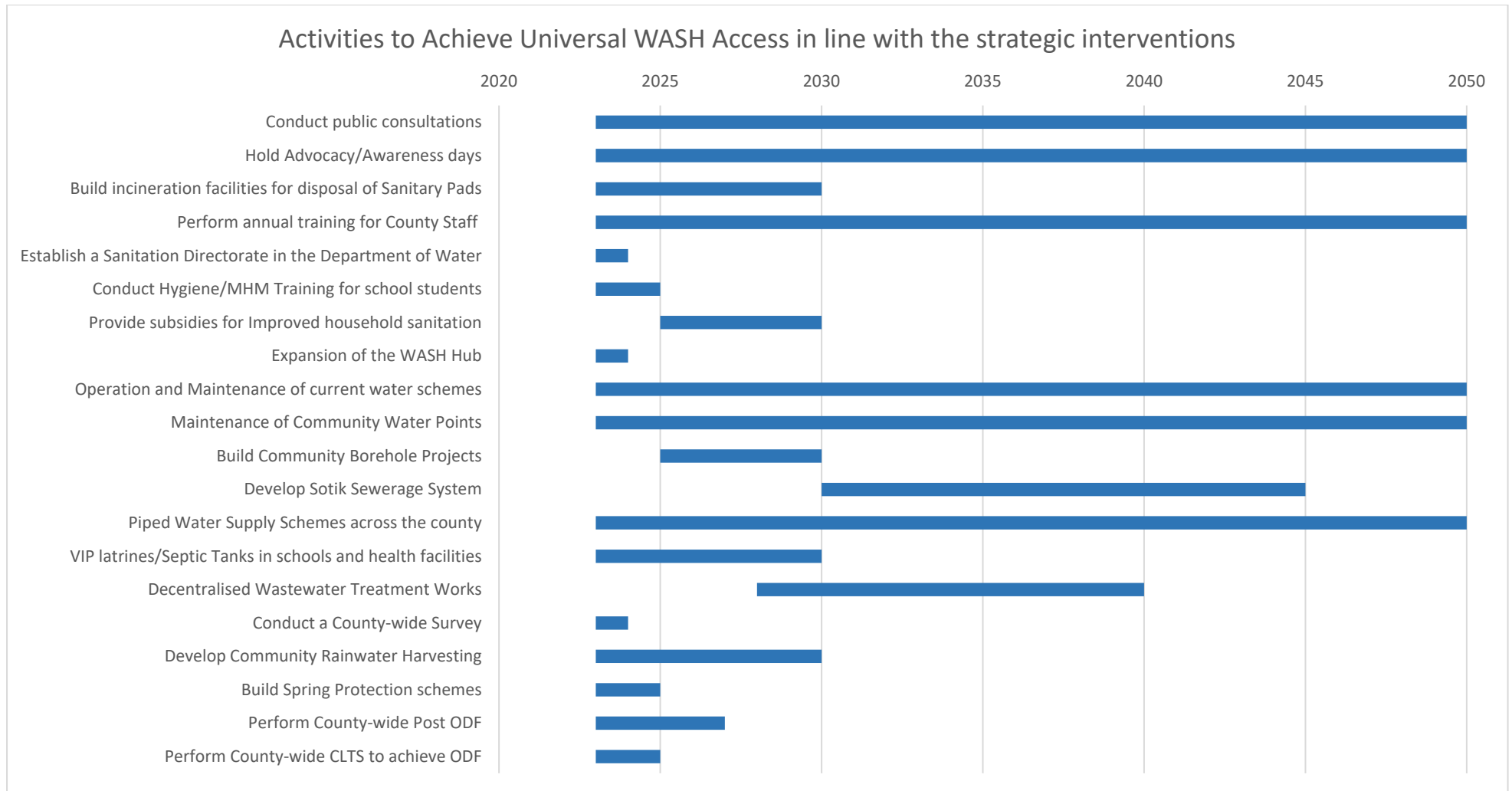


Figure 28 Interventions required to achieve the objectives of the Masterplan



CHAPTER FIVE

5 COSTING THE MASTERPLAN

This section sets out the projected costs of implementing the Masterplan. These activities are aimed at providing basic access to water and sanitation for all households in the county by 2030, and to making significant progress towards safely managed access. In addition, schools and health facilities will be provided with basic WASH access.

5.1 Methodology

The costing approach considers the following:

- A population estimate for year 2022 is used, and extrapolates at population growth rate of 2.7% (KNBS, 2019) forward to 2050 to calculate access proportions. In this time frame the population projected to grow from 1.01 million to 2.02 million.
- The costs presented include the technologies (infrastructure and other types of intervention such as CLTS) required, and the WASH service delivery costs for all related activities.
- The costs have been calculated using the life-cycle cost approach that gives components for delivery of sustainable WASH services, including Capital Expenditure (CapEx), Capital maintenance expenditure (CapManEx), and Expenditure on direct support (ExpDS). The cost components are:
 - Capital Expenditure (CapEx) - The cost for providing the WASH infrastructure.
 - Capital maintenance expenditure (CapManEx) - The cost of replacing assets or asset renewal. This covers major maintenance activities.
 - Expenditure on direct support (ExpDS) - The cost for supporting service delivery, which includes monitoring and evaluation, technical support, backstopping, capacity building etc. provided and/ or requested by the County Government of Bomet.
- These budgets do not include capital maintenance and direct support for existing infrastructure.



5.2 Costing of Water Services

The costs for achieving Universal Basic water access, and for developing safely managed water access have been estimated based on current levels of service and taking into account the viability of technologies based on population distribution and geography. Most of the expenditure goes to fund new piped water schemes, including the Bosto Dam project, which will eventually supply almost 200,000 residents with safely managed water access (Table 14). However, from 2022-2030 smaller scale water projects including Spring protection, Community Rainwater Harvesting and Shallow Boreholes can provide almost all residents with Basic water supply at a lower cost.

Item	Quantity	Unit Cost (KES)	Total (KES)	Impact of intervention (Basic or Safely Managed)
Kibusto Water Project			1,000,000,000	Basic and Safely Managed
Bomet-Mulot Water Project			1,700,000,000	Basic and Safely Managed
Bosto Dam			20,400,000,000	Basic and Safely Managed
Bosto Water Supply			4,500,000,000	Basic and Safely Managed
Water supply schemes to public standpipes			3,521,000,000	Basic and Safely Managed
Rehabilitation and Mapping of existing infrastructure			2,043,039,384	n/a
Gravity powered Community RWH	110	243,000	26,730,000	Basic
Pump powered Community RWH	60	313,000	18,780,000	Basic
Spring Protection Scheme	220	650,000	143,000,000	Basic
Borehole installation	50	5,739,000	286,950,000	Basic and Safely Managed
Setting up water committees, water quality and quantity testing	440	395,000	173,800,000	n/a
Operation and maintenance costs			7,798,501,500	Basic and Safely Managed
		Total	41,611,800,884	

Table 12 Bomet County water infrastructure capital investment costs

Table 15 shows the cost of water infrastructure per year. CapManEx has been calculated at a 2% cost of CapEx investment spent per year. This includes the replacement and repair of equipment, the electricity costs of pumping, and the cost of chemicals and other costs needed for water treatment.



Year	Population (Projected)	Basic Water Access	Safely Managed Water Access	Water CapEx (Million KES)	Water CapManEx (Million KES)	Water Totex (Million KES)
2022	1,010,722	27%	3%	312	6	318
2023	1,046,951	35%	4%	312	12	325
2024	1,083,179	42%	6%	312	19	331
2025	1,119,408	49%	7%	587	26	613
2026	1,155,636	57%	8%	587	33	620
2027	1,191,865	64%	10%	587	40	627
2028	1,228,093	71%	11%	600	48	648
2029	1,264,322	76%	13%	600	55	656
2030	1,300,550	81%	14%	1572	82	1654
2031	1,336,779	85%	16%	1519	108	1627
2032	1,373,007	88%	17%	1519	134	1653
2033	1,409,236	90%	19%	1519	160	1679
2034	1,445,464	92%	20%	1292	186	1478
2035	1,481,693	94%	22%	1573	217	1790
2036	1,517,921	99%	24%	1448	246	1694
2037	1,554,150	100%	26%	1448	275	1723
2038	1,590,378	100%	28%	1448	304	1752
2039	1,626,607	100%	30%	1448	333	1781
2040	1,662,835	100%	32%	1448	362	1810
2041	1,699,064	100%	34%	1448	391	1839
2042	1,735,292	100%	36%	1448	420	1868
2043	1,771,521	100%	37%	1448	449	1897
2044	1,807,749	100%	39%	1448	478	1926
2045	1,843,978	100%	41%	1448	507	1955
2046	1,880,206	100%	41%	1253	532	1784
2047	1,916,435	100%	42%	1253	557	1809
2048	1,952,663	100%	43%	1253	582	1835
2049	1,988,892	100%	43%	1253	607	1860
2050	2,025,120	100%	44%	1253	632	1885
Totals				33,639	7,799	41,438

Table 13 Yearly progress towards Universal Water Access

With this investment, 100% basic access is projected to be achieved by 2036, and safely managed water access is projected to reach 44% by 2050, mainly due to increases in the population of the county (Figure 27). The infrastructure to provide this will provide almost full geographic coverage of the county by 2050, which means that this figure may be much higher if the socio-economic conditions of residents allow them to pay for the installation of household connections, as these will have been developed by the infrastructure projects detailed above.

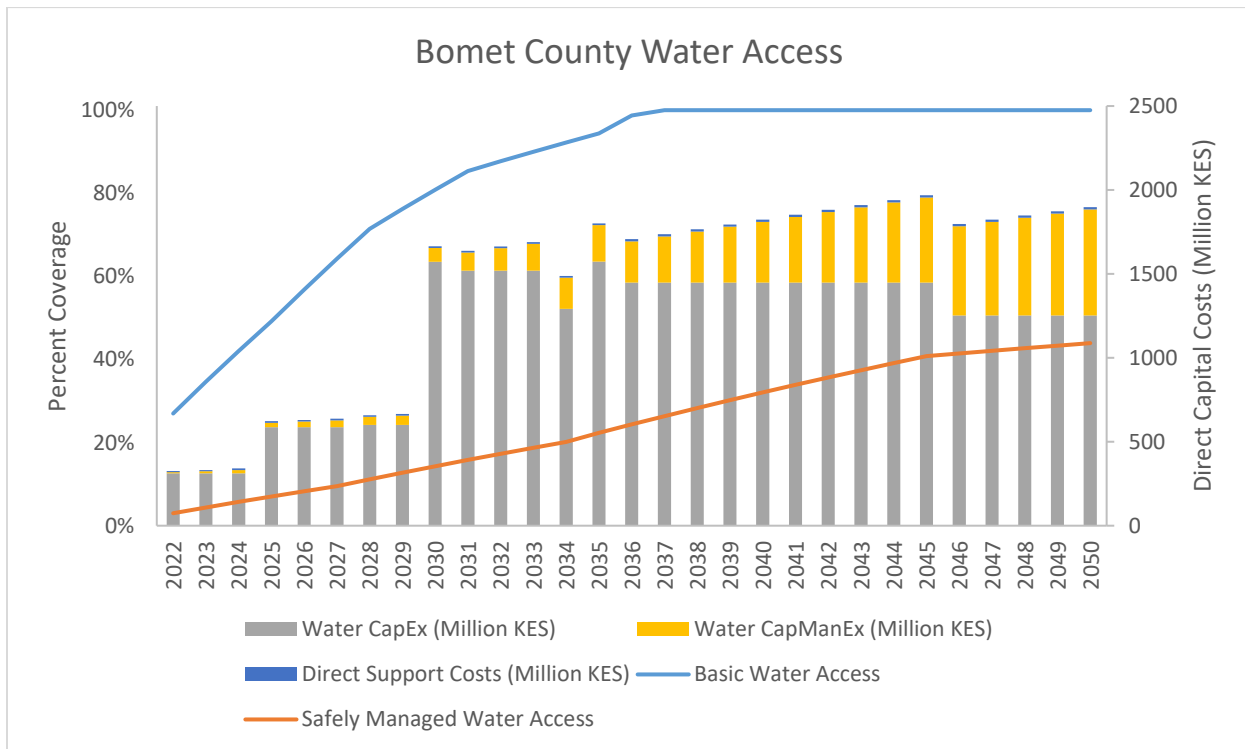


Figure 29 Cost of Water delivery 2022-2050

5.3 Costing of Sanitation Services

The costs for achieving Universal Basic sanitation access, and for developing safely managed sanitation access have been estimated based on current levels of service and taking into account the viability of technologies based on population distribution and geography, as for the water access calculations above (Table 16). The target for 2030 is to reach 100% of the population with access to basic sanitation through a combination of Community Led Total Sanitation and Post ODF activities, in conjunction with subsidies to help the poorest households in the county get support for developing improved household sanitation.

Project	No	Unit Cost (KES)	Total (KES)
Decentralised treatment facilities	5	12,645,000	63,225,000
Bomet Town sewerage			710,721,840
Sotik Town sewerage			650,000,000
Mulot Sanitation System			50,000,000
Silibwet Sanitation System			70,000,000
Mogogosiek Sanitation System			40,000,000



Land acquisition estimates			359,422,961
CLTS	2342	58,700.00	137,475,400
Post ODF (per year)	8	18,979,200	151,833,600
Development of subsidy policy			3,005,000
Sanitation Subsidies	98015	5,000	490,075,000
CapManEx			358,019,213
		Total	2,725,758,801

Table 14 Bomet County sanitation infrastructure capital investment costs

The two main population centres in the County, Bomet Town and Sotik Town, will have expanded sewerage systems with wastewater treatment, and 8 other population centres will have decentralised wastewater treatment works for treatment of on-site sanitation. This will allow households and public institutions within a reasonable distance (for these purposes calculated as a radius of 20km) to safely remove sludge from pit latrines or septic tanks (Table 17).

Year	Population (Projected)	Basic Sanitation Access	Safely Managed Sanitation Access	Sanitation CapEx (Million KES)	Sanitation CapManEx (Million KES)	Sanitation Totex (Million KES)
2022	1,010,722	44%	5%	23.9	0.0	23.9
2023	1,046,951	49%	5%	51.2	0.0	51.2
2024	1,083,179	54%	5%	51.2	0.0	51.2
2025	1,119,408	65%	5%	131.9	0.0	131.9
2026	1,155,636	76%	5%	131.9	0.0	131.9
2027	1,191,865	87%	5%	131.9	0.0	131.9
2028	1,228,093	97%	5%	113.8	0.1	113.9
2029	1,264,322	100%	5%	113.8	0.2	114.0
2030	1,300,550	100%	7%	122.1	0.5	122.6
2031	1,336,779	100%	11%	88.8	1.7	90.5
2032	1,373,007	100%	16%	88.8	2.9	91.7
2033	1,409,236	100%	20%	88.8	4.1	92.9
2034	1,445,464	100%	24%	88.8	5.4	94.1
2035	1,481,693	100%	28%	133.2	7.5	140.7
2036	1,517,921	100%	31%	121.5	9.6	131.1
2037	1,554,150	100%	35%	121.5	11.7	133.2
2038	1,590,378	100%	39%	121.5	13.8	135.4
2039	1,626,607	100%	42%	121.5	16.0	137.5
2040	1,662,835	100%	46%	121.5	18.1	139.6
2041	1,699,064	100%	47%	105.3	19.9	125.2



2042	1,735,292	100%	48%	105.3	21.7	127.0
2043	1,771,521	100%	50%	105.3	23.5	128.7
2044	1,807,749	100%	51%	105.3	25.3	130.5
2045	1,843,978	100%	52%	105.3	27.0	132.3
2046	1,880,206	100%	52%	46.3	28.0	74.3
2047	1,916,435	100%	53%	46.3	28.9	75.2
2048	1,952,663	100%	53%	46.3	29.8	76.2
2049	1,988,892	100%	54%	46.3	30.8	77.1
2050	2,025,120	100%	54%	46.3	31.7	78.0
Totals				2,725.8	358.0	3,083.8

Table 15 Yearly progress towards Universal Sanitation Access

The projected safely managed sanitation access by 2050 is 54% (Table 17). Taking into account the estimated population increase this means that over 1,000,000 people in Bomet County are projected to have safely managed sanitation access by this time. This percentage could vary based on the uptake of residents being able to access pit exhaustion.

Sanitation subsidies are calculated as KES 5,000 per household whose monthly income is under KES 10,000, which in 2022 is approximately 98,000 households. These households, as well as more affluent families will be able to upgrade their existing sanitation using local sanitation technologies developed during Post ODF.

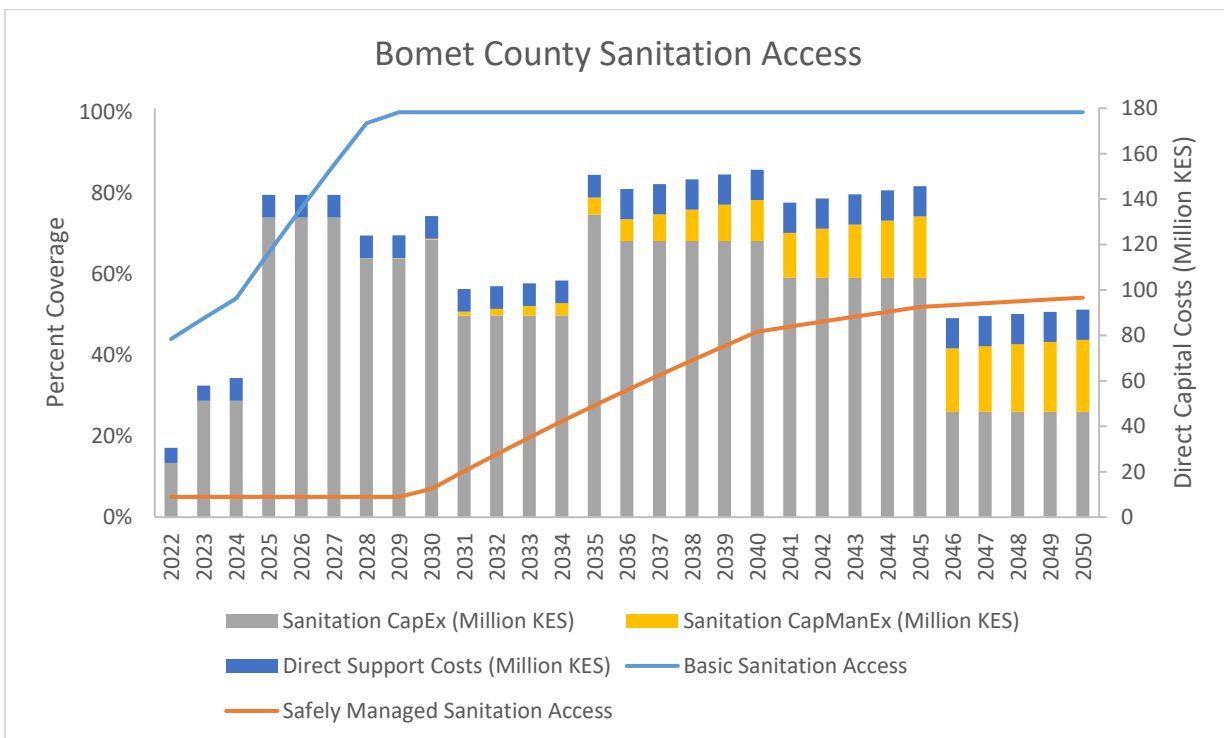


Figure 30 Cost of Sanitation delivery 2022-2050



Figure 28 shows the costs for CapEx, CapManEx and Direct Support Costs for achieving Basic sanitation by 2030, and making progress towards safely managed sanitation by 2050. Current projections for costs are much lower than those for water, but safely managed access still largely depends on on-site sanitation, and development of sewerage schemes, if they occur in future, will be more capital-intensive.



5.4 Costing of Institutional WASH Services

The institutions considered in this budget are public schools and health facilities. Table 18 shows the cost for providing Basic water and sanitation access to all schools and health facilities in the count, as well as providing hygiene training to students and staff.

	Item	Quantity	Unit Cost (KES)	Total (KES)
WASH in Schools	Primary School Latrines	690	1,462,396	1,009,053,240
	Secondary School Latrines	250	1,462,396	365,599,000
	Primary School RWH	690	791,370	546,045,300
	Secondary Schools RWH	250	791,370	197,842,500
	Primary School training	690	20,000	13,800,000
	Secondary School training	250	20,000	5,000,000
				Subtotal
WASH in Health Facilities	VIP Latrines	131	1,462,396	191,573,876
	Rainwater Harvesting System	131	791,370	103,669,470
			Subtotal	295,243,346
MHM Sanitary Disposal	Health Centers and Referral Hospitals incinerator	31	1,476,800	45,780,800
	Motorecycle	31	130,000	4,030,000
	WASH Champion	31	120,000	3,720,000
			Subtotal	53,530,800
			Total	2,486,114,186

Table 16 Bomet County Institutional WASH Service costs

Direct Support Costs

The Direct Support costs included in this Masterplan are shown below (Table 19). These do not include current staff costs, but include extra training and development of monitoring frameworks set out in the strategic interventions listed above.

Project	Total people trained (people X years)	Unit Cost (KES)	Total (KES)
Advocacy Days			1,731,600
Sanitation Directorate			210,000.00
Training of County Staff (per person per year)	20,020	11,482	229,866,000.00
Senior Staff Training Days (per year)	896	107212	96,062,400.00
Survey of WASH access in the county			4,646,980.00
WASH Hub Expansion			212,500.00
		Total	332,729,480

Table 17 Bomet County Direct Support cost



CHAPTER FIVE

6 FINANCING THE MASTERPLAN

This section sets out the funding mechanisms for the Masterplan. Table 20 shows a summary of the total costs associated with implementation, which is currently well beyond the budgetary capacity of the County Government of Bomet. To be able to address this shortfall a range of funding streams will need to be leveraged, which are discussed in the following sections.

	Cost (KES)	Cost (USD)	Percent of Total
Water Infrastructure	Kshs. 41,611,800,884	\$353,700,308	88.8%
Sanitation Infrastructure	Kshs. 2,725,758,801	\$23,168,950	5.8%
WASH in Schools	Kshs. 2,137,340,040	\$18,167,390	4.6%
WASH in Health Facilities	Kshs. 295,243,346	\$2,509,568	0.6%
Menstrual Hygiene Management	Kshs. 53,530,800	\$455,012	0.1%
Direct Support Costs	Kshs. 332,729,480	\$2,828,201	0.7%
Grand Total	Kshs. 46,861,160,004	\$398,319,860	

Table 18 Total Cost of implementing the WASH Masterplan

6.1 Financing Options

The Water and Sanitation sector has relied heavily on the exchequer for financing. However, over the years, with declining resources, the sector has suffered from inadequate funding. The following financing options can be explored:

6.2 Government Financing

Government financing continues to play an important role in the development of the water and sanitation sector. In line with the Poverty Reduction Strategy Paper (PRSP), the national government finances are directed to the sector through Water Sector Trust Fund (WSTF) whose major responsibility is financing provision of water and sanitation to disadvantaged groups. This remains a viable option to finance water supply to rural areas and urban low-class areas. Other national institutions funded by the national governments through which funding of rural water supply can be sourced to include Lake Basin Development Authority.

6.3 External Funding

Funding of development programs through external resources in the form of concessionary loans, grants or commercial loans continue to play an important role in the development of water resources. Concessionary loans and grants can be obtained at relatively low cost through government to government agreements and are normally designed to benefit the disadvantaged groups.



6.4 Private Sector Involvement and Donor Funding

The nature of the private sector participation envisaged will be largely in the form of public- private sector partnerships. The private sector partners bring in management expertise, technical skills and credit standing to finance investments. A mutually beneficial partnership is built between the public and private sector to ensure that consumers ultimately get the best service possible within the means available. The partnership can be fulfilled in different forms, such as service, management, and lease contracts, concessions and joint ownership.



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