KITUI COUNTY

COUNTY WATER AND SANITATION STRATEGY AND INVESTMENT PLAN (CWSSIP)

2025 - 2030









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DEFINITION OF TERMS

Adaptive Capacity: Adaptive capacity is the property of a system to adjust its characteristics or behavior, in order to expand its coping range under existing climate variability, or future climate conditions.

Climate Change: Means a change of weather patterns which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere, and which is in addition to natural climate variability observed over comparable time periods.

Coping: Refers to the use of existing resources to achieve desired goals during and immediately after climate-induced hazards.

Disaster: is a serious disruption of the functioning of the society, causing widespread human, material or environmental damage and losses which exceed the ability of the affected community to cope using their own resources.

Hazard: The potential for harm or an adverse effect (for example, to people as health effects, to organizations as property or equipment losses, or to the environment).

Impacts: Specific effects of hazards or disasters also referred to as consequences or outcomes.

Mitigation: Short and long-term actions, programs or policies implemented in advance of a natural hazard or in its preliminary stages, to reduce the degree of risk to the people, property, and productivity capacity.

Response: Actions taken immediately before, during or directly after a disaster to reduce impacts and improve recovery.

Risk: Chance or probability that a person will be harmed or experience an adverse health effect if exposed to a hazard. It may also apply to situations with property or equipment loss, or harmful effects on the environment.

Vulnerability: The conditions determined by physical, social, economic and environmental factors or processes which increase the susceptibility of an individual, a community, assets or systems to the impacts of hazards.

ACRONYMS AND ABBREVIATIONS

ASALs: Arid and Semi-Arid Lands
CBOs: Community Based Organizations
CCCAP: County Climate Change Action Plan
CCCF: County Climate Change Fund
CHP: Community Health Promoters
CIDP: County Integrated Development Plan
CIDP: County Integrated Development plan
CWSSIP: Water and Sanitation Strategy and Investment Plan
DMAs: District Metered Areas
DWQ: Drinking Water Quality
EMCA: Environment Management and Coordination Act
FLLoCA: Financing Locally Led Climate Action
GBV: Gender-Based Violence
GIS: Geographical Information System
IoT: Internet of Things
JICA: Japan InterNational Cooperation Agency
KEBS: Kenya Bureau of Standards
KEWI: Kenya Water Institute
KIMWASCO: Kiambere-Mwingi Water and Sanitation Company
KITWASCO: Kitui Water and Sanitation Company
KNBS: Kenya National Bureau of Statistics
KPIs: Key Performance Indicators
NAWASIP: National Water and Sanitation Investment Plan
NbS: nature-based solutions
NGOs: Non-Governmental Organizations
NRW: Non-Revenue Water
ODF: Open Defication Free
PCRA: Participatory Climate Risk Assessment
PPPs: Public-Private Partnerships
PWDs: Persons with Disabilities
RCE: Revenue Collection Efficiency
RUSH: Rural Sanitation and Hygiene
SDGs: Sustainable Development Goals
TAWWDA: Tanathi Water Works Development Agency
TDS: Total Dissolved Solids
WASH: Water, Sanitation and Hygiene
WASREB: Water Services Regulatory Board
WHO: World Health Organization
WSPs: Water Service Providers
WSTF: Water Sector Trust Fund
WUAs: Water User Associations

PREAMBLE

Water is life, and access to clean, safe and reliable water and sanitation services is a fundamental right that underpins good health, dignity, economic opportunities and sustainable development. Kitui County is pleased to present this **County Water and Sanitation Strategy and Investment Plan (CWSSIP) 2025-2030** as a bold and transformative roadmap for achieving universal water and sanitation access across our County.

This Strategy represents our collective ambition and commitment to address the persistent challenges that have hindered service delivery in the water and sanitation sector in Kitui County. Our communities have suffered for a long period from inadequate infrastructure, erratic water supply and poor sanitation.

Guided by the Constitution of Kenya 2010, Kenya Vision 2030, the Sustainable Development Goals (SDGs) and Kitui County Integrated Development Plan (CIDP) III 2023-2027, this Strategy articulates clear priorities, programs and investment pathways that will enable Kitui County to become water secure and climate resilient. It also reflects our dedication to inclusive planning, public participation and evidence-based policy-making.

As a County government, we are leveraging innovation, indigenous knowledge and strategic partnerships to ensure that every household, institution and enterprise across Kitui County enjoys the benefits of improved water and sanitation. The strategy outlines short-, medium- and long-term actions, and provides an investment framework that will guide resource mobilization and implementation.

I wish to sincerely thank all those who contributed to this vital document - from our County leadership and technical teams, to community stakeholders and development partners. Let us now move from planning to action, with unity of purpose and unwavering resolve.

Together, we will realize a future where every resident of Kitui County has access to safe water and dignified sanitation services.



H.E. Dr. Julius M. Malombe, EGH
Governor, Kitui County

ACKNOWLEDGEMENT

The successful development of Kitui County Water and Sanitation Strategy and Investment Plan (CWSSIP) is a testament to collaborative spirit, dedication and technical expertise of a committed team of professionals who worked tirelessly to deliver a forward-looking and actionable strategy.

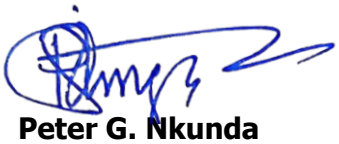
I extend my sincere appreciation to H.E. Dr. Julius M. Malombe, EGH, Governor Kitui County, for his visionary leadership and unwavering support in prioritizing sustainable water and sanitation provision across the County.

I am also deeply grateful to my counterpart in the County Ministry of Health and Sanitation, Ruth Koki. Together, we offered strategic guidance and policy direction to ensure that the Strategy aligns with the County and national water and sanitation goals. Additionally, I extend special appreciation to the Chief Officers for Water and Sanitation, Nathan Vungo and Lynn Kitwan respectively, for their hands-on coordination and oversight throughout the strategy development process.

This Strategy would not have been possible without the diligent efforts of the Strategy Taskforce Team, ably led by the Deputy Director for Water Services, Eng. Kennedy Mutati. Under his leadership, the Taskforce brought together multi-sectoral expertise and ground-level insights to shape a holistic and impactful document. Your efforts are appreciated.

To all the other team members, community representatives, stakeholders and development partners who contributed to the formulation of this Strategy, I thank you for your invaluable support, ideas and feedback.

This document is not just a strategy - it is a shared commitment to ensuring that every resident of Kitui County has access to safe, reliable and sustainable water and sanitation services.



Peter G. Nkunda
County Executive Committee Member
Ministry of Water and Irrigation

EXECUTIVE SUMMARY

Achieving universal access to safe and sustainable water and sanitation services in Kitui County by 2030 is an ambitious but attainable goal. According to 2019 census the County population was 1.1M and is currently estimated to be about 1.3M residents across the 40 wards, including thousands of learners in over 2,000 schools, health facilities, and growing market centers. Hence the urgent need for accelerated investment and strategic planning in the water, sanitation, and hygiene (WASH) sector.

The Kitui County Water and Sanitation Strategy and Investment Plan (CWSSIP) serves as a strategic blueprint to guide policy direction, resource mobilization, and coordinated implementation of interventions towards sustainable WASH access, resilience and sustainance. It builds on ongoing County and national efforts and aligns with the Constitution of Kenya 2010, the Sustainable Development Goals (SDG 6), the National Water and Sanitation Investment Plan (NAWASIP) and the Kitui County Integrated Development Plan (CIDP) III 2023-2027.

The CWSSIP is developed with the support of the World Bank through the Kenya Water, Sanitation and Hygiene (K-WASH) Program, which seeks to increase sustainable access to improved water and sanitation services, eliminate open defecation, and strengthen the financial viability of water service providers across 19 Counties. The Plan complements regional efforts including those of Tanathi Water Works Development Agency (TAWWDA) and other sector actors.

The strategy envisions *a water secure and sanitation safe Kitui County* and is anchored on the mission *to provide equitable, affordable and sustainable water and sanitation services to all residents by 2030*. It seeks to address current service gaps while fostering climate resilience and long-term sustainability.

Key strategic objectives include:

1. Achieving universal access to safe and affordable drinking water by 2030.
2. Ensuring equitable access to improved sanitation, eliminating open defecation, and improving waste management services.
3. Promoting hygiene awareness, particularly in schools, health facilities, and vulnerable communities.
4. Enhancing climate resilience and protecting water resources through integrated watershed and catchment management.
5. Moblising strategic partnerships for water and sanitation infrastructure development and human capital development.

Kitui County faces significant WASH challenges: Only an estimated 56% of the population has access to improved water sources, with even lower figures in the rural areas. Sanitation access remains uneven, particularly in rural areas, with widespread reliance on unimproved or shared facilities. Currently, approximately 2.80% and 37.10% have access to safely managed and basic sanitation levels, respectively. These challenges are compounded by recurrent droughts, overreliance on seasonal water sources, inadequate infrastructure and weak institutional capacity.

To overcome these barriers, the CWSSIP outlines the following strategic priority areas:

1. *Adequate Infrastructure Development:* Expansion and rehabilitation of water supply systems including sump wels, earth and sand dams, boreholes, existing pipelines, and distribution networks.
2. *Sanitation Improvement*: Investment in household and institutional sanitation, waste water management, and market-based sanitation.
3. *Climate Resilience and Resource Protection*: Adoption of nature-based solutions, groundwater mapping, and watershed conservation to mitigate climate-related water risks.
4. *Community Engagement and WASH Education:* Mobilization of communities to champion hygiene behavior change and take ownership of water and sanitation facilities.
5. *Institutional Strengthening and Governance*: Building capacity of WASH personnel and institutions, promoting transparency, and strengthening regulatory frameworks and data systems.

To implement this Strategy, an estimated **KES 21.1 billion** will be required over a five-year period. Investment priorities include:

1. Water storage and distribution infrastructure.
2. Sanitation facilities in schools, health centers, and public places.
3. Climate adaptation and environmental conservation.
4. Training, research, and capacity development.
5. Monitoring and Evaluation (M&E) frameworks to ensure performance tracking and accountability.

This CWSSIP is more than a development plan - it is a County-wide commitment to dignity, equity, health, and environmental stewardship. Through strong leadership, inter-agency collaboration and inclusive participation, Kitui County is charting a path toward sustainable water and sanitation for all.

1 COUNTY SOCIO-ECONOMIC AND POLITICAL CONTEXT

1.1 Socio-Political and Administrative Background

1.1.1 Overview of the County's geographic, demographic and economic context

Kitui County is one of the three Kenyan Counties inhabited by the majority Akamba community. The Akamba people were historically long-distance traders, and this trade inclination has made them highly receptive and hospitable to visitors. With its headquarters at Kitui town, the County is resource rich with commercially viable coal reserves in the Mui Basin. Other mineral resources include limestone, iron ore and sand. Forty six (46) percent of the Tsavo East National Park is in Kitui County and has a great heritage with great untapped tourism potential. The proximity to Nairobi and the Standard Gauge Railway offers great opportunities for economic transformation. Permanent Rivers, namely, Tana and Athi flow through the County.

Kitui County recorded a population of 1,136,187 persons in the 2019 Population and Housing Census, and this is projected to 1,210,035 in 2022. Despite the great potential, Kitui County is categorized as an Arid and Semi-Arid County, characterized by relatively high levels of poverty. The level of absolute poverty is estimated at 47.5% compared to the National average of 32.4% in 2021. The absolute porverty levels translates to about 522,000 persons or 3.2% of the Kenyan poor live in the County. Food poverty is estimated at 39.4% compared to the National average of 32% of the Kenyan population. About 50% of the population does not have access to clean water and 57.6% of households spend thirty or more minutes to fetch drinking water.

Kitui County is a member of the Southeastern Kenya Economic Bloc (SEKEB) that also comprises of Makueni and Machakos Counties. It also forms part of the proposed Vision 2030 Metropolitan region of Kitui-Mwingi-Meru.

1.1.2 Location

Kitui County is about 160 kilometres from Nairobi City on the eastern part of Kenya. The County is the sixth largest in Kenya covering an area of approximately 30,496.4 km^2. It shares its borders with seven other Counties; namely, Machakos and Makueni Counties to the west, Tana River County to the east and south-east, Taita Taveta County to the south, Embu to the north-west, and Tharaka-Nithi and Meru Counties to the north. It is located between latitudes 0°10 South and 3°0 South and longitudes 37°50 East and 39°0 East. Figure 1 displays the geographical position of Kitu County in Kenya. The County comprises of 8 sub-Counties and 40 administrative Wards as shown in the figure 2 below.

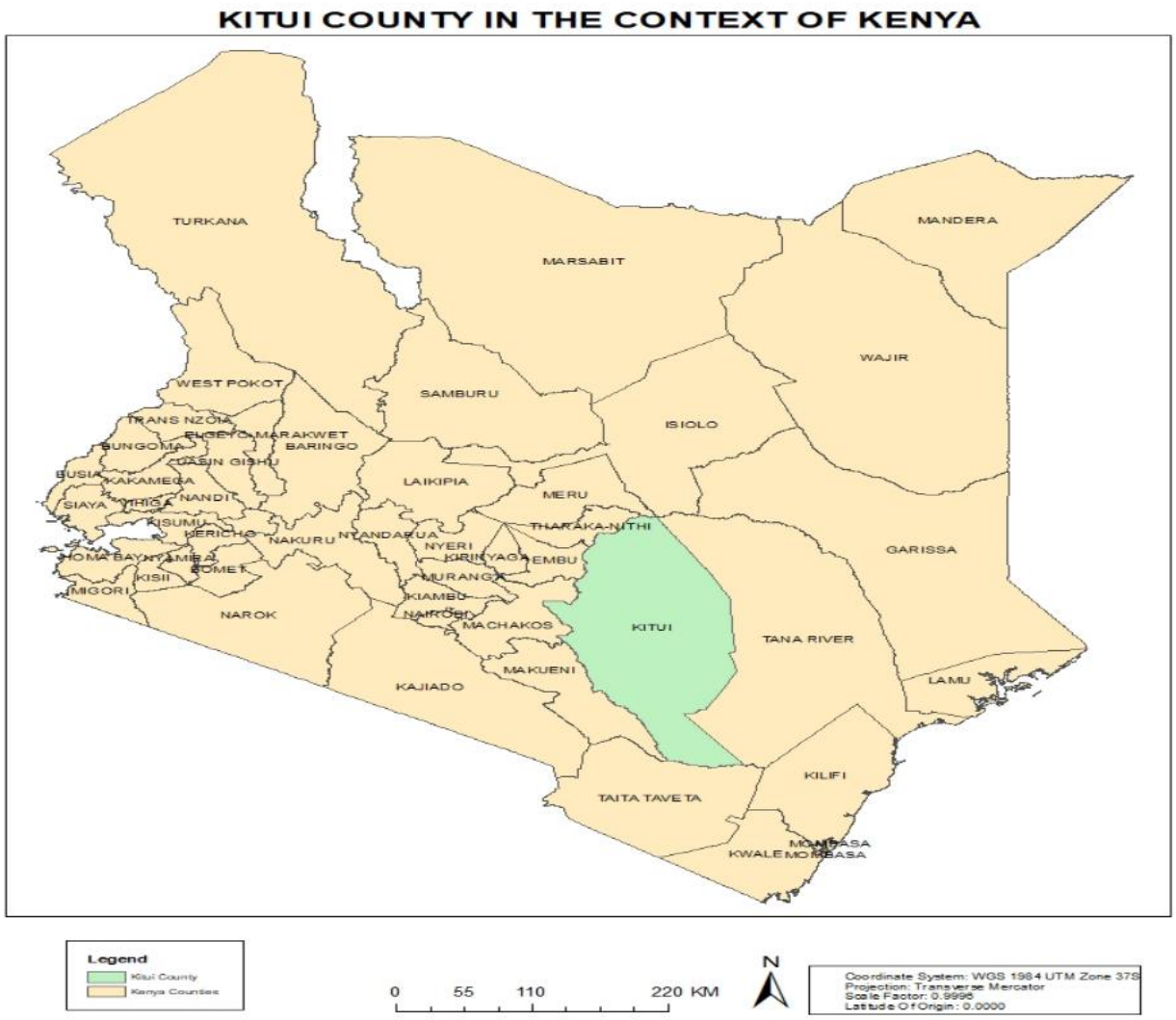


Figure 1: Location of Kitui County in Kenya

1.2 Physiographic and Natural Conditions

1.2.1 Physical and Topographic Features

Kitui County, located in eastern Kenya, has a diverse range of physical and topographic features. The County's landscape is dominated by a semi-arid and arid environment, with rugged terrain, rocky hills, and vast plains. The County covers an area of approximately 30,496 square kilometres, making it one of the largest Counties in Kenya. Its location ranges from 200 meters to 2,100 meters above sea level. The County's topography is defined by the hills and mountains that are spread throughout the region. These includes Ikoo Valley and Kanyonyoo Hills. This hilly mountainous topography is typically composed of rocky formations and steep cliffs, making them unsuitable for agricultural activities. Nevertheless, they provide a natural habitat for a wide range of flora and fauna, which is vital for the region's biodiversity. The County's plains and plateaus are mainly located in the central and northern parts of the County. The plains are characterized by a vast expanse of flat lands, with scattered shrubs and grasses. The plateau areas, such as the Yatta Plateau, are characterized by rugged terrain, rocky outcrops, and deep gorges. The plains and plateaus are suitable for rain-fed agriculture, with most of the County's agricultural activities taking place in these areas.

The County's Rivers and streams are mainly seasonal, with Athi and Tana Rivers being permernent. The main Rivers in the County include Athi, Tiva, and Thika. The Rivers and streams are important sources of water for the communities in the County, supporting irrigation and domestic use. The County's vegetation is mainly composed of thorny bushes, grasses, and acacia trees. This vegetation cover has been under threat due to human activities such as overgrazing, deforestation, and charcoal burning. Consequently, there have been efforts to preserve and protect the vegetation cover in the County through conservation initiatives.

1.2.2 Climatic Conditions

Kitui County is predominantly characterized by arid and semi-arid climatic conditions. It receives low and unreliable rainfall throughout the year ranginging from 200 to 600 mm of rainfall annually, which is insufficient to support agriculture and other human activities.

Table 1: Mean Annual Rainfall

Year	2015	2016	2017	2018	2019	2020
Average Annual Rainfall (mm)	319	229	304	432	378	357

*(**Data source:** Kenya Metereological Department - Kitui, 2022)*

The rainfall patterns in the County are characterized by two rainy seasons, the short rains from October to December and the long rains from March to May. However, the rainfall is highly unpredictable, and the County experiences frequent droughts and floods that affect the region's socio-economic activities. It experiences high temperatures throughout the year, with the average temperature ranging between 25 to 30^{o}C with the lowest average of 14^{o}C and highest average of 32^{o}C. These hot and dry conditions contribute to the arid conditions and makes it difficult for crops and vegetation to thrive, thus contributing to limited agricultural productivity in the region.

While most of the County is semi-arid, there are a few highland areas namely, Migwani, Mumoni, Kitui Central, Mui and Mutitu hills that exhibit a sub-humid climate.

Table 2: Mean Annual Temperatures in Degrees Celsius

	2016	2017	2018	2019	2020	Average
Temperature in ^{0}C (annual average Lowest)	17.9	17.9	17.3	16.3	17.4	17.36
Temperature (annual average highest)	29.7	30.9	28.8	31.9	29.8	30.04
Temperature (annual average)	23.8	23.95	23.05	24.23	23.6	23.78

*(**Data source:** Kenya Metereological Department – Kitui, 2022)*

Despite the challenging climatic conditions, the County Government of Kitui has implemented various measures to mitigate the increasing aridity and impacts of climate change. These include the promotion of sustainable agriculture practices such as agroforestry, conservation agriculture, and rainwater harvesting. The County Government has also invested in water infrastructure, including boreholes, dams, and water pans, to improve the water supply to the residents.

1.2.3 Ecological Conditions

The County has seven agro-ecological zones. These are: Upper-Midland 3-4; Upper-Midland 4; Lower-Midland 3; Lower-Midland 4; Lower-Midland 5; Inner Lowland 5; and Inner Lowland 6. The unique ecological conditions of Kitui County have also influenced the types of economic activities that are viable in the region. Livestock rearing, particularly of goats, sheep and camels, is a major source of livelihood for many residents, as is rain-fed agriculture. However, the limited availability of water and fertile land means that these activities are often characterized by low productivity and high vulnerability to climatic shocks. The actual and potential agricultural development activities are summarized in Table 3 below.

Table 3: The Actual and Potential Agricultural Development Activities in Kitui County

Zone	Sub County	Agricultural Development Potential
UM 3-4	Kitui Central, Kitui East, Mwingi West, Kitui Rural	Coffee, Maize, Sunflower, Vegetables, Sorgum, Avocado, Millet, Sweet Potatoes, Cabbage, Pawpaw
UM4	Kitui Central, Kitui Rural, Kitui West, Mwingi West, Mwingi North	Coffee, Maize, Sunflower, Vegetables, Sorghum, Avocado, Millet, Sweet Potatoes, Cabbage, Pawpaw, Bananas, Mango, Fodder and Pasture
LM3	Kitui East, Mwingi North	Cotton, Dry Land Maize Varieties, Sweet Potatoes, and Beans
LM4	Kitui Central, Kitui Rural, Kitui West, Kitui East, Kitui South, Mwingi Central, Mwingi West, Mwingi North	Sorghum, Millet, Dry Maize Varieties, Green Grams, Ground Nuts, Cow Peas, Sunflower, Vegetables, Dolichos
LM5	Kitui East, Kitui South, Kitui Rural, Kitui Central, Kitui West, Mwingi Central, Mwingi North	Livestock, Millet, Sorghum, Fodder and Pasture
IL5	Kitui East, Mwingi North, Mwingi Central	Livestock, Millet, Sorghum
IL 6	Kitui South, Kitui East, Mwingi Central, Mwingi North	Livestock, Millet, Sorgum

*(**Data source:** Kitui County Statistical Abstract, 2016)*

1.3 Administrative and Political Units

1.3.1 Administrative Units

Kitui County covers an area of 30,430 km^2. It is divided into eight sub-Counties, each with its own unique characteristics. These sub-Counties are Kitui Central, Kitui West, Kitui East, Kitui South, Kitui Rural, Mwingi North, Mwingi Central, and Mwingi West. In total, there are 40 wards within the County which are the County's planning unit and they are responsible for ensuring that services are delivered effectively to the people at the grass roots. To ensure that services reach every corner of the County, the Government further established 247 villages through the Kitui County Villages Act of 2015. These villages act as the smallest administrative units. Each sub-County is administered by a Sub-County Administrator who is responsible for the overall management of the sub-County's affairs. Similarly, each ward is headed by a Ward Administrator who oversees the delivery of services at the ward level. A village Administrator is appointed to oversee the management of affairs within the village.

The County also has representation from the National Government officers, which is headed by the County Commissioner and supported by the Deputy County Commissioners (DCCs), Assistant County Commissioners (ACCs), chiefs, assistant chiefs, and village elders at the division, location, sub-location, and village levels, respectively. These officials work together to ensure that the Government's programs and policies are implemented effectively, and that peace and security are maintained throughout the County.

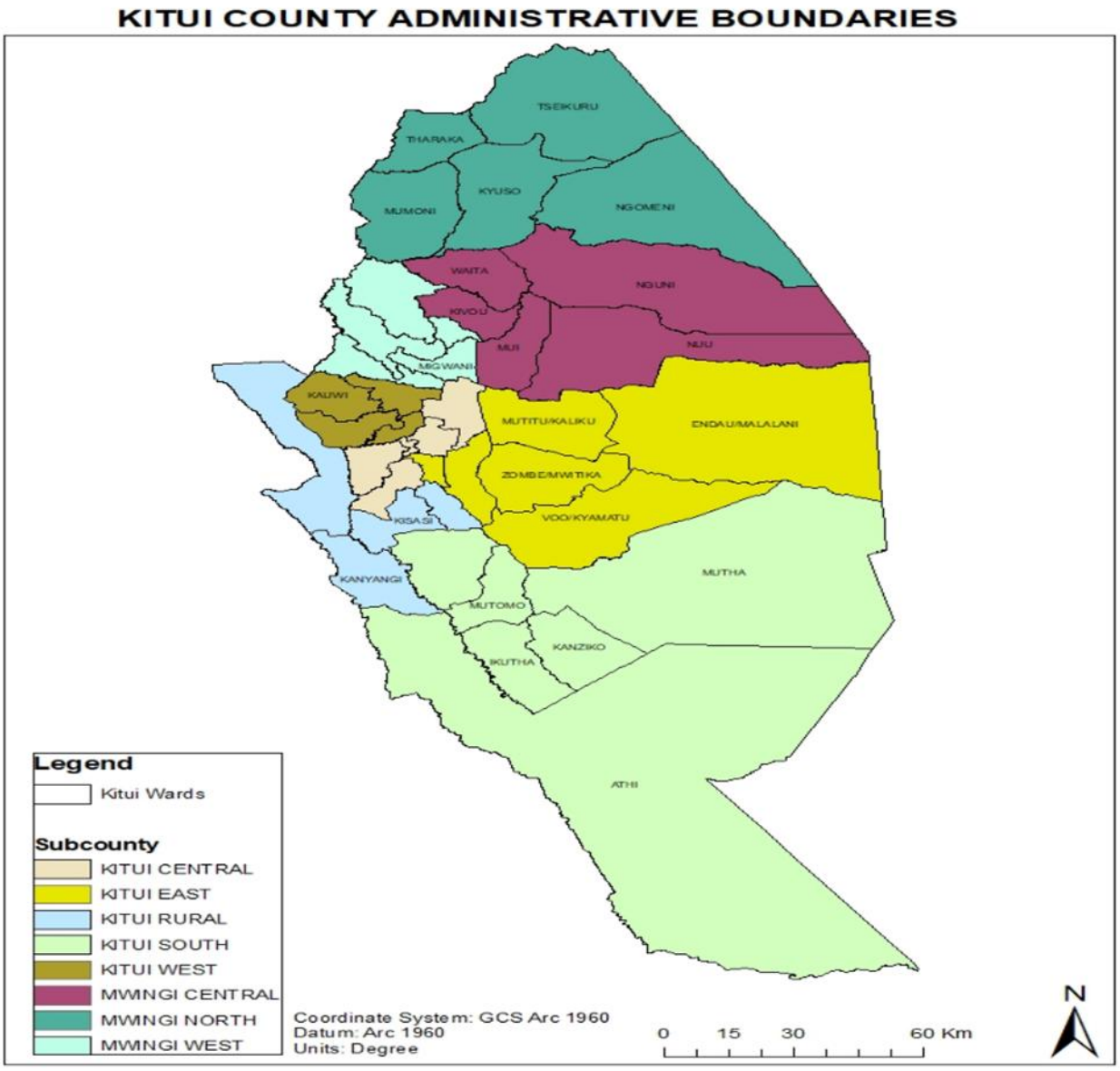


Figure 2: Kitui County Administrative Units

Table 4: Area by Sub-County

Sub-County	No. of Divisions	No. of Locations	No. of Su Locations	Land Area (Km^2)
Kitui South	6	15	60	11,507.00
Kitui Central	3	19	43	665.10
Kitui East	6	18	50	5,957.00
Kitui West	6	25	54	654.50
Kitui Rural	3	19	37	1,639.40
Mwingi Central	7	28	65	4,109.00
Mwingi West	3	15	36	1,090.70
Mwingi North	10	33	82	4,807.30
Total	**44**	**172**	**427**	**30,430.00**

*(**Data source:** Kenya National Bureau of Statistics, 2022)*

The number of wards within a sub-County varies, with Mwingi Central, Kitui East, and Kitui South sub-Counties/Constituencies having the highest number of wards (6) while Mwingi West, Mwingi North, Kitui West, and Kitui Rural have the lowest number (4). This variation in the number of wards is influenced by a variety of factors, such as population density, the size of the geographic area, and the distribution of resources. Furthermore, the number of villages within a sub-County also varies, Kitui West having the lowest number (23) and Kitui South having the highest (41) as shown in Table 5 below. The appointment of a village administrator to oversee affairs at the village level is critical in ensuring effective service delivery and governance. The administrator works closely with other County officials, including ward administrators and sub-County administrators, to ensure that Government programs and policies are implemented effectively.

Table 5: Administrative Units

Sub-County/ Constituency	No. Wards	List of Wards	No. of Villages
Kitui Central	5	Miambani, Kitui Township, Kyangwithya West, Mulango, Kyangwithya East	30
Kitui West	4	Mutonguni, Kauwi, Matinyani, Kwa Mutonga/Kithumula	23
Kitui East	6	Zombe/Mwitika, Nzambani, Mutitu/Kaliku, Chuluni, Voo/Kyamatu, Endau/Malalani	33
Kitui South	6	Ikanga/Kyatune, Mutomo, Mutha, Ikutha, Kanziko, Athi	41
Kitui Rural	4	Kisasi, Mbitini, Kwavonza/Yatta, Kanyangi.	25
Mwingi North	5	Ngomeni, Kyuso, Mumoni, Tseikuru, Tharaka	34
Mwingi West	4	Kyome/Thaana, Nguutani, Migwani, Kiomo/Kyethani	26
Mwingi Central	6	Kivou, Nguni, Nuu, Mui, Waita, Mwingi	35
Total	**40**		**247**

*(**Data source:** Kitui County Villages Act, 2015)*

1.3.2 Political Units

As shown in Table 6 below, Mwingi North sub-County has five wards with a total of 68,829 registered voters. Ngomeni ward has the lowest number of registered voters with 9,131 while Kyuso ward has the highest with 19,921. Mwingi West sub-County has four wards with a total of 57,138 registered voters. Kyome/Thaana ward has the highest number of registered voters with 14,979 while Kiomo/Kyethani ward has the lowest with 12,360. Mwingi Central sub-County has six wards with a total of 74,231 registered voters. Central ward has the highest number of registered voters with 14,525 while Waita ward has the lowest with 10,472. Kitui West sub-County has four wards with a total of 59,047 registered voters. Mutonguni ward has the highest number of registered voters with 17,979 while Kwa Mutonga/Kithumula ward has the lowest with 11,022. Kitui Rural sub-County has four wards with a total of 55,000 registered voters. Kwavonza/Yatta ward has the highest number of registered voters with 18,020 while Kanyangi ward has the lowest with 11,092. Kitui Central sub-County has five wards with a total of 77,764 registered voters. The Township ward has the highest number of registered voters with 19,538 while Miambani ward has the lowest with 11,759. Kitui East sub-County has six wards with a total of 65,377 registered voters. Zombe/Mwitika ward has the highest number of registered voters with 13,152 while Endau/Malalani ward has the lowest with 7,897. Lastly, Kitui South sub-County has six wards with a total of 75,372 registered voters. Athi ward has the highest number of registered voters with 15,843 while Kanziko ward has the lowest with 8,403. The total number of registered voters in Kitui County is 532,758.

Table 6: County's Electoral Wards by Sub-Counties and Registered Voters

Sub-County	Ward Name	No. of Voters
Mwingi North	Ngomeni	9,131
	Kyuso	19,921
	Mumoni	15,877
	Tseikuru	16,471
	Tharaka	7,429
Sub Total		**68,829**
Mwingi West	Kyome/Thaana	14,979
	Nguutani	15,121
	Migwani	14,678
	Kiomo/Kyethani	12,360
Sub Total		**57,138**
Mwingi Central	Central	14,525
	Kivou	12,301
	Nguni	13,165
	Nuu	12,729
	Mui	11,039
	Waita	10,472
Sub Total		**74,231**
Kitui West	Mutonguni	17,979
	Kauwi	15,767
	Matinyani	14,279
	Kwa Mutonga/Kithumula	11,022
Sub Total		**59,047**
Kitui Rural	Kisasi	13,840
	Mbitini	12,048
	Kwavonza/Yatta	18,020
	Kanyangi	11,092
Sub Total		**55,000**
Kitui Central	Miambani	11,759
	Township	19,538
	Kyangwithya west	15,931
	Mulango	15,135
	Kyangwithya east	15,401
Sub Total		**77,764**
Kitui East	Zombe/Mwitika	13,152
	Nzambani	11,723
	Chuluni	12,622
	Voo/Kyamatu	10,003
	Endau/Malalani	7,897
	Mutito/kaliku	9,980
Sub Total		**65,377**
Kitui South	Ikanga/kyatune	15,384
	Mutomo	12,637
	Mutha	11,039
	Ikutha	12,066
	Kanziko	8,403
	Athi	15,843
Sub Total		**75,372**
Totals		**532,758**

*(**Data source:** Independent Boundaries and Electoral Commision, 2022)*

1.4 Demographic Features

1.4.1 Population Size and Composition

According to the 2019 population and household census report, the population of Kitui County was 1,136,187. It was projected that it would grow to 1,210,035 in 2022 and 1,343,998 in 2025. Kitui South sub-County has the highest population of 180,679, consisting of 87,350 males and 93,322 females, while Kitui west has the lowest population of 113,862 consisting of 55,004 males and 58,856 females. The overall population of the County is projected to increase to 192,421, 204,933, and 213,724 in 2022, 2025, and 2027, respectively. The population growth is a significant indicator of the County's development, and it presents opportunities and challenges to the County Government, such as the provision of adequate resources and services to its residents.

1.4.2 Population Density and Distribution

According to data from 2019, the population density in Kitui County was recorded at 37 persons/km^2 which is significantly lower than the National average of 92 persons/km^2. However, it is projected that this figure will increase to 44 individuals per square kilometre by the year 2027. The distribution of settlements in the region is uneven and is influenced by a range of factors including land potential, livelihood zones, infrastructure access, land use systems, and the availability of social amenities. Kitui Central was found to be the area with the highest population density in the County, with a figure of 224 persons/km^2 in 2019. It was followed by Mwingi West, which had a population density of 106 individuals per square kilometre in the same year. Conversely, Kitui South had the lowest population density of 16 persons/km^2 in the same year. Tsavo East National Park lies in Kitui South, and this explains the low population density.

Table 7: Population Distribution and Density by Sub-County

Sub-County	Census 2019			2022 (Projection)			2025 (Projection)			2027 (Projection)		
	Land Area (Km2)	Population	Density/ Km2	Land Area (Km2)	Population	Density/ Km2	Land Area (Km2)	Population	Density/ Km2	Land Area (Km2)	Population	Density/ Km2
Kitui South	11,506.7	180,679	15.70	11,506.70	192,421	16.72	11,506.70	204,933	17.81	11,506.70	213,724	18.57
Kitui East	5,957.0	138,931	23.32	5,957.0	147,958	24.84	5,957.0	157,579	26.45	5,957.0	164,338	27.59
Kitui Central	665.10	149,217	223.39	665.10	158,914	238.94	665.10	169,247	254.48	665.10	176,507	265.38
Kitui Rural	1,639.40	118,173	72.10	1,639.40	125,857	76.77	1,639.40	134,042	81.76	1,639.40	139,791	85.27
Kitui West	655	113,862	173.84	654.50	121,264	185.28	654.50	129,149	197.33	654.50	134,689	205.79
Mwingi Central	4,109	157,291	38.28	4,109	167,514	40.77	4,109	178,407	43.42	4,109	186,059	45.28
Mwingi West	1,090.7	115,816	106.19	1,090.7	123,343	113.09	1,090.7	131,363	120.44	1,090.7	136,998	125.61
Mwingi North	4,807	162,218	33.75	4,807	172,764	35.94	4,807	183,999	38.28	4,807	191,891	39.92

*(**Data source:** Kenya National Bureau of Statistics, 2022)*

Table 8: Population Projections by Sub-County and Sex

Sub-County	Census 2019			2022 (Projection)			2025 (Projection)			2027 (Projection)		
	Male	**Female**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**
Kitui south	87,350	93,322	180,679	93,030	99,390	192,421	99,080	105,853	204,933	103,330	110,394	213,724
Kitui east	67,109	71,815	138,931	71,473	76,485	147,958	76,121	81,458	157,579	79,386	84,953	164,338
Kitui central	73,288	75,923	149,217	78,054	80,860	158,914	83,129	86,118	169,247	86,695	89,812	176,507
Kitui rural	58,577	59,596	118,173	62,386	63,471	125,857	66,443	67,599	134,042	69,293	70,498	139,791
Kitui west	55,004	58,856	113,862	58,581	62,683	121,264	62,390	66,759	129,149	65,066	69,623	134,689
Mwingi central	75,271	82,015	157,291	80,166	87,348	167,514	85,379	93,028	178,407	89,041	97,019	186,059
Mwingi west	55,107	60,705	115,816	58,690	64,652	123,343	62,507	68,857	131,363	65,188	71,810	136,998
Mwingi north	77,297	84,919	162,218	82,323	90,441	172,764	87,677	96,322	183,999	91,437	100,454	191,891
Total	**549,003**	**587,151**	**1,136,187**	**584,703**	**625,332**	**1,210,035**	**622,724**	**665,995**	**1,288,719**	**649,436**	**694,562**	**1,343,998**

*(**Data source:** Kenya National Bureau of Statistics, 2022)*

1.4.3 Population Size by Age and Sex

In 2019, the highest population in Kitui County was of children aged 10-14 years old, with 173,446 individuals, comprising of 87,724 males and 85,722 females. It is expected that this population will continue to grow in the coming years, with projected numbers of 184,725, 196,737, and 205,176 in 2022, 2025, and 2027, respectively. The lowest population in the County was of individuals aged 80 years and above, with only 19,165 people in 2019. However, this number is projected to increase to 20,411 by 2022. Table 9 provides a summary of the County's population by age and sex in 2019, 2022, as well as the projected growth for 2025 and 2027.

Table 9: Population Projections by Age and Sex

Age Cohort	2020 (Census Projection)				2025 (Census Projection)				2030 (Census Projection)				2035 (Census Projection)			
	M	F	Intersex	T	M	F	Intersex	T	M	F	Intersex	T	M	F	Intersex	T
0-4	75,302	75,038	0	150,340	74,068	70,575	-	144,644	73,147	69,710	-	142,857	72,185	68,820	-	141,005
5—9	72,727	73,957	0	146,834	74,065	75,236	-	149,301	72,863	70,751	-	143,614	71,190	69,865	-	141,855
10—14	70,999	72,177	0	143,176	71,687	75,261	-	146,948	73,024	76,509	-	149,533	71,851	71,850	-	143,701
15-19	70,274	70,335	0	140,629	68,532	71,379	-	139,911	69,241	74,420	-	143,661	70,593	75,650	-	146,243
20-24	58,289	60,363	0	118,652	67,444	68,705	-	136,148	65,794	69,700	-	135,494	66,517	72,674	-	139,192
25-29	52,958	53,969	0	106,927	55,458	58,279	-	113,739	64,287	66,387	-	130,673	62,745	67,365	-	130,110
30-34	39,255	42,836	0	82,091	50,119	51,159	-	101,278	52,552	55,249	-	107,801	61,035	63,032	-	124,067
35-39	29,037	32,063	0	61,100	37,097	40,241	-	77,338	47,429	48,075	-	95,505	49,812	51,971	-	101,783
40-44	23,724	28,373	0	52,097	26,968	29,779	-	56,748	34,533	37,423	-	71,957	44,255	44,772	-	89,027
45-49	21,253	23,912	0	45,165	21,574	25,485	-	47,060	24,558	26,762	-	51,321	31,549	33,737	-	65,286
50-54	16,368	17,127	0	33,495	18,981	20,932	-	39,913	19,280	22,318	-	41,598	22,004	23,502	-	45,507
55-59	10,789	11,486	0	22,275	14,170	14,582	-	28,752	16,517	17,874	-	34,391	16,826	19,114	-	35,941
60-64	9,579	9,633	0	19,212	9,009	956	-	18,565	11,869	12,170	-	24,038	13,956	15,015	-	28,971
65-69	8,652	8,971	0	17,623	7,497	7,848	-	15,345	7,113	7,770	-	14,883	9,449	9,970	-	19,418
70-74	7,560	7,607	0	15,167	6,273	7,136	-	13,408	5,531	6,265	-	11,796	5,339	6,221	-	11,560
75-79	5,811	5,846	0	11,657	5,031	5,761	-	10,791	4,276	5,632	-	9,707	3,873	4,806	-	8,679
80+	9,508	10,248	0	19,756	9,322	9,743	-	19,065	8,992	9,643	-	18,635	8,226	9,434	-	17,660
All Ages	**582,085**	**603,961**	**0**	**1,186,046**	**617,296**	**641,658**	**-**	**1,258,953**	**651,005**	**676,458**	**-**	**1,327,464**	**682,206**	**707,799**	**-**	**1,390,005**

(***Data source:*** *Kenya National Bureau of Statistics, 2022)*

1.5 Description of Governance Structures in Water and Sanitation

The County Government of Kitui, like other County Governments in Kenya, has specific responsibilities related to water and sanitation under the Constitution of Kenya, 2010, and the County Governments Act, 2012. These responsibilities primarily fall under the devolved functions of the County Government.

1.5.1 Responsibilities of the Kitui County Government Regarding Water and Sanitation

Here are the main responsibilities of the Kitui County Government (Departments of Water, and Public Health and Sanitation) regarding water and sanitation:

a) Provision of Water Services

- **Supply of Clean Water**: The County Government, through the Deapartment of Water and WSPs is responsible for ensuring the provision of clean and safe drinking water to its residents, which involves sourcing, treating, and distributing water.
- **Water Infrastructure**: Developing and maintaining water infrastructure such as dams, boreholes, piped water systems, and other water distribution systems.
- **Water Access in Rural and Urban Areas**: Ensuring equitable access to water in both rural and urban areas. This includes addressing challenges in remote areas where water sources may be scarce.

b) Water Quality Management

- Ensuring the water supplied to the residents meets the required standards for safety and health. The County Government must monitor and manage the quality of water to prevent waterborne diseases.

c) Wastewater and Sanitation Services

- **Sanitation Systems**: Developing and maintaining proper sanitation systems such as sewerage systems in urban areas and alternatives like pit latrines and eco-friendly sanitation solutions in rural areas.
- **Wastewater Treatment**: The County is responsible for treating wastewater to prevent pollution of water sources, such as Rivers, lakes, and underground aquifers.
- **Solid Waste Management**: Ensuring proper waste collection, disposal, and management to avoid contamination of water bodies and prevent environmental pollution.

On the issue of clean water and sanitation, the County has seen improvements in household access to safe water, with 65% of households having access compared to the previous 30%. This was attributed to the supplies of water treatment chemicals provided by CHPs. Moreover, 100% of households have access to a sanitary facility, thanks to market-based sanitation marketing supported by CHPs and PHOs. The number of units fully using sanitary facilities also increased from 3,555 to 4,930.

1.5.2 Role of Women Leadership in Water and Sanitation Service Delivery

Women in Kitui County play a pivotal role in water service delivery, acting as primary users, managers, and advocates for water resources. Their leadership and active participation have led to significant improvements in water access and management within the region.

In Matinyani sub-County, the Matinyani Development Women Group, led by Chairlady Esther Musili, has distributed 400 water storage tanks to its members. These 5,000-liter tanks, costing over Ksh 10 million, aim to alleviate the burden of long-distance water fetching, especially during drought seasons. The initiative has enhanced domestic water access and empowered women economically, as members contribute 50% of the tank's cost, with the balance subsidized by the group's funds.

Similarly, the construction of the Mbarani earth dam in Mwingi North sub-County has been transformative. Funded by the National Drought Management Authority (NDMA) with a Ksh 7 million investment, the dam has significantly reduced the time women spend fetching water. Residents now access water within an hour, compared to the previous four-hour round trip to distant wells. This improvement has also facilitated agricultural activities, with women cultivating vegetables for both household consumption and income generation.

1.5.3 The Role of Private Sector in Water and Sanitation Investments and Operations

The private sector plays a vital role in water and sanitation by offering innovative solutions, attracting investment, and improving efficiency in service delivery, often through public-private partnerships. The following is a more detailed look at the private sector's roles in water and sanitation:

a) **Public-Private Partnerships (PPPs):** PPPs can help Governments fund investments and bring in technology and efficiency to improve the performance and financial sustainability of the water sector.
b) **Private Ventures:** The private sector can provide water and sanitation services directly, offering new, sustainable solutions where traditional infrastructure has failed.
c) **Infrastructure Development:** Private companies can invest in and manage water treatment plants, sanitation systems, and other infrastructure.
d) **Innovative Technologies:** The private sector can introduce new technologies and approaches, such as desalination and water reuse, to address water scarcity and improve sanitation.
e) **Investment and Finance:** The private sector can attract private capital and other forms of investment to the water and sanitation sector.
f) **Financial Sustainability:** Private sector involvement can lead to more financially sustainable water and sanitation services, potentially reducing reliance on public subsidies.

1.6 Discussion of Key Environmental and Socio-Political Factors Affecting Water and Sanitation Service Delivery

1.6.1 Social-Political Factors

Water and sanitation service delivery in Kitui County is influenced by a complex interplay of socio-political factors. These factors do stem from governance structures, political dynamics, community engagement and institutional capacities.

- **Devolution and Governance Structures:** The 2010 Constitution of Kenya introduced a devolved system of governance, assigning water and sanitation service delivery responsibility to County governments. While this aimed to bring services closer to the people, it also led to challenges in coordination between national and County governments. The national Water Act 2016 sought to clarify roles, but ambiguities still remain especially, in regards to budget allocations for rural water services and institutions like schools and clinics. These remain underfunded as the struggle for the limited budget continue.
- **Intra-County Political Dynamics:** political interests can influence water and sanitation projects, leading to fragmented initiatives and resource allocation based on political affiliations.
- **Community Engagement and Social Capital:** Community involvement is crucial for the success of water and sanitation projects. In Kitui, social capital—networks of relationships among people plays a significant role in water access. Community participation leads not only to increased government service provision but also to improved quality and sustainability of water and sanitation infrastructure. For instance, Community-led processes to implement WASH policies (e.g., to design and build community toilets) can increase the likelihood that the WASH infrastructure will align with community needs and priorities. Communities often rely on mutual aid and informal agreements to manage water resources. However, these arrangements can be strained by external interventions that do not align with local practices or fail to involve community members in decision-making processes.
- **Institutional Capacity and Policy Implementation:** The capacity of local institutions to implement water and sanitation policies effectively is a critical factor. Challenges include limited technical expertise, inadequate funding, and insufficient data for planning and monitoring. Efforts to develop comprehensive water policies at the County level have been made, but implementation is often hampered by these institutional weaknesses.
- **Gender and Social Inclusion:** Gender disparities and the marginalization of vulnerable groups affect access to water and sanitation services. Women and girls often bear the burden of water collection, impacting their education and economic opportunities. Additionally, people with disabilities face significant barriers due to inadequate infrastructure and lack of inclusive planning.
- **Donor Influence and External Interventions:** External donors and NGOs play a role in water and sanitation projects in Kitui County. While their support can bring much-needed resources and expertise, it can also lead to challenges if projects are not well-coordinated with County officers especially at grass root or fail to consider the socio-political context. Sustainability of such projects often depends on the extent to which they are integrated into local County governance structure.

1.6.2 Environmental Factors

Kitui County, located in Kenya's arid and semi-arid region, faces significant environmental challenges primarily driven by climate variability and recurrent droughts. The County experiences erratic rainfall and long dry seasons, leading to water scarcity, reduced agricultural productivity, and food insecurity. With only 1.2% of arable land under irrigation, most County residents depend on unreliable rain-fed agriculture and seasonal water sources, often walking 5-6 kilometers in search of water. These challenges are worsened by inadequate water infrastructure and maintenance, resulting in poor access to safe drinking water for a majority of the population.

Environmental degradation is also a pressing issue in Kitui. Overreliance on wood fuel has contributed to widespread deforestation, leading to soil erosion, declining soil fertility, and loss of biodiversity. Unsustainable land use practices such as overgrazing further exacerbate land degradation, making the environment increasingly fragile and less productive. Additionally, poor waste management - evident in areas like the Kalundu dumpsite, poses severe health and environmental risks, including outbreaks of diseases like cholera and malaria due to pollution and inadequate sanitation.

Despite the existence of interventions like sand dams and zai pits aimed at improving water harvesting and climate resilience, the uptake of such sustainable practices remains limited. Moreover, weak environmental policy enforcement, low community awareness, and underfunded local institutions hinder effective environmental management. Tackling these environmental issues requires integrated efforts involving government, communities, and development partners to promote sustainable land and water use, enhance resilience to climate change, and improve infrastructure for water and sanitation services.

1.7 Existing Legal and Policy Frameworks Governing Water and Sanitation at the County Level

At the Coiunty level, responsibilities for water and sanitation are divided between the departments of Water and Public Health and Sanitation. Below are the relevant laws, policies, strategies, regulations and guidelines driving water and sanitation service delivery in Kitui County:

a) **Draft Kitui County Water and Sanitation Policy and Bill:** The Kitui Water Policy and Bill (Draft) establishes a comprehensive framework for sustainable WASH service delivery. Key provisions considered include;

- Roles and responsibilities that define the County Government's duties in planning, building, maintaining, monitoring and financing WASH services.
- Sustainable funding by introducing guidelines that link capital and operational expenditures, promote affordable tariffs, and explore alternative funding models.
- Service delivery contracts that encourage partnerships with rural water utilities and maintenance service providers to ensure efficient and equitable service provision.
- Water service delivery models to ensure efficient and sustainable water provision applicable for different categorization.
- Sector coordination aimed at establishing WASH forums and monitoring systems to enhance collaboration among stakeholders.

b) **Kenya Environment and Sanitation and Hygiene Policy (KESHP) 2016-2030:** Provides for a universal access to improved sanitation and clean environment.
c) **School Health Policy:** Provision of WASH services to learning institutions.
d) **Rural and Urban Sanitation and Hygiene Protocol 2023:** Phased approach from open defecation to clean and healthy environment.
e) **UN Sustainable Development Goals 6.2:** End open defecatation, vulnerable commnuties.
f) **County Integrated Development Plan (CIDP) III 2023–2027:** The CIDP III 2023–2027 outlines the County's commitment to improving WASH services as part of its broader development agenda. Key initiatives include:

    - Infrastructure development such as drilling and equipping boreholes, constructing and desilting earth dams, and extending water pipelines to enhance water accessibility.
    - Enhancing water treatment through adoption of technologies to ensure provision of safe drinking water.
    - Improving water and sanitation infrastructure in public institutions and communities.

g) **Service Delivery Models**: Kitui County has adopted Service Delivery Models to ensure the reliability of WASH services. For instance, the FundiFix model has been implemented in Mwingi North and parts of Mwingi Central sub-Counties to provide timely repairs and maintenance of water infrastructure, reducing downtime and improving service delivery. This model is open for expansion by the County for improved service delivery.
h) **Community Engagement and Education**: The County emphasizes community involvement in WASH initiatives aimed at fostering behavioral change and ensure the sustainability of WASH interventions. These initiatives include;
    - **Community-Led Total Sanitation (CLTS):** Encouraging communities to eliminate open defecation and improve sanitation practices.
    - **Hygiene Education:** Conducting awareness campaigns to promote handwashing and other hygiene practices.

The institutions below, both at the National and County levels, are involved in the sanitation sector:

- **The National/County Treasury:** Guide sanitation-related fiscal activities, including administering all public investments in environmental sanitation as well as negotiating for grants and loans in accordance with the Public Finance Management Act.
- **The Ministry of Education, in collaboration with the Ministry of Health at both the National and County levels** are responsible for implementing school WASH programmes and ensuring that all schools are provided with adequate sanitation and hygiene facilities and services, while taking into account the special needs of especially girls and children with disabilities.
- **The Ministry/County Department of Tourism, Trade and East African Community Affairs** is responsible for ensuring improved environmental sanitation and hygiene amenities in the sector, especially for outdoor tourism sites.
- **The Ministry/County Department of Gender, Children and Social Services** is responsible for policy issues on environmental sanitation that affect

the well-being of women, children, older members of society and persons with disability.

The table eblow outlines the on-going sanitation projects in Kitui County by the National and County Governments, and the development partners.

Table 10: On-going Sanitation Projects in Kitui County

Organization	Project	Activities
Department of Health and Sanitation/UNICEF	Market Based Sanitation	It involves demand creation for toilet upgrades and ensuring availability of the sanitation products in the local market. Additionally, capacity building of all stakeholders on sanitation technologies and ensuring marketing of the technologies to the households. Coordination, monitoring and evaluation.
National Government Ministry of Education/UNICEF	WASH in Schools-Safe Toilets Enhancement Project (STEPs)	Latrine facilities rehabilitation in vulnerable schools through installation of safe toilet (SaTo) pans and hand washing facilities, training of teachers and BoM on operation and maintenance and training of school health clubs for peer hygiene promotion
World Vision	WASH Project	Training of artisans on climate smart latrine technologies, Behavior Change Communication (BCC) to community health promoters and community at large and sanitation and hygiene promotion in schools.
WHH	WASH Project	Connection of water to learning institutions, training of learners on hygiene promotion through CHASTE approach and hygiene and sanitation promotion in the community.
Samaritan Purse	WASH Project	Construction of latrine facilities and hand washing stations in primary schools and provision of water tanks to the schools
AMREF/FINISH	Market Based Sanitation	Sanitation financing through promotion of engagement between local Financial Services Institutions (FSIs) and the community. Promotion of sanitation financing technologies like the e-Ledger system.

i) **Kenya's 2010 Constitution**, which created a devolved system of government, gave the mandate of service delivery to Kenya's 47 County governments. Regarding sanitation, the County governments' responsibilities include;

- Issuing necessary legislations and by-laws to ensure effective sanitation regulations and enforcements.
- Ensuring the provision of safe, adequate and high standards of environmental sanitation services to all population of the Counties without discrimination.
- Establishing, by appropriate legislation, a County Government agency with the responsibility of actualizing the policy objective of achieving 100% ODF and access to improved sanitation access by 2030 at the County level.
- Ensuring the provision of appropriate and adequate sanitation facilities in all public institutions.
- Setting sanitation tariff, where applicable, considering affordability and willingness to pay for services by the households.

1.8 Water in the County Economy

1.8.1 Role of Water in Economic Planning and County Development Objectives

Water plays a critical role in economic planning and achieving County development objectives, particularly in rural and arid/semi-arid regions like Kitui County. It acts as a catalyst for various

sectors including agriculture, health, education, industry, and overall livelihoods. Below is a concise discussion on the role of water in economic planning and County development, with citations:

1.8.2 Water as a Driver of Agricultural Productivity

Agriculture is the backbone of Kitui rural economy, and water is central to both rain-fed and irrigated farming systems. Agriculture contributes significantly to both income generation and employment in the County. Access to reliable water sources enhances crop yields, supports livestock production, and facilitates agro-processing activities. Water availability and irrigation are directly linked to increased agricultural productivity and rural incomes (World Bank, 2017).

In Counties like Kitui, investments in water infrastructure such as dams, water pans and irrigation schemes are essential for building climate resilience and improving food security (Republic of Kenya, 2018). The main irrigation schemes in Kitui County include Wikithuki (Mwingi West sub-County). There are also small-scale cluster irrigation schemes done by the County such as Mandalwa and Kavisuni (Kitui Rural sub-County) and Ngomano (Kitui East sub-County). In total the County has over 70 cluster irrigation schemes. The County has a department of Irrigation which develops irrigation infrastructure, and the water generated is used for agricultural purposes.

The County's semi-arid conditions make water access vital for crop and livestock productivity. Agriculture supports over 75% of Kitui's population and contributes 87.3% of rural incomes (Kitui County CIDP 2018–2022).

1.8.3 Water and Health Outcomes

Clean water is fundamental for public health. It reduces the incidence of waterborne diseases, improves hygiene, and decreases healthcare costs. Safe drinking water, sanitation, and hygiene are critical to health and development (WHO, 2019).

In economic planning, improving access to potable water contributes to a healthier workforce, which in turn boosts productivity and reduces absenteeism. The analysis of WASH status and challenges in healthcare facilities is provided in Chapter 2.

1.8.4 Water and Education

In Kitui County, children, especially girls, often miss school due to the burden of water collection in water-scarce areas. Provision of water in or near schools improves attendance and educational performance and supports school feeding programs. Improved water access reduces time spent collecting water, allowing children more time for schooling. Detailed analysis on WASH status and associated challenges in schools is provided in Chapter 2.

1.8.5 Water for Industrial and Economic Growth

In Kitui County, water is a key in industrial processes including artisinal mining (iron ore, copper), mining of limestone, textile manufacturing (Kitui County Textile Centre), slaughterhouses processes and water vending. Moreover, water is essential in producing bricks, ballast making, concrete, and other building materials, supporting construction activity in the County (Kitui County CIDP 2018–2022). Water, also supports agro-processing industries within the County such as

Cotton Ginneries and mango processing plants. Additionally, reliable water supply supports small-scale enterprises such as car washes, salons, food kiosks, and hospitality businesses, which are essential to the growing urban economy.

The County Development Plans increasingly consider the availability of water resources in identifying potential industrial zones like the upcoming Kitui County Aggregation and Industrial Park, at Kanyoonyoo in Yatta Kwa-Vonza ward.

1.8.6 Water and Climate Resilience

Kitui County is ASAL region characterized by extreme climate variability. Climate change impacts in the County includes water scarcity. The County has invested in water conservation inteverventions such as construction climate proof infrastures like earth pans, borehole drilling, sand/subsurface dams, sump wells, pipeline extenstions rock catchment and spring water harvesting and protection.

1.8.7 Water Governance and Local Economic Empowerment

Kitui County has both rural and urban water supplies. The conventional water systems from Masinga and Kiambere dams serve mainly Kitui and Mwingi towns and their environs. The rural population is served majorly by boreholes, sump wells, springs, rock catchments and earth pans. The urban and peri-urban WSPs are regulated by WASREB. However, rural water supplies are voluntarily managed by the elected community members, dubbed committees. These committees are not regulated, and thus cunstomer interests are not protected. Though this has been the case, WASREB developed guildelines on service delivery models for improved governance that the County has embraced. The County is in the process of aligning rural water management committees to the recommended service delivery models to strengthen rural water governance.

1.8.8 Water Conservation and Sustainability Measures Being Implemented in the County

Kitui County, located in Kenya's arid and semi-arid lands (ASALs), faces recurring droughts and water scarcity. To address these challenges, the County has implemented various water conservation and sustainability measures aimed at improving water access, enhancing climate resilience, and promoting socio-economic development.

a) Sand Dams and Subsurface Dams

Sand dams are a widely adopted technology in Kitui County for harvesting water from seasonal Rivers. These dams trap sand, which stores water and reduces evaporation while promoting aquifer recharge. Subsurface dams are similarly designed but are constructed below the Riverbed to retain groundwater.

As of 2023, over 370 sand dams had been constructed, with plans to build 2,400 more under the World Bank-supported FLLoCA programme (The Star, 2023a). Proper siting, geological surveys, and community engagement are essential for their success (Cyrho Consult & SEKU, 2016).

b) Earth Dams and Water Pans

Earth dams and water pans serve as crucial rainwater harvesting facilities, especially in areas lacking piped water infrastructure. These structures collect and store runoff during rainy seasons for use in dry periods.

In 2025, the County Government rehabilitated 14 earth dams, including Kwa Ndaki Dam, with a storage capacity of over 150 million litres (Kenya News Agency, 2025). These water points reduce the burden of water collection and support both human and livestock needs.

c) Solar-Powered Water Purification and Desalination

Given the salinity of many boreholes in Kitui, the County has adopted solar-powered UV and reverse osmosis systems to provide safe drinking water. These systems are often integrated with smart meters and mobile payment platforms like M-Pesa.

One such initiative, supported by Gulu University and FundiFix, has installed solar purification units at community kiosks, significantly improving water quality and accessibility (UNSW Newsroom, 2025; SNV, 2022).

1.9 Constraints to Economic Growth due to Water Access, Quality and Management Challenges

The barriers limiting economic growth in Kitui County due to inadequate water services are multifaceted, involving systemic issues that hinder the effective utilization of water resources. These challenges include infrastructure deficits, inefficient water management, regulatory and institutional obstacles, and financial constraints. The following sections explore these barriers in detail, with references to relevant studies and reports.

a) Infrastructure Deficits

A major barrier to economic growth in Kitui County is the lack of adequate water supply infrastructure. The County's infrastructure for water distribution and storage is underdeveloped, with many rural areas relying on traditional sources such as shallow wells and seasonal Rivers, which are unreliable and often insufficient. The absence of comprehensive water supply networks and storage systems means that large portions of the population do not have reliable access to water, particularly during dry seasons, which negatively impacts agricultural and industrial productivity.

b) Inefficient Water Management

Inefficiencies in water management are another key barrier limiting economic growth in Kitui County. Water resources in Kitui are not always utilized optimally, due to poor planning, lack of coordination between stakeholders, and outdated technologies. For instance, while there are several sources of water, such as boreholes, Rivers, and dams, the management of these resources is often fragmented and lacks a holistic, integrated approach. This results in water waste, inconsistent supply, and an inability to meet the growing demand, which is especially problematic for agriculture and livestock farming.

c) Regulatory and Institutional Challenges

Regulatory and institutional barriers also play a significant role in limiting economic growth related to water services in Kitui. While Kenya has policies and regulations aimed at improving water access, the enforcement of these regulations remains weak. The decentralized water management system, as stipulated in the Kenyan Constitution and the Water Act of 2002, has led to a fragmented approach to water governance. Local authorities, such as Water User Associations (WUAs), often lack the capacity to manage water resources effectively, leading to issues of mismanagement and corruption. Additionally, there is often a lack of accountability in the distribution of water services.

d) Financial Constraints

Financial constraints are perhaps the most pervasive barrier limiting the improvement of water services in Kitui County. The initial capital required to build water infrastructure, such as dams, boreholes, pipelines, and treatment plants, is substantial. However, Kitui County, like many other arid regions, faces challenges in securing adequate funding for these projects. The lack of financial resources means that water supply projects are often delayed or scaled down, leading to inadequate coverage and limited impact on local economies (Wambugu *et al.,* 2020).

1.9.1 Other Issues

a) Water Scarcity

Water scarcity is a persistent and severe issue in Kitui County due to its classification as an arid and semi-arid land (ASAL). The region experiences low and erratic rainfall, with prolonged dry spells that drastically reduce water availability for domestic, agricultural, and industrial uses. This scarcity impacts agricultural productivity, livestock rearing, and household health and hygiene, all of which are foundational to the region's economic and social well-being.

b) Water Contamination

Water quality in Kitui is another pressing concern. Many rural communities rely on open sources such as Rivers, shallow wells, and unprotected springs, which are highly vulnerable to contamination from both human and animal waste. The lack of water treatment infrastructure and public health education exacerbates the risk of waterborne diseases like cholera, typhoid, and diarrhea, especially among children. For instance, Kalundu River is highly polluted by illegal discharge of untreated effluents from the informal urban settlements of Kitui town, making it unsuitable for domestic uses. Other Rivers and streams in the County have been contaminated by sediments and agrochemicals from the farms along the riparian zones.

c) Inefficient Distribution

The distribution of water in Kitui County is often hampered by a lack of adequate infrastructure and poor management. Water is unevenly distributed across the region, with some areas being relatively well-served by boreholes or piped systems, while others remain completely underserved. This inefficiency stems from old or broken-down distribution systems, limited capacity within water agencies, and poor coordination between local Government and water service providers.

1.10 Risks and Opportunities Related to Water Resource Availability and Climate Variability

The following is a structured explanation of the risks and opportunities related to water resource availability and climate variability in Kitui County.

1.10.1 Impact of Climate Change on Water Availability and Service Provision

Climate change significantly affects water resources primarily through prolonged droughts, erratic rainfall, and rising temperatures. These changes reduce water availability and challenge service provision by increasing stress on water infrastructure and disrupting traditional water sources. The matrix below presents different water sources against key climate risks, assessing their vulnerability, severity of impact, and frequency of occurrence:

Table 11: Water Source vs Climate Risk Matrix for Kitui County

Water Source	Drought Risk (Severity/Frequency/Vulnerability)	Flood Risk (Severity/Frequency/Vulnerability)	Temperature Rise (Severity/Vulnerability)	Rainfall Variability (Severity/Vulnerability)
Rainwater Harvesting	High/ Frequent/ High – Dependence on rain	Low/ Rare/ Low – Systems not flood-prone	Low/ Medium – Indirect effect	High/ High – Directly affected by rain patterns
Boreholes	Medium/ Occasional/ Medium – Aquifer depletion	Low/ Rare/ Low – Underground source	Medium/ Medium – Reduces recharge	Medium/ Medium – Affects groundwater recharge
Shallow Wells	High/ Frequent/ High – Dry up quickly	Medium/ Rare/ Medium – Can flood	High/ High – Increased evaporation	High/ High – Very sensitive to seasonal changes
Surface Water (Rivers, Dams)	High/ Frequent/ High – Drying of Rivers	High/ Occasional/ Medium – Flash floods	High/ Medium – Increased evaporation	High/ High – Fluctuating River levels
Piped Water from Dams	High/ Frequent/ High – Supply disruptions	Medium/ Rare/ Medium – Infrastructure damage	Medium/ Medium – System inefficiencies	High/ High – Source supply inconsistencies

Key Interpretations:

- Rainwater Harvesting is highly vulnerable to rainfall variability and drought. In years with delayed or insufficient rains, households relying on this source often face prolonged water shortages (UNICEF, 2022).
- Shallow Wells and Surface Water Sources are extremely climate-sensitive, particularly to droughts and temperature increases, which rapidly reduce water levels. Their high exposure and low resilience make them especially risky in climate-stressed seasons.
- Boreholes, though more resilient, face medium vulnerability due to over-extraction and reduced groundwater recharge, particularly under changing rainfall regimes and increasing temperature.
- Piped Water Schemes, which depend on dams and Rivers, are vulnerable to both drought and infrastructure stress during floods. Interruptions in dam-fed systems reduce the reliability of service provision during extreme weather events (WRMA, 2018).

1.10.2 Assessment of Gender-Specific Climate Induced Vulnerabilities

Climate change affects communities differently based on gender roles, access to resources, and decision-making power. In Kitui County — a semi-arid region highly susceptible to climate variability, women and girls bear a disproportionate burden due to their traditional roles in water collection, food production, and household care. Some of the key gendered vulnerabilities associated with climate change impacts on water availability and related livelihoods include the following:

a) Increased Burden of Water Collection

Climate-induced water scarcity exacerbates the time and energy burden on women and girls, who are traditionally responsible for fetching water. As water sources dry up or become unreliable during droughts, women must travel longer distances and spend more hours collecting water, often under harsh conditions. The average trekking distance to water sources during dry seasons is 5-6 km while during the wet season is 2-3 km. This reduces time available for income-generating activities, education, childcare, and rest, reinforcing gender inequality.

b) Food Insecurity and Agricultural Vulnerability

In Kitui, women dominate subsistence agriculture, yet they often lack secure land rights, access to climate-resilient inputs, and technical extension services. Erratic rainfall and extended dry spells reduce crop yields, directly impacting women's ability to feed their families and earn livelihoods. Women farmers face more barriers to adapt to climate change, resulting in deeper levels of poverty and food insecurity.

c) Health and Sanitation Risks

Diminished water availability due to climate stress impacts menstrual hygiene management, maternal health, and general sanitation, particularly for women and girls. In times of water scarcity, households often prioritize water for cooking and drinking, leaving hygiene needs unmet. Women suffer more from waterborne diseases, reproductive tract infections, and psychosocial stress linked to poor sanitation and care responsibilities (UN Women, 2021).

d) Limited Participation in Climate Adaptation Decision Making

Despite being central to managing household water and food systems, women are often underrepresented in water user associations, climate action committees, and local governance structures. This exclusion limits their influence over resource allocation and adaptation planning. Climate solutions may not reflect the realities of women's needs, perpetuating ineffective and inequitable outcomes (World Bank, 2020).

In Kitui County, climate change is not gender-neutral. Women and girls are more vulnerable to its impacts due to socio-cultural roles, unequal access to resources, and systemic exclusion from decision-making. Addressing these gender-specific vulnerabilities requires integrating gender-responsive policies into climate adaptation strategies, improving women's access to climate-smart technologies, and empowering them through inclusive governance.

1.10.3 Assessment of Risks and Opportunities Related to Climate Variability and Water Security for Economic Sustainability

Kitui County, located in Kenya's semi-arid region, faces increasing pressure from climate variability, which directly affects water availability — a critical determinant of local livelihoods, especially in agriculture, livestock, and informal trade. Understanding the interplay between climate risks and economic outcomes is essential to design adaptive strategies that enhance both water security and economic sustainability.

Table 12: Assessment of Climate Risks: Likelihood vs Economic Impact

Climate Risk	Likelihood	Economic Impact	Overall Risk Level	Primary Affected Sectors
Drought	Very High	Very High	Critical	Agriculture, Livestock, Trade, Water Services
Erratic Rainfall	High	High	Severe	Farming, Rainwater Harvesting, Water Supply
Extreme Heatwaves	Medium	High	High	Health, Agriculture, Infrastructure
Floods/Flash Floods	Medium-Low	Medium	Moderate	Infrastructure, Health, Settlements
Storms/Strong Winds	Low	Low-Medium	Manageable	Housing, Trees, Infrastructure

Table 13: Opportunities for Economic Sustainability amid Climate Risks

Opportunity	Description	Potential Impact
Rainwater Harvesting Expansion	Increase use of tanks and small dams to buffer drought and rainfall variability	Reliable water for households and farms
Climate-Smart Agriculture	Adoption of drought-tolerant crops, mulching, and drip irrigation	Stabilizes crop yields, reduces losses
Green Job Creation	Community-based watershed management and water conservation projects	Local employment and ecosystem restoration
Resilient Infrastructure Development	Reinforcing boreholes, roads, and storage against flood and heat damage	Reduces service disruption and recovery costs
Early Warning Systems and Weather Apps	Digitally delivered forecasts for farmers and traders	Informed decision-making and planning

1.10.4 Identification of Sector-Specific Adaptation and Mitigation Measures to Enhance Water Security

Climate variability, including recurrent droughts and erratic rainfall, poses major challenges to water security in Kitui County. Sector-specific strategies tailored to local conditions are essential. Below is a breakdown of adaptation and mitigation measures by key sectors, along with cost-benefit prioritization based on local feasibility, return on investment, and socio-economic impact.

Table 14: Agriculture Sector

Measure	Adaptation or Mitigation?	Estimated Cost	Expected Benefit	Priority Level
Rainwater harvesting (farm ponds, tanks)	Adaptation	Low-Medium	Increased water availability for irrigation; reduced reliance on rain-fed systems	High
Drought-tolerant crop varieties	Adaptation	Low	Maintains yields during dry seasons; enhances food security	High
Conservation agriculture (mulching, no-till)	Adaptation & Mitigation	Low	Enhances soil moisture retention; reduces water demand and emissions	High
Small-scale irrigation (drip/smart)	Adaptation	Medium-High	Increases efficiency; allows off-season production	Medium

Table 15: Water Supply and Infrastructure

Measure	Adaptation or Mitigation?	Estimated Cost	Expected Benefit	Priority Level
Sand dams and subsurface dams	Adaptation	Medium	Store seasonal runoff underground; reduce evaporation losses	High
Borehole rehabilitation and solarization	Adaptation & Mitigation	Medium	Improves reliability; reduces diesel use and energy costs	High
Leak detection and pipeline optimization	Adaptation	Low-Medium	Reduces water loss in piped systems; improves service efficiency	Medium
Expansion of piped water infrastructure	Adaptation	High	Enhances coverage but costly; long-term benefits	Medium

Table 16: Livestock Sector

Measure	Adaptation or Mitigation?	Estimated Cost	Expected Benefit	Priority Level
Strategic rangeland water points	Adaptation	Medium	Reduces livestock trekking distances; avoids overgrazing	High
Livestock insurance schemes	Adaptation	Low-Medium	Protects pastoralists from drought-related losses	Medium
Controlled grazing and rotational systems	Mitigation	Low	Improves land-water balance; sequesters carbon	Medium

Table 17: Household and Community Resilience

Measure	Adaptation or Mitigation?	Estimated Cost	Expected Benefit	Priority Level
Household water purification (filters, tabs)	Adaptation	Low	Improves health outcomes; ensures safe drinking water	High
Community water governance training	Adaptation and Mitigation	Low	Promotes equitable resource sharing; builds local adaptive capacity	High
Gender-responsive water access programs	Adaptation	Low	Reduces burden on women; increases inclusive access to water resources	High

Table 18: Cost-Benefit Prioritization Summary

Measure	Benefit-Cost Ratio (BCR)	Implementation Feasibility	Priority
Rainwater harvesting	High	High	High
Drought-resistant seeds	Very High	Very High	High
Sand dams	High	Moderate-High	High
Borehole solarization	Medium-High	Moderate	High
Small-scale irrigation	Medium	Moderate	Medium
Pipeline optimization	Medium	High	Medium
Livestock water points	High	Moderate	High
Household water treatment	Very High	High	High

1.11 Overview of Planned and Ongoing Interventions aimed at Enhancing Water's Role in the Economy

The County Government's planned water and sanitation projects are detailed in Chapter 5.

1.11.1 Summary of Existing Programs Supporting Water-Driven Economic Development

The County department of Water is undertaking the construction of 8 sump well water supply schemes, drilling, equipping/hybridization of 25 boreholes and repair and maintenance of 40 boreholes across the County. The governance of the existing rural water schemes is key, and therefore, the County is aligning their management to the guidelines on service delivery models developed by WASREB. Ministry of Energy, Environment, Climate Change, Forestry, Natural and Mineral Resources (FLLoCA) where ther are undertaking water interventions geared towards building climate resilience among the communities.

The National Government is undertaking investments towards water and sanitation projects such as Umaa dam (Kyangwithya East ward), Kamuw'ongo sump well water supply project (Kyuso ward), operationalization of Thitani borehole water supply (Migwani ward) and upgrading of Kiambere-Mwingi intake.

The County has key development partners that are investing in water and sanitation projects. Some of the projects being undertaken in partnership with the County include, Kangu Kangu and Ngomano-Mwitika (sump well) water supply systems (implemented by the County Government and the World Vision, Kenya). The National Council Churches of Kenya and the Catholic Medical Mission Board are implementing sump well water supplies in Kitui South and Mwingi North respectively. Welt Hunger Hilfe (WHH) is undertaking Ngaani (Mutha Ward), Ngulini (Voo/Kyamatu Ward) and Ngomano (Zombe/Mwitika) borehole rehabilitations and pipeline extensions. The other partners implementing water and sanitation projects include Samaritan Purse, FundiFix, CARITAS – Kitui, Anglican Development Services – Eastern (ADSE), Project Maji and African Sand Dam Foundation.

2 WATER, SANITATION AND HYGIENE SERVICES COVERAGE STATUS

2.1 County Water Resources Endowment - Overview of Available Water Sources

2.1.1 Inventory of Water Resources and their Capacity

Kitui County faces significant challenges in water resource management due to its arid climate and variable rainfall patterns. The County's water resources encompass rainfall, surface water, and groundwater, each with distinct characteristics and capacities.

Surface Water

Surface water sources in Kitui County are primarily seasonal Rivers and streams that flow during the rainy seasons and often dry up during extended dry periods. Kitui County is endowed with two permanent Rivers located on the periphery of the County namely, Tana and Athi Rivers. There are also seasonal Rivers and streams that flow during the rainy seasons and often dry up during the extended dry periods. Major seasonal Rivers include Tiva, Nzeeu, Thua, Mwitasyano, Tyaa, Enziu, Kamuwongo, Katse and Muoo.

To mitigate water shortages, the County has implemented various water conservation projects, including sand dams, earth dams, and water pans. Sand dams, in particular, have been effective in capturing and storing water within sand particles, replenishing groundwater levels, and providing water that support multiple uses, including domestic, irrigation and livestock watering The Kitui region has approximately 500 functional sand dams (Maddrell, 2018).

The riverbeds are an alternative water source accessed through hand-dug scoop well during dry seasons, where water is stored under the sand. Earth Dams and Water Pans are also constructed to collect and store surface runoff, with their distribution varying based on local topography and community initiatives.

Groundwater

Groundwater serves as a crucial water source for many residents of Kitui County, accessed through boreholes and shallow wells. The County's geology, primarily consisting of crystalline basement rocks, influences the availability and quality of groundwater. Studies have shown spatial and temporal variations in groundwater quality across different regions. For example, in the Yatta Plateau, fluoride concentrations in some boreholes, such as Kanyongonyo, have been recorded at levels exceeding the World Health Organization's drinking water standard of 1.5 mg/l, with measurements up to 2.4 mg/l. Total Dissolved Solids (TDS) levels also vary, with some boreholes recording concentrations above the Kenya Bureau of Standards (KEBS) limit of 1,000 mg/l, indicating concerns regarding water salinity (Ndengwa *et.al.,* 2012).

Central and Eastern Regions of Kitui areas have been identified as more suitable for groundwater exploitation due to favorable geological conditions (David *et.al.,* 2012).

In Kitui County, currently we have 828 boreholes, whereby 214 are equipped with handpumps whereas 614 are piped schemes equipped with solar, grid or genset. Despite this large number of boreholes 70% of the boreholes have a yield of less than or equal to $3m^3/hr$. Functionality levels also remain approximately 60% due to mechanical breakdowns, low yields and governance issues.

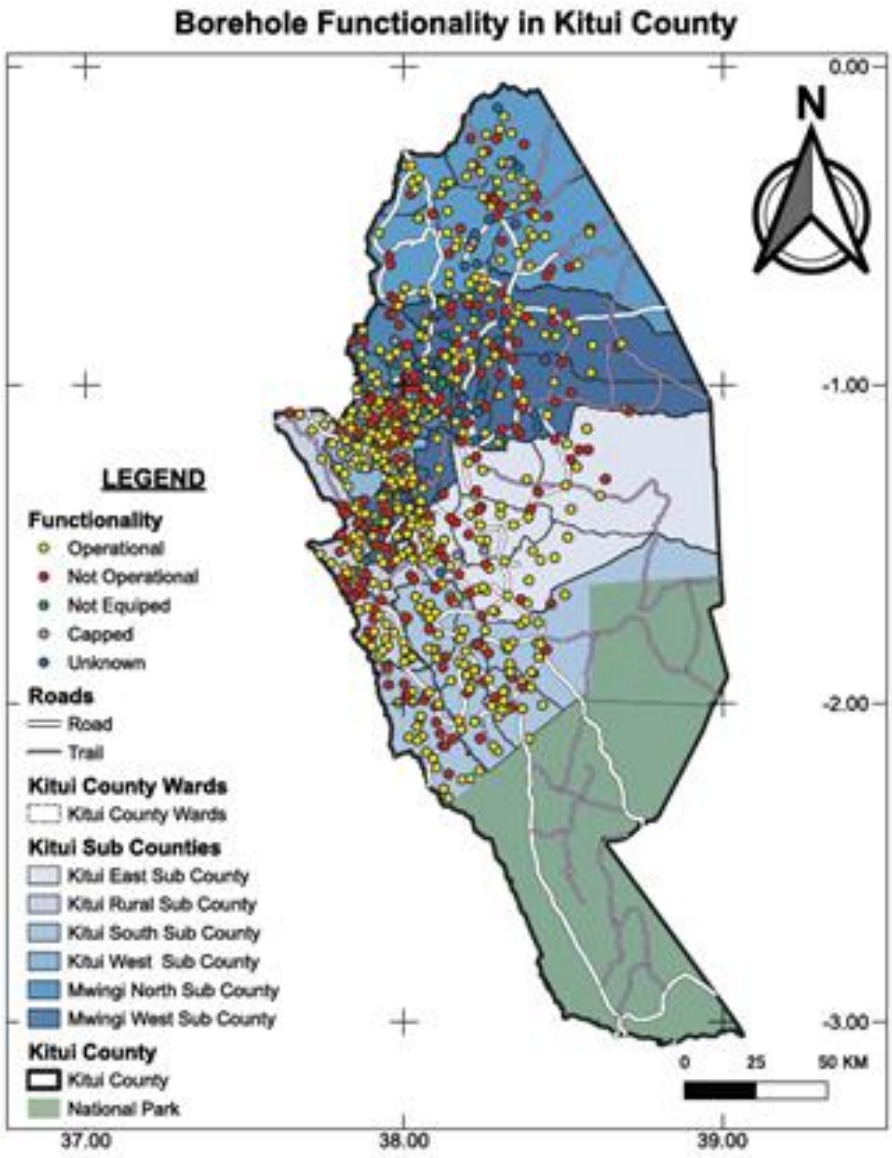


Figure 3: Borehole Functionality in Kitui County

2.1.2 Water Conservation Projects

The County has initiated various water conservation projects to enhance water availability. These include the following; rock catchments, earth dams, earth pans, sand dams, sub surface dams. A study assessing these projects revealed that 43% of respondents had water conservation projects located within 2 km of their homesteads, 38% between 2 – 5 km, 6% between 5 – 7 km, and 5% more than 7 km away (Kitui County PCRA Report, 2023). While these projects have improved water access, challenges remain in ensuring equitable distribution and sustainability.

2.1.3 Water Supply Coverage

According to a survey carried out by KNSB and SID in 2013, coverage defined as people using an improved water source is only 26%. Kitui County estimates the coverage at 56%. The County has two commercial water supply schemes namely; Kiambere-Mwingi Water and Sanitation Company (KIMWASCO) whose water is abstracted from Kiambere dam and Kitui Water and Sanitation Company (KITWASCO) whose water is abstracted from Masinga dam serving urban and rural water schemes. Fifty six (56) percent of 1.2 million people in the County have access to clean water within 2 km radius. KITWASCO and KIMWASCO provides for 30% whereas the remaining 26% is met by rural water supplies.

There are over 3,500 rural water sources, out of which only 667 are piped schemes sources for provision of clean and safe water. Only 61% of these are fully functional. The average trekking distance to sources is 5 - 6 km against recommended 500 m for basic access.

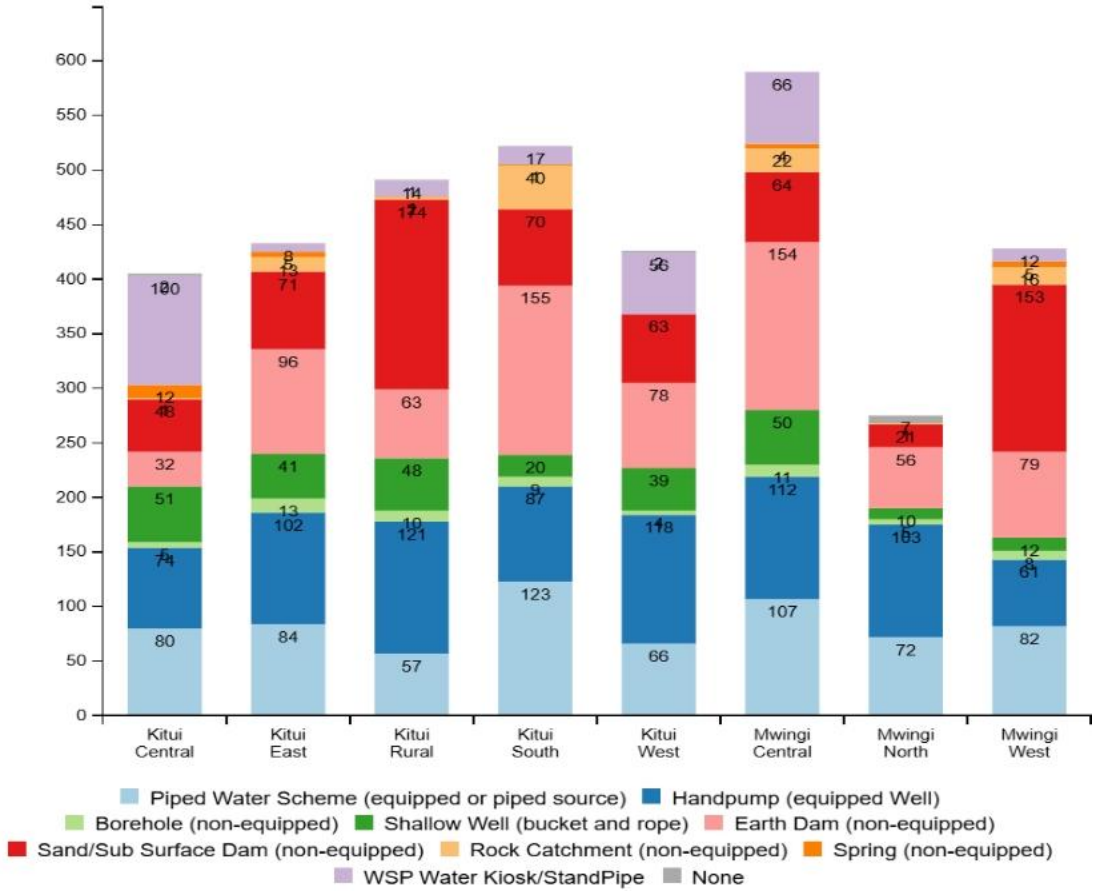


Figure 4: Distribution of Water Sources in Kitui County

*(**Data source:** County Ministry of Water)*

2.1.4 Spatial Distribution of Water Resources across the County

Kitui County, located in eastern Kenya, exhibits a heterogeneous distribution of water resources influenced by its semi-arid climate, geological formations, and topography. The primary water

sources include rainfall, surface water, and groundwater, each varying in availability and quality across different regions.

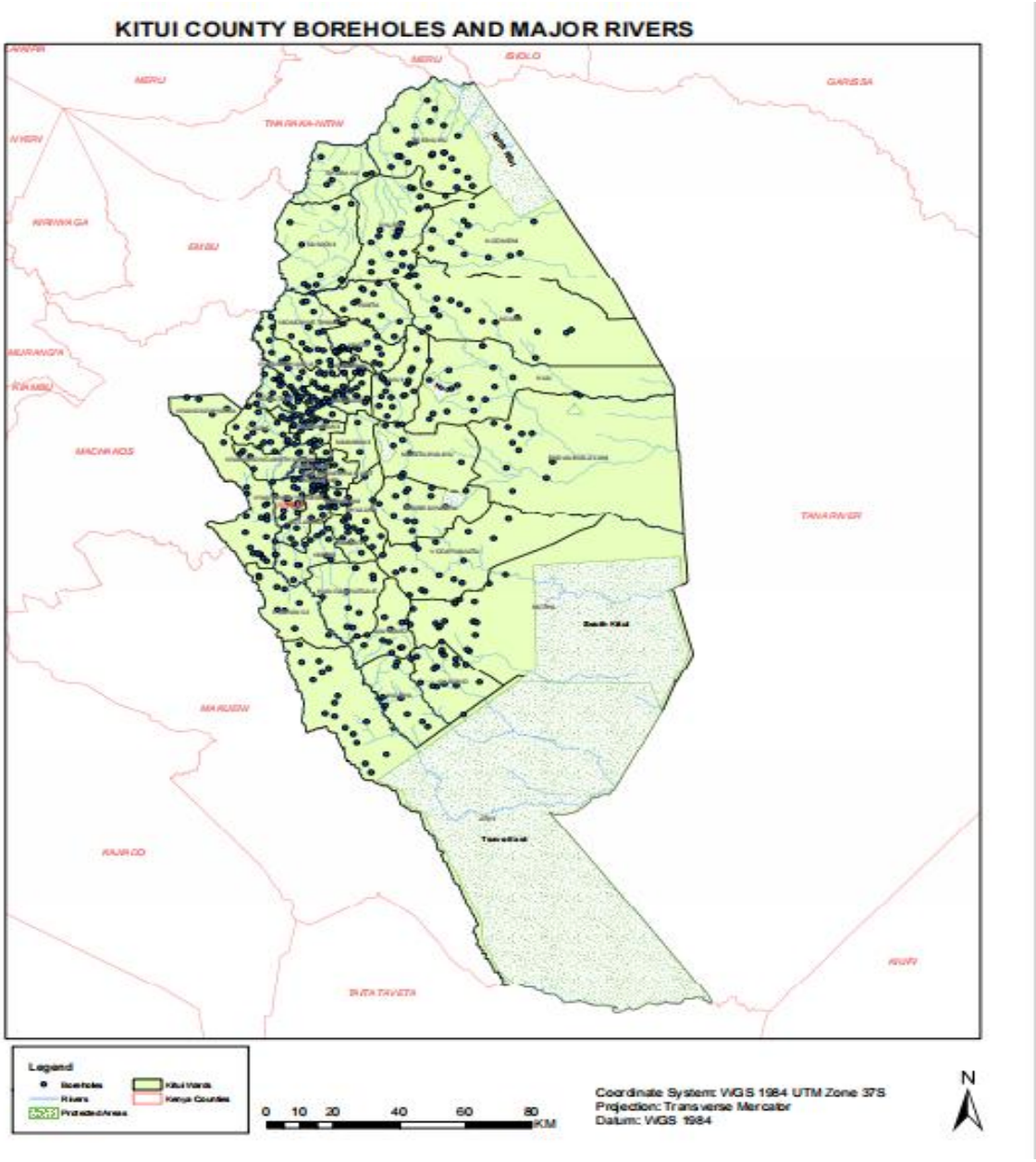


Figure 5: Spatial Distribution of Water Sources

2.1.5 Shared Water Resources

One significant shared water resource is the Thwake Dam, a major infrastructure project designed to serve Kitui, Makueni, and Machakos Counties. This dam aims to provide water for domestic use, irrigation, and hydropower generation across the three Counties. The equitable distribution and management of the dam's resources require coordinated inter-County agreements to address the diverse needs of the populations in these regions.

Water Allocation Criteria and Agreements

Water allocation in Kenya is governed by the Water Act 2016 and its subsidiary regulations, which establish the framework for equitable and sustainable management of water resources. The Water Resources Regulations 2021 outline the roles of Basin Water Resources Committees (BWRCs) in overseeing water use applications and ensuring that allocations consider factors such as existing water rights, environmental sustainability, and the socio-economic needs of communities. These committees facilitate cooperation among Counties sharing water resources, ensuring that allocations are made transparently and equitably (Water Act, 2016).

In Kitui County, local policies have been developed to guide the utilization and conservation of water resources. The Kitui County River Basins Sand Utilization and Conservation Policy 2023 aims to regulate sand harvesting activities, which impact River ecosystems and water availability. By implementing such policies, the County seeks to balance economic activities with the preservation of water resources, ensuring their sustainability for neighboring regions as well (Kitui County River Basins Sand Utilization and Conservation Policy, 2023).

Inter-County Collaborations

To enhance water service delivery, Kitui County has engaged in partnerships with various organizations. For instance, the County Government signed a Memorandum of Understanding (MoU) with the National Council of Churches of Kenya (NCCK) to collaborate on community development projects, including the provision of water services. This partnership focuses on improving water access in underserved areas, demonstrating the County's commitment to cooperative approaches in addressing water challenges.

Additionally, Kitui County has piloted public-private-community partnerships to manage rural water supply systems. In collaboration with SNV, the County facilitated the signing of delegated management contracts between the KITWASCO and community-managed water systems. These agreements aim to improve water governance, expand service reach, and enhance the resilience of communities to climate effects.

2.2 Current Water Abstraction and Usage Patterns

The Kitui County current water supply and demand, using an average consumption of 50 liters per person in urban and 25 liters per person in rural areas stands at 36,960 m^3 per day, with a projection of 41,646 m^3 per day by 2030. KITWASCO supplies 8,800 m^3 per day while KIMWASCO supplies 5,069 m^3 per day. On the other hand, extraction from groundwater sources is approximately 11,907 m^3 per day, assuming a 6-hr pumping period. This, therefore, leaves a deficit of approximately 11,000 m^3 per day. Assuming everything remains constant, that is, no new infrastructure or improvement of existing sources is done, and then by 2030, the deficit will be at approximately 16,000 m^3 per day.

Challenges in Water Utilization

Kitui County faces several challenges in water utilization**:**

a) **Limited access to piped water**: As of 2019, only 13.4% of households in Kitui County had access to piped water, indicating a heavy reliance on alternative water sources (KIPPRA, 2024).
b) **Environmental degradation**: Activities such as deforestation and unsustainable sand harvesting have led to environmental degradation, impacting water catchment areas and reducing water availability.
c) **Climate variability**: The County experiences frequent droughts and erratic rainfall patterns, exacerbating water scarcity and affecting the reliability of surface and groundwater sources.

Policy and Management Efforts

To address these challenges, Kitui County has developed policies aimed at sustainable water resource management. The Kitui County River Basins Sand Utilization and Conservation Policy, 2023, seeks to regulate sand harvesting and promote conservation efforts to protect River ecosystems and ensure sustainable water extraction.

2.2.1 Sectoral Demand and Consumption Trends

Understanding water demand and consumption across different sectors and how it varies by social status and gender is essential for equitable water resource planning.

Access to Improved Water Sources

Only 56% of Kitui County residents use improved water sources, such as protected springs, boreholes, or piped water. Access to improved water sources is relatively similar between male-headed households (27%) and female-headed households (25%). Mwingi Central Sub-County has the highest share of residents using improved water sources at 39%, while Kitui Rural Sub-County has the lowest at 19%.

Gender Roles in Water Collection

Women and girls are primarily responsible for collecting water, often walking long distances daily. Women leverage social networks and participate in self-help groups to manage and maintain water sources, especially during shortages. Men are most likely to hold leadership positions in the water projects whereas women are often left out in WASH planning. Usage of water for sanitation and hygiene is higher in women and girls than in men and boys.

Socio-Economic Factors Affecting Water Access

Men typically own land where water sources are located, granting them control over access. Low-income households often rely on informal arrangements, such as borrowing water or paying in installments.

Institutional and Policy Considerations

The Kitui Water and Sanitation Company (KITWASCO) and the Kiambere-Mwingi Water and Sanitation Company (KIMWASCO) serve only 32% of the County's population, primarily in urban areas. Many water sources suffer from poor maintenance and functionality, particularly during dry seasons.

Disaggregation by Social Status

a) Low-Income Households:
- Often rely on community water points, vendors, or unimproved water sources.
- Spend a higher proportion of income on water.
- Experience irregular supply and limited storage capacity thus frequent trip to water points for water.
- They have limited access to water infrastructure, reducing productivity and food security.

b) Middle/High-Income Households:
- It is more likely to have piped connections into the household or a nearby collection water point.
- Use significantly more water per capita (for gardening, flushing toilets, washing vehicles, etc.).
- Can afford storage and treatment systems.
- Have a greater access to more water and thus can be use for irrigation.

Emerging Trends and Pressures

Urbanization is increasing household and commercial water demand rapidly. Climate change and variability, on the other hand, are stressing already limited rural water sources, amplifying demand while reducing supply, especially for vulnerable groups. Water vending and privatization is growing, affecting affordability for the poor. There's a rising push for gender-sensitive water programming to address disparities in access and control.

2.3 Seasonal Variations and Climate-Related Vulnerabilities Affecting Water Supply

2.3.1 Seasonal Fluctuations in Water Availability and their Impact on Service Delivery

Seasonal fluctuations in water availability significantly impact service delivery in Kitui County. The County experiences a semi-arid climate with a bi-modal rainfall pattern, leading to pronounced wet and dry seasons. The longer dry season typically begins in May or June and can extend until October or November, though the timing and intensity of rainfall are often unpredictable. The following are the impacts of seasonal fluctuations in water availability on service delivery.

a) Reduced Groundwater Collection During Rainy Seasons

During rainy periods, many residents shift from using groundwater sources to collecting rainwater or utilizing surface water. This behavioral change leads to a significant decrease in groundwater collection from water points. For instance, water service providers like FundiFix have observed a five to tenfold reduction in water collection and near-zero revenues during the rainy seasons.

b) Challenges in Water Infrastructure Maintenance

The shift away from groundwater sources during the rainy season poses challenges for the sustainability of water service providers. Reduced revenue during these periods can hinder the maintenance and operation of water infrastructure, potentially leading to longer repair times and decreased functionality. In Kitui County, an audit revealed that only 56% of piped water schemes and 45% of hand pumps were fully functional at the time of assessment.

c) Increased Vulnerability During Dry Seasons

Extended dry periods exacerbate water scarcity, impacting both domestic and agricultural water use. The lack of adequate water storage facilities, such as dams and reservoirs, limits the County's ability to capture and store rainwater for use during droughts. This situation leads to crop failures, livestock deaths and heightened food insecurity, forcing some residents to migrate in search of better living conditions.

Mitigation Efforts

a) Construction of Sand Dams

To address water scarcity, communities in Kitui and neighboring regions have been constructing sand dams on seasonal Rivers. These structures help harvest and store water during the rainy season, providing a reliable source during dry periods. Sand dams also aid in recharging groundwater and reducing evaporation losses.

b) Desilting of Existing Water Reservoirs

Efforts have been made to desilt dams and water pans to restore their capacity for water storage. For example, the desilting of the Kwa Ndaki dam aimed to regain its full capacity, facilitating better water harvesting during rains and ensuring availability during subsequent dry seasons.

Addressing the challenges posed by seasonal water fluctuations in Kitui County requires a multifaceted approach, including infrastructure improvements, sustainable water management practices, and community engagement to enhance resilience against climate variability.

2.3.2 Climate Risks' Impacts on Water Sources

Climate risks such as droughts and floods significantly affect water sources and service delivery in Kitui County. The following matrix outlines the severity of these impacts, estimated numbers of affected households, and other key indicators.

Table 19: Climate Risk Impact Matrix for Kitui County

Climate Hazard	Water source affected	Severity of impact	Estimated affected households	Key indicators / effects
Drought	- Seasonal Rivers - Earth dams - Shallow wells - Open water pans	High	149,306 (households keeping goats) 147,023 (chickens) 103,497 (donkeys) 30,134 (beehives)	- Water scarcity - Livestock deaths - Crop failure - Food insecurity - Rural-urban migration - Breakdown of family units - Increased theft/crime
Floods	- Seasonal Rivers - Earth dams - Sand dams (overtop risk)	Moderate to High	Not precisely quantified (However, floods have caused displacements and fatalities)	- Flash floods damaging infrastructure - Impassable roads - Transportation delays - Disrupted water access points - Contamination of water sources - Higher food and goods prices

(***Data source:*** *Kitui County Participatory Climate Risk Assessment Report, 2023*)

2.4 Water Resource Challenges

2.4.1 Key Threats to Water Quality and Sustainability

Water quality and sustainability in Kitui County face significant threats, many of which are exacerbated by climate change. Key challenges include:

a) **Microbial Contamination:** A substantial proportion of Kitui residents are at risk of contracting waterborne diseases due to the consumption of contaminated water. Studies have identified high levels of pathogenic microorganisms, such as *E. coli* and total coliforms in water sources like Kalundu Stream and Kalundu Dam, posing significant health risks.

b) **Climate-Induced Water Stress:** Climate change has led to altered rainfall patterns, increased frequency of droughts and floods, and changes in water availability and quality. These changes pose significant threats to water resources in Kitui County.

c) **Environmental Degradation:** Deforestation and land degradation, driven by activities such as tree logging and charcoal burning, have exacerbated the impacts of climate change. These practices contribute to soil erosion and siltation of water bodies, further threatening water quality and availability.

d) **Infrastructure Challenges:** A significant portion of water infrastructure in Kitui County is non-functional due to mechanical breakdown. A County water audit estimated that only 57% of piped schemes and 45% of handpumps were fully operational, highlighting the challenges in providing sustainable drinking water services.

e) **Community Health Risks:** The combination of contaminated water sources and inadequate sanitation practices increases the risk of waterborne diseases, particularly during rainy seasons, when water-related illnesses often rise.

2.4.2 Strategies for Conservation and Sustainable Management

The table below shows a detailed summary of Kitui County's strategies for conservation and sustainable management of water resources; emphasizing the status, effectiveness, and the integration of nature-based solutions (NbS).

Table 20: Water Resource Conservation and Management Strategies in Kitui County

Strategy	Description	Status	Effectiveness	Nature-Based Component
Sand dams and subsurface dams	Small dams built across seasonal Rivers to store water in sand – reducing evaporation and improving groundwater recharge.	Widely implemented by NGOs (e.g., SASOL Foundation). County continues to support expansion.	Proven to increase water access for rural households year-round. Communities report reduced time collecting water.	Uses natural Riverbeds and sedimentation; enhances aquifer recharge.
Reforestation for water catchment protection	Planting of indigenous and fruit trees in critical catchment areas and farms.	Ongoing via initiatives of the County Department of Environment, Climate Change and Forestry; FLLoCA Program, NGOs, CBOs, and other partners like the InterNational Tree Foundation's climate adaptation program.	Helps reduce erosion and increase soil moisture retention; improved crop yields reported.	Promotes soil health, water infiltration, and biodiversity.
Protection of springs and shallow wells	Capping and fencing off of water sources, ensuring hygienic collection.	Implemented in targeted areas; requires expansion and maintenance.	Reduces contamination risk, particularly from livestock and open defecation.	Limited scale but integrates well with natural water flow and filtration.
Construction of water pans and earth dams	Community water reservoirs to store rainwater for dry season use.	Ongoing, often co-funded by the County Climate Change Fund (CCCF).	Improves water availability but prone to siltation and evaporation if not maintained.	NbS potential increases with tree buffer zones and proper siting.
Riverbank and watershed restoration	Planting vegetation and preventing encroachment along Rivers.	Included in County environmental plans, but implementation is localized.	Helps mitigate flooding and improves water quality downstream.	Core nature-based strategy with long-term benefits.
Use of water committees for community-led management	Local governance for source protection, maintenance, and equitable access.	Strong in areas with NGO involvement; weak where support is lacking.	Fosters ownership, reduces conflict, and improves sustainability.	Social governance with NbS synergy (e.g., managing catchment vegetation).
Promotion of climate-resilient agriculture	Techniques like zai pits, mulching, and conservation tillage to reduce water stress.	Adopted in parts of Kitui West, Mwingi North and Kitui Rural.	Reduces water use and runoff, and enhances infiltration.	It indirectly supports sustainable water management.

2.4.3 Potential Climate Change Impacts on Available Water Resources

Climate change significantly impacts water resources in Kitui County, a region characterized by its arid and semi-arid conditions. The County faces challenges such as increased drought frequency, reduced rainfall, and environmental degradation, all of which threaten water availability and quality (Kitui County Environment and Climate Change Policy, 2023).

2.5 Climate Change Vulnerability Assessment

2.5.1 Identification of Climate Hazards affecting Water and Sanitation

The majority of the population (44%) in Kitui County lack access to safe water and sanitation due to climate change impacts, owing to the County's semi-arid climate and increasing vulnerability to climate change. Climate hazards have significantly impacted water and sanitation in the County, primarily due to increased drought frequency, reduced rainfall and rising temperatures, all of which exacerbate water scarcity. These changes lead to challenges in accessing clean water, managing sanitation and ensuring water quality, ultimately affecting public health and livelihoods.

The following are the specific climate hazards that affect water and sanitation systems in Kitui County, and their impacts:

a) **Frequent and Prolonged Droughts:** The frequency of drought in Kitui County is 2 - 3 years. More frequent and prolonged droughts reduce water availability or cause drying of wells, boreholes, pans, springs and Rivers, causing severe water shortages for households, schools and health facilities. This has led to reduced hygiene due to water rationing.
b) **Prolonged Dry Spells between Rainy Seasons:** This causes low recharge rates of aquifers and wells, causing elevated demand for water, especially in schools and health centers. In such scenario, households turn to unprotected water sources such as scoop holes in dry Riverbeds.
c) **Erratic and Reduced Rainfall:** Changes in rainfall patterns, including a decrease in overall precipitation and shifts in seasonal rainfall, further intensify water scarcity, making it harder to replenish water sources. Water scarcity makes it difficult to operate and maintain sanitation systems.
d) **Rising Temperatures:** Higher temperatures increase water evaporation rates from dams and pans, leading to faster depletion of water reserves and potentially degrading water quality through increased microbial growth and chemical contamination. The combination of water scarcity, contamination of water sources, and poor sanitation increases the risk of waterborne diseases, malnutrition and other health problems in vulnerable communities.
e) **Flooding:** Intense rainfall events overwhelm drainage and cause flash floods, damaging shallow water sources and sanitation infrastructure (latrines, septic systems), and contaminating water sources with waste and pathogens.
f) **Land Degradation and Desertification:** Climate change impacts such as drought contribute to limited vegetation cover and desertification, which reduces infiltration rates in water catchments, lowering the replenishment of groundwater reserves. Low vegetation cover contributes to accelerated soil erosion which silts up water pans and dams, reducing their capacities.

2.5.2 Characterization of Climate Change Impacts in Kitui County

Kitui County lies in Kenya's ASALs, making it highly vulnerable to climate change and variability. Over recent decades, observable shifts in climate patterns have had significant socio-economic and environmental consequences.

According to the Kitui County Participatory Climate Risk Assessment (PCRA) Report (2023), climate change in Kitui County manifests through increased temperatures, altered rainfall patterns and more frequent and intense droughts, leading to water scarcity, reduced agricultural productivity and increased vulnerability for communities reliant on these resources. These changes exacerbate existing vulnerabilities, impacting livelihoods, food security and the sustainability of value chains in the County. Furthermore, competition over scarce resources like water and pastureland has been fueling conflict and instability, particularly in areas of Ngomeni, Endau/Malalani, Tseikuru, Mutha, Athi, Ikutha, Kanyangi, Chuluni and Mutomo wards.

The following key factors characterize climate change in Kitui County:

a) **Extreme Temperatures**: Kitui County, characteristically, experience extreme temperature variations, with the months of January - March and June - September, experiencing heat stress. The increasing temperatures above average have led to severe events of drought due to drying up of water resources. An increase in warmer days has been noted in Mwingi North, Kitui South and Kitui East Sub-Counties. Projections indicate continued warming, especially in the dry spells. The extreme temperatures cause increased evaporation from water reservoirs; heat stress on both humans and livestock; shift in agro-ecological zones (i.e. traditional crops struggle, and pests and diseases like fall armyworm and ticks are more prevalent); and decreased water quality due to higher bacterial activity in warmer water.
b) **Changes in Rainfall Patterns:** Kitui County faces erratic rainfall that makes it difficult for farmers to plan and manage their crops, leading to reduced yields and food insecurity. Rainfall onset is delayed, with mid-season dry spells and early cessation becoming common. Rainfall is now more intense but short-lived, leading to flash flooding and runoff. The unreliable rainfall patterns have caused planting uncertainty and reduced agricultural productivity.
c) **Drought and Water Scarcity**: Historically, major droughts occurred every 5 – 7 years. Currently, droughts recur every 2 – 3 years, with increasing severity and duration, leading to chronic water stress. Persistent and intense droughts cause crop failures, affecting household food security; contribute to increased livestock mortality due to lack of pasture and water; cause drying of water sources such as Rivers, seasonal streams, boreholes and shallow wells; lead to malnutrition, especially in children under five, due to food and water scarcity; and enhance school dropouts, especially girls who miss school to fetch water or migrate with families in search of pasture. Environmental degradation occurs as a result of desertification, soil erosion and loss of biodiversity, further exacerbating vulnerability.
d) **Extreme Weather Events:** Climate change has increased the intensity and frequency of extreme events like flash floods, which damage infrastructure, disrupt livelihoods and cause displacement. Flash flooding causes soil erosion and land degradation due to heavy rainfall in short bursts, which leads to silting of earth dams and pans, reducing their storage capacities. Increased runoffs causes poor infiltration and surface water loss instead of groundwater recharge.
e) **Reduced Agricultural Productivity**: Shifts in rainfall and temperature have impacted crop yields, leading to food shortages and increased food prices.
f) **Livestock Impacts:** Livestock keeping is a crucial livelihood for many communities in Kitui County. However, inadequate forage availability due to drought and heat stress has

negatively impacted livestock rearing in the County, leading to low productivity and death of livestock.

g) **Increased Vulnerability:** Climate change impacts have disproportionately affected vulnerable communities in Kitui County, exacerbating their vulnerability to climate hazards.
h) **Ecosystem Degradation:** Increased aridity and changes in temperature and rainfall patterns have led to land degradation, including desertification and loss of biodiversity.

2.5.3 Exposure of WASH Infrastructure and of Water Resources

In Kitui County, climate change has significantly impacted WASH (Water, Sanitation, and Hygiene) infrastructure and water resources, increasing their vulnerability to various hazards. Increased frequency and intensity of extreme weather events like floods and droughts, rising temperatures as well as changes in water availability and quality have posed a threat to WASH services. Below are the specific impacts of climate change to WASH infrastructure and water resources in the County;

a) **Extreme Weather Events:** High intensity storms cause flash floods which damage existing WASH infrastructure, hindering access to clean water and sanitation. Contamination of open water sources such as earth dams, scoop holes, water pans and shallow wells is prevalent in Kitui County due to flash floods. Flood waters wash debris, fecal matter and agricultural runoff into water sources, severely impacting water quality. Pit latrines flood or collapse, especially in areas with poor drainage and sandy soils. Public sanitation facilities are damaged, particularly in low-lying schools and health centers. Access roads to water points become impassable, affecting water trucking and maintenance activities.
b) **Rising Temperatures:** High temperatures accelerate evaporation from open water bodies, especially water pans, reducing their storage efficiency. Furthermore, algae growth and pathogen survival in warmer water increases the risk of waterborne diseases. High temperatures accelerate the degradation of latrines and increase bad odors, reducing user preference.
c) **Water Scarcity and Drought:** Climate change has exacerbated the existing water scarcity issues in Kitui County (Kitui County PCRA Report, 2023). Prolonged droughts have occurred over the years, causing water sources such as seasonal Rivers, water pans and springs to dry up earlier than expected, hence reducing water availability for households, schools and healthy facilities. Groundwater levels fall due to overexploitation and low recharge rates, making shallow wells and boreholes less productive or non-functional. This triggers high water demands for livestock, agriculture and households, particularly in the rural areas, exerting pressure on limited supplies. Water scarcity makes households turn to unsafe and unprotected sources, leading to outbreaks of waterborne diseases such as diarrheal. Competition for water resources among different users, has triggered conflicts, particularly in the rural parts of the County i.e. Ngomeni, Nguni and Mutha Wards (Kitui County PCRA Report, 2023). Reduced water availability, on the other hand, limits functionality of sanitation systems, further exacerbating health risks. Besides, maintenance needs increase as water demands escalate, causing pumps to run dry or break down from overuse during dry spells.
d) **Increased Vulnerability:** Climate change has disproportionately affected the marginalized and vulnerable groups in Kitui County, mainly women and the elderly in the

rural parts of the County, exacerbating the existing inequalities in access to WASH services.

The combination of these factors highlights the need for climate-resilient WASH systems and policies to protect public health and ensure equitable access to safe water and sanitation services in the face of a changing climate.

2.5.4 Analysis of Climate Risks Based on Hazards and Exposure

Historical Climate Hazards and Risks Profile

Kitui County face heightened climate risks due to increased exposure to droughts, high temperatures and extreme weather events, exacerbated by climate change. The County is highly vulnerable to climate hazards because its ecosystems and livelihoods, particularly agriculture and livestock, heavily depend on rainfall and water availability. The combination of these hazards and high exposure creates a complex web of risks that impact food security, livelihoods and overall stability.

The Kitui County PCRA, 2023 identified and ranked four (4) climate hazards in the County as follows;

1. Drought
2. Environmental degradation
3. Floods
4. Extreme temperatures

Table 21 below illustrates the historical climate hazards and risks profile for Kitui County.

Table 21: Kitui County Historical Climate Hazards and Risks Profile

Period	Hazard	Risks
1980 - 1981 2007 - 2011 2012 - 2022	Drought	- Famine (Nikwa ngwete) - Water scarcity - Human-human conflict (Ngomeni, Nguni and Mutha) - Human-wildlife conflict (Ikutha, Endau/Malalani, Voo Kyamatu, Tseikuru)
2000 - 2022	Environmental Degradation	- Loss of biodiversity - Degradation of environmentally sensitive ecosystems
1993 1997 2002 2006	Floods	- Low crop yield - Destruction of infrastructure/property - Destruction of farming lands - Loss of lives - Outbreak of waterborne diseases
1998 – 2004 2006 – 2008 2014 – 2016 2020 - 2022	Extreme high temperatures	- Heat stress

*(**Data source:** Kitui County Participatory Climate Risk Assessment Report, 2023)*

Exposure and Vulnerability Profiles

According to the Kitui County PCRA report (2023), the climate vulnerable groups are women, youth, PWD, children, elderly and children-headed households. Climatic conditions dictate the livelihoods of the people and their exposure to climate hazards. Table 22 below shows the vulnerable groups and their livelihoods that have been exposed to climate hazards.

Table 22: Vulnerable Groups and their Livelihoods that have Been Exposed to Climate Hazards

S/No.	Hazard	Vulnerable Groups Exposed	Livelihoods Affected
1.	Drought	Women, youth, PWD, elderly	- Crop farming - Livestock keeping - Horticulture farming - Kitchen garden - Poultry farming - Boda boda
2.	Environmental Degradation	Women, youth, PWD, elderly	- Crop farming - Livestock keeping - Horticulture farming - Kitchen garden - Poultry farming
3.	Floods	Women, youth, PWD, elderly	- Crop farming - Horticulture farming - Boda boda - Retail businesses - Market days
4.	Extreme temperatures	Women, youth, PWD, elderly	- Crop farming - Livestock farming - Boda boda and retailing

*(**Data source;** Kitui County Participatory Climate Risk Assessment Report, 2023)*

Differentiated Impacts of Climate Trends and Risks

Table 23 below shows differentiated impacts of climate trends and risks in Kitui County.

Table 23: Differentiated Impacts of Climate Trends and Risks in Kitui County

Hazard	Direct and indirect impacts	
	Impacts on community	**Impacts on ecosystems/biodiversity**
Drought	- Low crop yields - Death of livestock - Loss of household incomes - Rural-urban migration - Family conflicts and breakups - Increased crime (theft issues) - Human-human conflict - Human-wildlife conflict	- Drying of springs - Loss of vegetation and forest cover - Extinct of indigenous tree species - Lowered water table - Migration of wildlife (wild animals) - Destruction/loss of natural habitats
Environmental degradation	- Low crop yields - Death of livestock - Loss of household incomes - Human-human conflict - Human-wildlife conflict	- Drying of springs - Loss of vegetation and forest cover - Extinct of indigenous tree species - Lowered water table - Migration of wildlife (wild animals) - Destruction/loss of natural habitats
Floods	- Destruction of crops - Destruction of farming lands - Loss of lives - Destruction of infrastructure - Outbreak of waterborne diseases	- Loss of aesthetic value of landscapes - Destruction of wildlife - Soil erosion - Siltation of water reservoirs
Extreme temperature	- Drying of crops - Low yields - Loss of income - Heat stress - Headaches and human suffering - Increased snake bites	- Migration of wildlife - Drying of water springs and reservoirs - Drying of vegetation - Emergence of invasive species

*(**Data source:** Kitui County Participatory Climate Risk Assessment Report, 2023)*

Spatial Distribution of Hazards and Associated Risks in Kitui County

The following table shows the hazards, associated risks and the affected Wards. Maps for each hazard and spatial risk distribution are shown in the Kitui County PCRA report, 2023.

Table 24: Hazards and Associated Risks per Ward

S/N	Hazard	Associated Risk	Ward
1.	Drought	Water scarcity	***Most hit areas:*** Mui, Ikanga, Kauwi, Chuluni, Ikutha, Kanyangi, Kiomo/Kyethani, Yatta/Kwa Vonza, Kyome/Thaana, Endau/Malalani, Voo/Kyamatu, Kanziko/Simisi, Athi, Mutomo/Kibwea, Kyuso, Tharaka, Ngomeni, Tseikuru, Mumoni, Mutha. ***Moderately hit areas:*** Mutitu/Kaliku, Nguni, Waita, Nzombe/Mwitika, Kivou, Nuu, Ngutani, Mui, Nguni. ***Low hit areas:*** Kyangwithya East, Kyagwithya West, Kithumula/Kwa Mutonga, Kisasi, Mulango, Miambani, Mwingi Central, Nzambani, Mbitini, Kitui Township, Matinyani, Migwani.
		Lack of pasture	***Most hit areas:*** Ngomeni, Mutha, Kanziko, Endau/Malani,Mumoni, Tharaka, Tseikuru, Nguni,Athi, Ikutha, Nzombe/Mwitika, Mutitu/Kaliku, Yatta/Kwa Vonza. ***Moderately hit areas:*** Chuluni, Ikanga, Kanyangi, Mutomo, Waita, Ngutani. ***Low hit areas:*** Miambani, Kyangwithya east, Kyangwithya west, Mulango, Kisasi, Mbitini, Nzamabni and Kitui township.
		Low crop yields	***Most hit areas***: Mui, Ikanga/Kyatune, Kauwi, Chuluni, Ikutha, Kanyangi, Kiomo/Kyethani, Yatta/Kwa Vonza, Kyome/Thaana, Endau/Malalani, Voo/Kyamatu, Kanziku/Simisi, Athi, Mutomo/Kibwea, Kyuso, Tharaka, Ngomeni, Tseikuru, Mumoni, Mutha. ***Moderately hit areas:*** Mutitu/Kaliku, Nguni, Waita, Nzombe/Mwitika, Kivou, Nuu, Ngutani, Mui, Nguni. ***Low hit areas:*** Kyangwithya East, Kithumula/Kwa Mutonga, Kisasi, Mulango, Miambani, Mwingi Central, Nzambani, Mbitini, Kitui Township Matinyani, Migwani, Kyagwithya West.
		Human/wildlife conflict	***Areas:*** Ngomeni, Endau/Malalani, Tseikuru, Mutha, Athi, Ikutha, Kanyangi, Chuluni, and Mutomo.
2.	Environmental degradation	Degrading ecosystems/habitats	***Areas:*** Mui, Ikanga/Kyatune, Chuluni, Ikutha, Kanyangi, Kiomo/Kyethani, Yatta/Kwa Vonza, Kyome/Thaana, Endau/Malalani, Voo/Kyamatu, Kanziku, Athi, Mutomo/Kibwea, Ngomeni, Tseikuru, Mumoni, Mutha Nuu and Nguni.
		Pollution of air, water, and soils	***Areas:*** Kitui Township, Mwingi Central, Mutomo/Kibwea, Kyuso, Kauwi, Kyagwithya West, Kyangiwthya East, Mulango, Yatta/Kwa Vonza.
3.	Flash Floods	Landscape changes	***Areas:*** Nguni, Chuluni, Voo/Kyamatu, Mutha, Athi.
		Soil erosion	***Areas:*** Nguni, Chuluni, Voo/Kyamatu, Mutha, Athi.
4.	Extreme temperatures	Emergence of crop pests and diseases	***Areas:*** Ngomeni, Kyuso, Mumoni, Tseikuru, Tharaka, Waita, Nguni, Mwingi Central and Kivou ward.

*(**Data source:** Kitui County Participatory Climate Risk Assessment Report, 2023)*

The table below shows a summary of climate risks based on climate hazards and the exposure of water resources, WASH infrastructure, ecosystems, community livelihoods and environment in

Kitui County. This format supports planning, risk reduction and prioritization of climate adaptation actions.

Table 25: Summary of the Analysis of Climate Risks Based on Hazards and Exposure in Kitui County

Climate hazard	Type of exposure	Specific exposure description	Potential impacts	Overall risk level
Drought	Water resources	Drying of seasonal Rivers, water pans and boreholes due to prolonged dry spells; breakdown of water infrastructure i.e. pumps due to overuse.	Water scarcity; overuse of unprotected sources; increased waterborne disease risk.	High
	WASH infrastructure	Inadequate water for sanitation in households, schools and health facilities; latrine use is adversely affected.	Poor hygiene; increased disease transmission (i.e. cholera, diarrhea)	High
	Agriculture	High temperatures; erratic and low rainfall; new pests and diseases.	Low crop and livestock productivity; crop failure; livestock mortality	High
	Livelihoods	Food insecurity; water scarcity; environmental degradation.	Malnutrition; lack of sufficient water to maintain sanitation systems; poor water quality; health risks due to poor hygiene; asset loss; displacement; increased poverty.	High
Flash Floods	Water sources	Flooding of shallow wells, scoop holes and unprotected springs.	Water contamination; siltation of water sources i.e. dams, pans reduce their capacity.	Moderate to High
	Sanitation facilities	Pit latrines and septic tanks built in flood-prone, low-lying areas.	Structural collapse; environmental contamination i.e. pollution of water sources (poor water quality)	High
	Settlements & roads	Informal settlements and rural access roads lack drainage infrastructure.	Property loss; inaccessibility to water points, schools and health centers.	Moderate
	Soil & environment	Flood-induced erosion.	Loss of fertile topsoil; reduction in water infiltration rates and loss of surface water – low aquifer recharge rates.	High
	Livelihoods	Loss of lives, property, crops and livestock; contamination of water sources; environmental degradation.	Grief; disruption of the local economy; food insecurity; increased incidences of waterborne diseases i.e. cholera, typhoid and dysentery; poor land productivity.	Moderate to High
Rising Temperatures	Water sources	Increased evaporation from waters resources i.e. water pans, dams, tanks.	Reduced usable water; lower water storage efficiency.	Moderate
	Human health	Heat stress; increased bacterial growth in stored water.	Health risks; increased cost of water treatment.	Moderate
	Crops and livestock	Heat stress on staple crops (maize, beans) and livestock.	Lower yields; increased mortality; pest invasions.	High
	Ecosystems	Drying up of wetlands; increased fire risk in dryland forest areas	Habitat loss; loss of biodiversity.	Moderate to High
Land Degradation	Water catchments	Loss of vegetation cover due to desertification, deforestation and overgrazing.	Reduced groundwater availability due to low infiltration rates.	High
	WASH infrastructure	Siltation and weakening of water pans; blocking pipes and tanks.	Increased maintenance costs; failure of WASH systems.	Moderate to High
	Agricultural land	Permanent loss of soil productivity; accelerated erosion on slopes.	Unsustainable farming; poverty.	High

*(**Data source:** Kitui County Participatory Climate Risk Assessment Report, 2023)*

2.6 Water Supply Services Coverage and Gaps

2.6.1 Overview of Water Supply Systems and Service Levels and Water Quality

Water supply systems and service levels in Kitui County exhibit notable disparities between urban and rural areas, influenced by infrastructure availability, water source reliability and quality aspects.

Urban Water Supply Systems and Service Levels

Urban centers like Kitui and Mwingi towns are primarily served by two water service providers: KITWASCO and KIMWASCO. These providers mainly operate in urban areas, with limited reach into rural regions. In 2017, only about 32% of the County's population was served by these providers, and approximately 42% had access to at least basic water services.

The Masinga–Kitui Water Supply Project is a significant urban water scheme, sourcing water from Masinga Dam along Tana River. It includes treatment works with a capacity of 8,640 m^3/day and a distribution network supplying Kitui town and surrounding areas. Other sources for the utility include five (5) boreholes in Matinyani, four (4) in Ikanga, three (3) in Katwala, one (1) in Voo South West, one (1) in Mutitu, two (2) in Kwa Vonza, one (1) in Kavisuni South West, one (1) in Athi River- Kangu Kangu, eight (8) in Kitui Township and one (1) in Kanyangi. Additionally, the utility has water reservoirs at Kwamuthumba (3,000m^3), Katheka (3,000m^3) and Kwa-Ngindu (15,000m^3). Additionally, KITWASCO operates water kiosks at every KITWASCO station and boreholes across the County.

Rural Water Supply Systems and Service Levels

Rural areas in Kitui County rely on a mix of water sources:

a) Surface water: Streams and Rivers, used by about 42.3% of the population.
b) Boreholes: Accessed by 13.2% of residents.
c) Public taps: Utilized by 9.3%.
d) Protected wells: Used by 6.3%.
e) Unprotected wells: Accessed by 6.2%
f) Water vendors: Relied upon by 5.9%.
g) Dams: Used by 5.5%.

Many rural residents practice rainwater harvesting through roofs, gutters, rock catchments and sand dams. However, during extended dry periods (June to October), these sources become unreliable, leading to water scarcity.

In 2017, Kitui County had 3,126 water sources, both equipped (e.g., hand pumps, piped schemes) and non-equipped (e.g., sand dams, shallow wells). Only about 60% of these sources were fully functional. Currently, in 2025, over 3,500 rural water supplies are in existent but only 52.6% are fully functional and 12% partially functional.

To improve rural water service reliability, initiatives like professionalized maintenance services have been introduced, eg the FundiFix Model working in Mwingi North sub-County. This has consequently reduced the average repair time from one to two months to two days or less for hand pumps and 5 days for piped schemes (REACH, 2022).

Water Quality Concerns

According to the draft County policy on Water and Sanitation (2024), water quality-related challenges in Kitui County include salinity and mineral content in the ground water, due to inadequate use of safely managed sanitation services and lack of access to safely managed water services. These challenges hamper the provision of adequate water of sufficient quality to rural, urban and peri-urban areas. For this reason, most of the groundwater is rendered unusable for domestic purposes due to poor quality.

Water samples from the Masinga – Kitui supply system were contaminated with *E. coli* and total coliforms, exceeding WHO and KEBS limits. The contributing factors included poor sanitation, inadequate waste management and poorly maintained infrastructure. In addition, it has emerged that many households in urban areas of the County rely on shallow wells and other sources, whose quality is untested and in other cases where the water is deemed unsafe for domestic consumption, hence posing a major public health risk.

Groundwater sources in rural areas often have high salinity levels, making them unsuitable for drinking. Innovative solutions like solar-powered desalination units have been implemented in areas like Ndauni Market, providing clean water and reducing the need for long treks to fetch water (SNV, 2022).

The peri-urban areas that are serviced by the two main WSPs are characterized by few households accessing water piped into dwelling, while the majority have access to a basic service through standpipes in plot/yard, and through water kiosks.

Table 26 below shows a summary of Kitui County groundwater quality analysis results at Ward level.

Table 26: Summary of Kitui County Groundwater Quality Analysis Results at Ward Level

Parameters	**Av. of pH**	**Max. of colour**	**Max. of conductivity (25°c)**	**Max. of total alkalinity**	**Max. of total dissolved solids**	**Max. of total hardness**
Unit	pH scale	mgPt/l	µS/cm	$mgCaCO_3/l$	mg/l	$mgCaCO_3/l$
WHO Standards	6.5-8.5	15	2500	500	1500	500
KEBS (KS 459-1:2007) Standards	6.5-8.6	15	-	-	1000	300
Kitui Central Sub-County Wards						
Kyangwithya West	7.8	5	6840	342	4240.8	2500
Mulango	7.7	0	630	226	390.6	216
Mulutu	7.1	5	5070	300	3143.4	2150
Township	7.9	60	600.5	164	372.31	158
Kitui East Sub-County Wards						

Parameters	Av. of pH	Max. of colour	Max. of conductivity (25°c)	Max. of total alkalinity	Max. of total dissolved solids	Max. of total hardness
Endau/Malani	7.4	75	26620	644	15700	4750
Mutito/Kaliku	8.1	0	1875	500	1315	140
Mutitu/Kaliku	7.5	25	1990	501.6	1090	270.48
Nzambani	7.5	0	1078	354	668.36	384
Voo	7.1	40	9320	124	5778.4	3500
Voo/Kyamatu	7.0	60	25100	370	15562	10750
Zombe	8.0	10	7770	840	4817.4	140
Kitui Rural Sub-County Wards						
Kanyangi	7.2	0	2290	482	1419.8	162
Kavisuni	7.7	40	2070	432	1283.4	530
Kisasi	7.8	40	3540	410	2194.8	1780
Kwa Vonza/Yatta	7.8	30	4295	414	2662.9	960
Mbitini	8.1	20	2130	476	1320.6	760
Nzambani	7.2	0	439	170	272.18	156
Yatta/Kwa Vonza	7.8	0	1427	356	884.74	268
Kitui South Sub-County Wards						
Athi	7.2	150	3290	424	2039.8	860
Ikanga/Kyatune	7.6	60	5327	360	3302	2080
Ikutha	7.5	0	4320	970	2678.4	720
Kanziku	7.6	70	10650	546	6603	1680
Mutha	7.9	20	7480	538	4637.6	2280
Mutomo	8.2	0	1905	200	118.1	310
Kitui West Sub-County Wards						
Matinyani	7.1	0	397	146	246.14	80
Mutonga/Kithumula	7.7	70	2370	388	1450.8	870
Mutonguni	7.3	60	1994	374	1236.28	668
Mwingi Central Sub-County Wards						
Kivou	7.7	0	2610	458	1618.2	960
Mui	7.6	0	3110	33	1928.2	1000
Mwingi Central	7.9	0	1151	294	713.62	158
Nguni	7.7	60	12520	718	7762.4	1300
Nuu	7.5	100	7250	700	4495	2000
Waita	6.9	20	305	80	189.1	176
(Unnamed)	8.1	0	746	336	462.52	148
Mwingi North Sub-County Wards						
Katse	8.2	0	965	238	598.3	202
Kyuso	7.9	85	7780	472	4823.6	2920
Mumoni	7.8	50	4010	516	2486.2	1000
Ngomeni	8.2	0	12650	500	7843	8200

Parameters	Av. of pH	Max. of colour	Max. of conductivity (25°c)	Max. of total alkalinity	Max. of total dissolved solids	Max. of total hardness
Tseikuru	7.5	0	5280	600	3273.6	1500
Mwingi West Sub-County Wards						
Kiomo	8.0	0	960	250	595.2	370
Kiomo/Kyethani	7.6	20	5930	300	3676.6	2640
Migwani	7.6	0	1405	334	871.1	552
Nguutani	7.8	10	1973	410	1223.26	630
Others (Boreholes in Kwa Sendi, Iyani/Manyuni, and Kyuasini)	7.4	20	6310	602	3912.2	2480

(***Data source:*** *County Department of Water)*

Tables 27 and 28 below shows an inventory of saline boreholes in each sub-County. It is worthy of note that many of the boreholes that were found to have high salinity were either abandoned, used for purposes of brick making or for watering livestock only. However, a borehole at Kasaini in Mwingi North's Tseikuru Ward had a desalination plant installed but, it was found to be slow and inefficient to serve the population in need.

Table 27: Summary of Kitui County Saline Boreholes at Sub-County Level

Sub-County	No. of Saline Boreholes
Kitui Central	22
Kitui East	25
Kitui Rural	18
Kitui south	27
Kitui West	32
Mwingi Central	67
Mwingi West	12
Mwingi North	27
Total	**230**

Table 28: Kitui County Saline Boreholes Inventory

Sub-County/Ward	Average of population density per sq km	Average of yield (m^3/hr)	Level of salinity
Kitui Central Sub-County			
Kyangwithya East	294	4.0	Low
Kyangwithya West	143	8.1	Low
Miambani	94	8.0	Medium
Mulango	262	5.8	Low
Township	393	4.3	Low
Kitui East Sub-County			
Endau/Malalani	6	8.5	High
Mutitu/Kaliku	39	5.0	High
Voo/Kyamatu	41	3.7	High
Zombe/Mwitika	53	7.9	High

Sub-County/Ward	Average of population density per sq km	Average of yield (m^3/hr)	Level of salinity
	56	15.0	Medium
Kitui Rural Sub-County			
Kanyangi	56	9.2	Medium
	56	26.1	Medium
Kisasi	157	3.5	High
	157	8.8	Medium
Mbitini	263	3.2	Medium
Yatta/Kwa Vonza	37	4.0	High
	37	8.1	Medium
Kitui South Sub-County			
Athi	40	2.0	High
Ikutha	63	7.0	High
Kanziko	55	5.5	High
Mutha	20	4.1	High
Mutomo/Kibwea	77	2.7	High
Kitui West Sub-County			
Kauwi	121	7.2	High
	121	3.7	Low
	121	4.0	Medium
Kwa Mutonga/Kithumula	87	8.0	High
	87	10.0	Low
	87	4.0	Medium
Matinyani	181	12.0	Low
	181	4.0	Medium
Mutonguni	261	2.0	High
	261	8.3	Low
Mwingi Central Sub-County			
Kivou	108	3.7	Medium
Mui	58	4.2	High
Mwingi Central	163	4.5	Medium
Nguni	17	6.8	High
Nuu	28	2.3	High
Waita	58	2.0	Medium
Mwingi North Sub-County			
Kyuso	56	9.1	High
Mumoni	48	2.5	High
Ngomeni	15	3.8	High
Tseikuru	30	4.1	High
Mwingi West Sub-County			
Kiomo/Kyethani	65	4.0	High

Sub-County/Ward	Average of population density per sq km	Average of yield (m^3/hr)	Level of salinity
Kyome/Thaana	161	21.4	Medium
Migwani	125	5.9	Medium
Nguutani	94	3.8	Medium

The Japan InterNational Corporation Agency (JICA), a development partner in Kitui County, conducted a quality analysis survey of water projects across the County to provide an indication of the potential of water sources for domestic use. The table below is a summary of the water quality across the County Wards.

Table 29: Kitui County Boreholes' Water Quality Analysis

Sub-County/Ward	Quality Report
Kitui Central Sub-County	
Miambani Ward	The water is chemically suitable for domestic purposes
Kitui East Sub-County	
Chuluni Ward	The water is chemically suitable for domestic purposes
Endau/ Malalani Ward	Highly mineralized hard, saline clean water with slightly high nitrite content. The other chemical characteristics are satisfactory
Mutito/ Kaliku Ward (1)	Hard, saline clear water whose other chemical characteristics are satisfactory for domestic use
Mutito/ Kaliku Ward (2)	The water is chemically suitable for domestic purposes
Zombe/Mwitika Ward (1)	Hard, saline clear water whose other chemical characteristics are satisfactory for domestic use
Zombe/Mwitika Ward (2)	The water is hard but chemically suitable for domestic purposes
Kitui Rural Sub-County	
Yatta/ Kwa Vonza Ward (1)	Moderately hard water with slightly high fluoride but chemically suitable for domestic use
Yatta/ Kwa Vonza Ward (2)	The water is chemically suitable for domestic purposes
Kitui South Sub-County	
Ikanga/ Kyatune Ward	The water is chemically suitable for domestic purposes
Kitui West Sub-County	
Matinyani Ward (1)	Moderately hard, colored water with slightly high fluoride content. Other chemical characteristics are satisfactory
Matinyani Ward (2)	The water is chemically suitable for domestic purposes
Mutonguni Ward (1)	The water is chemically suitable for domestic purposes
Mutonguni Ward (2)	The water is hard but chemically suitable for domestic purposes
Mwingi Central Sub-County	
Mui Ward (1)	Hard, saline water but chemically suitable for domestic use
Mui Ward (2)	Hard,slightly saline water but chemically suitable for domestic uses
Mui Ward (3)	The water is chemically suitable for domestic purposes
Mui Ward (4)	The water is hard but chemically suitable for domestic purposes
Nuu Ward (1)	The water is chemically suitable for domestic purposes
Nuu Ward (2)	The water is hard but chemically suitable for domestic purposes
Mwingi North Sub-County	
Kyuso Ward (1)	Hard, slightly saline water with high sodium and chloride contents. Mixing with water of low mineral content will better the quality

Sub-County/Ward	Quality Report
Kyuso Ward (2)	Hard, slightly saline water but chemically suitable for domestic uses
Kyuso Ward (3)	Slightly saline water with rather high fluoride content. Other chemical characteristics are satisfactory
Kyuso Ward (4)	The water is chemically suitable for domestic purposes
Kyuso Ward (5)	The water is hard but chemically suitable for domestic purposes
Mumoni Ward (1)	Hard, slightly saline water with high sodium and chloride contents. Mixing with water of low mineral content will better the quality
Mumoni Ward (2)	Hard, slightly saline water but chemically suitable for domestic uses
Mumoni Ward (3)	Moderately hard water with rather high fluoride content. Other chemical characteristics are satisfactory
Tharaka Ward	The water is chemically suitable for domestic purposes
Mwingi West Sub-County	
Migwani Ward (1)	Hard water with rather high fluoride content. Other chemical characteristics are satisfactory
Migwani Ward (2)	Hard, clear water with rather high fluoride and chloride contents. The other chemical characteristics are satisfactory
Migwani Ward (3)	Hard, slightly saline water but chemically suitable for domestic uses
Migwani Ward (4)	Moderately hard, clear water with slightly high fluoride content
Migwani Ward (5)	Slightly saline water with rather high fluoride content. Other chemical characteristics are satisfactory
Migwani Ward (6)	The water is chemically suitable for domestic purposes

Urban vs Rural Disparities

The disparities between urban and rural water services in Kitui County are evident as follows;

- **Infrastructure**: Urban areas benefit from centralized water treatment and distribution systems, while rural areas rely on decentralized and often less reliable sources.
- **Access**: Urban residents have higher access to piped and treated water, whereas rural residents often travel long distances (4 – 7 km) to access water.
- **Quality**: Urban water systems face contamination issues due to infrastructure challenges, while rural areas deal with natural water quality issues like salinity.

2.6.2 Infrastructure Gaps and Capacity Constraints

Water infrastructure gaps and capacity constraints in urban and rural areas of Kitui County are significant and multifaceted. Here's a breakdown of the current challenges, focusing on infrastructure gaps and capacity constraints in both urban and rural contexts:

a) Urban Areas

Infrastructure Gaps

- **Aging and Limited Piped Water Systems:** Kitui town and other urban centers rely on outdated infrastructure which has outlived its design period, with limited expansion to meet the growing population.
- **Inadequate Water Storage Facilities:** Urban centers often lack sufficient reservoirs or elevated tanks to ensure continuous supply during shortages.

- **Limited Sewerage and Wastewater Treatment Systems:** Most urban areas still lack comprehensive sewer systems, leading to pollution and public health risks.
- **Inefficient Water Distribution:** Leakages due to aged infrastructure and illegal connections reduce the efficiency of urban water systems due to high Non-Revenue Water.

Capacity Constraints

- Low technical capacity of local utilities (e.g. KITWASCO) to manage and maintain infrastructure.
- Limited financial resources to invest in large-scale urban water projects.
- Poor coordination between County departments, utility providers and development partners.
- Weak regulatory enforcement, resulting in poor service quality and accountability issues.

b) Rural Areas

Infrastructure Gaps

- Sparse and scattered water access points: Many villages rely on seasonal Rivers, earth dams, boreholes, and shallow wells.
- Poorly maintained water projects: Many rural water schemes collapse due to lack of maintenance or community ownership.
- Low coverage of rainwater harvesting systems, despite potential due to Kitui's bimodal rainfall.
- Limited use of modern technology: Few rural water projects use solar-powered pumps, remote monitoring, or modern storage solutions.

Capacity Constraints

- Insufficient trained personnel at the community level for maintenance and operation.
- Weak institutional support for community water management committees.
- Inadequate funding for rural water development and rehabilitation.
- Increased drought frequency strains already limited water sources.

c) Cross-Cutting Issues

- High non-revenue water (NRW) due to leaks, poor metering and theft.
- Gender and social equity issues whereby women and girls bear the burden of water collection in rural areas, affecting education and income opportunities.
- Lack of real-time data hampers planning and rapid response to breakdowns or shortages.
- Over reliance on external support in case of any challenge.

2.6.3 Social and Gender-Disaggregated Water Supply

Water access in Kitui County is deeply influenced by gender, socio-economic status, disability, age and geographic location. Disparities in access to clean, reliable water supply have pronounced impacts on vulnerable populations, particularly women and girls.

a) Women and Girls Disproportionate Burden

- **Time and Labor:** Women and girls are primarily responsible for fetching water, often walking 5 – 10 km daily, especially in rural areas. This affects school attendance, economic productivity and health, due to the heavy physical burden.
- **Education:** Girls are more likely to miss school during drought seasons or due to menstruation-related issues when schools lack clean water and sanitation facilities.
- **Gender-Based Violence (GBV)**: Long treks to distant water points increase vulnerability to GBV, especially during early morning or late evening hours.
- **Limited Decision-Making Power**: Despite being the primary users and managers of household water, women are often underrepresented in water management committees and local decision-making platforms.

b) Impact on Other Vulnerable Groups

- **Elderly and Persons with Disabilities (PWDs:** These groups often cannot walk long distances to fetch water and depend on caregivers, making them highly vulnerable during shortages. Infrastructure is rarely designed with accessibility in mind e.g., no ramps, hand pumps are too heavy to operate.
- **Children:** Young children are at higher risk of waterborne diseases due to poor water quality. In some cases, children are tasked with fetching water, compromising their safety and education.
- **Poor Households**: In both rural and peri-urban areas, low-income households often pay more for water from vendors, especially during drought, while wealthier families may have private storage tanks or piped supply.

The table below shows a summary of social and gender-disaggregated water access challenges in Kitui County.

Table 30: Summary of Social and Gender-Disaggregated Water Access Challenges in Kitui County

Group	Key Challenges
Women	Long collection hours, GBV risk, limited say in water governance
Girls	School absenteeism, health issues, and menstrual hygiene constraints
Elderly	Physical limitations, dependency
PWDs	Inaccessible water points, social exclusion
Poor Households	High cost of water, reliance on unsafe water sources

2.7 Percentage of the Population with Access to Improved Water Services

2.7.1 Coverage Levels Based on National and Global Standards

Kitui County exhibits some of the lowest access levels to improved water services nationally.

Access to Improved Water Services in Kitui County

Kitui County's semi-arid climate, characterized by recurrent droughts and seasonal Rivers, poses significant challenges to water access. The Kenya Population and Housing Census (2019) outlines the access to improved water services in Kitui County as follows:

a) **Basic Drinking Water Access**: Only 21.2% of Kitui's population has access to at least a basic drinking water service.
b) **Surface Water Reliance**: Approximately 58.6% of Kitui residents depend on surface water sources such as Rivers and dams, which are often unprotected and susceptible to contamination.
c) **Piped Water Access**: In 2019, only 5.1% of households had access to piped water, placing Kitui among the Counties with the lowest piped water coverage in Kenya (Kenya Population and Housing Census, 2019).

Kitui County Government Efforts to Improve Water Access

The Kitui County Government has initiated several projects to enhance water accessibility. These include;

a) **Small Dam Construction**: Completed 46 out of 80 planned small dams, aiming to increase local water sources.
b) **Sand/Subsurface Dams**: Constructed 145 out of 160 targeted sand dams, contributing to improved water availability.
c) **Water Access Goal**: Currently, household access to water stands at 42%, with a target to reach 60%.

Comparison to National and Global Standards

In 2022, 25.3% of Kenyan households had access to piped water. Urban areas had a higher access rate (40.1%) compared to rural areas (15.3%). On the other hand, Kitui County had only 5.1% of households having piped water, thus Kitui falls significantly below both the National average and rural average: (Kenya Demographic and Health Survey, 2022).

2.7.2 Disparities in Access across Different Regions and Communities in Kitui County

Disparities in access to improved water services across different regions and communities in Kitui County are shaped by a mix of geographical, socio-economic and infrastructural factors. Here's a breakdown of how access varies and why:

a) Regional Disparities

- **Urban vs Rural**

Urban areas such as Kitui and Mwingi Towns benefit from relatively better infrastructure, including treated piped water and access to boreholes and public taps.

Rural areas, which make up the majority of the County, rely heavily on seasonal Rivers, dams (earth and sand) and unprotected wells. Also, in rural villages, some households trekking 5-10 kilometers daily to fetch water.

- **Disparities by sub-Counties**

Water access levels vary greatly between sub-Counties in Kitui County as shown in the table below.

Table 31: Disparities in Access to Improved Water Sources within Kitui County Sub-Counties

Sub-County	Access to Improved Sources	Main Sources Used
Kitui Central	Relatively higher	Piped water, boreholes
Mwingi Central	Moderate	Boreholes, public taps
Kitui South	Low	Surface water, dams
Kitui South: Mutomo and Ikutha Wards	Very low	Seasonal Rivers, unprotected wells

These disparities are often due to terrain, remoteness and low investment in water infrastructure. An analysis of the access level in the current (2024/25) financial year by the water department indicated that access to water services is highest in Kitui Central (urban region) at 75% and lowest in Mwingi North (rural region) at 28.6%.

Figure 6 below shows percentage water access levels across Kitui County sub-Counties in the 2024/25 financial year.

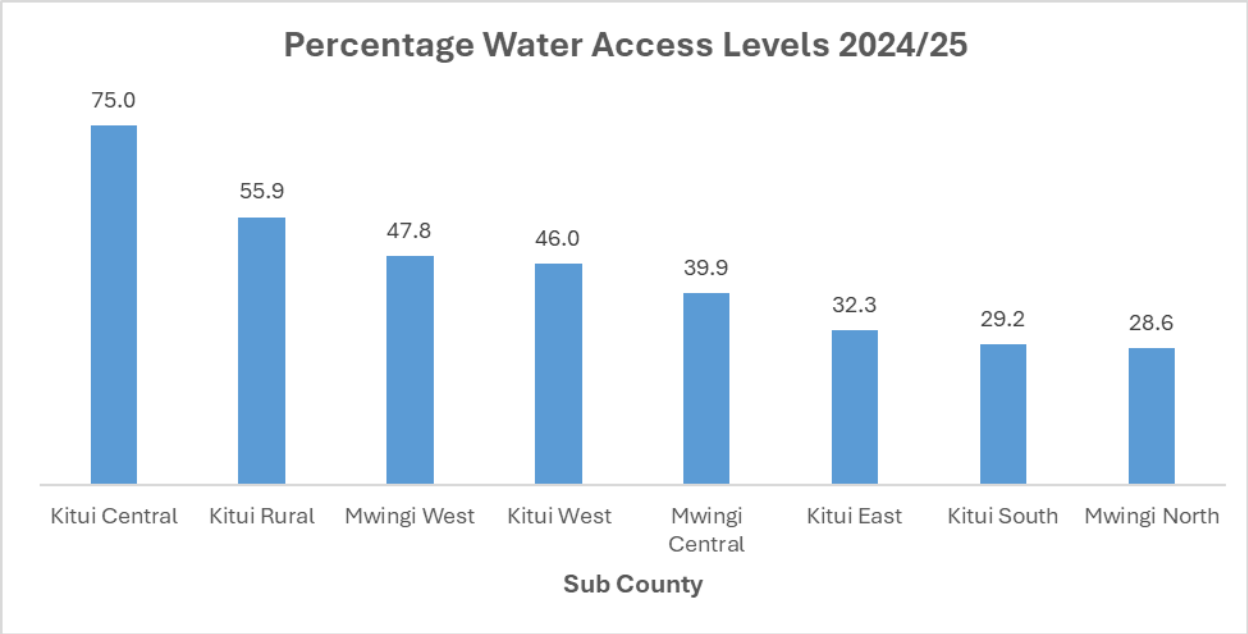


Figure 6: Percentage Water Access Levels, 2024/2025

b) Community-Level Disparities

Low-income households in Kitui County mainly rely on unimproved water sources like surface water or water vendors, which are more expensive, less reliable and often unsafe.

The disparities among communities in the County are exacerbated by the vulnerability of rural communities to climate hazards such as drought and extreme weather events, causing water sources such as seasonal Rivers and streams, surface water, shallow wells and dams to dry up. The most vulnerable communities (remote rural areas, female-headed households, schools) face the greatest challenges. Rainwater harvesting, on the other hand, is underutilized among the rural communities due to lack of tanks or roofing systems, limited community know-how and low financial support. Besides, gender disparities are prominent among communities in Kitui County, whereby women and girls in rural areas bear the burden of fetching water, limiting time for school or income-generating activities.

Ongoing Efforts to Bridge Disparities in Access to Improved Water Sources in Kitui County

a) Construction of sand dams and sub-surface dams is now concentrated in the drier Sub-Counties such as Kitui South. These structures will store water underground (within the sand particles) and reduce evaporation.
b) Water Kiosks funded by NGOs like FundiFix and Tools for Life provide affordable and safe water in underserved rural areas.
c) County Intergrated Development Plan 2023 - 2027: whereby the goal is to increase water access from 42% to 60%. Priority being on borehole drilling, dam construction and expanding piped networks.

2.7.3 Services Coverage and Gaps, Disaggregated By Income Levels and Gender

a) Services Coverage and Gaps by Income Levels

Poor households spend a higher proportion of income buying water from vendors due to lack of infrastructure (UNICEF WASH Country Review 2022 – Kenya). The table below shows disparities in water access within Kitui County by income level.

Table 32: Services Coverage and Gaps within Kitui County by Income Level

Income group	Primary water sources	Challenges
Low-income	Surface water, seasonal Rivers, unprotected wells, vendors	Long distances (up to 10 km), higher unit cost, waterborne disease risk.
Middle-income	Boreholes, rainwater harvesting, communal taps	Seasonal shortages, maintenance issues.
High-income	Piped connections, private boreholes, rooftop tanks	Reliable access, though only a small elite can afford these options.

b) Services Coverage and Gaps by Gender

- **Access by Household-Head Gender:** Male-headed households using improved water sources is higher at 27% whereas female-headed households have lower access of 25%.
- **Water Collection Burden:** Women and girls in rural areas often walk over 5 km daily to fetch water, especially in dry seasons. This burden impacts school attendance, health and time for economic activities.
- **Policy Reforms Supporting Women**: KITWASCO removed land ownership deed requirements for water connections, helping widows and single mothers access services. Furthermore, projects like USAID-STAWI and FundiFix prioritized women's access to safe water and involvement in water governance.
- **Community Initiatives:** Women groups, such as the Matinyani Development Women Group, have distributed 5,000-liter rainwater tanks to over 400 vulnerable households.

Table 33: Summary of Services Coverage and Gaps, Disaggregated by Income Levels and Gender

Dimension	Coverage	Gap	Sources
Income Level	26% improved water (avg.)	Low-income groups rely on unsafe sources or costly vendors	SID Inequality Report, UNICEF WASH, KNBS
Gender (Access)	Male HHs – 27%, Female HHs – 25%	Women and girls carry the burden of fetching water	SID Inequality Report, USAID Global Waters
Gender (Policy)	KITWASCO reforms, tank distribution	Limited ownership and affordability previously excluded many women	USAID, Kenya News Agency

2.8 Service Delivery Challenges

2.8.1 Operational Inefficiencies and their Impact on Service Provision

Access to clean and reliable water is a fundamental human right and a cornerstone of socio-economic development. Operational inefficiencies in water services provision can significantly

affect the quality, accessibility and sustainability of water supply in any region. In the context of Kitui County, which is a semi-arid area, facing frequent water shortages, these inefficiencies can be, especially, damaging.

Key Operational Inefficiencies

Several operational inefficiencies plague the water service provision in Kitui County, hindering effective delivery and sustainability. These include:

a) Poor Infrastructure and Inadequate Maintenance

A major contributor to inefficiencies in Kitui County's water service delivery is the poor state of infrastructure. Many boreholes, hand pumps and water pipelines are in disrepair due to inadequate maintenance, lack of spare parts and insufficient technical capacity at the local level (Water Services Regulatory Board [WASREB], 2021). The high rate of non-functional water points forces communities to rely on unsafe and distant water sources.

b) Fragmented Governance and Institutional Weaknesses

Water service delivery in Kitui County involves multiple actors including the County Government, community-based organizations, NGOs, and the Tanathi Water Works Development Agency. The lack of coordination among these stakeholders leads to duplication of efforts, resource wastage and inconsistent service delivery (Republic of Kenya, 2020). Moreover, weak enforcement of policies and poor monitoring exacerbate inefficiencies.

c) Low Financial Sustainability

Water service providers in Kitui County often operate under unsustainable financial models. Revenue collection is hampered by irregular billing, lack of metering and low water tariffs that do not reflect the cost of service delivery (WASREB, 2021). Consequently, water providers struggle to fund routine operations, repairs and expansions, resulting in service disruptions. Inadequate funding for operations, maintenance and infrastructure development remains a major impediment to efficient water service provision. While the County Fiscal Strategy Papers for FY 2024/25 and FY 2025/26 highlight the allocation of more resources to address water supply challenges, the actual disbursement and effective utilization of these funds are critical (Kitui County, 2024; Kitui County, 2025).

d) Limited Technical Capacity and Use of Technology

Kitui County suffers a shortage of skilled personnel in water system operation, maintenance and management. This challenge is compounded by minimal use of technology such as remote monitoring systems, which could help in early detection of faults and reduce downtime (Water Sector Trust Fund [WSTF], 2019).

e) Unreliable Power Supply

Most boreholes and water pumping systems in Kitui County rely on electricity or diesel, both of which are expensive and unreliable. Power outages frequently halt water distribution, affecting

both urban and rural households (Republic of Kenya, 2020). The high cost of diesel, also, inflates the operational costs of water provision. These costs strain the financial resources of the WSPs, and potentially lead to higher tariffs for consumers. However, efforts are underway to explore solarized water pumping systems to mitigate these costs.

f) Non-Revenue Water (NRW)

High levels of NRW, which includes water losses due to leakages, theft and unmetered consumption, significantly impact the financial viability and operational efficiency of WSPs like KITWASCO. In January 2023, the Principal Secretary for the State Department of Water and Sanitation noted that Kitui County experiences a 49% loss of water as NRW (WASREB Impact 16 report, 2024).

g) Limited Community Involvement and Awareness

Low levels of community awareness and involvement in water conservation and management have led to issues such as vandalism of infrastructure and illegal connections, contributing to NRW.

h) Climate Variability and Droughts

Kitui County is prone to climate variability and recurrent droughts, which exacerbate water scarcity, and put immense pressure on existing water infrastructure and sources. Reliance on rainwater harvesting, especially in schools and healthcare facilities often proves insufficient during extended dry seasons (REACH, 2023).

Impact of Operational Inefficiencies on Water Services Provision

The operational inefficiencies have a profound negative impact on water service provision in Kitui County, affecting various aspects:

a) **Reduced Access to Safe Water:** Operational inefficiencies directly affect the availability and reliability of water supply. Non-functional systems leave communities without access to safe water, increasing the risk of waterborne diseases such as cholera and typhoid (UNICEF, 2021).
b) **Reduced Reliability:** The high percentage of non-functional water sources and infrastructure directly translates to limited access to clean water for a significant portion of Kitui population. Even where infrastructure exists, its unreliability due to breakdowns and poor maintenance leads to inconsistent water supply, forcing residents to seek alternative, often unsafe water sources or spend considerable time fetching water.
c) **Increased Water Costs for Households:** With unreliable public systems, residents often turn to private vendors who charge exorbitant prices for water. This places a heavy financial burden on low-income households and exacerbates inequality (World Bank, 2020). Operational inefficiencies, such as high energy costs and NRW, can drive up the cost of water service provision. While a rising block tariff structure is in place to subsidize low-income consumers, overall inefficiencies can lead to higher tariffs, making water less affordable for vulnerable households.

d) **Gender and Educational Impacts:** Women and children are disproportionately affected, as they are traditionally responsible for water collection. The time spent fetching water from distant sources reduces time available for education, income-generating activities and childcare (UN Women, 2020).
e) **Environmental Strain:** Frequent breakdowns and poor planning lead to over-extraction of groundwater and deforestation for water catchment. This degrades the environment and reduces long-term water availability (WSTF, 2019).
f) **Health and Sanitation Issues:** Lack of access to clean and reliable water has severe implications for public health and sanitation. It increases the risk of waterborne diseases, affecting the well-being and productivity of the people, particularly children (NDMA, 2019). The situation is further compounded in healthcare facilities where unreliable water supply hinders hygiene practices critical for preventing infections (REACH, 2023).
g) **Economic Development:** Water scarcity and unreliable water supply impede economic activities, particularly agriculture and small businesses that rely on water. This hinders the overall socio-economic development of Kitui County.
h) **Social Equity:** Disparities in access to water services can exacerbate existing social inequalities. Rural and marginalized communities often bear the brunt of these inefficiencies, facing longer distances to water sources and higher risks of waterborne diseases (Frontiers, 2022; REACH, 2023).
i) **Sustainability of Water Resources:** High NRW has negatively affected the financial sustainability of WSPs and led to unsustainable use of precious water resources in an already water-scarce region.

2.8.2 Potential Solutions for Reducing Non-Revenue Water and Improving Reliability

Kitui County, located in a water-scarce region of Kenya, experiences persistent challenges in water service provision, particularly related to high levels of Non-Revenue Water (NRW) and unreliable water service delivery. These have hindered access to clean and consistent water for Kitui residents. NRW is water that is produced but not billed due to physical losses (leaks), commercial losses (illegal connections, inaccurate metering), or unbilled authorized consumption. NRW is reportedly high in Kitui County, estimated at 49% (WASREB Impact 16 report, 2024), and poses a major threat to the sustainability of water utilities and the availability of water for the population in the County (WASREB, 2021).

A recent water infrastructure audit in Kitui County indicated that a substantial proportion of water sources in the County are either partly or non-functional (A Water Infrastructure Audit, 2025). This unreliability forces communities to rely on unsafe water sources and spend considerable time fetching water, affecting their health and socio-economic well-being.

Addressing these intertwined issues of high NRW and unreliable service delivery is essential for improving service delivery, reducing costs and achieving sustainable water access. These solutions encompass technological advancements, infrastructure improvements, enhanced management practices, community engagement, and policy interventions aimed at minimizing water losses and ensuring a consistent and sustainable water supply for all residents as outlined below.

a) Infrastructure and Technical Improvements

- **Leak Detection and Repairs:** Regular maintenance, leak detection campaigns and proactive pipe replacement can significantly reduce physical water losses. Using acoustic sensors, pressure loggers and flow meters to identify and localize leaks improves system performance (World Bank, 2020). In Kitui, where aging infrastructure and informal connections are common, such programs are especially impactful (WASREB, 2021). For instance, rehabilitation of old and dilapidated pipelines, leaking tanks and rerouting of pipelines installed in inappropriate locations.
- **Metering and Calibration:** Ensure universal metering of all consumer connections and system entry points (bulk meters), replace faulty or aging meters and calibrate regularly to avoid commercial losses from under-recorded consumption (WSTF, 2019).
- **District Metered Areas (DMAs)**: Dividing the network into DMAs allows water providers to monitor flows, detect anomalies and isolate areas with high losses. DMAs enable targeted interventions, minimizing costs and maximizing efficiency.

b) Strengthening Utility Management and Governance

- **Capacity Building for Utilities:** Train staff in leak management, asset maintenance, customer service and financial management. Moreover, introduce performance-based contracts and Key Performance Indicators (KPIs) for staff responsible for NRW management.
- **Digitized Billing and Customer Information Systems:** Implement automated billing and mobile money platforms to improve collection efficiency and reduce losses from manual errors or fraud. Real-time data systems increase transparency and improve customer satisfaction.

c) Community Engagement and Public Awareness

- **Community-Based Water Management:** Empower local Water User Associations and Committees to report leaks, monitor illegal connections and manage water points. Community participation enhances accountability and promotes ownership of water systems.
- **Public Awareness Campaigns:** Conduct public education on the costs and consequences of water losses, and the importance of legal connections. Promote water conservation practices, especially during dry seasons.

d) Use of Renewable Energy Technologies

- Install solar-powered pumping systems to reduce dependency on diesel or unreliable electricity grids. Solar systems offer long-term cost savings and reliability, particularly in off-grid rural areas of Kitui (SNV, 2018).

e) Partnerships and Innovation

- **Public-Private Partnerships (PPPs):** Engage private sector actors in funding, managing and maintaining water infrastructure. PPPs can provide both capital and operational efficiencies.
- **Adoption of Smart Technology:** Use Internet of Things (IoT) sensors, GIS systems and real-time dashboards for better asset management and leak detection. These systems can reduce NRW significantly by enabling faster response times.
- Installation of Water utility management system such as GIS software.
- Involvement of the WSPs and the community during the project implementation and sensitization of the public through barazas.

f) Regular Audits and Performance Monitoring

- Conduct regular water balance audits to identify and quantify sources of NRW. Link audit results to action plans with clear targets and timelines for NRW reduction.

g) Sensitization Broadcasts on Popular Mainstream Media houses and Social Media Platforms on:

- Reporting of illegal water use, bursts and leakages.
- The need to pay for water services to avoid bill accumulation and subsequent disconnections.
- The water tariff in place and penalties imposed on illegal water use.
- Procedure for new connection application and its charges.

2.8.3 Existing Water Service Providers and their Operational Efficiency

Several water service providers (WSPs) operate within the County, each with varying degrees of efficiency, influenced by infrastructure, management capacity, community involvement and funding.

a) Kitui Water and Sanitation Company (KITWASCO)

KITWASCO primarily serves Kitui Central, Kitui West, Lower Yatta, Matinyani, Nzambani, Mutomo, Kisasi, Katulani and parts of Masinga Sub-County in Machakos County. The main source of water for KITWASCO is Masinga Dam (accounts for 90% of supply), supplemented by boreholes in Ithookwe, Matinyani, Ilusya, Mbooni, and Mutune. As of 2023, KITWASCO served approximately 550,000 people Kitui County, covering about 39% of the County's population.

KITWASCO faces challenges with aging infrastructure and high non-revenue water (NRW) losses.

b) Kiambere-Mwingi Water and Sanitation Company (KIMWASCO)

KIMWASCO serves Mwingi North and Mwingi Central Sub-Counties in Kitui County. It primarily draws water from the Kiambere Dam. In 2017, both KITWASCO and KIMWASCO collectively served only 32% of Kitui County's population, mainly in urban areas. The remaining population relied on alternative sources such as sand dams, shallow wells, and rainwater harvesting.

KIMWASCO has limited coverage in rural areas. KIMWASCO'S infrastructure maintenance and expansion are constrained by limited financial and technical resources.

The table below shows KPIs for KITWASCO and KIMWASCO water service providers in Kitui County.

Table 34: Key Performance Indicators for KITWASCO and KIMWASCO

Key Performance Indicator (KPI)			**Water Service Provider (WSP)**		**Regulator**		
			KITWASCO ***Category:*** **Large Company**	**KIMWASCO** ***Category:*** **Small Company**	**WASREB Standards**		
KPI Cluster	**Description**				**Good**	**Satisfactory**	**Poor**
Quality of service	Water coverage (%)		61%	72%	>90%	80-90%	<80%
	Drinking Water Quality (DWQ %)		100%	93%	>95%	90-95%	<90%
	Hours of supply/day	Population>100,000	15	9	21-24	16-20	<16
Economic efficiency	Personnel Expenditures as a % of total O+M costs	Large & very large companies	28		<20%	20-30%	>30%
		Medium			<30%	30-40%	>40%
		Small		25%	<40%	40-45%	>45%
	O+M cost coverage (%)		60%	83%	≥150%	100-149%	≤99%
	Revenue Collection Efficiency (%)		104%	92%	>95%	95-85%	<85%
Operational sustainability	Non-Revenue Water (NRW %)		49%	35%	<20%	20-25%	>25%
	Staff productivity (No. of staff/1,000 connections	Large & very large companies	11		<5	5-8	>8
		Medium & small (<3 towns)		15	<7	7-11	>11
		Medium & small (>3 towns)			<9	9-14	>14
	Metering ratio (%)		100%	100%	100%	95-99%	<95%
Total score			**93**	**88**	**200**		
Ranking by category			**Large: 16/35**	**Small: 7/22**	**As per category**		
Overall ranking			**37**	**41**	**88**		

*(**Data source:** WASREB, 2024)*

c) Community-Based Water Projects

Examples of Community-Based Water Projects in Kitui County are Kabati and Kavoo Community-Managed Water Systems. In July 2022, KITWASCO signed delegated management contracts with Kabati and Kavoo Community-Managed Water Systems to enhance technical support and supervision (SNV, 2022). These partnerships aim to improve operations, revenue collection and service delivery. However, the Kabati's solar-powered borehole system serves only 28 out of 1,000 households across seven villages. On the other hand, Kavoo water system faces high operational costs, with diesel accounting for approximately 70% of expenses.

d) NGOs and Private Sector Initiatives

- **Solar Water Solutions:** In 2022, solar-powered desalination units were installed in Ndauni Market, providing clean water through solar-powered ATMs integrated with M-Pesa payment systems.
- **Tools for Life and Hardcore Help Foundation** established water kiosks in Kitui County to serve approximately 2,000 residents. However, the Foundation faced challenges with initial construction quality, requiring system redesigns and repairs to ensure functionality.

2.8.4 Challenges in Engaging with Public and Private Water Service Providers

Engaging with public and private water service providers in Kitui County presents several challenges that impact the effectiveness and sustainability of water service delivery. Below is a detailed overview of these challenges;

a) Fragmented Coordination among Stakeholders

The water sector in Kitui County involves multiple actors, including Government entities, NGOs, private companies and CBOs. A study by the Sustainable WASH Systems Learning Partnership revealed that interactions among these stakeholders are often fragmented, leading to duplication of efforts and inefficiencies. The lack of a centralized coordination mechanism hampers the alignment of goals and resource sharing among the actors and create bureaucratic hurdles.

b) Organizational Challenges within Public Water Service Providers

The following are the key internal organizational issues affecting strategy implementation in Kitui County. These challenges include:

- **Leadership Gaps:** Inadequate leadership skills hinder effective decision-making and accountability.
- **Structural Inefficiencies:** Poor organizational structures lead to unclear roles and responsibilities, affecting operational efficiency.
- **Cultural Barriers:** Resistance to change and lack of a performance-oriented culture impede the adoption of innovative practices.
- **Bureaucratic Processes**: These slow down decision-making and the implementation of collaborative projects. These cause frustration to external partners seeking timely action and responsiveness.
- **Changes in Management and Governance within Public WSPs:** These impact the stability and focus of the WSPs, potentially affecting their engagement with external stakeholders.

c) Limited Private Sector Participation

The private sector's involvement in Kitui's water services is minimal due to financial risks (i.e. high non-revenue water losses and unreliable billing systems make investments unattractive), regulatory uncertainty (i.e. ambiguities in policies and enforcement discourage private entities

from entering the market and infrastructure challenges (i.e. aging and inadequate infrastructure increase operational costs and risks for private operators).

d) Policy and Legal Framework Limitations

While efforts have been made to reform water policies, challenges persist. These include; slow institutional reforms (i.e. the transition to new governance structures has been sluggish, affecting service delivery) and lack of inclusivity (i.e. policy formulation processes often exclude key stakeholders, leading to policies that do not address on-the-ground realities).

e) Gender and Minority Representation Gaps

Engagement processes in the water sector have shown low participation from women and minority groups. For instance, women constituted only 31% of participants in public forums, despite being primary water users. This underrepresentation leads to policies and programs that may not fully address the needs of all community members.

f) Data Scarcity and Information Sharing

Lack of reliable data on water resources, infrastructure, consumption patterns and NRW can make it difficult for both public and private entities to plan effectively and engage in informed discussions about service improvements.

g) Technical and Capacity Constraints

Both public and private water service providers face technical challenges:

- **Skill Deficiencies:** Limited technical expertise among staff affects the maintenance and operation of water systems.
- **Resource Limitations:** Inadequate financial and material resources hinder the expansion and improvement of services. Public WSPs like KITWASCO often face significant financial limitations, hindering their ability to invest in infrastructure upgrades, expand services and implement efficient management practices. This makes them less responsive to engagement initiatives that require financial contributions or co-investment.
- **Data Management Issues:** Poor data collection and management impede effective planning and decision-making.

Below are specific challenges in engaging with Private Water Service Providers (where they exist or for potential partnerships):

- **Profit Motive vs. Social Responsibility:** Private sector entities are primarily driven by profit, which can sometimes conflict with the social responsibility aspect of providing essential water services, especially to underserved or remote communities in Kitui County. This leads to disagreements on service areas, pricing and investment priorities.
- **Trust Deficit:** Historically, there might be a lack of trust between the public sector, communities and private entities due to past experiences or perceptions of profit-seeking at the expense of public good. Building this trust is essential for successful engagement.

- **Sustainability Concerns:** There are concerns about the long-term commitment and sustainability of private sector involvement, particularly if projects are not immediately profitable or if the private entity's priorities shift.
- **Community Acceptance:** Engaging private providers sometimes face resistance from communities who prefer public ownership or have concerns about affordability and accessibility under private management. Public sensitization and involvement are crucial to address these concerns.
- **Contract Negotiation and Enforcement:** Developing and enforcing fair and effective contracts for private sector participation can be complex and time-consuming, requiring legal and technical expertise that might be limited within the County.

2.8.5 Areas for Strengthening Service Delivery Models

Strengthening water service delivery models in Kitui County requires a comprehensive approach that addresses both structural weaknesses and operational inefficiencies. Below are key areas for improvement, supported by insights from field studies, Government reports and development partners' analyses:

a) Strengthening Coordination Structures

Establish a centralized coordination body at the County level to align the work of KITWASCO, KIMWASCO, NGOs and community projects, and improve transparency and clarity of ownership structures, particularly for KITWASCO. This will exclude duplication of efforts and resource wastage.

b) Strengthening Governance and Institutional Capacity

- **Establish Clear Roles and Responsibilities:** Establish clear delineation of roles and responsibilities for water service delivery between the National and County Governments to avoid overlaps and ensure accountability.
- **Effective Regulation and Monitoring:** Enhance the County's capacity for monitoring and regulating water service delivery to ensure quality, efficiency and accountability. This should include establishing common databases and regular WASH forums.
- **Policy Implementation and Enforcement:** Strengthen the implementation and enforcement of existing water policies and laws at the County level to promote sustainable water resource management and service delivery (REACH, 2024).
- **Reducing Political Interference:** Minimize political interference in the management and operations of water service providers like KITWASCO and KIMWASCO to ensure professional and efficient service delivery.

c) Reducing Non-Revenue Water (NRW)

Invest in smart metering, leak detection systems and proactive maintenance, and train staff on data analytics, for better water loss monitoring. The strategy will help SWPs minimize NRW (NRW Report – KEWI and KITWASCO, 2022).

d) Expanding and Maintain Infrastructure

Scale up solar-powered boreholes, water kiosks and sand dams. Also, prioritize asset management plans for existing pipelines and treatment plants. This is because much of the water infrastructure is old or non-functional, especially in rural zones.

e) Enhancing Community Engagement and Equity

Promote inclusive decision-making processes by ensuring that women, youth and vulnerable groups have a say in water governance. In addition, support training for Community Water Management Committees. Statistics show that only 31% of water management participants are women, despite them being the main water users (Frontiers in Water – Community Participation in Kitui, 2022).

f) Building Technical and Institutional Capacity

This can entail upskilling County engineers, utility staff and WSP leaders in planning, finance, GIS and customer service. It can be achieved by establishing County training centers in partnership with the Kenya Water Institute (KEWI). This is because many WSPs lack the capacity to maintain systems or implement innovations.

g) Community Involvement

Foster meaningful community participation in the planning, implementation and monitoring of water service projects to ensure local ownership and sustainability.

h) Building Capacity for Water Management Committees

Provide continuous training and support to community-based Water Management Committees to enhance their technical, financial and managerial skills (Kitui County Annual Development Plan 2022/2023).

i) Awareness and Education

Implement public awareness campaigns on water conservation, hygiene practices and the importance of protecting water sources.

j) Promoting Financial Sustainability

Introduce tiered tariff systems to reflect actual usage and ability to pay, and facilitate public-private partnerships (PPPs) for infrastructure development and O&M. This will ensure that there is no overreliance on donor funding and Government grants because of unsustainability.

- **Cost Recovery Mechanisms:** Explore and implement appropriate cost recovery mechanisms for water services to ensure financial sustainability for operation and maintenance. However, these mechanisms must consider the affordability for vulnerable populations.

- **Dedicated Funding for Operation and Maintenance:** Secure dedicated and consistent budgetary allocations at the County level for the operation and maintenance of water infrastructure, moving beyond reliance on intermittent National Government funding (REACH, 2022).
- **Exploring Innovative Financing Models:** Investigate innovative financing models, potentially involving partnerships with the private sector or leveraging climate finance, to support both capital investments and ongoing maintenance (Kitui County Annual Development Plan 2022/2023).

k) Leveraging Technology and Data

This is developed to ensure a real-time monitoring dashboard for WSP performance, asset conditions and user complaints. GIS mapping can be used for planning and NRW tracking.

l) Enhancing Infrastructure Functionality and Maintenance

- **Professionalized Maintenance Services:** Transitioning towards professionalized maintenance models, as opposed to solely relying on community-based management, has shown significant potential in enhancing water service delivery. Studies indicate that this approach can increase the functionality of water systems (piped schemes and hand pumps) from around 50% to over 80%, and lead to a substantial increase in water production. This includes proactive repairs and preventive maintenance, reducing major breakdowns and long-term costs.
- **Water Infrastructure Audits and Inventory:** Regular and comprehensive audits of existing water infrastructure are crucial to understand their status, identify needs for rehabilitation, and plan for targeted investments.
- **Invest in Reliable and Climate-Resilient Infrastructure:** New infrastructure development should prioritize climate-resilient designs, considering the impacts of droughts and floods. This should include exploring diverse water sources like groundwater and investing in efficient water harvesting and storage technologies.

2.8.6 The Impact of Climate Change Vulnerability and Associated Hazards on Water Supply Reliability

Climate change poses additional challenges to water resource management in Kitui County. Projections indicate that temperatures in Kenya are expected to rise by approximately 1.7°C by 2050s and around 3.5°C by the end of the century. This increase is likely to exacerbate drought conditions and reduce water availability, underscoring the need for adaptive strategies in water resource planning (Kitui County PCRA Report, 2023).

Below are the key impacts of climate change vulnerability and associated hazards on water supply reliability in Kitui County.

a) Prolonged Droughts and Erratic Rainfall

Kitui County experiences increasingly frequent and severe droughts, leading to reduced surface water flows and declining groundwater levels. This variability hampers the reliability of water sources, affecting both human consumption and agricultural activities. The Kitui County Climate

Change Action Plan 2023-2027 highlights the need for climate-resilient water infrastructure and improved water harvesting and storage systems to mitigate these impacts. Below are the impacts of prolonged droughts and erratic rainfall in Kitui County.

- **Reduced Water Availability:** Prolonged dry periods lead to the drying up of seasonal Rivers, which are a crucial source of water for many communities in Kitui County.
- **Increased Water Scarcity:** The decrease in available water sources leads to increased competition for the remaining water sources, often resulting in longer distances to fetch water and higher costs, particularly from vendors. This disproportionately affects vulnerable populations, especially women and children.
- **Impact on Water Harvesting Systems:** While water harvesting techniques like sand dams and earth dams are employed in Kitui, their effectiveness is reduced during severe and prolonged droughts due to limited or no recharge. Some existing water infrastructure, primarily relying on rainwater harvesting, becomes insufficient during extended dry seasons (REACH, 2023).

b) Rising Temperatures

Elevated temperatures contribute to higher evaporation rates, diminishing the effectiveness of existing water storage facilities such as dams and pans. This exacerbates water scarcity, particularly during dry seasons, and stresses the already limited water resources. The impacts of rising water temperatures in Kitui County are:

- **Increased Evaporation:** Higher temperatures lead to increased evaporation from surface water sources such as Rivers, dams and open water storage, further reducing the available water.
- **Increased Water Demand:** Rising temperatures also increase the demand for water for domestic use, livestock and irrigation, exacerbating pressure on already limited resources.
- **Impact on Water Quality:** Higher water temperatures affect water quality by promoting growth of algae and other microorganisms, making treatment more challenging and potentially impacting human health.

c) Flooding

While droughts are prevalent, Kitui County also faces episodes of intense rainfall in short periods, leading to flash floods. These floods damage water infrastructure, contaminate water sources and disrupt supply systems. The dual threat of droughts and floods necessitates adaptive infrastructure capable of withstanding such extremes (Kitui County Climate Change Action Plan, 2023-2027). Below are the detailed impacts of flash floods in Kitui County.

- **Contamination of Water Sources:** Intense rainfall and flooding events, often experienced during the long rains, contaminate surface and groundwater sources with pollutants, debris and pathogens, rendering them unsafe for consumption.
- **Damage to Water Infrastructure:** Floods damage water infrastructure such as pipelines, boreholes and storage facilities, disrupting water supply networks, and requiring costly repairs (REACH, 2023).

- **Increased Runoff and Reduced Infiltration:** High intensity storms lead to increased surface runoff rather than groundwater recharge, paradoxically reducing long-term water availability.

d) Impacts of Climate Hazards on Water Service Providers in Kitui County

Climate variability affects the operations of water service providers like KITWASCO and KIMWASCO. During droughts, water sources dwindle, reducing supply capacity. Conversely, floods damage infrastructure, leading to service interruptions. These challenges underscore the need for climate-resilient operational strategies.

Community-Based Adaptation Strategies

In response to these challenges, communities in Kitui County have adopted innovative solutions such as the construction of sand dams. These structures capture and store rainwater, replenishing groundwater and providing a reliable water source during dry periods. Over 500 sand dams have been established in the region, significantly enhancing water security for local populations.

County Policy and Planning Interventions

The Kitui CIDP 2023–2027) incorporates climate change considerations into water sector planning. It emphasizes the development of climate-proof infrastructure and the promotion of water harvesting and storage techniques. Additionally, the County has committed to allocating a portion of its annual development budget to climate change initiatives, reflecting a proactive approach to building resilience (Kitui County Climate Change Action Plan, 2023-2027).

Addressing the impacts of climate change on water supply in Kitui County requires a multifaceted approach that combines infrastructure development, community engagement, and policy reforms. By implementing adaptive strategies and investing in resilient systems, the County can enhance water security and safeguard the well-being of its residents.

2.9 Sanitation Services Coverage and Service Gaps

2.9.1 Status of Household Sanitation Access

Analysis of Existing Sanitation Infrastructure, Access Levels and Service Options

KITWASCO, in addition to water supply also offers sanitation services. The status is as follows:

Sanitation Services

- No. of sewered connections; 317
- Length of sewerage distribution network : 18 km
- Waste water collected/treated (Annually): 2,014 m^3
- Waste water treatment capacity; 2,500 m^3/day
- Waste water treatment type: use of stabilization lagoons

Sewerage Services

- Exhauster services for emptying septic tanks.
- Sewer extension and line maintenance.
- Sewer unblocking services.
- Septic tank exhausting and discharging

No Centralized Sewerage in Some Areas: some areas within the service region rely on septic tanks rather than a centralized sewerage system.

Kenya is committed to achieving the UN Sustainable Development Goal 6.2 which states that, "by 2030 achieve access to adequate sanitation and hygiene for all and end open defeacation." According to Census 2019, Kitui County has moderate rates of open defecation with 111,536 people or 9.2% of households still practicing OD. In addition, only 3.5% have basic sanitation services (use of improved facilities which are not shared), 12.3% are using unimproved latrines (pit latrines without slab) and the majority at 75% are using limited sanitation services (use of improved facilities shared between two or more households). It is therefore imperative to accelerate latrine upgrading and climbing of the sanitation ladder. They aim to achieve "safely managed" status as per the JMP/WHO recommendations or Grade 2 "clean and health status as envisioned in the RuSH Protocol.

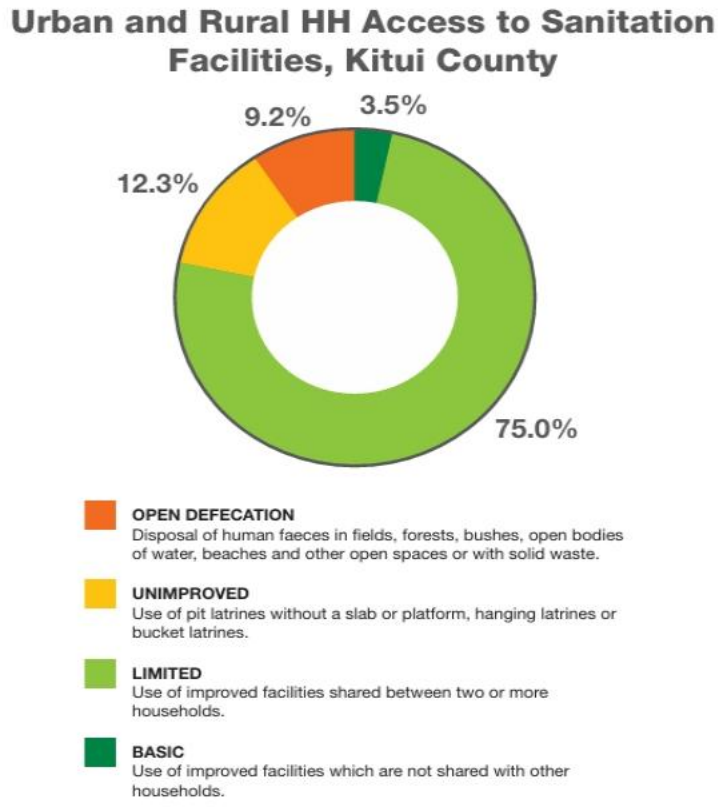


Figure 7: Urban and Rural HH Access to Sanitatiobn Facilities, Kitui County

*(**Data source:** Kenya National Bureau of Statistics, 2019)*

Kitui County has an estimated 37.1% households having improved sanitation systems (basic sanitation service level), with 57.8% is at limited-service level and an estimated 5.1% open defecation. The County is implementing promotion of Market Based Sanitation that will ensure households are able to upgrade their latrines to washable, safely covered and reduces any form of contamination. In addition, sharing among households is discouraged and individual households are encouraged to own their latrines. The County has embraced the community wide sanitation approach aiming at ensuring all the institutions including schools and health facilities attain the safely managed status as per the JMP service levels and Grade 2 safe and sustainable as we endeavor to clean and healthy as per the RUSH protocol

Most of the latrines, especially in the rural areas are at the limited sanitation level. As a result, there is need to accelerate upgrades of the sanitation systems through installation of economic friendly sanitation options like the SaTo products. This can be achieved through sanitation financing options including coming up with subsided prices during sanitation promotion activities. Communities working in groups (like CHP groups or women chamas) have shown to be productive in developing economically hence supporting the already established groups through sensitization on sanitation and financing.

2.9.2 Rural-Urban Disparities and Informal Settlement Challenges

Kitui County has two key urban centres namely Kitui and Mwingi municipality. The level of urbanization stands at 12.98% and is predicted to reach 15.35% by 2027. The rapid rate of urbanization has clear implications for the need for urban planning. The planning should take care of the growing population in the two municipalities and provide for efficient sewerage system and treatment plants. Currently, the coverage of sewer systems stands at 0.5% as reported in the Population and Housing Census 2019, with majority of the population relying on septic tanks and use of exhaustion services. The practice of open defeacation is generally high in rural areas as compared to urban centres with 10% OD rate reported in Census, 2019. Kitui County has made great strides in elimination of open defeacation in rural areas with approximately 9.2% of households reported in census 2019 as compared to 5.1% as per the Kenya Demographic Health Survey, 2023. All rural communities are envisioned to end open defeacation, achieve universal access to sanitation and work towards a clean and safe environment by 2030 and County Governments are called upon to plan, implement and monitor interventions towards attainment of this.

Due to the rapid urban migration experienced in the County, informal settlements have cropped up in the two municipalities which have created the following challenges; the informal settlements are overcrowded and poorly planned and thus there is infrastructure gaps leading to poor sanitation and environmental pollution; in the informal settlements, there is economic inequalities which limits development and maintenance of sanitation and hygiene facilities; the communities in the informal settlements are faced with health risks due to poor sanitation and this can lead to spread of sanitation and hygiene related diseases like cholera and typhoid. In addition, residents in the informal settlements face social marginalization especially the vulnerable in the community like women and children who often face barriers in access to the sanitation facilities. County Government needs to address these challenges through promotive policy reforms, sanitation investments in infrastructure and working with communities for social behavior change.

2.9.3 Social and Gender Disaggregated Access to Sanitation

According to the 2019 population and household census report, the population of Kitui was projected to have reached 1,343,998 in 2025 with 622,724 being male while 665,995 are female. This is a key indicator for the County's development and presents opportunities for sanitation planning and to tackle sanitation challenges related to gender disparities in the County. In 2019, 104,530 people in Kitui were defecating in the open of which 54,018 were women and girls. This poses greater risks due to issues of stigmatization or gender-based violence including rape especially during the night when relieving themselves in bushes. However, much progress has been made in sanitation improved with 36.72% of the population have access to improved sanitation service level in the community with only 5.2% defecating in the open (KDHS, 2023). As the County implements sanitation strategies to ensure a phased sanitation approach towards clean and health community by 2030, it is paramount to invest on inclusive sanitation designs which ensure the needs of all genders are met with provisions for menstrual cycle management in women sanitation facilities. Kitui County should incorporate gender policies to address sanitation system inequalities and build the capacity of implementers of the policies and guidelines. To ensure efficient implementation, gender disaggregated indicators should be formulated in the regular reporting of sanitation data.

2.10 Coverage of Public and Shared Sanitation Facilities

2.10.1 Availability and Adequacy of Public Sanitation Services

Urban centers in Kitui County face challenges in providing adequate public sanitation facilities. The facilities are managed by local groups to enable their operation and maintenance. The public has been sensitized to ensure they utilize the facilities despite the small charges that are made. The two main municipalities of Kitui and Mwingi towns have public sanitation facilities and also major towns like Kabati and Mutomo. Here are some key points:

a) **Overstretched Facilities**: The growing population in urban areas, such as Kabati market, has put a strain on existing sanitation facilities.
b) **New Developments**: The European Union is funding the construction of a modern sanitation facility at Kabati market. This facility will include toilets and bathrooms for men, women, and persons with disabilities, along with water tanks to ensure a steady water supply
c) **Infrastructure Improvements**: Efforts are underway to unclog blocked drainage systems and enhance garbage collection in urban centers. Streetlights are also being rehabilitated to improve the overall environment.

2.10.2 Infrastructure Gaps and Investment Needs

Kitui County faces various infrastructure gaps and investment needs due to urban development and emergence of informal settlements. Some of the issues include;

- **Limited Coverage**: Many of the town centres have no access to public sanitation facilities, especially in the rural communities. This has led to open defeacation and poor hygienic practices especially in dark alleys and the town outskirts.

- **Inadequate Waste Management**: Poor waste disposal systems in the urban areas will contribute to environmental pollution and vector and vermin control becomes a challenge. This results in the urban communities facing health challenges and risks.
- **Lack of Inclusive Facilities**: Many latrine facilities in the urban centres do not accommodate persons with disability and they face challenges of accessibility.Therefore, there is need by the County Government and partners to invest in the provision of hygienic and sanitation facilities in the informal settlements and towns to accommodate all people in the areas.

Some of the startegies include; construction and maintainance of public sanitation facilities particularly in the market centres and deserving localities, enhancing Public Private Partnerships in infrastructure development and capacity building of local artisans in construction and maintenance of public sanitation facilities.

2.10.3 Operation and Maintenance Modalities

The operation and maintenance of public sanitation facilities should be enhanced through proper planning by observing community engagement; ensuring participation of the community members in siting, construction and operation of the sanitation facilities in their areas. This is through their representatives to select already formed groups including women groups, persons with disability groups and the youth. This ensures economic development as well as maintaining hygienic conditions of the facilities. Furthermore, implementing clear policies and regulatory frameworks while developing the CIDP and Annual Work Plans ensures accountability, proper management and equal distribution of sanitation facilities in all market and informal centers.

2.11 Sanitation Challenges

2.11.1 Key Behavioral, Cultural and Logistical Constraints

Access to sanitation and hygiene in Kitui County faces several challenges including:

a) **Behavioral constraints:** Slow adoption or resistance to new and innovative sanitation technologies due to ignorance among community members. There is need for persistence sensitizations on social behavior change to enable adoption of sanitation and hygiene promotive strategies.
b) **Cultural factors in the community:** These include gender roles may sometimes hinder women making some decisions pertaining the sanitation facilities at the household level. In addition, men and youth are most of the times not found in the rural households as they are engaged economically in towns and market centres.
c) **Sanitation Financing:** The people in the households are aware of various sanitation systems for toilet upgrades but lack the economic capabilities to actualize it. Challenges in scaling up sanitation technologies due to lack of technical expertise and maintenance support. There is thus need to have robust and economically friendly sanitation financing models that are locally available to all households

2.11.2 Impacts of Climate Change on Sanitation Infrastructure

Kitui County being an ASAL region experiences erratic climatic conditions including prolonged drought episodes and rains which may cause flooding in some areas and especially along riverbanks and their surroundings; This has effects on the sanitation and hygiene infrastructure including the following;

a) **Flooding:** flood water has the potential of damaging sanitation facilities including latrines, septic tanks and sewerage systems. Due to loose soils in Kitui, latrine facilities collapse due to heavy rains and are washed away during floods. This can lead to flood waters carrying pathogens which can lead to outbreaks of waterborne diseases in the affected areas. In addition, it leads to environmental pollution of the affected areas.
b) **Rising water tables:** High water tables as experienced during long rain periods can compromise the structural integrity of sanitation systems, such as pit latrines, causing them to collapse or overflow. It also increases the risk of groundwater contamination, especially in areas relying on shallow wells as their main source of water.
c) **Drought:** Limited water availability may hinder the functionality of sanitation systems which require water for their operation; this includes flush toilets. In addition, poor hygienic practices like hand washing will be a problem due to water scarcity. This increases the risks of contamination and spread of sanitation related diseases.

2.11.3 Potential Strategies for Improving Sanitation Uptake

Kitui County requires a multifaceted approach towards sanitation in order to improve from the majority in limited-service level towards the safely managed service level. The approaches should provide a phased approach as set out in the Rural Sanitation and Hygiene Protocol. The health officials will work with other key stakeholders such as development partners, other Government departments, communities and community leaders to achieve G1 (Open Defecation Free, G2 (Safe and Sustainable) and G3 (clean and healthy) grades as per the RUSH protocol. Each of the three grades has a slightly different focus:

a) G1 Open Defecation Free (ODF) is focused on behaviour change and the elimination of the unsafe return of excreta to the open (e.g. unsafe excreta return through open defecation or unsafe disposal of child excreta and diapers).
b) G2 Safe & Sustainable is focused on the safe management of toilets, hands, food, water and animal wastes to block the primary routes of faecal exposure and faecal-oral contamination; and on more sustainable services.
c) G3 Clean & Healthy is focused on more permanent and safely managed services and on other critical aspects of environmental sanitation and hygiene, to create a "clean and healthy environment" for rural Kenyans as required by the 2016-2030 Kenya Environmental Sanitation and Hygiene Policy.

All rural communities should be certified as living in G2 Safe & Sustainable environments by 2030. In order to achieve this, the following strategies should be enhanced;

a) **Community engagement:** members of the community including their leaders should be involved in planning and decision making on sanitation and hygiene practices in their settings. Sensitization and awareness campaigns through social behavior change and

communication should be enhanced for communities to adopt behaviors conducive to sanitation and hygiene. These approaches include community barazas/dialogue meetings, Community Health Promoter's household visitations and radio talk shows through the local vernacular stations.

b) **Infrastructure development:** communities should be encouraged to construct durable and eco friendly latrines which are able to withstand different climatic conditions as exhibited in Kitui County. The County has made great strides in capacity building of artisans and masons on construction of low cost and durable sanitation facilities which are pit lined to prevent collapsing.
c) **Policy and governance:** Kitui County endeavours to create an enabling environment through strengthened policy framework and regulations which are promotive to sanitation and hygiene services. The County management up to the senior management are supportive of sanitation activities and there exists political goodwill towards promotive and preventive health in the County. In addition, there is an established WASH hub which ensures proper monitoring and evaluation to track achievements and address any arising challenges. The PHOs and CHPs are updated on new policies and guidelines on sanitation including the RUSH protocol which was launched recently.
d) **Sanitation financing:** this has been a major challenge in the country with many Counties including Kitui. There should be provision of subsidies and incentives to vulnerable households to afford sanitation facilities which are climate proof. The County Government should encourage Public Private Partnerships (PPPs) to fund large scale sanitation projects like sewer systems in urban centres. In addition, a vote head should be established in County budgeting systems which is specific to sanitation and hygiene improvements and ensures resources are ring fenced for sanitation activities in the County.
e) **Climate resilient solutions**: the County Government should encourage sanitation facility designs which are climate proof and can withstand climatic impacts like flooding and drought which are exhibited in the County. Capacity building of masons and artisans on pit lining and construction of weather proof sanitation facilities should be capitalized.

2.12 Assessment of Fecal Sludge and Wastewater Management and Existing Treatment Facilities

2.12.1 Status of Sludge and Wastewater Containment, Collection, Treatment and Disposal

Kitui County faces several challenges in sludge and wastewater management, with gaps in containment, collection, treatment, and disposal. The KITWASCO, which provides the water and sanitation services to Kitui town and its surroundings. The main sewer efforts have been made to improve sanitation infrastructure, many areas still rely on non-sewered sanitation systems, leading to inefficiencies in feacal waste management. According to census 2019, the sewer coverage system was 0.5% mainly in Kitui town while 2.8% rely on septic tanks.

2.12.2 Climate Risks Affecting Wastewater and Fecal Sludge Management

Climate risks pose significant challenges to wastewater and fecal sludge management systems in Kitui County. Some of the risks experienced includes the following;

a) **Flooding**: Increased rainfall and flooding can overwhelm wastewater treatment plants and septic systems, leading to untreated waste being discharged into the environment. This is mainly in the market centers and urban towns due to poor drainage systems.
b) **Drought**: Reduced water availability can affect the operation of wastewater systems, as they often rely on water for transport and treatment. During the dry period, there is water rationing and this affects usage of sanitation systems.

2.12.3 Opportunities for Investment in Climate-Resilient Sanitation Services

Kitui County has several opportunities for investment in climate-resilient sanitation services, both for sewered and non-sewered infrastructure:

a) **Rainwater Harvesting Systems:** Given the arid and semi-arid nature of Kitui, investing in rainwater harvesting systems can provide reliable water sources for sanitation facilities. This includes use of gutters in all available places.
b) **Professionalized Maintenance Models:** in Kitui County, there are initiatives like FundiFix, which ensure timely repairs of water points that can be scaled up to include sanitation infrastructure. This will ensure durability of the sanitation systems and increase their use.
c) **Wastewater Treatment Facilities:** Establishing decentralized wastewater treatment plants can cater to areas without sewer networks, ensuring safe disposal and reuse of wastewater.
d) **Innovative Non-Sewered Solutions:** Technologies such as container-based sanitation systems can be introduced to serve remote areas where sewer networks are not feasible.
e) **Public-Private Partnerships:** Collaborations between the Government and private sector can drive investment in climate-resilient sanitation projects, ensuring sustainability and scalability.
f) **Capacity Building and Awareness:** Training local communities and stakeholders on climate-resilient practices can enhance the effectiveness of sanitation services.

These investments will address climate risks to the sanitation facilities and also improve public health environmental sustainability.

2.13 Access to WASH for Schools and Healthcare Facilities

2.13.1 Existing WASH Infrastructure and Service Levels

In Kitui County, most of the schools (85%) are within 500M to dwellings and students don't walk long distances to school and 77% of the schools are also within 500 meters to healthcare facilities. 78% of the schools are not within 500m to open defecation sites hence less contamination with 45.8% of the schools having traditional latrines. Slightly mare than half (50.27%) of the buildings housing WASH infrastructures in the schools are broken down, missing or have damaged some components due mainly to issues of vandalism by the community or by the students themselves.

The majority of the learning institutions (59.5%) reported having water at all times with rainwater (68.5%) being the main source of water in the schools. The rainwater, is, however, not available throughout the year. The majority of the latrine are located more than the recommended 30

meters from the water source to prevent contamination. Most of the schools treat water through chlorination as they are not aware if the water meets the standards as per KEBS.

The sanitation facilities are located outside the building but on premises with only 5% reporting facilities being off the premises. 96% of the schools have gender disaggregated facilities which are also separated for pupils and the staff in the schools. The majority of the latrines (58%) are accessible to physically and visually impaired pupils. In addition, 88% of the sanitation facilities have no or limited lighting. The latrines were somewhat clean and most required minor repairs to increase usability. The majority of the latrines (80%) were in good condition. Pit latrines with slabs are the most prevalent in the schools at 88% with most of them having no faecal emptying services available. 72% of the schools have a hand washing facility with a majority having container with a tap type of hand washing. Soap and water are available in 27% of the facilities and are mostly located near the latrine facilities. Menstrual hygiene management is a challenge with 89% of the schools having no waste bins and no clear disposal mechanisms available.

In Kitui County, healthcare facilities WASH infrastructure service levels are generally inadequate, with many lacking basic services like reliable water and adequate sanitation. While many facilities report having water, reliance on rainwater harvesting or unreliable piped water from utilities leads to shortages and service interruptions, particularly during the dry season. Sanitation services are also low, with no public dispensaries meeting WHO/UNICEF standards for basic sanitation.

Water Service Levels:

- Most of the healthcare facilities have water (66%) with majority relying on rainwater harvesting (76%), which is unreliable during the dry season. Few have been connected to piped water which is also not reliable.
- Piped water from community or utility networks is often unreliable and prone to breakdowns and water rationing leading to shortages especially during the dry seasons.
- Vended water, a common alternative, is significantly more expensive, with costs potentially 30 times higher than piped water.
- The common water treatment method is chlorination at more than 54% of the facilities.
- Water quality tests have not been carried out in 75% of the facilities and where they were carried the most commonly done are bacteriological tests for *E. coli* to assess levels of feacal contamination.
- The common water storage tanks are the plastic type of tanks and in good condition with an average storage of 28,072 liters storage capacity.

Sanitation Service Levels:

- No public dispensaries in Kitui County meet the WHO/UNICEF standard for basic sanitation service level. Majority of healthcare facilities (94.32%) have latrines with 42.8% of the facilities uses traditional pit latrines with the rest have permanent structures. The common type of soil is loamy soil (40%), followed by loose sandy soil at 29% which makes the sanitation facilities susceptible to collapsing especially during the heavy rains.
- Slightly above average (54.6%) of the healthcare facilities lack provision of gender disaggregated sanitation facilities.

- Majority (83%) have no provision of menstrual hygiene facilities and also lack of disability friendly facilities (57.2%).
- Toilet lightening to enable use at all times is a challenge with 83.8% having inadequate lighting excluding the natural light.
- The latrines facilities are clean at all times especially where the facility has employed casuals and they are generally in good working condition.
- The common type of latrines are the pit latrine with slabs (92.6%) with the pour flush connection being the lowest.
- A high number of the latrine facilities have never been emptied (93.5%) and are generally backfilled whenever they fill up.
- Half of the facilities have a hand washing facilities (veronica bucket being popular) available and within 5 meters to the sanitation facilities but lacking soap.
- Limited-service coverage or no service is common among healthcare facilities.

It is recommended for the County Government to improve the reliability of water supply by investing in more dependable sources, such as boreholes and piped water connections and construct sanitation infrastructure to meet basic standards per WHO/UNICEF standards.

Water in Schools

Rivers, rain-harvested water and boreholes are the main sources of water in schools. According to the Education Sector Report, SRA 2025, in the period ending Jan 2025, of all the schools in Kitui County (Pre primary, Primary, Junior Secondary and Secondary Schools), 50% had no access to safe water (functional source within 100m radius). Sixty six (66) percent of schools had no water treatment measures whereas 69% needed water harvesting and storage facilities (e.g., gutters, water tanks).

Table 35: Water Situation in Schools

Main Sources of Water in Schools	No. of Schools which nad NO Access to Safe Water (Functional Source Within 100m Radius)				No. of Schools with NO Water Treatment Measures				No. of Schools in Need of Water Harvesting and Storage Facilities			
	Pre-Primary	Primary	Junior School	Secondary	Pre-Primary	Primary	Junior School	Secondary	Pre-Primary	Primary	Junior School	Secondary
Rivers, Rain Harvested water and Boreholes	663	652	455	218	882	875	580	287	947	869	628	288
% per category	48%	50%	51%	54%	64%	68%	65%	71%	68%	67%	71%	71%

Sanitation and Hygiene Conditions in Schools

Schools have different types of school-based waste disposal mechanisms such as soak-pits and drainage channels. Over the period 41% of the schools had inadequate functional latrines (i.e., Pupil toilet Ratio - PtOR of above 1:60). Also 45% of the schools lacked or had inadequate hand-washing facilities.

Table 36: Sanitation and Hygiene Situation in Schools

Types of School-Based Waste Disposal Mechanisms	No. of Schools with Inadequate Functional Latrines (i.e. Pupil Toilet Ratio of above 1:60)				No. of Schools with NO or Inadequate Hand-Washing Facilities			
	Pre-Primary	Primary	Junior School	Secondary	Pre-Primary	Primary	Junior School	Secondary
Waste disposal bins, Soak Pits	499	548	426	156	627	628	353	185
% per category	36%	42%	48%	39%	49%	49%	40%	46%

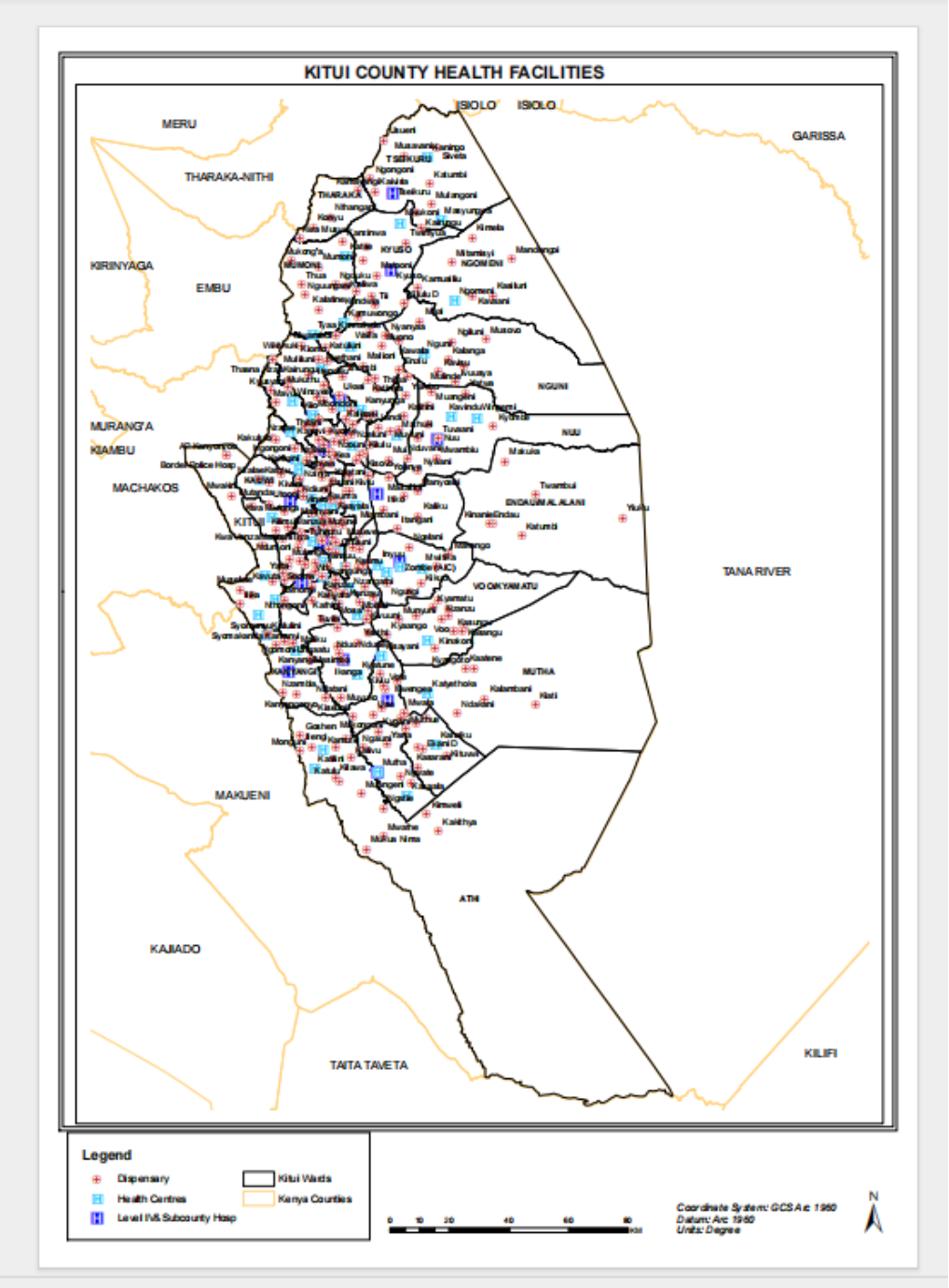


Figure 8: Spatial Distribution of Healthcare Facilities across the County

2.13.2 Disparities in Access across Different Institutions

Access to sanitation and hygiene services in Kitui County's healthcare facilities shows significant disparities, particularly between rural and urban areas. Rural facilities often face challenges such

as reliance on rainwater harvesting, which is insufficient during dry seasons, and shared community water supplies that frequently break down. Additionally, half of healthcare facilities in developing countries lack basic water services, and a quarter do not provide hand hygiene at points of care. These gaps create risks for vulnerable patients and healthcare workers.

Access to sanitation and hygiene services in learning institutions reflects notable disparities, particularly between rural and urban schools. Many rural schools face challenges such as inadequate water supply, poorly maintained sanitation facilities, and limited access to hygiene products. The sanitation facilities are dilapidated in most rural schools with limited provision of hand washing facilities. These issues disproportionately affect girls, as the lack of proper facilities can lead to absenteeism during menstruation. Urban schools, while generally better equipped, still struggle with overcrowding and maintenance of facilities especially in the informal settlements in the urban areas.

The County Ministry of Health and Sanitation is working towards addressing these disparities with implementation of activities like school health programs in schools and community-led sanitation initiatives in the households. Non Governmental organisations are also partnering with the institutions in provision of WASH services through construction of latrines facilities, provision of water tanks and connected to piped water from community service providers. However, achieving equitable access remains a challenge due to funding limitations and logistical barriers.

2.13.3 Assessment of Current Operation and Maintenance Modalities in Delivering WASH Services for School and Healthcare Facilities

The operation and maintenance (O&M) modalities in Kitui County's schools and healthcare facilities involve several approaches which the County Government is working towards to ensure quality provision of WASH services. This includes;

- **Community Engagement**: Local communities often play a role in maintaining WASH facilities, especially in rural areas. The catchment communities to institutions have been sensitized to construct basic latrine facilities and Community Health Promoters (CHPs) are tracking the households to ensure everyone has and is using the sanitation facilities. The community led water points have managerial leaders who ensures operation and maintenance of the water facilities. This includes contributions to repairs and ensuring the functionality of water points.
- **Government Policies**: Kenya has established policies and institutions to support the operation and management of WASH facilities. The County has customised the policies and enacted regulations to ensure proper implementation of sanitation and hygiene services. Currently, the County has been trained on the RUSH protocol, guidelines for implementation and costed roadmap which if implemented will assist the County towards clean and healthy environment as envisioned by the SDGs. However, gaps in resource allocation sometimes hinder effective implementation.
- **Cost Estimation Tools**: Tools are used to estimate the costs of maintaining WASH facilities, which help in budget allocation and resource mobilization. The County has adopted the RUSH costed roadmap which is key in budgeting and ensuring delivery of sanitation and hygiene services.

2.13.4 Assessment of Current Financing Modalities in Delivering WASH Services for School and Healthcare Facilities

The financing modalities in Kitui County's schools and healthcare facilities typically involve a mix of approaches intended to supplement each other and depending on the settings in the geographical areas. These approaches include the following;

- **Government Funding**: Allocations from National and County budgets are a primary source for WASH infrastructure and maintenance. The CIDP outlines WASH infrastructure which the County expects to construct in a few year cycle while the Annual Work plan will outline WASH infrastructure and services to be implemented during the financial year. However, these funds are often limited and may not fully meet the needs.
- **Donor Contributions**: InterNational organizations and NGOs play a significant role in financing WASH services, often through grants or project-based funding. These contributions help bridge gaps in Government funding. Kitui County is in partnership with WASH stakeholders in various services including water connections to schools and healthcare facilities, construction of latrines and sensitization of school going children on sanitation and hygiene behaviour change communication.
- **Public-Private Partnerships (PPPs)**: Collaborations between the Government and private entities are increasingly used to improve service delivery and ensure sustainability in WASH service delivery. Construction of major sanitation infrastructure like sewer systems and construction of major dams require PPPs to actualize.
- **Community-Based Financing**: Local communities sometimes contribute to the costs of maintaining WASH facilities, especially in rural areas. The community may establish mechanisms of supporting the most vulnerable in the community to construct sanitation facilities in their areas. In addition, local Financial Services Institutions (FSIs) have established sanitation financing mechanisms to offer small loans specifically for latrine construction. They have also established sanitation loan products which they have sensitized the community to undertake.

2.14 Hygiene Promotion Programs in Educational and HealthCare Facilities

2.14.1 Current Health and Hygiene Awareness Initiatives

Kitui County has implemented several health and hygiene awareness initiatives in schools and healthcare facilities for promotion of hand washing to prevent infection from spreading. This includes the following;

- **School Health Clubs**: in collaboration with Ministry of Education and partners, school health clubs have been established with training of teachers and students to promote hygiene practices such as handwashing, proper sanitation, and menstrual hygiene management. The school health club members actively participate in spreading awareness among peers and ensuring sanitation facilities are clean and ensuring presence of water and soap in hand washing facilities.
- **Training Programs**: Teachers and pupils have been sensitized on various models for encouraging hygiene and sanitation in CHASTE approaches. The healthcare workers

receive regular training on hygiene promotion and maintenance of sanitation facilities during monthly Continuous Medical Education (CMEs). The training packages for hygiene includes menstrual hygiene management and the importance of clean and safe water for drinking.

- **Innovative Solutions**: Introduction of technologies like SATO toilets and SATO Taps, which are designed to improve sanitation and inclusivity for individuals with disabilities. The facilities are user friendly especially to children to encourage their correct usage. These innovations are also climate smart with use of little water for their maintenance.

2.14.2 Potential Areas for Improvement and Expansion

There are several potential areas for improvement and expansion in sanitation and hygiene awareness initiatives in Kitui County's schools and healthcare facilities. These are areas that the County Government can focus on to improve to basic sanitation and hygiene service level as well as Grade 2 service level. These areas include the following;

- **Infrastructure Development**: Many schools and healthcare facilities lack adequate WASH infrastructure in Kitui County. Expanding access to clean water, functional toilets, and handwashing stations is critical. The National and County Government should work together to ensure all primary and secondary learning institutions have improved sanitation and hygiene facilities.
- **Menstrual Hygiene Management (MHM)**: The schools should work towards increasing awareness and providing resources for menstrual hygiene management. Provision of MHM facilities including provision of a bathroom in girls' latrines can help reduce absenteeism among girls in schools.
- **Innovative Solutions**: Leveraging technology, such as SATO toilets and Taps for sanitation and hygiene promotion or solar-powered water systems infrastructure, can enhance the reach and effectiveness of programs in institutions.

2.14.3 Assessment of Climate-Adaptive and Inclusive WASH Infrastructure

The status of infrastructure in healthcare facilities and learning institutions in Kitui County reflects broader challenges and opportunities seen globally. While there is growing recognition of the importance of WASH in schools and healthcare facilities, data gaps remain a significant barrier to comprehensive monitoring and evaluation. The available data shows efforts have been done to train artisans and masons in building climate resistant sanitation facilities. A number of health facilities had constructed latrines which were pit lined to prevent collapsing during the rainy periods.

2.15 Challenges and Gaps in Service Provision

2.15.1 Menstrual Hygiene Management Approaches

MHM services in Kitui County faces several challenges and gaps which are a reflection to ASAL Counties in the country. This includes the following:

- **Limited Access to Menstrual Products**: Many girls attending learning institutions and women in the County struggle to access affordable and sustainable menstrual hygiene products. This is often due to economic constraints and limited availability in rural areas. The Government program of provision of sanitary towels to girls faces challenges mainly stock out of the products in schools. As a result, the girls may miss school during menses. In addition, most learning institutions have not provided a bathroom with a mirror for use in the girls' washrooms.
- **Inadequate WASH Facilities**: Schools and public spaces often lack adequate water, sanitation, and hygiene (WASH) facilities. This includes private and safe spaces for changing and disposing of menstrual products.
- **Knowledge Gaps**: There is a lack of comprehensive education on menstrual health, both for girls and boys. This gap in knowledge perpetuates stigma and limits the ability of individuals to manage menstruation effectively.
- **Policy Implementation Challenges**: While Kenya has a Menstrual Hygiene Management Policy (2019 - 2030), Counties including Kitui are facing hurdles in implementation such as insufficient funding, lack of coordination among stakeholders, and inadequate monitoring. Through working with partners in the WASH sector, Kitui County has made attempts in implementation of the strategy.

Menstrual Hygiene is especially a challenge in schools over the period, 764 primary schools received menstrual kits for girls in Term III 2024 from Dr. Kasalu foundation, Ministry of Gender, Culture, The Arts and Heritage, Ministry of Education, and NGAAF while 43 secondary schools received the kits from Kenya Red Cross Society.

Provision of sanitary kits to girls improved retention of girls in school, promoted hygiene amongst girls thus enhancing conducive environment for learning, lowered rate of absenteeism, maintained girls' self-esteem, lowered drop-out cases, increased school attendance, participation, retained girls in school and improved their performance. The effect of non-provision of sanitary kits to girls were irregular school attendance, high rate of absenteeism, low self-esteem, poor performance and high drop-out cases (Education Sector Report, SRA 2025)

2.15.2 Medical Waste Management Approaches

Kitui County employes various strategies in management of medical waste with an intention of minimizing contamination to ensure safety and environmental sustainability. The approaches used include the following;

a) **Segregation at Source**: Waste is categorized into hazardous and non-hazardous types at the point of generation. This includes infectious waste, sharps, chemical waste, and general waste. The waste at the healthcare facilities are separated in colour coded bins for ease in identification and collection.
b) **Safe Storage**: Colour coded bins and containers and safe storage areas are used to prevent contamination and ensure safety during handling. The waste materials are collected frequently for safe disposal.
c) Waste treatment: Incineration; Kitui County Referral Hospital and Kauwi Hospital have a high-temperature incineration facilities used for hazardous waste, though it must be carefully managed to avoid harmful emissions; Autoclaving: Steam sterilization is

employed for infectious waste to neutralize pathogens mostly in the laboratory departments.

d) **Disposal**: Treated waste is disposed of in designated compost pits or through other environmentally sound methods to avoid environmental contamination.

2.15.3 Barriers to Access

Access to sanitation and hygiene services in healthcare facilities and learning institutions in Kitui County faces several barriers including:

a) **Infrastructure Limitations**: Many facilities lack adequate WASH infrastructure, including clean water sources, functional toilets, and handwashing stations. In most institutions, the ratio of users to sanitation facilities in not met and the latrines are dilapidated.
b) **Financial Constraints**: Insufficient funding often hampers the development and maintenance of sanitation and hygiene facilities in schools and healthcare facilities.
c) **Cultural and Social Barriers**: Stigma and lack of awareness about hygiene practices especially on menstrual hygiene management can limit their adoption. This is more so in learning institutions where both genders need sensitization to clearly understand.

2.15.4 Strategies for Improving Inclusivity and Sustainability

Improving inclusivity and sustainability of sanitation and hygiene services in healthcare facilities and learning institutions requires a multi-faceted approach. Some of the strategies which Kitui County has employed include the following;

a) **Infrastructure Development:** Build and maintain accessible WASH facilities that cater to diverse needs, including those of people with disabilities and gender-specific requirements in healthcare facilities and schools. These will include age-appropriate toilets especially for pre-primary pupils, separation of boys' and girls' toilets, include MHM facilities such as bins, washing area and changing rooms, etc
b) **Community Engagement:** Involve local communities in the planning and implementation of WASH projects to ensure they meet the unique needs of the population including the vulnerable in our community.
c) **Climate-Resilient Solutions:** Incorporate climate-adaptive designs to ensure WASH facilities remain functional in varying environmental conditions.
d) **Partnerships:** Collaborate with organizations and stakeholders to leverage resources and expertise for sustainable solutions.
e) **Capacity Building:** Train staff and students on proper hygiene practices and the importance of inclusivity in WASH services.

Some of these strategies have been evident and actualized in the STEP (School Toilet Enhancement Project) in Kitui West for the 20 selected Schools who benefitted from the project. This was after a successful pilot in Kyuso ward in Mwingi North sub-County. This was implemented through a partnership between UNICEF and the MOE.

2.16 WASH Plus/Multiple Use Water (MUS) Services

2.16.1 Assessment of Multi-Use Water Demands

This assessment reviews multi-use water demands and evaluates how well these are met under the current water service infrastructure and governance frameworks in Kitui County.

a) Domestic Water Use

- **Demand:** Daily per capita need, estimate is ~20–30 liters per person per day (WHO minimum standard).
- **Usage:** Drinking, cooking, cleaning and sanitation.
- **Estimated Countywide demand:** >120 million liters/day (based on a population of ~1.1 million).
- **Current Coverage:** Partial coverage, with reliance on boreholes and shallow wells (many non-functional during dry periods), seasonal Rivers and scoop holes, rainwater-harvesting tanks (mostly at institutions like schools).

The challenges include long distances to water points (over 5 km in some areas), water quality issues due to unprotected sources and intermittent supply in piped schemes.
The conclusion is that domestic water demand remains underserved, especially in rural villages, and service reliability is poor during dry seasons.

b) Irrigation Water Use

There is increasing demand due to the push for climate-smart agriculture and smallholder food production. Typical use is between 3,000 – 6,000 liters/day per household for small-scale irrigation plots while current coverage suffers limited irrigation infrastructure where few smallholder farmers use drip irrigation kits provided by NGOs (e.g., SNV, World Vision) and sand dams are sometimes retrofitted with irrigation lines.

The challenges include lack of dedicated water sources for irrigation and competing use of boreholes and water pans designed for domestic use. Therefore, Irrigation is highly constrained by water access, storage capacity, and infrastructure. Multi-use is not adequately planned.

c) Livestock Watering

Livestock ownership is widespread; daily water needs are as follows;

- **Cattle:** 20 – 30 liters/day.
- **Goats/sheep:** 3 – 5 liters/day.

Used at communal watering points and seasonal Rivers. There is moderate coverage, particularly in areas with sand dams and water pans and shared boreholes with livestock troughs. The challenges are drying of surface sources during droughts and livestock and domestic users often compete for limited water at shared points. Livestock watering is somewhat better supported than irrigation, but systems are not designed with MUS in mind, creating seasonal pressure and potential conflict.

d) Small-Scale Industry and Enterprises

In this category, water is used in brick making, soap production and food processing (e.g., mango drying) and small beverage kiosks, bakeries, and agro-vet shops. There is Minimal coverage and therefore most small-scale industries tap into household or communal domestic water points, limiting expansion. Additionally, no dedicated systems for productive enterprise support. This sector is severely underserved. Water service planning does not currently account for the needs of economic activities.

Table 37: Multi-Use Water Demand vs. Coverage in Kitui County

Water Use	Demand Level	Current Coverage	Key Challenges
Domestic	High	Moderate–Low	Distance, reliability, poor quality, seasonal drying
Irrigation	High (rising)	Very Low	Lack of dedicated infrastructure, competition for water
Livestock Watering	Moderate–High	Moderate	Seasonal shortages, user conflicts
Small-Scale Industry	Moderate	Very Low	No integration in water planning

Water service planning in Kitui is still predominantly single use focused, largely prioritizing domestic supply. Integrated MUS systems are rare, despite clear demand for water to support livelihoods. Livelihood-based water uses (irrigation, livestock, and small enterprises) remain underserved, limiting poverty reduction and climate resilience efforts.

Recommendations for Improvement

- **MUS-Integrated Planning:** Incorporate productive uses into water project design (e.g., build shared water troughs, irrigation lines).
- **Infrastructure Investment:** Develop multipurpose water infrastructure (solar-powered boreholes, lined pans, gravity-fed tanks).
- **Data-Driven Allocation:** Conduct regular water audits to guide equitable allocation across uses.
- **Support for Small Enterprises:** Facilitate access to water for micro-enterprises through business-friendly tariffs and piped access.

2.16.2 Strategies for Integrated Water Service Delivery

In Kitui County, the need for integrated water service delivery is driven by the community's dependence on water not only for domestic needs (Water, Sanitation, and Hygiene) but also for livelihood-related uses such as agriculture, livestock, and small-scale industry. Given the County's semi-arid climate and recurrent droughts, adopting Multiple Use Water Services (MUS) through integrated delivery models is essential for building resilience and improving quality of life.

Integrated Infrastructure Planning and Design

- **Multipurpose Water Points:** Design and construct water systems (e.g., boreholes, sand dams, water pans) that support both domestic and productive uses, such as irrigation and livestock watering.
- **Zonal Water Systems:** Develop zoned water distribution networks where water is allocated based on specific community needs (e.g., domestic zones, irrigation plots, and livestock zones).

A great example is the Ngomeni Ward Integrated Water Project which combines household water supply with community irrigation plots and livestock troughs.

Mainstreaming Livelihood Uses in WASH Programming

- **WASH and Livelihood Assessments:** Include analysis of local livelihoods when designing water systems. Understand how water supports farming, trade, and domestic life.
- **Livelihood-WASH Bundling:** Combine water access with support for small-scale farming, poultry, dairy, or beekeeping, ensuring that WASH investments also boost income and nutrition.
- **Targeted Support for Women & Youth:** Integrate water provision with skills training and microfinance to help marginalized groups use water productively.

Institutional Coordination and Policy Alignment

- **Interdepartmental Collaboration:** Foster coordination between the Department of Water, Agriculture, and Public Health to plan and monitor integrated services.
- **County Integrated Development Plans (CIDPs):** Ensure MUS principles are mainstreamed into CIDP strategies, climate adaptation plans, and sectoral policies.
- **Policy Example:** Kitui's 2023 – 2027 CIDP prioritizes climate-resilient water systems that serve both WASH and livelihood sectors.

Climate-Smart and Resilient Technologies

- **Drip Irrigation Linked to Water Points:** Equip community boreholes with solar-powered pumps and drip irrigation kits to allow sustainable small-scale farming.
- **Rainwater Harvesting Tanks and Sand Dams:** Capture and store rainwater for dual use such as drinking and irrigation, especially in schools, health centers, and homesteads.
- **Water Safety Planning:** Implement WSPs that address risks from multi-use systems, such as contamination from livestock or agriculture runoff.

Community-Based Management Models

- **Water User Associations (WUAs):** Empower WUAs to manage water access across uses, ensure equity in distribution, and resolve use conflicts.
- **Training and Capacity-Building:** Train community groups on how to manage water for domestic and economic activities, including tariff systems that consider productive use.
- **Inclusive Governance:** Promote participation of women, youth, and vulnerable groups in water governance and decision-making.

Financing Models that Promote Integration

- **Blended Finance for Water Systems:** Combine Government funding, donor support, and community contributions for multipurpose infrastructure.
- **Productive Water Tariffs:** Set differentiated tariffs for domestic vs. productive use, with cross-subsidies to ensure affordability and sustainability.

Monitoring, Learning and Scaling

- **Integrated Data Systems:** Monitor water use across sectors (WASH, agriculture, livestock) using community scorecards and mobile apps.
- **Pilot and Scale:** Test integrated service delivery models in one ward, then scale up based on lessons learned.
- **Partnerships with NGOs and Academia:** Collaborate with organizations like SEI, SNV, and Africa Sand Dam Foundation to document and disseminate best practices.

Table 38: Integrated Water Service Delivery Approaches

Strategy	Approach	Outcome
Infrastructure planning	Multi-use systems (e.g. sand dams, boreholes)	Domestic + livelihood use supported
WASH-livelihood bundling	Combine water access with farming/business programs	Income generation and improved nutrition
Institutional coordination	Inter-sectoral planning and budgeting	Efficient use of resources and accountability
Climate-smart technologies	Drip irrigation, rainwater harvesting	Sustainable water use
Community-led governance	WUAs manage MUS services locally	Equitable access and ownership
Financing innovation	Blended finance and fair tariffs	Sustainability and scalability
Monitoring and scaling	Data-driven learning and adaptation	Continuous improvement

2.16.3 Role of Small-Scale Climate-Smart Agriculture and Water-Efficient Irrigation Systems in Promoting MUS Services

Kitui County's semi-arid environment demands innovative and sustainable approaches to water management. Small-scale climate-smart agriculture (CSA) and water-efficient irrigation systems play a transformative role in promoting Multiple Use Water Services (MUS) by supporting food security, livelihood resilience, and sustainable water use across sectors.

Enhancing Water Use Efficiency for Livelihoods

a) Drip Irrigation Systems

- Widely adopted in Kitui through partnerships with organizations like The Water Project and Farm Africa.
- Delivers water directly to plant roots, minimizing loss through evaporation or runoff.
- Ideal for vegetable gardens and smallholder farms.

b) Impact on MUS

- Increases crop yields using minimal water.
- Enables the same water infrastructure (e.g., boreholes, sand dams) to serve both domestic and productive purposes.

Climate-Smart Agriculture as a Water Resilience Strategy

a) Conservation Agriculture

- Use of minimum tillage, crop rotation, and mulching to retain soil moisture.
- Reduces the need for frequent watering and prevents soil erosion.

b) Rainwater Harvesting and Storage

- Roof catchments, water pans, and sand dams are used to store water for off-season irrigation.

c) Agroforestry

- Intercropping trees with crops improves microclimates and retains groundwater.

d) Impact on MUS

- Reduces dependency on seasonal rainfall.
- Allows water systems initially intended for domestic use to be expanded to productive uses, enhancing their value.

Supporting Livestock Watering and Integrated Farming

a) Water-Efficient Troughs

- Community boreholes and dams now include low-waste livestock troughs.
- Promotes shared water use points without compromising supply for households.

b) Manure-Integrated Cropping Systems

- Encourages a closed-loop system where water supports crops and livestock in tandem.

c) Impact on MUS

- Ensures that water infrastructure supports mixed livelihoods (crop + livestock) without conflict.

Economic Empowerment through Climate-Smart MUS

a) Kitchen Gardens and Microenterprises

- Women-led groups use MUS to run vegetable gardens, poultry rearing, and soap-making businesses.
- Increased access to productive water supports entrepreneurship, especially among youth and women.

b) Climate-smart marketing

- Local farmer cooperatives now package climate-resilient produce for local and regional markets.

Policy and Institutional Support

a) Kitui County Climate Change Action Plan (2023 – 2027)

- Prioritizes CSA and MUS as core pillars for resilience.
- Supports scaling of CSA through extension services and subsidies for drip kits.

b) NGO Involvement

- Organizations like Africa Sand Dam Foundation and SEI have supported capacity building in CSA and MUS-linked irrigation.

Table 39: Summary of Benefits

CSA / Water-Efficient Tech	Benefit to MUS Services
Drip irrigation	Dual use for food and household water
Rainwater harvesting	Year-round supply for multiple uses
Agroforestry	Conserves soil and water, promotes biodiversity
Efficient troughs	Shared domestic-livestock water access
Kitchen gardens	Improved nutrition and income

2.17 Role of Water User Associations in Managing Multiple-Use Services

2.17.1 Community-Led Management and Governance Models

Kitui County, located in the semi-arid region of Eastern Kenya, experiences frequent water scarcity that affects domestic use, livestock, and small-scale agriculture. To address these challenges, community-led Multiple Use Water Services (MUS) have emerged as a vital solution. MUS is an integrated approach that ensures water systems serve diverse needs beyond basic domestic supply, including agriculture, livestock, and other livelihoods. The success of MUS in Kitui relies on robust community management, supportive policies, and technical innovations.

Community-Led Management Models

- **Water User Associations (WUAs):** WUAs in Kitui County are democratically formed groups responsible for the management and maintenance of communal water sources such as sand dams, boreholes, and piped systems. These associations enforce water-use rules, collect user fees, and carry out minor repairs. A great example is the African Sand Dam Foundation (ASDF) has supported numerous WUAs to manage sand dams in Kitui, promoting long-term sustainability and ownership.
- **Self-Help Groups (SHGs) and Cooperatives:** Community based organizations, especially women's groups, play a critical role in MUS governance. These groups mobilize resources, oversee construction and maintenance, and ensure that water systems support multiple uses. An example Caritas Kitui has worked with SHGs to develop solar-powered boreholes and irrigation systems, enhancing food security and income.
- **Community-Based Water Supply Schemes (CBWS):** These schemes are entirely managed by the community and often initiated with NGO or donor support. The schemes include rainwater-harvesting systems, shallow wells, and piped systems designed for multiple uses.

Policy and Institutional Frameworks

- **National Policy Framework:** Water Act 2016 - Recognizes Water Resource Users Associations (WRUAs) as key stakeholders in water governance. Legalizes the role of Community Water Service Providers (CWSPs).
- **County-Level Policies:** Kitui County Water and Sanitation Services Act (2018) - Provides guidelines for registration and support of community-managed water schemes. Encourages partnerships between the County Government, KITWASCO (Kitui Water and Sanitation Company), and local communities.
- **Institutional Support:** National Drought Management Authority (NDMA) - Implements Community Managed Disaster Risk Reduction (CMDRR) frameworks.Supports MUS through drought preparedness initiatives.
- **Kenya RAPID Program (2016 – 2021):** A public-private partnership active in Kitui, promoting integrated MUS models.

Technical Frameworks

- **MUS Infrastructure Design:** Designs incorporate multiple access points (e.g., taps, livestock troughs, irrigation outlets) and consider the varied needs of community members.
- **Appropriate Technologies:**
  - Sand Dams: Store water in seasonal Riverbeds and are easy to maintain.
  - Solar-powered Boreholes: Provide reliable and clean water for multiple uses.
  - Rainwater Harvesting Systems: Used at household and institutional levels.
- **Capacity Building and Training NGOs such as ASDF and Caritas**: Kitui County provides ongoing training in technical maintenance, governance, financial management and sustainable use of water systems.

Table 40: Success Factors and Lessons Learned

Success Factor	Description
Community Ownership	Ensures sustainability through participatory planning and management.
Inclusive Governance	Women and youth involvement increases equity and resilience.
Supportive Policies	National and County laws legitimize community water schemes.
Technical Innovation	Use of low-cost, resilient infrastructure suited for semi-arid regions.
Institutional Collaboration	Partnerships between Government, NGOs and communities.

2.17.2 Strategies to Enhance Resilience in MUS Systems

Enhancing resilience in Multi-Use Water Systems (MUS) in Kitui County, Kenya, is critical to adapting to climate change and managing water resources effectively across diverse sectors. Given Kitui's semi-arid environment, climate variability, and limited water availability, a comprehensive approach is required to improve water security, livelihoods, and sustainability. Below are strategies to enhance resilience in MUS systems, with climate adaptation measures and risk management tailored to different water uses in Kitui County. I've also provided references for further reading on each topic.

Integrated Water Resource Management (IWRM) Approach

- **Rationale:** IWRM ensures that water resources are managed efficiently, equitably, and sustainably for different uses (domestic, agriculture, and livestock).
- **Action:** Implement IWRM by developing a water management framework that balances the needs of various water users, ensures efficient water use, and promotes environmental sustainability.
- **Outcome:** Improved water quality and availability for all users, particularly during droughts (UN-Water, 2018 & World Bank, 2007).

Rainwater Harvesting and Storage

- **Rationale:** Kitui is prone to irregular rainfall patterns. Capturing and storing rainwater during wet seasons helps ensure availability during dry periods.
- **Action:** Promote the construction of rainwater harvesting systems such as roof catchments, ponds, and dams. Use appropriate technologies for small- and large-scale storage.
- **Outcome:** Reduced dependency on unreliable rainfall and increased water availability during droughts.

Water Efficiency Technologies

- **Rationale:** Water-efficient technologies ensure that water use is minimized and maximized for all sectors.
- **Action:** Promote efficient irrigation systems (drip irrigation, low-pressure sprinklers), and implement water-saving technologies for livestock watering (e.g., troughs, rainwater-fed tanks).
- **Outcome:** Optimized water uses in agriculture and livestock, improving system resilience.

Climate-Smart Agriculture and Livestock Management

- **Rationale:** Climate change impacts agricultural productivity and livestock health. By adopting climate-smart practices, resilience to changing climates can be improved.
- **Action:** Introduce drought-resistant crop varieties, promote agroforestry, and adopt sustainable grazing practices. Train farmers and herders on managing livestock health in the face of extreme heat.
- **Outcome:** Increased crop yields, improved livestock health, and more sustainable farming practices (FAO 2017 & World Bank 2013).

Community-Based Water Management

- **Rationale:** Local communities' active participation is crucial for the success and sustainability of water management systems.
- **Action:** Establish Water User Associations (WUAs) for collective management, maintenance, and distribution of water resources.
- **Outcome:** Improved community ownership and long-term sustainability of water systems.

Climate Forecasting and Early Warning Systems

- **Rationale:** Early warning systems enable communities to prepare for extreme weather events, such as floods or droughts.
- **Action:** Strengthen meteorological data collection and forecasting systems to provide timely and accurate weather predictions.
- **Outcome:** Increased preparedness for extreme weather events and better planning for water use (UNEP 2012 & WMO 2020).

Alternative Water Sources (Desalination, Wastewater Reuse)

- **Rationale:** Diversifying water sources reduces vulnerability to climate change impacts.
- **Action:** Explore the feasibility of alternative water sources such as desalinated water, greywater reuse, and the treatment of wastewater for non-potable uses.
- **Outcome:** Expanded access to water sources, reducing the risk of water scarcity.

Water Governance and Policy Development

- **Rationale:** Strong governance ensures equitable and sustainable water use and conflict resolution, especially during water shortages.
- **Action:** Strengthen water governance frameworks that prioritize the equitable allocation of water, especially in times of scarcity. Develop flexible and adaptive policies to respond to climate-induced changes.
- **Outcome:** Improved water management, conflict resolution, and equitable distribution of water resources (World Bank, 2010).

Capacity Building and Education

- **Rationale:** Training and awareness are critical for ensuring that communities adopt and sustain water management and climate adaptation practices.
- **Action:** Implement educational programs on water conservation, climate change, and sustainable agricultural practices, especially targeting youth and women.
- **Outcome:** A well-informed community capable of managing water resources sustainably.

Strengthening Infrastructure for Water Storage and Distribution

- **Rationale:** Robust infrastructure is essential for efficient water storage and distribution, particularly in arid and semi-arid regions.
- **Action:** Invest in the construction and maintenance of resilient water infrastructure, including dams, pipelines, and community-managed distribution systems.
- **Outcome:** Improved water storage and distribution capacity, ensuring reliable access to water during dry periods (KCIDP 2015).

2.17.3 Best Practices and Capacity-Building Needs in MUS Implementation

Multi-Use Water Systems (MUS) are designed to address the water needs of different sectors, including domestic use, agriculture, and livestock, often within the same system. This approach is particularly important in regions like Kitui County, Kenya, where water scarcity is a significant

challenge. Successful MUS implementation requires a careful combination of best practices and capacity-building efforts to ensure sustainability, resilience and equitable water distribution. Below are the best practices in MUS implementation;

Inclusive and Participatory Planning

- **Practice:** Involve all water users (households, farmers, livestock keepers, etc.) in the planning, design, and implementation phases of MUS to ensure that the system meets diverse needs.
- **Action:** Facilitate community consultations, where stakeholders can voice their needs and preferences for water use.
- **Outcome:** Increased community ownership, reduced conflicts, and better allocation of water resources.
- **Example:** Involve women's groups and youth in decision-making, ensuring gender equality in water distribution and management (Van Koppen *et al*., 2006).

Sustainable Water Resource Management

- **Practice:** Ensure that the water resources used in the MUS are managed sustainably to avoid over-extraction and degradation.
- **Action:** Develop sustainable water use plans, including water conservation practices like rainwater harvesting, watershed management, and efficient irrigation techniques.
- **Outcome:** Long-term sustainability of the water system and protection of the water source.
- **Example:** Introduce drip irrigation for agriculture and promote water-efficient crop varieties to minimize water wastage.

Integration of Climate Change Adaptation

- **Practice:** Factor climate change into the design and management of MUS, considering future shifts in precipitation patterns, drought risks, and water availability.
- **Action:** Implement climate-resilient water infrastructure such as rainwater harvesting systems, storage tanks, and drought-resistant crops.
- **Outcome:** Increased resilience to climate shocks, such as droughts and floods.
- **Example:** Install water storage systems that can buffer against dry seasons and droughts (FAO, 2017).

Water Allocation and Fair Distribution

- **Practice:** Establish clear rules and regulations for water allocation that ensure equitable distribution among different sectors (domestic, agricultural, and livestock).
- **Action:** Use data-driven methods to allocate water based on priority needs (e.g., domestic use during critical times) and monitor usage regularly.
- **Outcome:** More efficient and equitable water use, especially during periods of water scarcity.
- **Example:** Set up a rotational water distribution system that ensures fair access for all water users (WASREB, 2018).

Maintenance and Capacity for Local Management

- **Practice:** Empower local communities, especially Water User Associations (WUAs), to manage and maintain the water infrastructure.
- **Action:** Train local community members in the operation and maintenance of water facilities, including pumps, pipes, and storage tanks.
- **Outcome:** Reduced dependency on external support and more sustainable management of MUS.
- **Example:** Set up a community-led maintenance schedule for regular inspection and repair of infrastructure (Moriarty et al., 2004).

Monitoring and Evaluation (M&E) Systems

- **Practice:** Implement monitoring systems to assess the performance of MUS, including water quality, quantity, and system functionality.
- **Action:** Set up data collection tools and regular reporting mechanisms to monitor water usage and system efficiency.
- **Outcome:** Early detection of problems, better management of water resources, and informed decision-making.
- **Example:** Use simple flow meters and water quality testing kits to monitor system performance.

Conflict Resolution Mechanisms

- **Practice:** Develop mechanisms for resolving disputes over water use, especially in the face of water shortages.
- **Action:** Establish conflict resolution frameworks within Water User Associations (WUAs) and encourage dialogue between different user groups.
- **Outcome:** Peaceful coexistence and collaborative water management.
- **Example:** Set up a WUA committee to mediate water-related disputes based on agreed-upon rules and regulations (Kenya Water Act, 2016).

Capacity-Building Needs for MUS Implementation

a) Leadership and Governance Training

- **Need:** WUA leaders need strong governance skills to manage water allocation, resolve conflicts, and oversee the maintenance of MUS.
- **Action:** Provide leadership and governance training to WUA members to improve decision-making, accountability, and transparency.
- **Outcome:** More effective water management, reduced corruption, and improved system sustainability.
- **Example:** Training WUA leaders in budgeting, community engagement, and conflict resolution.

b) Technical Skills for Water System Operation

- **Need:** WUA members and local communities require technical training in maintaining water systems such as pumps, storage tanks, and pipes.

- **Action:** Offer hands-on training in the operation, maintenance, and troubleshooting of water infrastructure.
- **Outcome:** Improved local capacity to repair and maintain water systems without relying on external support.
- **Example:** Train community members in the repair and maintenance of solar-powered pumps or hand pumps.

c) Financial Management and Resource Mobilization

- **Need:** WUAs need financial management skills to sustainably operate and maintain MUS, including managing funds, collecting fees, and budgeting.
- **Action:** Provide training in financial literacy, budgeting, and resource mobilization, including how to access funding from donors or Government programs.
- **Outcome:** Financially sustainable MUS with the ability to self-finance through user fees or other revenue sources.
- **Example:** Offer training on how to set up a water tariff system and manage funds for maintenance (WASREB, 2018).

d) Water Quality Monitoring Skills

- **Need:** WUA members need to monitor water quality to ensure it is safe for domestic and agricultural use.
- **Action:** Provide training in basic water quality testing (e.g., pH, turbidity, chlorine levels) and introduce regular water testing protocols.
- **Outcome:** Improved health outcomes due to the provision of safe drinking water and early identification of water contamination.
- **Example:** Train community members on how to use water-testing kits to monitor quality regularly (WHO, 2017).

e) Climate Change Adaptation Awareness

- **Need:** Communities and WUA members need to understand how climate change can affect water availability and how to build resilience in the water system.
- **Action:** Provide training on climate-resilient water management strategies, including drought-tolerant crops and water conservation techniques.
- **Outcome:** Increased climate resilience and the ability to adapt to changing water availability.
- **Example:** Conduct workshops on climate-smart agriculture and water conservation methods, such as mulching and rainwater harvesting.

f) Conflict Resolution and Mediation Skills

- **Need:** WUA members need skills in conflict resolution to manage disputes over water use, particularly during droughts or periods of water scarcity.
- **Action:** Train WUA members in negotiation and mediation techniques to address conflicts fairly and transparently.
- **Outcome:** Reduced conflicts and smoother management of shared water resources.
- **Example:** Set up community dialogue platforms where water-related disputes can be discussed and resolved peacefully.

g) Legal and Policy Knowledge

- **Need:** WUA members need to understand the legal frameworks governing water management, including water rights, policies, and regulations.
- **Action:** Provide training on the National and local water policies, the role of WUAs under the law, and water rights.
- **Outcome:** Increased compliance with water laws and a better understanding of rights and responsibilities.
- **Example:** Educate WUA members about the Kenyan Water Act and its implications for local water management (Kenya Water Act, 2016).

For MUS to be successful and sustainable, it requires the integration of best practices, such as participatory planning, sustainable water management, and equitable allocation, with targeted capacity-building efforts. By strengthening the technical, financial, governance, and conflict resolution capacities of local communities and WUAs, MUS can become a powerful tool for addressing water scarcity, improving livelihoods, and building resilience to climate change. These efforts will help ensure the long-term success and sustainability of MUS systems.

3 WATER and Sanitation Services Institutional Structure and Financing

3.1 Policy and Legal Framework

a) United Nations Agenda 2023 for Sustainable Development

The United Nations' Sustainable Development Goal 6 declares the importance of achieving "Clean Water and Sanitation". The aim being to ensure the availability and sustainable management of water and sanitation for all as envisioned in Vision 2030. This goal encompasses several targets related to water provision, sanitation, and the overall sustainable use of water resources.

The Kitui Water and sanitation Strategy and investment plan seeks to the achieve United Nations' agenda 2023 through:

- Access to cleanliness by ensuring universal and equitable access to safe and affordable drinking water for the County residents.
- Access to adequate and equitable sanitation and hygiene for all, including improved facilities and proper waste management.
- Implementing integrated water resources management to ensure the sustainability of water sources and ecosystems.
- Increasing water-use efficiency across various sectors
- Promoting stakeholder cooperation and community participation in water-related management and decision-making processes.
- Reducing the number of people affected by water-related disasters and ensuring disaster-resilient infrastructure.

b) Constitution of Kenya 2010

Article 43(1) (d), of the Constitution of Kenya 2010 (COK 2010), provides for the right to clean and safe water in adequate quantities to every person. The COK 2010 in the Fourth Schedule specifies the devolved functions of the County Government. While the National Government has the responsibility to regulate water resources management, the County Governments are charged with water provision and sanitation services.

c) Kenya Vision 2030, Bottom-Up Economic Transformation Agenda and Fourth Medium Term Plan

The Kenya Vision 2030 seeks to transform Kenya into a globally competitive and prosperous nation with a high quality of life for its citizens. Water resources and their management play a crucial role in various aspects of this development agenda. The economic pillar is essential for the growth of the several sectors that drive the country's economy. Under Social pillar access to safe and clean water is important for human health and wellbeing.

d) Bottom-up Economic Transformation Agenda

The Bottom-Up Economic Transformation Agenda (BETA) is geared towards economic turnaround and inclusive growth in the country. The BETA blueprint seeks to increase investments in key sectors of the economy where water is a key enabler.

e) Fourth Medium Term Plan (MTP-IV) 2023-2027 and its Sector Plan

Under MTP-IV, this refers to sustainable use of aquatic and marine spaces including oceans, seas, coasts, lakes, Rivers and underground water. It encompasses a range of productive sectors including fisheries, aquaculture, tourism, transport, shipbuilding, energy bio prospecting and underwater mining and related activities.

The MTP-IV is a five-year plan that implements the Kenya Vision 2030 which is a development blueprint. The MTP-IV contains five sectors namely: Finance and Production Economy; Infrastructure; Environment and Natural Resource; Social Sector; and Governance and Public Administration.

Over the medium term, the Ministry through the Fourth Medium-Term Plan (2023 - 2027) has prioritized implementation of economic recovery strategies to re-position the economy on a steady and sustainable growth trajectory. The Ministry will focus on the water conservation and management, protection and conservation of wetlands, restoration and protection of water towers among others to ensure that the Fourth Medium Term Plan is achieved.

The Role of Kitui County in implementing the Fourth Medium Term Plan

Given the significance of water and sanitation in the socio-economic development and to the quality of life of the people of Kenya, Kitui County will play its role in the water sector. Kitui County Government will therefore undertake its role in the water sector as follows:

- Improve access to safe and clean water to the residents of Kitui County.
- Protect, manage and enhance Kitui County water resources for current and future generations.
- Strengthen research to inform policies and decision-making in the water, sewage and sanitation sector in Kitui County.
- Strengthen linkages and partnerships in the water, sewerage and sanitation sector for sustainable development.

f) The National Disaster Risk Management Policy, 2017

The overall objective of the policy is to substantially reduce natural and human-induced disaster risk and associated losses in social, economic and environmental assets at National and County levels through the establishment of an integrated multi-hazard DRM approach.

It helps the Ministry to explore how stakeholders manage water risks and disasters in a cooperative way. The Ministry will come up with risk assessment and awareness as well as setting and revising acceptable levels of water risks. The Ministry will explore prevention and mitigation, and emergency responses measures. The Ministry will invest in social policies and financial mechanisms to minimize disruption, while ensuring transparency, accountability and public awareness in decision-making.

g) The County Governments Act 2012

The County Governments Act of 2012 was formulated to operationalize Kenya's devolved system of governance. It anchors the autonomy and functionality of County Governments within the constitutional framework. This Act clearly defines the structures, powers, and functions of County Governments that facilitate effective local administration, public participation, and service delivery. The Act serves as an instrument for actualizing the principles of devolution, promoting democratic governance, and enhancing socio-economic development at the grassroots level.

h) The Water Act 2016

The Water Act 2016 Section 77 (1) requires County Governments to establish water services providers (WSPs). Section 94 read together with section 158 of the act mandates County Governments to put in place measures for provision of water services to rural areas which are considered not commercially viable in compliance with standards set by the National regulator. The measures referred to include the development of point sources, small scale piped systems, and stand pipes which meet the standards set by the Regulatory Board and which may be managed by the community associations, public benefits organizations, or a private person under a contract with the County Government as guided by management models.

i) The Companies Act 2015

The Companies Act of 2015 entrenches the overall governance of the commercially viable water service providers (WSPs) in the country. This Act modernizes company law by enhancing transparency, accountability, and shareholder rights, while simplifying the processes for company formation, management, and dissolution. Commercially viable WSPs are established as corporate bodies operating under the Companies Act 2015. This is to ensure the benefits of corporatization where revenue is ring-fenced, human resource is professionalized, and commercial principles are used to drive the creation of an efficient and economical water service provision that will fulfil the right to water as per section 91 of the Water Act 2016. The recommended model by the Water Act 2016 is a public limited liability company under the Companies Act 2015 and the memorandum and articles of that entity is required to be compliant to the Model issued by WASREB.

j) The Environmental Management and Coordination Act 1999

The Act provides for environmental governance, a comprehensive legal and institutional framework for sustainable environmental management. This Act integrates environmental considerations into any form of development and mandates the coordination of diverse environmental activities in both levels of Government. The Act enshrines the principles of environmental stewardship by instituting regulatory mechanisms for pollution control, environmental impact assessments (EIAs), and the conservation of biodiversity. Through its holistic approach, the Act ensures that environmental sustainability is a central tenet in the pursuit of water development and sanitation service provision.

k) The Public Health Act Cap 242

The Public Health Act, Cap 242 of the Laws of Kenya, constitutes a pivotal legal framework for the preservation and promotion of public health within the country. By codifying the responsibilities of Government entities and public health officers, the Act provides a comprehensive regulatory mechanism for disease prevention, sanitation, and environmental health. It empowers authorities with the mandate to enforce public health standards, inspect premises, and intervene in cases of non-compliance to mitigate public health risks. Through its multifaceted provisions on water safety, waste management, and infectious disease control, the Act serves as an essential instrument in the orchestration of public health governance, ensuring a cohesive and systematic approach to maintaining the nation's health standards.

l) The Public Finance Management Act 2012

The Act institutionalizes financial discipline by setting out comprehensive procedures for the collection, allocation, and expenditure of public funds across all levels of Government. It ensures that public resources are utilized efficiently in supporting sustainable economic development and enhancing public trust in financial governance. The Water Act 2016 provides for the establishment of County water service providers (WSPs) and oversight of the existing County entities and therefore, the provisions of the PFM Act are essential to their operation and management.

m) The National Water Master Plan 2030

The National Water Master Plan of Kenya implements Kenya Vision 2030 with respect to water resources. Water is defined as an essential resource to support development activities under Vision 2030. The water master plan is a blueprint that envisions the sustainable management and equitable distribution of water resources. The plan integrates a comprehensive assessment of water availability, demand, and usage, projecting future needs considering population growth, climate change, and economic expansion. It outlines a coordinated framework for water resource development, conservation, and governance, emphasizing intersectoral collaboration, innovation in water management technologies, and the decentralization of water services. By advancing an integrated approach to water security, the Master Plan ensures that water remains a pivotal enabler of socio-economic development and environmental sustainability.

n) WASREB Corporate Governance Standards for the Water Services Sector 2024

WASREB has designed standards to elevate the governance and operational efficiency of water service institutions, particularly Water Service Providers (WSPs). WASREB utilizes these standards to assess the commercial viability of WSPs, ensuring alignment with legislative reforms under key statutes such as the Constitution of Kenya 2010, the Water Act 2016, and the National Water Policy. It has also mooted guidelines on service delivery models for governance of rural water supplies and underserved areas. It continuously gives guidelines for improvement of water service delivery and customer protection.

o) Kitui County Government County Integrated Development Plan 2023 – 2027

The Kitui CIDP 2023-2027, under the theme "Accelerating the Kitui Economic and Social Transformation Agenda (KESTA)", was developed through a participatory process, ensuring local perspectives were integrated into the framework. The CIDP is structured around six core pillars: Food Security, Water Access, Healthcare, Industrial Parks, Human Capital Development, and Planned Urban Development, which align with the Governor's 16-point development agenda **"The Kitui Promise"**.

Chapter 1 presents an in-depth analysis of the County's resources, economic activities, demographic trends, and key developmental constraints. Chapter 2 reviews the performance of the previous CIDP, assessing County revenue, expenditure, sector achievements, and challenges. Chapter 3 outlines the Spatial Development Framework, while Chapter 4 identifies key development priorities, strategies, and flagship programs, with resources and performance targets for the planning period 2023-2027, where water provision and sanitation are key to the agenda

3.2 Role of County Government, Water Service Providers and Community-Based Organizations

The Water Act 2016 Section 77 (1) mandates the County Government to establish Water service providers (WSPs) as County entities and shall comply with the standards of commercial viability set out the Regulatory Board. The articles of association places County Governments as the principle to the entities. County Government water assets developed, and any other infrastructure used for the provision of water and sanitation services belong to the County Government and shall be transferred or leased to the WSP. The WSP shall provide water and sanitation services on behalf of the County while the County oversights the WSP to ensure standards set by the Regulator are adhered to.

Kitui has two WSPs dubbed Kitui Water and Sanitation Company and Kiambere-Mwingi Water & Sanitation Company which are licensed by WASREB to provide water services to urban and peri-urban areas of Kitui town and Mwingi town respectively. Under the Water Act 2016, Section 91 (1) a water services provider shall, as the licensee, be responsible for the efficient and economical provision of water services so as to fulfil the rights to water and other conditions specified in the license. Section 92 of the Water Act 2016 mandates every WSP to establish mechanisms for handling consumer complaints which meet the standards set by the Regulatory Board as part of their function.

Community based organizations (Water Users Associations) have a key role in the management of rural water supply schemes. These are unregulated entities but currently the Regulator has set out guidelines that will ensure professionalization and customer interests/protection is taken into account through mooted service delivery models. It envisaged that the community-based water service providers will enter into an agreement with County WSP or maintenance service provider of private entity for the operation, management and or both.

3.3 Role of Communities and Community Organizations in Managing Water Systems

The County Government Act 2012 provides platform for community participation in matters of development. In management of water systems, communities play pivotal role in selection of the community-based management committees. These committees are charged with the responsibly of water provision, operation and maintenance and putting in place mechanisms for customer complaints and feedback. In discharge of their delegated mandate the community-based organization are expected to comply with the principles of good governance including holding Annual General Meeting to enhance accountability. The County Government of Kitui has established administrative and technical structures on the ground where community-based organizations operate and are thus responsible and enforcement and compliance.

3.4 Public-Private Partnership Opportunities in Service Delivery

Through the Public Private Partnerships (PPP) Policy 2012 and the PPP Act 2021, Kenya is committed boost its economy and sector performance through private sector participation. They provide an environment that is instrumental and opens opportunities in realizing the Vision 2030 goal of engaging private sector as key towards reducing the infrastructure deficit and to delivering high quality services. The National Treasury and key stakeholders have developed PPP Guidelines which are being customized to be sector specific such as the Water Sector both for the National Government and County Governments. The County Government has recognized the significance of the private sector as a funding source for the County programmes including water and sanitation services, the County plans to introduce innovative public-private partnerships in development, raise awareness through forums promoting such partnerships, and foster strong collaborations to jointly plan, finance and implement water and sanitation initiatives. The County also seeks to strengthen partnerships with development partners where there will be increased collaboration, networking and trust with development partners for mutual investment in water and sanitation programmes and other County programmes. Thera has as well development of bankable proposals to attract funding to support water and sanitation investment including policy and development of legislations to guide water and sanitation service provision.

Kitui County in the water sector has engaged in public-private partnership programmes more geared towards community managed projects which brings element of Public-private community partnership. The partnership focuses on accelerating professional management for sustainability aiming at operation & maintenance, management or both.

Successful case study is that of FundiFix (a private operator/company), Community, County WSPs and County Government of Kitui partnership. Under this arrangement there have been 30 piped schemes and 14 shallow wells that have been sustainably managed and maintained. Before FundiFix took over, the water facilities faced challenges of high breakdowns, and some were abandoned by the community due to poor management and lack of accountability. Funding of the company is from the revenues generated from the schemes but quite often is due to low tariffs agreed between the community and the company. The company then develops proposals to attract donor funding to bridge the gap. This is viewed as a risk to the sustainability of the company in the wake of dwindling donor funding. However, since the company operates under delegated authority of County WSPs, there has been effort to sensitize the community through

County structures to review the tariff and adopt WSPs tariffs which have been reviewed and gazetted by the Regulator and are based on operation and maintenance full cost recovery. This not only addresses funding gaps but also avoids double standards in water service provision as far as tariffs are concerned.

Kitui County Government in the month of March 2025 hosted local sensitization forum for investors to take advantage of the great opportunities within the County to invest in. In any socio-economic growth, water development and sanitation provision services are key to spur that growth. The County coverage in water service provision is 56% and therefore to have universal water coverage indicates there is great opportunity for water investment.

Kitui County has in the past signed Memorandum of Understanding (MOU) with non-state actors for blended financing in the water sector. Among the projects implemented through blended financing is the River Athi-Kanyangi-Maluma-Ikutha-Kanziko Water supply system constructed in partnership with World Vison Kenya. Other blended financed water supply system is Kyuso Rock catchment which was co-financed by Water Sector Trust Fund and County Government of Kitui in which the County contributed 13% of the total cost of the project.

3.5 Sector Funding Arrangements

3.5.1 Sources of Funding

Majorly water and sanitation development and services are funded by National Government through various state authorities (WSTF, NWSHA, TAWWDA, NDMA, and NEMA), the County Government and non-state actors (World Vision Kenya, WHH, CMMB, JICA, Caritas Kitui NCCK, and ADS Eastern among others

In the last 10 years, the County Government of Kitui has invested a total of Kshs. 5,317,625,693 in the water sector. The lowest budget was in FY 2013/2014 of Kshs. 249,800,000 while the highest was FY 2018/2019 with Kshs. 732,070,811.

The Kitui County has not benefited from the private capital investment for the development of water and sanitation resources to warrant financial trend analysis. However, in the financial 2023/2024, the County water sector benefited with World Bank funding in the tune Kshs 112M through Kenya Devolution Support Program. The funds obtained were invested in development of water supply infrastructure in Kitui Rural and Kitui South sub-Counties.

Kitui County's GCP was approximately USD 1.29 billion in recent years. Agriculture, forestry, and fishing are dominant contributors to its economy. The GCP per capita for Kitui County is estimated at USD 1,137, which is below the National average. Kitui County has shown steady growth in its GCP, driven by investments in industrial parks and economic zones. The County's focus on mining, agribusiness, and renewable energy has been pivotal. Kitui County remains predominantly rural, with urbanization rates among the lowest in Kenya. The urban population accounts for less than 10% of the total.

Table 41: Analysis of County Public Financing (2017-2025)

S/No	Year	County GCP	Allocation	% Allocation
1.	2017/2018	10,891,256,672	981,807,297	9
2.	2018/2019	10,835,633,222	909,297,891	8
3.	2019/2020	11,231,977,622	755,447,928	7
4.	2020/2021	11,550,477,465	651,888,350	6
5.	2021/2022	11,447,317,776	596,801,910	5
6.	2022/2023	12,306,052,365	496,174,750	5
7.	2023/2024	14,257,138,713	687,879,521	5
8.	2024/2025	14,840,016,748	723,363,376.00	5

The County development budget allocated, 60% will be committed to water provision and sanitation services to meet goals and objectives of NAWASSIP program.

3.5.2 Revenue Generation Models

The existing revenue generating model for the water sector is based on the water tariffs that are proposed to WASREB by the WSPs, recommended by the County Government and subjected to public participation for amendment and subsequent adoption. The current tariffs for WSPs in operation are based on operation and maintenance full cost operation. The existing pricing structure is effective since it has looked into every category of customer and took into account the economic status and ability to pay. The tariff setting in rural water supply schemes is based on community participation, though guided and in most cases, it has alot of disparity. The disparity is based on the technology used in water abstraction. However, there is a knowledge gap in setting the tariffs. Mostly the tariff is set based on affordability as opposed to meeting operation and maintenance full cost recovery and that means they are not effective.

There are several challenges in affordability and willingness to pay for water and sanitation services as elaborated:

a) Political influence: Where leaders send messages that the water is free, even if the water and sanitation service is affordable and community is willing to pay, political pronouncements is a challenge
b) High price/tariff makes the service unaffordable despite willingness to pay for it
c) Alternative water sources which do not attract tariff, for instance where the water source is next to dry riverbeds where people can access water free
d) Income: higher or low income generally determines willingness to pay
e) Factors like quality, accessibility and perceived value also impact on willingness to pay.

3.5.3 Challenges in Financial Sustainability and Cost Recovery for Water and Sanitation Services

There are number of changes in financial sustainability and cost recovery for water and sanitation services in the County;

a) Limited public funding and dependence on user fees: Water and sanitation investments are funded by Government and interNational development agencies, but these sources are often limited.

b) Mobilizing financial resources from the users through tariffs is crucial for sustainability. However, achieving full cost recovery is difficult especially where the infrastructure is dilapidated.
c) Complexity of cost recovery: Many water and sanitation projects commence without full consideration of the interrelationships between various factors thus making it difficult to design a system that ensures both usage and payment.
d) Weak institutional frameworks and governance hinders effective collection of revenues, user fees and the efficient management of water and sanitation services.
e) Poor customer relations and lack of awareness among customers about importance of paying for water and sanitation services negates impact of cost recovery.

Strategies for improving revenue collection include;

a) Improved customer relations and awareness creation: sensitization, education and awareness campaigns are critical to help customers understand the importance of water and sanitation services and be encouraged to pay their bills
b) Strengthening institutional frameworks: improving institutional governance will lead to more efficient water and sanitation service delivery and better revenue collection
c) Tailored Tariff structure: Different tariff structures for various income groups makes services more affordable to the poor while those who have pay a little bit more will generate more revenue.

4 PLANNING Scenarios and Opportunities to Achieve County-Wide Universal Access

4.1 Sector Historic Expenditure Patterns

4.1.1 Analysis of Past Funding Allocations and Expenditures in Water and Sanitation

The table below indicates 10-year analyses of the County water funds utilization (allocated budgets, actual expenditure) and analyses on efficiency of utilization of the funds. The financial year 2013/2014 funds were 100% utilized while the lowest expenditure was recorded in the financial year 2022/2023 efficiency/expenditure in utilization.

Table 42: County Historic Expenditure Patterns

S/No	Recurrent			Development			Total	Actual expenditure	% Expenditure
Financial Year	**Budget**	**Actual Expenditure**	**% Expenditure**	**Budget**	**Actual Expenditure**	**% Expenditure**	**Budget**	**Actual Expenditure**	**% Expenditure**
2013/2014	28,139,598	28,139,598	100.0	249,800,000	249,800,000	100.0	277,939,598	277,939,598	100.0
2014/2015	40,078,128	33,387,498	83.31	469,050,766	477,173,507	101.7	509,128,894	517,251,635	92.51
2015/2016	88,864,583	80,135,019	90.2	683,198,573	566,510,880	82.9	772,063,156	646,645,899	83.8
2016/2017	222,375,715	194,211,467	87.3	537,129,392	403,900,517	75.2	759,505,107	598,111,984	78.8
2017/2018	99,610,319	98,733,917	99.1	731,147,800	618,417,072	84.6	830,758,119	717,150,989	86.3
2018/2019	142,913,157	134,643,893	94.2	732,070,811	681,603,827	93.1	874,983,968	816,247,720	93.3
2019/2020	88,062,544	86,863,205	98.6	630,151,603	538,338,309	85.4	718,214,147	625,201,514	87.0
2020/2021	84,509,021	77,709,353	92.0	533,582,830	502,126,343	94.1	618,091,851	579,835,696	93.8
2021/2022	96,259,261	84,399,983	87.7	465,311,295	426,224,918	91.6	561,570,556	510,624,901	90.9
2022/2023	111,072,127	102,694,925	92.5	286,182,623	186,858,117	65.3	397,254,750	289,553,042	72.9
Total	**1,001,884,453**	**920,918,858**	**92.6**	**5,317,625,693**	**4,650,953,490**	**87.5**	**6,319,510,146**	**5,578,562,978**	**87.93**

The utilization of the budget is expected to be 100% in every financial year. However, the efficiency in utilization is affected by and not limited to;

a) Lengthy budget process and approvals procedures,
b) Delay in disbursement of funds from the National treasury,
c) Lengthy procurement process
d) Credit financing of the contracts
e) Seasonality especially during rainy season where some activities delay in implementation leading revote.
f) Delays during political transition

4.2 Trends in Investment Compared to Service Delivery Outcomes

Water and Sanitation access improvement trend is yet low compared to the vision 2030 focus on safe & clean and improved sanitation services for all. Kitui access to safe and clean water stands at 56% and trend in investment achieves significantly an average of 2% annually with anticipation of service delivery outcomes of 64% by the year 2030 if the sector is not going to attract accelerated financing.

Previous funding initiatives by the County including proposal developed for funding, signing of memorandum of understating and negotiation with partners has yielded to significant investment in water and sanitation. Among these is investment is current ongoing construction of Ngomano-Mwitika- Endau water supply where the County is working with WHH.

Other initiatives include rehabilitation of rural water supplies through public private community partnership with various organizations undertaking several rehabilitation and operation of these schemes.

4.2.1 Impact Assessment of Previous Funding Initiatives

Since the advent of devolution in 2013, Kitui County has implemented sustained and strategic efforts to expand access to safe, adequate, and reliable water supply and sanitation services. Leveraging devolved governance structures, the County has made significant investments from public resources, development partners, and increasingly through emerging public-private initiatives. These collective efforts have propelled Kitui's progress towards achieving universal access to water and sanitation, as mandated by the Constitution of Kenya 2010 and in alignment with Sustainable Development Goal 6 (SDG 6).

Over the past decade, the County has prioritized the expansion of rural and urban water supply networks, rehabilitation and upgrading of critical water infrastructure, promotion of climate-resilient technologies such as solar-powered systems, and strengthening of institutional and operational capacities through Public-Private Partnerships (PPPs) and community-based management models. These interventions have been instrumental in enhancing service delivery, improving sustainability, and promoting resilience against climate variability and population growth pressures.

Following a recent sector assessment focused on the period since 2022, evidence shows notable improvements in water coverage and a reduction in the average walking distance to water sources to within two kilometers. The table below summarizes the impacts of previous funding initiatives on access to safe water, demonstrating the tangible outcomes of investments made over the last three years.

Table 43: Impact Assessment of Sector Previous Funding Initiatives

1. Kitui Central Sub-County							
S/No.	**Ward**	**Total Ward Population (HHs)- 2022/23**	**Population Served- within 2kms (HHs) - 2022/23**	**Total Ward Population (HHs)- 2023/24**	**Population Served- Within 2kms (HHs) - 2023/24**	**Total Ward Population (HHs)- 2024/25**	**Population Served- within 2kms (HHs) - 2024/25**
1	Township	13,097	12,188	13,202	12,603	13,314	12,995
2	Mulango	7,951	5,146	8,046	6,248	8,138	6,497
3	Miambani	5,837	1,258	5,932	1,101	6,024	1,217
4	Kyangwithya East	7,282	3,961	7,377	4,029	7,469	3,976
5	Kyangwithya West	8,018	4,909	8,113	5,155	8,205	7,680
	Total 1	42,185	27,462	42,670	29,136	43,150	32,365
% COVERAGE			**65.10**		**68.28**		**75.01**
2. Kitui Rural Sub-County							
S/No.	**Ward**	**Total Ward Population (HHs)- 2022/23**	**Population Served- Within 2kms (HHs) - 2022/23**	**Total Ward Population (HHs)- 2023/24**	**Population Served- Within 2kms (HHs) - 2023/24**	**Total Ward Population (HHs)- 2024/25**	**Population Served- Within 2kms (HHs) - 2024/25**
1	Kanyangi	5,883	2,293	5,978	2,424	6,070	2,557
2	Mbitini	6,398	2,292	6,493	2,390	6,585	2,524
3	Kisasi	7,355	3,785	7,450	3,243	7,542	3,366
4	Yatta/Kwa Vonza	10,383	5,875	10,478	8,117	10,574	8,748
	Total 2	30,019	14,245	30,399	16,174	30,771	17,195
% COVERAGE			**47.45**		**53.21**		**55.88**
3. Mwingi Central Sub-County							
S/No.	**Ward**	**Total Ward Population (HHs)- 2022/23**	**Population Served- within 2kms (HHs) - 2022/23**	**Total Ward Population (HHs)- 2023/24**	**Population Served- within 2kms (HHs) - 2023/24**	**Total Ward Population (HHs)- 2024/25**	**Population Served- within 2kms (HHs) - 2024/25**
1	Waita	5,387	3,085	5,482	3,125	5,574	2,886
2	Mwingi Central	8,129	5,771	8,224	5,285	8,320	5,675
3	Nguni	7,913	2,160	8,008	2,297	8,100	2,354

4	Nuu	6,424	1,599	6,519	1,666	6,611	1,720
5	Mui	5,611	1,901	5,706	1,971	5,798	2,015
6	Kivou	7,567	3,460	7,668	2,623	7,760	2,181
	Total 3	41,031	17,976	41,607	16,967	42,163	16,831
% COVERAGE			**43.81**		**40.78**		**39.92**
4. Kitui East Sub-County							
S/No.	**Ward**	**Total Ward Population (HHs)- 2022/23**	**Population Served- within 2kms (HHs) - 2022/23**	**Total Ward Population (HHs)- 2023/24**	**Population Served- within 2kms (HHs) - 2023/24**	**Total Ward Population (HHs)- 2024/25**	**Population Served- within 2kms (HHs) - 2024/25**
1	Nzambani	6,916	3,118	7,011	3,248	7,103	3,389
2	Chuluni	5,172	1,339	5,267	1,396	5,359	1,516
3	Zombe/Mwitika	6,559	1,506	6,654	1,586	6,746	1,625
4	Voo/Kyamatu	4,963	1,672	5,058	1,767	5,150	1,836
5	Mutitu/Kaliku	5,335	1,555	5,430	1,793	5,522	2,016
6	Endau/Malalani	4,000	523	4,095	550	4,187	610
	Total 4	32,945	9,713	33,515	10,340	34,067	10,992
% COVERAGE			**29.48**		**30.85**		**32.27**
5. Mwingi North Sub-County							
S/No.	**Ward**	**Total Ward Population (HHs)- 2022/23**	**Population Served- within 2kms (HHs) - 2022/23**	**Total Ward Population (HHs)- 2023/24**	**Population Served- within 2kms (HHs) - 2023/24**	**Total Ward Population (HHs)- 2024/25**	**Population Served- within 2kms (HHs) - 2024/25**
1	Kyuso	11,854	1,920	11,949	2,110	12,041	2,880
2	Tharaka	5,359	1,061	5,454	1,058	5,546	1,098
3	Mumoni	6,902	2,820	6,997	2,936	7,089	3,103
4	Ngomeni	4,951	1,495	5,046	1,613	5,138	1,787
5	Tseikuru	8,985	2,188	9,080	2,078	9,172	2,265
	Total 5	38,051	9,484	38,526	9,795	38,986	11,133
% COVERAGE			**24.92**		**25.42**		**28.56**
6. Kitui South Sub-County							
S/No.	**Ward**	**Total Ward Population (HHs)- 2022/23**	**Population Served- within 2kms (HHs) - 2022/23**	**Total Ward Population (HHs)- 2023/24**	**Population Served- within 2kms (HHs) - 2023/24**	**Total Ward Population (HHs)- 2024/25**	**Population Served- within 2kms (HHs) - 2024/25**

1	Mutomo/Kibwea	6,322	3,180	6,417	3,418	6,509	3,287
2	Ikanga/Kyatune	8,656	1,544	8,751	2,481	8,843	2,832
3	Ikutha	5,924	925	6,019	1,080	6,111	1,139
4	Athi	8,392	1,457	8,487	2,053	8,579	2,155
5	Kanziko/Simisi	3,498	471	3,593	649	3,685	863
6	Mutha	6,501	993	6,596	1,071	6,688	1,544
	Total 6	39,293	8,570	39,863	10,752	40,415	11,820
% COVERAGE			**21.81**		**26.97**		**29.25**
7. Kitui West Sub-County							
S/No.	**Ward**	**Total Ward Population (HHs)- 2022/23**	**Population Served- within 2kms (HHs) - 2022/23**	**Total Ward Population (HHs)- 2023/24**	**Population Served- within 2kms (HHs) - 2023/24**	**Total Ward Population (HHs)- 2024/25**	**Population Served- within 2kms (HHs) - 2024/25**
1	Mutonguni	4,992	2,117	5,087	2,232	5,179	2,418
2	Kauwi	7,762	3,548	7,857	3,805	7,949	3,836
3	Kithumula/Kwa Mutonga	5,720	2,168	5,815	2,366	5,907	2,591
4	Matinyani	6,605	2,390	6,700	2,769	6,792	3,045
	Total 7	25,079	10,223	25,459	11,172	25,827	11,890
% COVERAGE			**40.76**		**43.88**		**46.04**
8. Mwingi West Sub-County							
S/No.	**Ward**	**Total Ward Population (HHs)- 2022/23**	**Population Served- within 2kms (HHs) - 2022/23**	**Total Ward Population (HHs)- 2023/24**	**Population Served- within 2kms (HHs) - 2023/24**	**Total Ward Population (HHs)- 2024/25**	**Population Served- within 2kms (HHs) - 2024/25**
1	Migwani	12,509	3,538	12,604	3,823	12,696	3,938
2	Nguutani	8,162	4,502	8,257	4,961	8,349	5,257
3	Kiomo/Kyethani	5,361	981	5,456	1,012	5,548	1,101
4	Kyome/Thaana	4,557	4,415	4,652	4,587	4,744	4,669
	Total 8	30,589	13,436	30,969	14,383	31,337	14,965
% COVERAGE			**43.92**		**46.44**		**47.76**
TOTAL KITUI HHs		**279,192**	**111,109**	**283,008**	**118,719**	**286,716**	**127,191**
% COVERAGE			**39.80**		**41.95**		**44.36**

(Data source: *County Department of Water, 2025)*

Three-Year Overall Improvement (2023–2025):

- **Water access improved by 5%.**
- Approximately **16,082 additional households** gained access to safe water.

This growth demonstrates the County's commitment to scaling up water access, despite the prevailing environmental, financial and institutional challenges.

4.3 WASH Service Coverage Scenarios, Investments, and Reform Needs

4.3.1 Projections of Future Service Demand Based on Population Growth, Urbanization and Climate Change

Demographic growth and climate change is hypothesized as one of the factors affecting provision and sustainability of water services. In the urban areas the population is expected to increase significantly while our investments plan for both water and sanitation trend is still low. Water coverage in both urban and rural areas in Kitui currently stands at 56% and unless serious investment takes place the demand might lower the coverage. Sewerage coverage in Kitui is currently at 5% which means issues of ecosystem pollution are likely to increase unless investment is aligned with demand trends.

The infrastructure development should meet the demand of the projected population of 1,327,464 by the year 2030 (CIDP III 2023-2027). It is expected that the County and development partners in consulted efforts should mobilize resources to achieve universal access by 2030. Due to limited public financing on water and sanitation projects more resources are required to bridge the gap. The County will focus on hotspot areas such as Mwingi North, Kitui South and Kitui East Sub-Counties where issues distance, quantity and quality is a major challenge.

The County will establish a close rapport and cooperation with the State water sector department to unlock inadequacy of existing resources for projected service demand. To enhance access to safe affordable Water Services and sanitation services the department has initiated the following;

a) One mega dam in each sub-County, two large dams in each ward, one medium dam in each village.
b) Install 200 Water harvesting tanks in learning institutions
c) Survey and design of 45No strategic sump well water supply schemes. The sump wells will be constructed in the major seasonal Rivers such as Thua, Nzeeu, Ikoo, Mwitasyano, Katse, Tyaa, Tiva and Kaayo. These water supply schemes will be equipped with solar powered pumping systems.
d) Rehabilitation, maintenance and solarization of 200 existing boreholes, in conjunction with development partners such as SNV, UNICEF, Project Maji, Samaria Purse, FAO, CMMB WHH, Sweden Mutomo Project and World Vision.
e) Drilling of 100No new boreholes at strategic points in each ward/village.
f) Support to WSPs (Kitwasco and Kimwasco) with 200 km of pipeline extensions. These are County entities established under the Water Act 2016 to provide

water services to urban and peri-urbans in Kitui County.

g) Construction of sand dams 600No will enhance recharge in seasonal Rivers to provide water for multiple uses.
h) Construction of sewered system by completing the Kitui town sewer system
i) Construction of non-sewered facilities decentralized treatment facilities (DTF) in Mwingi, Mutomo, Kwavonza, Kabati and Tseikuru, sensitization in construction of flash toilets with bio digester system in major markets and sensitization to construct improved pit latrines with sato covers in rural areas.
j) Campaigns to ensure Kitui County is open defecation free.

Collaborative Initiatives

The County Government in collaboration with the National Government works on completion of the Mwingi-Kiambere Water Project, Kitumui Dam, Thwake Dam, Umaa Dam, Kindaruma-Kiomo-Mwingi-Migwani Pipeline Project, Kiambere-Mwingi Water Project, as well as the expansion of Masinga-Kitui water supply intake.

4.4 Policy and Institutional Reforms Needed for Effective Service Expansion

Kitui County is facing challenges of water supply and sanitation service provision that require robust policy, institutional, legal and regulatory framework. This will improve the governance of water and sanitation improvement. An essential component to achieving the Sustainable Development Goals, the Policy, Institution and Regulatory framework (PIR) will help Governments amid growing shocks and stresses in the water sector. However, the mainstreaming and implementation of policy, institution and regulatory framework into concrete reforms and investment programs is still sporadic.

The PIR is required to address the following constraints;

a) Weak financial and institutional capacity
b) Overlapping and unclear roles and responsibilities
c) Poor interGovernmental coordination
d) Unrealistic policies, reforms and financing strategies and
e) Limited oversight and reporting

It is important to make changes in policy, institutional and regulatory frameworks to address the highlighted challenges above that affect water supply and sanitation service provision. Policies that touch on requisite water quality, reliability, equity and sustainability are critical for universal access to water supply and sanitation services.

Institutional adjustments are necessary to address the challenge of fragmented institutions in water supply and sanitation services. The policies should come out strongly to address sustainability which is the major challenge hindering effective service delivery. Among proposed action is establishment of fund to attract public private participation not even in investment but also in management This will enable Counties to closely monitor key performance indicators like coverage, production, non-revenue water performance, quality, distance, water connectivity to

individual connection, revenue collection efficiency, metering and billing efficiency,, staff to metering ration, compliance to statutory obligation population connected to sewer system, population with improved sanitation and sustainability, pollution of water sources, market sanitation levels and homesteads with sanitation facilities.

4.5 Investment Needs to Close Service Gaps and Improve Sustainability

In line with our Vision and Mission, we have identified program areas that are key to this water & sanitation strategy and investment plan that reflect our mandate and responsibilities in the realization of Kenya's Vision 2030. These are as indicated below:

a) Water sources management
b) Development of water and sanitation infrastructure
c) Management of WSPs and rural water schemes
d) Resource mobilization and financial sustainability
e) Organizational development and institutional strengthening
f) Emerging water solutions technologies
g) Water quality management

The strategy proposes to align the funds to programmes that will be accomplished through activities that will deliver relevant and time bound targets within Kitui County Government mandate in provision of water and sanitation services. Among the projects to be done, priority shall be given to sustainable and climate-resilient investments (climate proof infrastructure and key reforms to institutional strengthening) to address existing service gaps.

The table below shows a summary of resources required for effective implementation of programmes,projects and activities in the strategy period showing investment estimates focusing on infrastructure development, policy, institutional and regulatory reforms. In each key result area detailed activities are aligned within the implementation plan in the proposed budget.

Table 44: County Investment Estimates Required to Implement the Srategy

Sub-sector	**Estimated Cost (KES)**
Rural water supply and Environmental and Social Impact Assessment (ESIA)	12 billion
Urban and Peri-Urban water infrastructure and Environmental and Social Impact Assessment (ESIA)	3.8 billion
Sanitation and hygiene (public and household)	1.4 billion
Water resources management and conservation and Environmental and Social Impact Assessment (ESIA)	1.3 billion
Institutional strengthening and capacity building	1.5 billion
Sector governance, regulation, ICT and innovation	600 million
Monitoring and Evaluation	500 million
Total	**21.1 billion**

5 SECTOR INVESTMENT PLAN, INSTITUTIONAL REFORMS AND FINANCING STRATEGY

This chapter presents evidence-based interventions, proposed based on lessons from past programs, and an in-depth review of emerging issues such as technology, urbanization and climate change. The sector investment plan, institutional reforms and financing strategy are informed by extensive consultations with stakeholders, including the County leadership, public partcipation, and development partners, so as to ensure that it is inclusive and actionable.

Below is the vision, mission, strategic goals and objectives, tailored to Kitui County context;

5.1 Vision

A County with universal access to safe, affordable and sustainable water and sanitation services for a healthy, productive, and prosperous lives.

5.2 Mission

To deliver effective, efficient, and climate-resilient water and sanitation services through sustainable water and sanitation systems designs, effective governance, strategic partnerships, and community ownership

5.3 Strategic Goals

The following strategic goals will guide the County's investment and development initiatives in the water and sanitation sector:

a) Universal and equitable access to safe and reliable drinking water by 2030.
b) Improved sanitation coverage and hygiene behavior, especially in rural and underserved communities.
c) Sustainable management and conservation of water resources within the strategy period.
d) Strengthened institutional frameworks for governance, accountability, and coordination.
e) Enhanced climate preparedness and resilience for water-related disasters.
f) Mobilization of financing and investment for sector development within the strategy period.

5.4 Strategic Objectives

To operationalize the above goals, the following strategic objectives have been identified:

Objective 1: To Expand and Upgrade Water Supply Infrastructure

- Increase access to safe and reliable water for domestic, agricultural, and institutional use.
- Rehabilitate and optimize existing water supply systems for improved efficiency and service reliability.
- Invest in new piped and non-piped water supply schemes targeting underserved areas.

Objective 2: To Improve Access to Safe and Dignified Sanitation Services

- Promote the construction and use of improved sanitation facilities in homes, schools, health centers, and public spaces.
- Strengthen sanitation and hygiene promotion programs through community-led total sanitation (CLTS) and awareness campaigns.
- Support private sector engagement in low-cost sanitation technologies.

Objective 3: To Ensure Sustainable Water Resources Management

- Protect and rehabilitate catchment areas, water towers, and aquifers.
- Promote integrated water resources management (IWRM) approaches at County and community levels.
- Establish data systems for water resources monitoring and planning.

Objective 4: To Strengthen Institutional Capacity and Sector Governance

- Build technical and managerial capacity in the County Water Department and Water Service Providers (WSPs).
- Strengthen policy implementation, regulation, and enforcement of service standards.
- Improve coordination among stakeholders through multi-sectoral platforms and forums.

Objective 5: To Mobilize and Leverage Financial Resources

- Develop and implement sustainable financing models.
- Secure external funding from development partners and donors to complement County allocations.

Objective 6: To Mainstream Climate Adaptation and Disaster Risk Reduction

- Integrate climate risk considerations into water and sanitation infrastructure design and planning.
- Promote rainwater harvesting, drought mitigation, and flood control measures.
- Enhance disaster preparedness and early warning systems for water-related risks.

Objective 7: To Promote Inclusive Participation and Stakeholder Engagement

- Strengthen community involvement in planning, implementation, and monitoring of water and sanitation projects.

- Ensure the inclusion of women, youth, persons with disabilities, and marginalized groups in sector decision-making.
- Build partnerships with NGOs, faith-based organizations, private sector actors, and civil society.

5.5 Alignment with County, National and Global Frameworks

The strategic objectives outlined in this Strategy are fully aligned with County's Kenya's National development agenda, constitutional mandates, and global commitments. The CWSSIP ensures that the water and sanitation priorities of Kitui County contribute directly to broader policy frameworks, ensuring coherence and sustainability.

5.5.1 County Integrated Development Plan (CIDP III 2023–2027)

The CWSSIP is fully aligned with the Kitui County CIDP III, crystallized as The Kitui Economic and Social Transformation Agenda (KESTA) which prioritizes:

- Enhanced access to clean water and sanitation facilities;
- Protection of water catchment areas;
- Construction and rehabilitation of water infrastructure;
- Institutional strengthening and stakeholder engagement.

5.5.2 The Constitution of Kenya 2010

Article 43(1)(d) of the Constitution guarantees every person the right to clean and safe water in adequate quantities and reasonable standards of sanitation. Article 174 further supports the principles of devolution, including equitable access to services and community participation in governance. The CWSSIP operationalizes these rights through strategic objectives that promote inclusive access, equity, and accountability in service delivery.

5.5.3 National Water Strategy 2021–2025

The National Water Strategy (NWS) 2021–2025, developed by the Ministry of Water, Sanitation and Irrigation, provides a roadmap for achieving universal access to water and sanitation services while ensuring the sustainable management of water resources across Kenya. The strategy outlines key priorities, including:

- Improving water security and increasing access to safe water supply.
- Enhancing sanitation and hygiene services.
- Strengthening water governance and institutional capacity.
- Promoting Integrated Water Resources Management (IWRM).
- Building resilience to climate change and water-related risks.

The Kitui CWSSIP is closely aligned with these National priorities and provides a localized implementation framework that:

- Expands both rural and urban water supply coverage through infrastructure investment.

- Enhances sanitation and hygiene outcomes via community-led and institution-based interventions.
- Establishes County-level governance, accountability, and coordination mechanisms.
- Promotes environmental conservation, catchment protection, and IWRM.
- Incorporates climate-smart approaches to infrastructure design and service delivery.

5.5.4 National Water and Sanitation Investment Plan (NAWASIP) 2023–2030

The National Water and Sanitation Investment Plan (NAWASIP) provide a long-term investment blueprint to achieve Kenya's targets for universal water and sanitation services by 2030. It outlines:

- Investment requirements by region and County.
- Financing mechanisms including public, private, and blended finance.
- Institutional reforms and capacity development.
- Alignment with Kenya Vision 2030 and the Constitution of Kenya.

This CWSSIP directly supports the operationalization of NAWASIP at the County level by:

- Identifying priority investment areas for water and sanitation in Kitui County.
- Structuring funding pathways through County budgets, donor engagement, and public-private partnerships.
- Providing a clear investment pipeline aligned with National estimates and resource mobilization strategies.
- Ensuring that service delivery is both equitable and sustainable, especially in marginalized areas.

Kitui County is committed to working with the Ministry of Water and other development actors to attract financing under NAWASIP frameworks and contribute to the National investment targets.

5.5.5 Medium-Term Plans (MTP IV 2023 – 2027)

The Fourth Medium-Term Plan of Vision 2030 identifies water and sanitation as key enablers of socio-economic transformation. It prioritizes:

- Scaling up water harvesting and storage.
- Expanding rural and urban water supply.
- Investing in sanitation infrastructure.
- Strengthening institutional frameworks for service delivery.

Kitui County's strategic objectives under CWSSIP are harmonized with these National priorities to ensure synergy and resource optimization.

5.5.6 Sustainable Development Goal 6

The Sustainable Develeopment Goal (SDG) 6 aims to "ensure availability and sustainable management of water and sanitation for all" by 2030. It includes several targets related to water

access, sanitation, water quality, efficiency, governance, and ecosystems. CWSSIP aligns with the following key SDG 6 targets as tabulated below;

Table 45: Alignment of the CWSSIP with SDG 6

S/No.	SDG 6 Target	CWSSIP Strategic Alignment
1.	6.1: Universal and equitable access to safe and affordable drinking water	Expansion of rural and urban water infrastructure and reduction of service gaps in arid zones
2.	6.2: Access to adequate and equitable sanitation and hygiene for all	Promotion of improved sanitation, school WASH programs, and CLTS for open defecation-free communities
3.	6.3: Improve water quality by reducing pollution and increasing safe reuse	Introduction of water quality monitoring systems and decentralized sludge management solutions
4.	6.4: Increase water-use efficiency and sustainable withdrawals	Promotion of water harvesting, efficient irrigation, and sustainable groundwater use
5.	6.5: Implement integrated water resources management	Development of catchment management plans and promotion of community-led IWRM
6.	6.a: Expand interNational cooperation and capacity-building support	Engagement with development partners, NGOs, and National Government through joint programs
7.	6.b: Support community participation in water and sanitation management	Active inclusion of community structures, WRUAs, and user associations in planning and implementation

5.6 Cross-Sectoral Integration

Water and sanitation are deeply interconnected with other sectors such as health, agriculture, environment, energy, and disaster risk management. The CWSSIP recognizes that sustainable water and sanitation services cannot be achieved in isolation. Therefore, the Strategy adopts a cross-sectoral approach that integrates climate resilience, environmental conservation, and inter-sectoral collaboration as outlined in the Kitui County Climate Change Policy (2023) and the County Climate Change Action Plan (2024).

5.6.1 Kenya Vision 2030

The CWSSIP aligns with the objectives of the Kenya Vision 2030, which aims to transform Kenya into a middle-income country through the provision of basic services such as water and sanitation. Under the Social Pillar, the Vision emphasizes access to clean water and improved sanitation as a foundation for health, education, and economic productivity.

5.6.2 Climate Resilience in Water and Sanitation

Kitui County is increasingly vulnerable to climate change impacts, particularly recurrent droughts, environmental degradation, floods and extreme temperatures. The spatial distributions of the stated climate hazards as outlined in the Kitui County Climate Change Action Plan (2024) are as shown in the figures below.

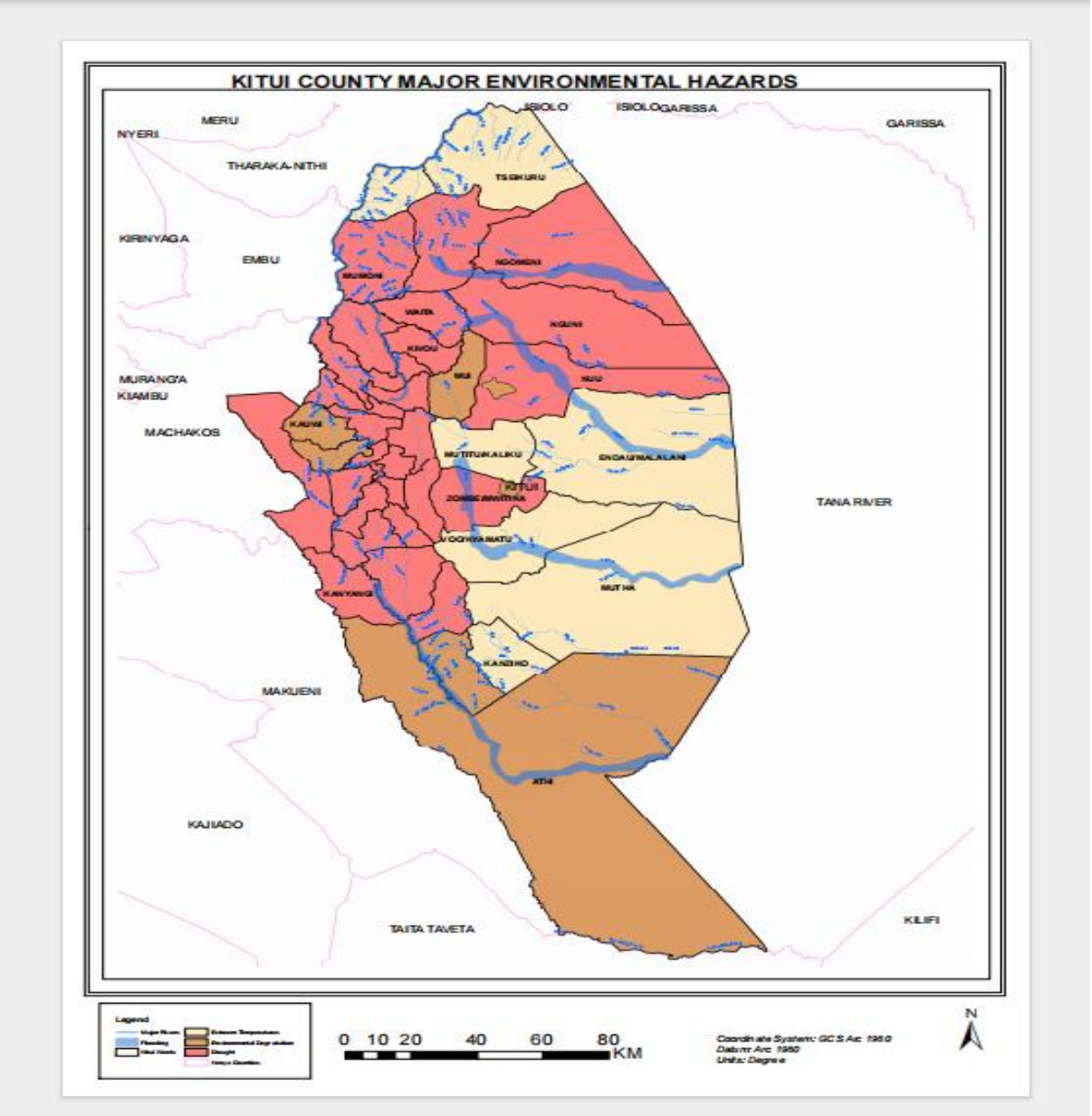


Figure 9: Spatial Distribution of Climate Hazards across the County

This CWSSIP integrates climate resilience into all aspects of planning, design, and implementation of water and sanitation services in line with the geospatial distribution of climate hazards shared through the following approaches:

- **Climate-Smart Infrastructure:** Prioritizing investment in drought-resilient technologies, such as solar-powered boreholes, sand dams, and rainwater harvesting systems.
- **Risk-based Planning**: Incorporating climate risk assessments in project selection and infrastructure siting to reduce exposure to floods, drought, extreme temperatures and water scarcity.

- **Adaptation Measures**: Promoting water conservation practices, leakage control, and sustainable groundwater management to ensure long-term service reliability.
- **Early Warning and Response**: Strengthening community-based systems for early warning and disaster preparedness to respond to climate-induced water stress and emergencies.

These approaches are consistent with the Kitui County Climate Change Action Plan (2024), which emphasizes the mainstreaming of climate adaptation into all sectors, especially water.

5.6.3 Environmental Conservation and Natural Resource Protection

Environmental degradation, including deforestation, overgrazing, and poor land-use practices, is a key dRiver of water scarcity and water quality deterioration in Kitui County. CWSSIP prioritizes environmental stewardship as a core strategy to safeguard water resources and sanitation systems. Specific interventions include:

- **Catchment Protection and Reforestation**: Supporting afforestation programs in critical water catchments and riparian areas to reduce runoff, enhance infiltration, and preserve water flows.
- **Soil and Water Conservation**: Promoting terracing, agroforestry, and water retention structures in agriculture to reduce erosion and sedimentation of water bodies.
- **Sustainable Groundwater Use**: Enhancing aquifer mapping, abstraction regulation, and recharge initiatives in line with IWRM principles.
- **Pollution Control**: Encouraging safe sanitation systems, improved waste management, and enforcement of environmental health regulations to prevent contamination of water sources.

5.6.4 Inter-Sectoral Coordination and Mainstreaming

CWSSIP supports inter-agency coordination and mainstreaming of water and sanitation within key sectors to optimize resource use and maximize development impact. Key areas of integration include:

- **Health Sector:** Joint planning with the Department of Health for WASH in healthcare facilities, hygiene promotion, and disease prevention.
- **Agriculture and Livestock**: Collaboration on water use for irrigation, livestock watering, and soil conservation to promote food and water security.
- **Education Sector**: Integration of WASH programs in schools to enhance learning environments and reduce absenteeism.
- **Disaster Risk Management**: Alignment with County disaster preparedness frameworks to improve community resilience to droughts and floods.

These collaborative actions ensure that water and sanitation development complement other sectoral priorities and accelerate sustainable development outcomes across the County.

By embedding climate resilience and environmental sustainability into water and sanitation programming, CWSSIP ensures long-term reliability of services, protection of ecosystems, and enhanced community resilience. This cross-sectoral approach reflects Kitui County's commitment

to sustainable development and positions the water and sanitation sector as a dRiver of climate adaptation and socio-economic transformation.

5.7 Water Supply Infrastructure Investment Plan

Access to safe, adequate, and reliable water supply remains a significant challenge in Kitui County, with vast areas characterized by arid and semi-arid conditions. Recurrent droughts, erratic rainfall, and environmental degradation further exacerbate water scarcity, especially in rural and marginalised regions. The Water Supply Infrastructure Investment Plan under the CWSSIP outlines a targeted, climate-resilient approach to expanding and improving water infrastructure, based on comprehensive climate risk vulnerability assessments conducted across the County.

5.8 Guiding Principles

The investment plan is anchored on the following principles:

- **Equity and Inclusivity:** Prioritizing underserved, water-stressed, and vulnerable populations.
- **Climate Resilience:** Incorporating climate vulnerability and hydrological risk into project planning.
- **Sustainability**: Ensuring long-term operation and maintenance through appropriate technologies and community participation.
- **Cost-Effectiveness:** Investing in interventions that offer maximum coverage and durability per unit of expenditure.
- **Integrated Planning:** Aligning with sector-wide strategies, including CIDP III, the National Water Strategy, NAWASIP, and Kitui County's Climate Change Policy and Action Plan, and
- Alignment to principles and values of governance in article 10 and principles and values of public service in article 232 of the Constitution of Kenya, 2010.

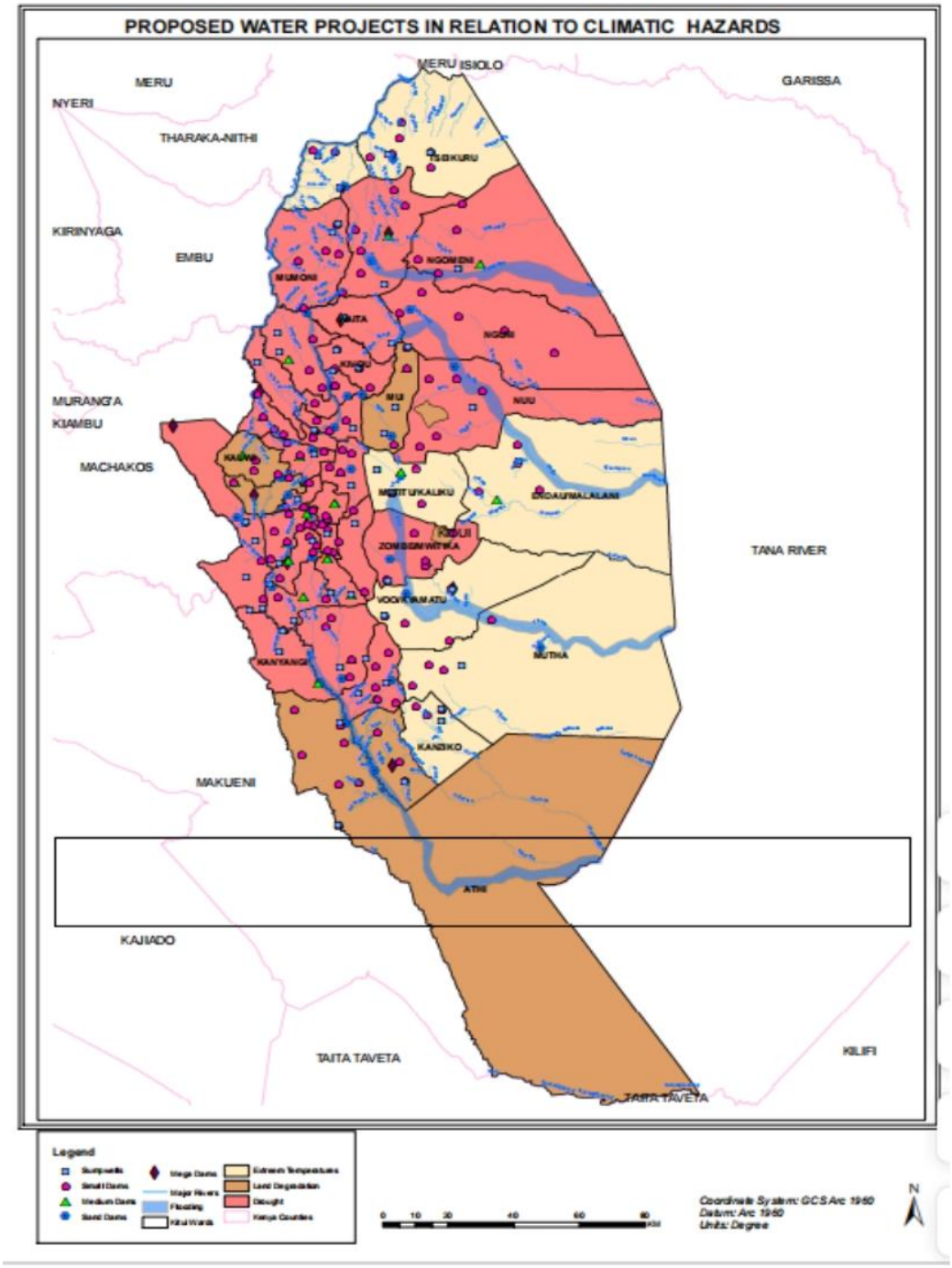


Figure 10: Map on Spatial Distribution of Proposed Water Projects in Relation to Possible Climate Risks

5.8.1 Investment Matrix – Water Supply Infrastructure Projects (2025 – 2030)

a) County Water Department

Table 46: Summary of the Water Department Investment Plan (2025 - 2030)

S/No.	Type of Project	Outcome Indicator	Year 1 Target	Year 1 Cost	Year 2 Target	Year 2 Cost	Year 3 Target	Year 3 Cost	Year 4 Target	Year 4 Cost	Year 5 Target	Year 5 Cost	Total Budget (Ksh. M)
1.	Construction and extension of water pipelines	Kms. of pipeline constructed/extended	50	75	80	120	80	120	80	120	50	75	510
2.	Construction/Desilting of rock catchments	No. of rock catchments protected	3	18	3	18	3	18	3	18	3	18	90
3.	Construction of Sump Well water supplies	No. of sump well water supplies constructed	5	150	5	150	5	150	5	150	5	150	750
4.	Spring protection & distribution	No. of springs protected	2	30	2	30	2	30	2	30	2	30	150
5.	Construction & equipping of shallow wells	No. of shallow wells constructed and equipped	10	5	5	5	5	5	5	5	5	5	25
6.	Installation of green energy in water supplies (Solarization)	No. of water systems solarized	20	70	20	70	20	70	20	70	20	70	350
7.	Construction of bulk water storage tanks	No. of bulk water tanks constructed	2	20	4	40	2	20	4	40	2	20	140
8.	Establishment of sub-County level workshops for repair and maintenance of water infrastructure	No. of sub-County workshops established	0	0	2	50	2	50	2	50	2	50	200
9.	Water Needs assessment Surveys done in all the 40 wards	% of water needs assessment surveys done in all 40 wards	25%	10	50%	20	25%	10	0%	0	0%	0	40
10.	Supply and installation of plastic water tanks for roof harvesting	No. of plastic water tanks supplied and installed	40	15	40	15	40	15	40	15	40	15	75
11.	Water Supplies maintenance, repairs & rehabilitations	No. of Water supplies repaired & rehabilitated	40	80	40	80	40	80	40	80	40	80	360
12.	Capacity building of community water management committees/WSPs	No. Water schemes introduced to sustainability models	10	10	8	8	8	8	8	8	6	6	36
13.	Boreholes drilling and equipping	No. of boreholes drilled & equipped	15	75	30	150	30	150	26	130	25	125	630
14.	Construction/desilting of 8no. Mega Dams	No. of Mega dams constructed	1	500	2	1000	2	1000	2	1000	1	1000	4500

15.	Construction/Desilting of 80no. Large Dams	No. Large dams constructed	5	150	20	600	20	600	20	600	15	450	2400
16.	Construction/Desilting of 247no. medium Dams	No. medium dams constructed	40	80	55	110	55	110	55	110	42	84	494
17.	Construction of 240 no. Sand dams	No. of sand dams/sub-surface dams constructed	20	100	80	400	80	400	20	100	40	200	1200
		Total Cost (Kshs) in M											**11,970**

Table 47 below gives details of mapped flagship projects in Kitui County to be implemented within the CWSSIP 2025 – 2030 period.

Table 47: Proposed Flagship Water Projects (2025 - 2030)

S/No.	Proposed Project	Project scope	Sub County	Ward	Estimated Cost (Kshs)	Beneficiaries (HHs)	Socio-Environmental Risks	Climate Proofing
1.	Tiva - Kisyoka-Masoka Sumpwell Water Supply	Construction of sump well, equipping with solar, rising mainline, bulk storage tank, distribution lines & water kiosks	Kitui Central	Kyangwithya West	30,000,000	300	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
2.	Equipping of Mangina borehole	Fabrication of solar module support tower, installation of submersible pump, pumping pipeline to existing water tank at Mangina market and distribution pipelines towards Kavuta and to the borehole site.	Kitui Central	Kyangwithya West	15,000,000	170	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
3.	Mutweii - Miambani market Sumpwell Water Supply	Construction of sump well, equipping with solar, rising mainline, bulk storage tank, distribution lines & water kiosks	Kitui Central	Miambani	25,000,000	235	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
4.	Mbuvuni springs water supply project	Construction of spring intake box with all necessary fittings and a gravity pipeline to Mbuvuni market, bulk storage tanks, distribution lines and water kiosks	Kitui Central	Miambani	15,000,000	155	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
5.	Mulango VCT borehole water supply	Hydrogeological surveys, drilling, equipping with solar and other civil works, pipeline distribution	Kitui Central	Mulango	15,000,000	135	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply

S/No.	Proposed Project	Project scope	Sub County	Ward	Estimated Cost (Kshs)	Beneficiaries (HHs)	Socio-Environmental Risks	Climate Proofing
6.	Manyenyoni borehole drilling and equiping	Drilling of borehole, equipping with solar, Pumping and distribution pipeline, 100m^3 Elevated steel water tank and distribution to manyeyoni,majengo,mjini and town	Kitui central	Township	25,000,000	250	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
7.	Syongila-Mutendea pipeline extension	Masinga pipeline extension from syongila to mutendea	Kitui central	Township	5,000,000	300	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
8.	Mutune pipeline extension	Rehabilitation and repair of mutune pipeline	Kitui central	Kyangwithya east	5,000,000	90	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structuresWater use efficiency programs (smart metering, water demand management)Storage tanks to buffer supply
9.	Kwa Ngindu Borehole Drillling and equiping	Drilling of borehole, equipping with solar, Pumping and distribution pipeline, 40 m3 UPVC tanks	Kitui central	Kyangwithya east	15,000,000	150	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
10.	Kyalilini Borehole Drillling and equiping	Drilling of borehole, equipping with solar, Pumping and distribution pipeline, pipeline extension to Kaylilini stoarage tank	Kitui central	Kyangwithya east	10,000,000	350	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
11.	Kyalilini -Kihara pipeline extension	Rehabilitation and repair of pipeline,water kiosks and connection to schools	Kitui central	Kyangwithya east	8,000,000	320	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
12.	Ithianii dispensary Borehole Drillling and equiping	Drilling of borehole, equipping with solar, Pumping and distribution pipeline, pipeline extension to Ithiani stoarage tank	Kitui central	Kyangwithya west	10,000,000	125	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
13.	Kalimenza sumpwell	Construction of ithimani SSD,sumpwell and distribution with 40m3 UPVC storage tank	Kitui central	Kyangwithya west	20,000,000	200	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods

S/No.	Proposed Project	Project scope	Sub County	Ward	Estimated Cost (Kshs)	Beneficiaries (HHs)	Socio-Environmental Risks	Climate Proofing
14.	Nzalwani borehole Equiping	Equipping with solar, Pumping and distribution pipeline, 40 m3 UPVC tanks	Kitui central	Kyangwithya west	15,000,000	100	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
15.	Nduumo sumpwell	Construction of Mutendea SSD,sumpwell and distribution to nduumoni storage tank Dispensary	Kitui central	Kyangwithya west	20,000,000	80	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
16.	Sokomoko sumpwell rehabillitation	Repair and rehabilitation of sokomoko sumpwell water supply pipeline extension rehabilitation	Kitui central	kyangwithya west	10,000,000	150	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
17.	Itoleka borehole equiping	Equipping with solar, Pumping and distribution pipeline to itoleka police station storage tank	Kitui central	kyangwithya west	5,000,000	100	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
18.	Katulani sumpwell	Mwilini River SSD,sumpwell,equiping with solar and distribution to exisiting pipeline infrustruscture and stoarage tank	Kitui central	Mulango	25,000,000	80	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
19.	Yambuu sumpwelll	Pipeline extension to kathungi village and rehabilitation of the sumpwell to optimise the yield	Kitui central	Mulango	10,000,000	90	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
20.	Kanyumu Borehole Drillling and equiping	Drilling of borehole, equipping with solar, Pumping and distribution pipeline, 40 m3 UPVC tanks	Kitui central	Mulango	15,000,000	95	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
21.	Kwa Muli Sumpwell	Construction of Mwilini SSD,sumpwell and distribution with 40m3 UPVC storage tank	Kitui central	Mulango	15,000,000	125	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
22.	Mamani earthdam	Desilting, fencing,pipeing,cattle trough	Kitui central	Mulango	8,000,000	150	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green

S/No.	Proposed Project	Project scope	Sub County	Ward	Estimated Cost (Kshs)	Beneficiaries (HHs)	Socio-Environmental Risks	Climate Proofing
								buffer zone), fencing to prevent livestock contamination
23.	Yambuu SSD	Construction of yambuu SSD	Kitui central	Mulango	3,500,000	200	Flooding	Proper siting and ensure quality workmanship
24.	Kithambangii water project	Rehabilitaion of kithambangii water scheme, kangalu pipeline extension, kisekini-mulango girls, kaumba-mulango polytechnic	Kitui central	Mulango	12,000,000	150	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
25.	Yakalia borehole	Solarization, 40m3 staorage tank and distribution network	Kitui central	Mulango	10,000,000	200	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structuresWater use efficiency programs (smart metering, water demand management)Storage tanks to buffer supply
26.	Yakali earthdam	Desilting,fencing,cattle trough	Kitui central	Mulango	8,000,000	100	Water contamination from animal acces	Elevated tanks; fencing; community water point management
27.	Mutukya borehole	Solarization	Kitui central	miambani	5,000,000	150	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
28.	Muthoo sumpwell	Rehabilitation of muthoo sumpwell, pipeline network	Kitui central	miambani	80,000,000	175	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
29.	Pipeline upgrading from Katheka to Kwa-Vonza hill tank	Upgrading of pipeline from Upvc/GI pipes to high class HDPE pipes, installation of air valves, BPT tanks and sectional valves	Kitui Rural	Yatta/Kwa-Vonza	35,000,000	200	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
30.	Tiva - Kwa Kaliti - Kalulini Sump Well Water Supply	Construction of sump well, equipping with solar, rising mainline, bulk storage tank, distribution lines & water kiosks	Kitui Rural	Kanyangi	40,000,000	220	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
31.	Tiva - Kiseuni Sump Well Water Supply	Construction of sump well, equipping with solar, rising mainline, bulk storage tank,	Kitui Rural	Kanyangi	100,000,000	235	Drought, land disputes, conflict	Construction of aquifer recharge structures, ensure public sensitization,

S/No.	Proposed Project	Project scope	Sub County	Ward	Estimated Cost (Kshs)	Beneficiaries (HHs)	Socio-Environmental Risks	Climate Proofing
		distribution lines & water kiosks					over water access during dry spells	installation of reseirvoir tanks to buffer supply during dry periods
32.	Tiva – Kitooni Sump Well Water Supply	Construction of sump well, equipping with solar, rising mainline, bulk storage tank, distribution lines & water kiosks	Kitui Rural	Kanyangi	35,000,000	235	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
33.	Tiva – Kamanyi-Kamakau sump well water supply	Extension of rising mainline from Kamanyi market to the bulk masonry storage tank at Kwa Munyao Mutili, distribution lines to Iviani, Kadogo & 138urrounding areas with water kiosks	Kitui Rural	Yatta/Kwa-Vonza	25,000,000	250	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
34.	Tiva-Kwa Vonza Sumpwell	Construction of sump well, equipping with solar, rising mainline, bulk storage tank, distribution lines & water kiosks	Kitui Rural	Yatta/Kwa-Vonza	35,000,000	455	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
35.	Tiva - Nzeve sump well water supply	Construction of sump well, equipping with solar, rising mainline, bulk storage tank, distribution lines & water kiosks	Kitui Rural	Yatta/Kwa-Vonza	30,000,000	235	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
36.	Drilling and equipping with solar of borehole at kiimani	Drilling and equipping with solar of borehole at kiimani, rising mainline, bulk storage tank, distribution lines & water kiosks	Kitui Rural	Yatta/Kwa-Vonza	15,000,000	205	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
37.	Equipping and pipeline extension of Ngaasani Kwa Mola sumpwell	Equipping, rising mainline, bulk storage tank, distribution lines & water kiosks	Kitui Rural	Kisasi	30,000,000	200	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
38.	Nzeeu - Bosnia sump well water supply	Construction of sump well, equipping with solar, rising mainline, bulk storage tank, distribution lines & water kiosks	Kitui Rural	Kisasi	30,000,000	125	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
39.	Nzeeu - Mbusyani sump well water supply	Construction of sump well, equipping with solar, rising mainline, bulk storage tank,	Kitui Rural	Kisasi	30,000,000	145	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods

S/No.	Proposed Project	Project scope	Sub County	Ward	Estimated Cost (Kshs)	Beneficiaries (HHs)	Socio-Environmental Risks	Climate Proofing
		distribution lines & water kiosks						
40.	Pipeline extension Tiva Kalala Water project	pipeline extension from Kalala to Ung'aatu market (distribution lines & water kiosks)	Kitui Rural	Kisasi	10,000,000	230	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
41.	Pipeline extension Mukameni Water project	pipeline extension from Kalala to Kasaalani and Kithuma (distribution lines & water kiosks)	Kitui Rural	Kisasi	10,000,000	215	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
42.	Drilling and equipping with solar of borehole at kasevi	Drilling and equipping with solar of borehole at kasevi, rising mainline, distribution lines & water kiosks	Kitui Rural	Kisasi	15,000,000	255	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
43.	Pipeline extension Seekea Water project	pipeline extension from Seekea to Ngangani(ya Maandazi) (distribution lines & water kiosks)	Kitui Rural	Mbitini	10,000,000	220	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structuresWater use efficiency programs (smart metering, water demand management)Storage tanks to buffer supply
44.	Mwiwe - Kilivi sump well water supply	Construction of sump well, equipping with solar, rising mainline, bulk storage tank, distribution lines & water kiosks	Kitui Rural	Mbitini	30,000,000	245	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
45.	Solarization of Kangukangu intake	Hybridization of intake works at Athi River (to use grid, genset & solar power)	Kitui Rural/South	Kanyangi/Mutomo	45,000,000	10,000	Land disputes, Flooding	Ensure community sensitization on land agreements prior to project implementation, Proper siting away from flooding zone
46.	Pipeline extension from Makutano ma Ilengi to Ilengi market and Muambani Market (Source - R. Athi - Kangukangu water supply)	Extension of distribution lines, construction of water kiosks, cattle troughs and storage tanks including connections to schools, health facilities and indivinduals	Kitui South	Athi	25,000,000	250	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply

S/No.	Proposed Project	Project scope	Sub County	Ward	Estimated Cost (Kshs)	Beneficiaries (HHs)	Socio-Environmental Risks	Climate Proofing
47.	Kataa sumpwell and SSD	Sumpwell and sand dam at kataa river with pipeline running from kataa through kambuthu to kanzilu to ngiluni to mwangaeni in kaatene with a booster station at kwa mutava and feeder pipeline to ngelani water tank.	Kitui South	Mutha	25,000,000	200	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
48.	Rehabilitation of Ngiluni earth dam	Rehabilitation works of ngiluni earth dam in kaatene/kalambani village	Kitui South	Mutha	15,000,000	150	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
49.	Construction of Kilongoni earth dam	new earth dam ata kilongoni within kivyuni/kiimani village	Kitui South	Mutha	15,000,000	150	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
50.	Nguni sumpwell and ssd	Nguni sumpwell and sand dam with pipeline extension to ikisaya market in mutindi/nguni/mang'enda river	Kitui South	Kanziko/simi si	25,000,000	200	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
51.	Mwanianag borehole drilling & equipping	borehole drilling with pipeline extensions near mwanianga secondary to mwanianga and kalu market centers.	Kitui South	Kanziko/simi si	15,000,000	150	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structuresWater use efficiency programs (smart metering, water demand management)Storage tanks to buffer supply
52.	Construction of Kyamwalany'a B earth dam	Construction of new earth dam at kyamwalany'a B in kakindu village.	Kitui South	Kanziko/simi si	15,000,000	150	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
53.	Equipping and construction of reticulation system for kwa malondo borehole	Equipping of Kwa Malondo Borehole and pipeline extensions to makutano, and ngali shopping centres	Kitui South	Kanziko/simi si	15,000,000	200	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply

S/No.	Proposed Project	Project scope	Sub County	Ward	Estimated Cost (Kshs)	Beneficiaries (HHs)	Socio-Environmental Risks	Climate Proofing
54.	Drilling & equipping of Matinga B borehole.	Drilling of a borehole at matinga B (kwa mukai) with pipeline extension to mavia, muuani, ndolekye shopping centers.	Kitui South	Ikutha	15,000,000	150	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
55.	Rehabilitation and expansion of Kasarani water project	Construction of new sumpwell, SSD and rehabilitation of Kasarani water projection with pipeline extension to kivuti market.	Kitui South	Ikutha	30,000,000	650	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
56.	Pipeline extension from kyoani to ngawuni market.	construction of kangu kangu pipeline from kyoani to nzeveni to ngawuni market 10km	Kitui South	Ikutha	20,000,000	400	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
57.	Equipping and distribution of Imiwa borehole	Equipping of Imiwa Borehole and pipeline extensions to imiwa, kyakavi, yaana, yumbu, ndili and mavia.	Kitui South	Ikutha	25,000,000	450	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
58.	Drilling & equipping of Senda borehole in Athi WARD	Drilling and equipping of Senda borehole with pipeline extension to senda and makutano shopping centres	Kitui South	Athi	15,000,000	250	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structuresWater use efficiency programs (smart metering, water demand management)Storage tanks to buffer supply
59.	construction of maluma sumpwell and SSD	Construction of sumpwell and SSD at tiver river with pipeline extensions to kililimbi hill, maluma and kakungula shopping centres.	Kitui South	Athi	25,000,000	200	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
60.	Drilling & equipping of Kalilii borehole.	Drilling and equipping of Kaliliii borehole with pipeline extension to mwathe and kamunga.	Kitui South	Athi	15,000,000	150	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
61.	Construction of Kwa Kithikii earth dam	Construction of Kwa Kithikii earth dam	Kitui South	Athi	18,000,000	300	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
62.	Construction of Kiangawa	Construction of sumpwell at nzeeu (ikanga) with pipeline extension to kiangwa, sua si,	Kitui South	Ikanga/kyatune	25,000,000	500	Drought, land disputes, conflict	Construction of aquifer recharge structures, ensure public sensitization,

S/No.	Proposed Project	Project scope	Sub County	Ward	Estimated Cost (Kshs)	Beneficiaries (HHs)	Socio-Environmental Risks	Climate Proofing
	sumpwell and SSD.	makutano, kaveta, itumbulile, manzee and kanguu.					over water access during dry spells	installation of reseirvoir tanks to buffer supply during dry periods
63.	Drilling of Kathithu borehole/Sumpwell construction	Kathithu sumpwell construction/Kathithu Borehole Drilling, equipping and reticulation in kyatune village	Kitui South	Ikanga/kyatune	25,000,000	300	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
64.	Enzou-Kanguli pipeline extension	pipeline extension from enzou to kanguli shopping centre with a booster station at enzou junction	Kitui South	Ikanga/kyatune	8,500,000	150	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
65.	Drilling & equipping of UAE borehole	UAE Borehole Drilling, equipping and reticulation in UAE village	Kitui South	Mutomo/Kibwea	15,000,000	300	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
66.	Construction of kyambusya sumpwell and SSD.	Construction of sumpwell at nzeeu/Tiva river with pipeline extension to kyambusya, ndatani and kitooni villages.	Kitui South	Ikanga/kyatune	25,000,000	500	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
67.	Kanzilu earth dam construction	Rehabilitation of kanzilu earth dam	Kitui South	Mutomo/Kibwea	10,000,000	100	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
68.	Itumba earth dam construction	construction of itumba earth dam	Kitui South	Mutomo/Kibwea	10,000,000	125	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
69.	Kaatumia earth dam construction	rehabilitation of kaatumia earth dam	Kitui South	Mutomo/Kibwea	15,000,000	50	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
70.	Rehabilitation of mutomo -kenze pipeline	rehabilitation of mutomo-kenze pipeline.	Kitui South	Mutomo/Kibwea	15,000,000	125	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand

S/No.	Proposed Project	Project scope	Sub County	Ward	Estimated Cost (Kshs)	Beneficiaries (HHs)	Socio-Environmental Risks	Climate Proofing
								management) Storage tanks to buffer supply
71.	Mutomo Girls Borehole water supply	Hydrogeological surveys, drilling, equipping with solar and other civil works, pipeline distribution	Kitui South	Mutomo/Kibwea	15,000,000	150	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
72.	Kaluasi Borehole drilling & equipping	Drilling of borehole, equipping with solar, Pumping and distribution pipeline, $50m^3$ Elevated steel water tank, water kiosks & Cattle troughs	Kitui East	Voo/Kyamatu	19,500,00	110	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
73.	Kalalani sumpwell development & equipping	Sumpwell construction, equipping with solar, Pumping and distribution pipeline, $30m^3$ Elevated Plastic water tanks, water kiosks & Cattle troughs to serve Kalalani girls sec, primary, Inyokoni mkt and Nzanzu village	Kitui East	Voo/Kyamatu	25,000,000	120	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
74.	Pipeline extension for Bondeni borehole	Extension of pipeline 3.5km with a kiosk and overhead tank and cattle trough	Kitui East	Voo/Kyamatu	8,500,000	150	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
75.	Pipeline extension to Itikie from kamwiu pipeline	Extension of pipeline 4km with a kiosk and overhead tank and cattle trough	Kitui East	Voo/Kyamatu	8,500,000	300	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
76.	Pipeline extension to Nditime from kamwiu Market	Distribution pipeline, $50m^3$ Elevated steel water tank, water kiosks & Cattle troughs	Kitui East	Voo/Kyamatu	10,000,000	210	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
77.	Kwa Mbithuka borehole equipping and extension	Borehole equipping with solar, Pumping and distribution pipeline, $50m^3$ Elevated steel water tank, water kiosks & Cattle troughs to serve Kikuu,	Kitui East	Zombe/Mwitika	25,000,000	320	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply

S/No.	Proposed Project	Project scope	Sub County	Ward	Estimated Cost (Kshs)	Beneficiaries (HHs)	Socio-Environmental Risks	Climate Proofing
		kandongo, Kaling'a, Mavia Maiu, kilimboni						
78.	Nzilani sump well development & equipping	Sumpwell construction, equipping with solar, Pumping and distribution pipeline, 30m^3 Elevated Plastic water tanks, water kiosks & Cattle troughs	Kitui East	Zombe/Mwitika	25,000,000	320	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
79.	Ithangathi borehole drilling and equipping	Drilling of borehole, equipping with solar, Pumping and distribution pipeline, renovation of 100m^3 masonry water tank, connection to schools, water kiosks & Cattle troughs	Kitui East	Zombe/Mwitika	15,000,000	290	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
80.	Thua - Zombe water project rehabilitation	Putting up a new Pumping line and repairs to distribution pipeline, 100m^3 Elevated steel water tank, water kiosks & Cattle troughs	Kitui East	Zombe/Mwitika	19,000,000	190	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
81.	Kivaki borehole equipping and extension to Itiko	Borehole, equipping with solar, Pumping and distribution pipeline, 50m^3 Elevated steel water tank, water kiosks & Cattle troughs	Kitui East	Mutitu/Kaliku	20,000,000	95	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structuresWater use efficiency programs (smart metering, water demand management)Storage tanks to buffer supply
82.	Ikoo sumpwell development & equipping	New Sump well construction and shifting pumping system, repairs to existing Pumping line and new distribution pipeline, Masonry water tank repairs, water kiosks & Cattle troughs	Kitui East	Mutitu/Kaliku	25,000,000	145	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
83.	Kabati Borehole Pipeline extension	Distribution pipeline, 50m^3 Elevated steel water tank, water kiosks & Cattle troughs	Kitui East	Mutitu/Kaliku	15,000,000	360	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
84.	Completion of Ilimukuyu earthdam	Dam wall construction, intake and treatment works completion, distribution pipeline with kiosks and cattle troughs	Kitui East	Endau/Malalani	70,000,000	500	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green

S/No.	Proposed Project	Project scope	Sub County	Ward	Estimated Cost (Kshs)	Beneficiaries (HHs)	Socio-Environmental Risks	Climate Proofing
								buffer zone), fencing to prevent livestock contamination
85.	Kwa Ndavi Earthdam Desilting and enlargement	Dam wall construction, intake with solar pump construction, Fencing and distribution pipeline with kiosk,Tank and cattle troughs	Kitui East	Endau/Malalani	8,000,000	110	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
86.	Ndovoini Earthdam Desilting and enlargement	Dam wall construction, intake with solar pump construction, Fencing and distribution pipeline with kiosk,Tank and cattle troughs	Kitui East	Endau/Malalani	8,000,000	298	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
87.	Utwiini Earthdam Desilting and enlargement	Dam wall construction, intake with solar pump construction, distribution pipeline with kiosk,Tank and cattle troughs	Kitui East	Chuluni	7,000,000	199	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
88.	Kanzooko Earthdam Desilting and enlargement	Dam wall construction, intake with solar pump construction, Spillway correction, distribution pipeline with kiosk,Tank and cattle troughs	Kitui East	Chuluni	7,000,000	309	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
89.	Kanzauwu borehole Rehabilitation	Pump replacement, rising main and distribution pipeline, $30m^3$ Elevated plastic water tanks, water kiosks repairs & Cattle troughs	Kitui East	Chuluni	6,100,000	238	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
90.	Ngomango borehole Rehabilitation	Pump testing, Equipping new pump, New rising main, Distribution pipeline, $100m^3$ masonry water tank, water kiosks & Cattle troughs to serve Kavui, Kaluva, Kwa Mboloi, Kyalele & Kamulu	Kitui East	Chuluni	16,000,000	522	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply

S/No.	Proposed Project	Project scope	Sub County	Ward	Estimated Cost (Kshs)	Beneficiaries (HHs)	Socio-Environmental Risks	Climate Proofing
91.	Utwiini borehole equipping and extension	Borehole, equipping with solar, Pumping and distribution pipeline, 30m^3 Elevated steel water tank, water kiosks & Cattle troughs	Kitui East	Chuluni	8,500,000	200	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
92.	Nduni borehole equipping and extension	Borehole, equipping with solar, Pumping and distribution pipeline, 50m^3 Elevated steel water tank, water kiosks & Cattle troughs	Kitui East	Chuluni	18,500,000	380	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
93.	Kisiio sump well development & equipping	Sumpwell construction, equipping with solar, Pumping and distribution pipeline, 100m3 masonry water tank, water kiosks & Cattle troughs	Kitui East	Chuluni	25,000,000	410	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
94.	Chuluni Girls borehole equipping	Borehole, equipping with solar, Pumping and distribution pipeline, 20m^3 Elevated plastic water tank	Kitui East	Nzambani	5,000,000	400	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
95.	Kwa Savi/ Kangweni borehole rehabilitation	Putting up a new Pumping line and repairs to distribution pipeline, 100m^3 Elevated steel water tank repairs, water kiosks & Cattle troughs	Kitui East	Nzambani	18,500,000	640	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structuresWater use efficiency programs (smart metering, water demand management)Storage tanks to buffer supply
96.	Pipeline extension from Kwa Kinyai steel tank to Maluma elevated tank	Putting up a new main line and repairs to distribution pipeline, , water kiosks	Kitui East	Nzambani	8,000,000	250	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
97.	Kwa Kivondo Earthdam Desilting and enlargement	Dam wall construction, intake with solar pump construction, Fencing, distribution pipeline with kiosk,Tank and cattle troughs	Kitui East	Nzambani	8,000,000	301	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination

S/No.	Proposed Project	Project scope	Sub County	Ward	Estimated Cost (Kshs)	Beneficiaries (HHs)	Socio-Environmental Risks	Climate Proofing
98.	Ngomano sump well pipeline extension	Putting up distribution pipelines with point kiosk with overhead tanks serving Mwitika, Kavingo,Makongo ,Kinanie, Kaluli, Kawala, Mwaani, Yiuku, Kaunange, Kathua, Endau and malalani centers	Kitui East	CROSS WARDS, Zombe/Mwitika, Mutitu/Kaliku, Voo/Kyamatu & Endau/ Malalani	160,000,000	3012	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
99.	Ikoo - Kwosuu - Mutitu Market Sumpwell Water Supply	Construction of sump well, equipping with solar, rising mainline, bulk storage tank, distribution lines & water kiosks	Kitui East	Mutitu/Kaliku	50,000,000	350	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
100	Ikoo - Musukini - Kalua - Yoonye sump well water supply	Construction of sump well, equipping with solar, rising mainline, bulk storage tank, distribution lines & water kiosks	Kitui East	Mutitu/Kaliku	30,000,000	235	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
101	Mui - Kwa Tundu - Kyombo - Manyoeni Sump well water supply	Construction of sump well, equipping with solar, rising mainline, bulk storage tank, distribution lines & water kiosks	Kitui East	Mutitu/Kaliku	30,000,000	155	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
102	Ngulini - Itiko-Kyaimu water supply project	Construction of new spring intake box with all necessary fittings, rehabilitation of main gravity pipeline to Itiko - Kyaimu markets, bulk storage tanks, distribution lines and water kiosks	Kitui East	Mutitu/Kaliku	15,000,000	145	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
103	Augmentation of Kwa Lala Springs - Mutitu Market water supply	Construction of new spring intake box with all necessary fittings, rehabilitation of main gravity pipeline to Mutitu Market, connection to Kitoo (A & B), Katuni & Mung'alu villages, bulk storage tanks, distribution lines and water kiosks	Kitui East	Mutitu/Kaliku	30,000,000	250	Water contamination from animal acces	Elevated tanks; fencing; community water point management

S/No.	Proposed Project	Project scope	Sub County	Ward	Estimated Cost (Kshs)	Beneficiaries (HHs)	Socio-Environmental Risks	Climate Proofing
104	Construction of Vutu earth dam	Reseirvoir & embankment construction, spillway construction and auxilliary works	Kitui East	Mutitu/Kaliku	8,000,000	100	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
105	Expansion of Kataka earth dam	Reseirvoir & embankment construction, spillway construction and auxilliary works	Kitui East	Mutitu/Kaliku	10,000,000	200	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
106	Expansion of Ndeng'u earth dam	Reseirvoir & embankment construction, spillway construction and auxilliary works	Kitui East	Mutitu/Kaliku	8,000,000	100	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
107	Augmentation of Ikoo - Imwaatine water supply	Construction of 150m3 elevated steel tank, replacement of rising mainiline, distribution lines, construction of additional ground masonry storage tanks & new water kiosks	Kitui East	Mutitu/Kaliku	20,000,000	450	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
108	Augmentation of Uwu Springs water supply	Construction of new spring intake box with all necessary fittings, 500m3 masonry storage tank at the hill, rehabilitation of main gravity pipeline to Kwosuu and Mutitu markets, distribution lines and water kiosks	Kitui East	Mutitu/Kaliku	10,000,000	200	Water contamination from animal acces	Elevated tanks; fencing; community water point management
109	Manyoeni borehole drilling & equipping, with extension to Kaayo & surrounding areas	Drilling of borehole, equiiping with solar power, construction of 150m3 elevated steel tank, distribution lines and water kiosks/cattle troughs	Kitui East	Mutitu/Kaliku	10,000,000	300	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
110	Rehabilitation of Raha earth dam	Reseirvoir & embankment construction, spillway construction and auxilliary works	Kitui East	Mutitu/Kaliku	8,500,000	150	Water contamination from animal acces	Elevated tanks; fencing; community water point management

S/No.	Proposed Project	Project scope	Sub County	Ward	Estimated Cost (Kshs)	Beneficiaries (HHs)	Socio-Environmental Risks	Climate Proofing
111	Enziu (Ililuni) - Malalani sumpwell water supply project	Construction of sump well, equipping with solar, rising mainline, bulk storage tank, distribution lines & water kiosks	Kitui East	Endau/Malalani	40,000,000	300	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
112	Reticulation of Kamulu - Kyoani (Muthungue) water supply project	Construction of elevated storage tank and Kamwiu, Extension pipeline to Itikie,distribution pipelines to Nditime, Ikithia & Masikalini and water drawing points at Nditime,Masikalini,Ikithia and Itikie	Kitui East	Voo/Kyamatu	19,500,000	265	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
113	Kilui-Kyaango sumpwell water supply project	Construction of sump well, equipping with solar, rising mainline, bulk storage tank, distribution lines & water kiosks	Kitui East	Voo/Kyamatu	30,000,000	200	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
114	Gatoroni Water Supply, Gatoroni Sumpwell	Cosntruction of a sump well at ciiri (Katse River) and equipping with solar, an elevated 50m3 steel tank, additional water kiosk, and water trough.	Mwingi North	Tharaka	25,000,000	200	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
115	Mukuyu sump well water supply	Construction of sump well, equipping with solar, rising mainline, bulk storage tank, distribution lines & water kiosks	Mwingi North	Tharaka	30,000,000	135	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
116	Nthangani sumpwell water supply	Construction of a sump well at Kamengya River equipped with solar system,with a 50m3 masonry tank and a distribution with water kiosks and cattle trough	Mwingi North	Tharaka	25,000,000	155	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
117	Nthintune borehole drilling & equipping	Hydrogeological surveys, drilling, equipping with solar and other civil works, pipeline distribution	Mwingi North	Tharaka	18,000,000	75	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand

S/No.	Proposed Project	Project scope	Sub County	Ward	Estimated Cost (Kshs)	Beneficiaries (HHs)	Socio-Environmental Risks	Climate Proofing
								management) Storage tanks to buffer supply
118	Maikune borehole water supply	Hydrogeological surveys, drilling, equipping with solar and other civil works, pipeline distribution	Mwingi North	Tharaka	16,000,000	120	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
119	Miramba Ikamba Sump well water supply	Construction of a sumpwell at river ciiri, Rising & Distribution lines, and elevated 50m3 steel tank, Water kiosk and cattle trough	Mwingi North	Tharaka	25,000,000	178	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
120	Konyu Sumpwell Water supply	Construction of a sumpwell at Konyu river to serve Konyu market, 2 Primary schools. 50m3 masonry tank, 2kiosks, and pipeline	Mwingi North	Tharaka	25,000,000	166	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
121	Nkaranku borehole water project	Drilling and equipping of borehole and equipping with solar pumping system, raised 20m3 plastic tanks, kiosk, with pipeline and cattle trough	Mwingi North	Tharaka	15,000,000	167	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
122	Kairini Earth dam	Desilting of Kairini earth dam and construction of an impervious layer of red/black cotton soil	Mwingi North	Tharaka	8,500,000	100	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
123	Operationalization of TWWUA water project Pumping system	Rehabilitation of TWWUA water project pumping system serving Kanthungu location	Mwingi North	Tharaka	15,000,000	300	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
124	Wimbuvu Borehole drilling and Equipping	Wimbuvu borehole drilling and equipping with solar pumping system, 50m3 elevated steel tank, pipeline, water kiosks and cattle trough	Mwingi North	Tseikuru	15,000,000	260	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
125	Desilting and fencing of Kiluilu Earth dam	Repair, desilting, fencing and motorised draw system with watering station, and cattle trough	Mwingi North	Tseikuru	15,000,000	188	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green

S/No.	Proposed Project	Project scope	Sub County	Ward	Estimated Cost (Kshs)	Beneficiaries (HHs)	Socio-Environmental Risks	Climate Proofing
								buffer zone), fencing to prevent livestock contamination
126	Drilling & equipping of Kwa Kamali borehole	Hydrogeological surveys, drilling, equipping with solar and other civil works, pipeline distribution	Mwingi North	Tseikuru	15,000,000	125	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structuresWater use efficiency programs (smart metering, water demand management)Storage tanks to buffer supply
127	Mulangoni sumpwell water supply	Construction of sump well at Mulangoni river with a weir, 50m3 elevated steel tower, pipeline, kiosks, cattle trough	Mwingi North	Tseikuru	25,000,000	300	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
128	Ngaani borehole drilling and equipping	borehole Drilling and equipping with solar pumping system, 20m3 elevated plastic tanks, Pipeline, kiosk and cattle trough	Mwingi North	Tseikuru	15,000,000	190	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
129	Nziitu Sump well water supply	Construction of sump well, equipping with solar, rising mainline, bulk storage tank, distribution lines & water kiosks	Mwingi North	Tseikuru	30,000,000	180	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
130	Mivukoni sumpwell water supply	Construction of a sump well at Mivukoni river to serve kwa Kisungu, sumoni & Kavutoni. Equipping with solar pumping ssystem, 50m3 elevated steel tank, pipeline, 3 kiosks and cattle trough, weir repair.	Mwingi North	Tseikuru	25,000,000	255	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
131	Ngongoni borehole drilling and equipping	borehole Drilling and equipping with solar pumping system, 20m3 elevated plastic tanks, Pipeline, kiosk and cattle trough	Mwingi North	Tseikuru	15,000,000	195	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
132	Desilting of Katue earthdam	desilting and expansion of Katue earthdam, Fencing, Motorised draw system and watering points	Mwingi North	Tseikuru	17,000,000	200	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination

S/No.	Proposed Project	Project scope	Sub County	Ward	Estimated Cost (Kshs)	Beneficiaries (HHs)	Socio-Environmental Risks	Climate Proofing
133	Usueni Tana water supply project/Usueni Girls Water Supply	Intake works from river tana, treatment plant, pipeline, equipping with solar/Grid hybridized pumping system,100m3 masonry tank, 50m3 elevated steel tank, pipeline, water kiosks and cattle troughs	Mwingi North	Tseikuru	75,000,000	480	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
134	Itung'uni borehole drilling and equipping	borehole Drilling and equipping with solar pumping system, 20m3 elevated plastic tanks, Pipeline, kiosk and cattle trough	Mwingi North	Tseikuru	15,000,000	200	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structuresWater use efficiency programs (smart metering, water demand management)Storage tanks to buffer supply
135	Desilting of Mukalaate Earth dam	Desilting and expansion of Mukalaate earth dam, fencing	Mwingi North	Tseikuru	9,500,000	175	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
136	Extension of Karumu/Kaningo sump well water supply pipeline to Kamali and Kithayoni	Pipeline extension from Kaningo sump well to Kamali, and Kithayoni with elevated 40m3 plastic tanks, kiosks, and cattle trough	Mwingi North	Tseikuru	15,000,000	250	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
137	Thunguthu sump well	Construction of sump well, equipping with solar, rising mainline, bulk storage tank, distribution lines & water kiosks	Mwingi North	Kyuso	30,000,000	300	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
138	Ithui Sump well - Kyuso Water Supply	Construction of sump well at Thunguthu River (Ithui Area), and equipping with solar pumping system, Elevated 50m3 water tank, pipeline, repair of masonry tank at Kyuso, 4 kiosks, 2 cattle troughs	Mwingi North	Kyuso	25,000,000	450	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
139	Construction of Kaaya Earth dam	Construction of Kaaya earthdam with Gravity draw off system, Fencing	Mwingi North	Kyuso	21,000,000	170	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green

S/No.	Proposed Project	Project scope	Sub County	Ward	Estimated Cost (Kshs)	Beneficiaries (HHs)	Socio-Environmental Risks	Climate Proofing
								buffer zone), fencing to prevent livestock contamination
140	Muselele borehole drilling and equipping	Borehole drilling & equipping with solar pumping system, 20m3 elevated plastic tanks, kiosks, cattle trough	Mwingi North	Kyuso	15,000,000	166	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
141	Marisi Borehole Drilling & Equipping	Borehole drilling & equipping with solar pumping system, 20m3 elevated plastic tanks, kiosks, cattle trough	Mwingi North	Kyuso	12,000,000	180	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structuresWater use efficiency programs (smart metering, water demand management)Storage tanks to buffer supply
142	Mavauni Sump well supply project	Construction of sump well Thunguthu River (Kwa Muthengi Mwinzi area) with 40m3 Eevated plastic tanks, kiosks, pipeline, and cattle trough	Mwingi North	Kyuso	25,000,000	195	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
143	Manzuva Borehole Drilling & Equipping	Borehole drilling & equipping with solar pumping system, 20m3 elevated plastic tanks, kiosks, cattle trough	Mwingi North	Kyuso	12,000,000	198	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
144	Desilting and expansion of Itulu Earthdam	Desilting and expansion of Itulu Earth dam, Fencing	Mwingi North	Kyuso	9,700,000	135	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
145	Mukameni Sump well water supply	Cosntrcution of a sump well at Mukameni stream, Sand dam, Equipping with Solar pumping system, 20m3 elevated plastic tanks, pipeline, kiosks, and cattle trough	Mwingi North	Kyuso	25,000,000	180	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
146	Kakoongo borehole drilling & Equipping	Borehole drilling & equipping with solar pumping system, 50m3 elevated steel tanks, Pipeline, kiosks, cattle trough	Mwingi North	Kyuso	13,500,000	215	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply

S/No.	Proposed Project	Project scope	Sub County	Ward	Estimated Cost (Kshs)	Beneficiaries (HHs)	Socio-Environmental Risks	Climate Proofing
147	Desilting and repair of Kamula Earth dam	Desilting, repair and fencing of Kamula earth dam	Mwingi North	Kyuso	7,500,000	110	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
148	Extension of Itivanzou borehole water to Kathitu primary	Extension of of pipeline from Itivanzou borehole to Kathitu primary, with kiosk	Mwingi North	Kyuso	8,500,000	156	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
149	Desilting of Katambauku earthdam	Desilting of Katambauku earthdam and Fencing of the dam	Mwingi North	Kyuso	9,000,000	160	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
150	Syukariga borehole drilling and Equipping	Borehole drilling & Equipping with solar pumping system with pipeline	Mwingi North	Kyuso	12,500,000	125	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
151	Mughoo Sump well water supply	Construction of sump well at mughoo river with sand dam, equipping with solar pumping system,pipeline, kiosk, cattle trough and 20m3 elevated plastic tank	Mwingi North	Kyuso	25,000,000	165	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
152	Maseki Borehole drilling & Equipping	Borehole drilling & Equipping with solar pumping system, pipeline, kiosk, 20m3 elevated plastic storage, & cattle trough	Mwingi North	Kyuso	12,000,000	170	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
153	myethani earth dam construction	Construction of myethani earth dam with gravity draw off system, fencing	Mwingi North	Kyuso	15,000,000	200	Water contamination from animal acces	Elevated tanks; fencing; community water point management
154	Wangutu Sump well - Kaliwa/Yangalasu Water supply	Construction of sump well at Wangutu river, Equipping with solar pumping system, 50m3 evelated steel tank, pipeline, water kiosks, cattle trough.	Mwingi North	Muumoni	25,000,000	300	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods

S/No.	Proposed Project	Project scope	Sub County	Ward	Estimated Cost (Kshs)	Beneficiaries (HHs)	Socio-Environmental Risks	Climate Proofing
155	Expansion and fencing of Kaisinga Earth dam	Scooping, expansion, and fencing of Kaisinga Earth dam.	Mwingi North	Muumoni	9,500,000	175	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
156	Mara/Kaisinga borehole drilling & Equipping	Borehole drilling and equipping with solar pumping, 20m3 elevated plastic tanks, pipeline, kiosks, and cattle trough	Mwingi North	Muumoni	15,000,000	185	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
157	Pipeline Extension from Kwa Kathukya to Kaisinga	Piping of water (4km), Water Kiosk, Cattle trough	Mwingi North	Muumoni	12,000,000	155	"	"
158	Pipeline extension from Masukanioni to Katooni	Piping of water (7.5km), 4 water kiosks, 2 cattle troughs	Mwingi North	Muumoni	9,000,000	280	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
159	construction of matingani earth dam	Construction of an earth dam, Fencing, and gravity draw off system.	Mwingi North	Muumoni	20,000,000	210	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
160	Construction of Ngakone Earthdam	Construction of an earth dam, Fencing, and gravity draw off system.	Mwingi North	Muumoni	15,500,000	170	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
161	Drilling and Equipping of Ngungi Borehole	Borehole drilling and equipping with solar pumping, 20m3 elevated plastic tanks, pipeline, kiosks, and cattle trough	Mwingi North	Muumoni	15,000,000	176	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply

S/No.	Proposed Project	Project scope	Sub County	Ward	Estimated Cost (Kshs)	Beneficiaries (HHs)	Socio-Environmental Risks	Climate Proofing
162	Mukong'a borehole water supply	Borehole drilling and equipping with solar pumping, 20m3 elevated plastic tanks, pipeline, kiosks, and cattle trough	Mwingi North	Muumoni	15,000,000	100	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
163	Ighuini Sump Well Water Project	Construction of sump well at Ighuini river, Equipping with solar pumping system, 40m3 evelated plastic tank, pipeline, water kiosks, cattle trough.	Mwingi North	Muumoni	20,000,000	190	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
164	Thua Sump Well Water supply	Construction of sump well at Thua river, Equipping with solar pumping system, 40m3 evelated plastic tank, pipeline, water kiosks, cattle trough.	Mwingi North	Muumoni	25,000,000	168	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
165	Construction of Kwa Muthira Earth dam	Construction of an earth dam, Fencing, and gravity draw off system.	Mwingi North	Muumoni	16,500,000	135	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
166	Pipeline Extension from Kaundu borehole to kasyalani	Piping fo water (5km), Rehabilitation of pipeline (4km), 2 water kiosks, and a cattle trough	Mwingi North	Muumoni	9,000,000	215	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
167	Pipeline extension from Kanzinwa Borehole to Mukekeni	Piping of water (5km), water Kiosk, 20m3 elevated plastic tanks.	Mwingi North	Muumoni	8,000,000	185	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
168	Construction of Mariri dam (Katuni Stream)	Construction of an earth dam, Fencing, and gravity draw off system.	Mwingi North	Muumoni	17,000,000	200	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
169	Kamathitu sump well water supply	Construction of sump well at Katse river, Equipping with solar pumping system, 50m3 evelated steel tank, pipeline, water kiosks, cattle trough.	Mwingi North	Muumoni	20,000,000	300	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods

S/No.	Proposed Project	Project scope	Sub County	Ward	Estimated Cost (Kshs)	Beneficiaries (HHs)	Socio-Environmental Risks	Climate Proofing
170	Desilting of Katia Earth dam	Desitling of the dam, expansion, constrcution of a check dam, Fencing, and motorised draw off system with watering points	Mwingi North	Muumoni	24,500,000	320	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
171	Rehabilitation of Ngeukya springs water project	Pipeline rehabilitation 5km	Mwingi North	Muumoni	8,000,000	130	Water contamination from animal acces	Elevated tanks; fencing; community water point management
172	Construction of Kanyoeni Earthdam	Construction of an earth dam, Fencing, and gravity draw off system.	Mwingi North	Muumoni	16,800,000	178	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
173	Expansion of Kathiani earthdam	Desilting & Expansion of Katthiani Earth dam	Mwingi North	Muumoni	8,200,000	154	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
174	Ngaitini borehole drilling & equipping	Borehole drilling and equipping with solar pumping, 20m3 elevated plastic tanks, pipeline, kiosks, and cattle trough	Mwingi North	Ngomeni	15,000,000	130	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
175	Kimela borehole drilling & equipping	Borehole drilling and equipping with solar pumping, 20m3 elevated plastic tanks, pipeline, kiosks, and cattle trough	Mwingi North	Ngomeni	12,000,000	187	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
176	Construction of Musuasuo Earth dam	Construction of an earth dam, Fencing, and gravity draw off system.	Mwingi North	Ngomeni	17,000,000	135	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
177	Ikime Sump well water supply	Construction of sump well at Thunguthu river, Equipping with solar pumping system, 50m3 evelated steel tank,	Mwingi North	Ngomeni	25,000,000	200	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods

S/No.	Proposed Project	Project scope	Sub County	Ward	Estimated Cost (Kshs)	Beneficiaries (HHs)	Socio-Environmental Risks	Climate Proofing
		pipeline, water kiosks, cattle trough.						
178	Desilting and Expansion of Katoo earthdam	Desilting, expansion, and fencing	Mwingi North	Ngomeni	8,800,000	147	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
179	Construction of Mandongoi Earth dam	Construction of an earth dam, Fencing, and gravity draw off system.	Mwingi North	Ngomeni	17,000,000	140	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
180	Pipeline Extension from Kanyunyi borehole to mandongoi, & GSU camp	Piping of water (12km), Kiosk, cattle trough & Elevated 20m3 plastic storage	Mwingi North	Ngomeni	10,000,000	180	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structuresWater use efficiency programs (smart metering, water demand management)Storage tanks to buffer supply
181	Katolongwe borehole drilling and equipping	Borehole drilling and equipping with solar pumping, 20m3 elevated plastic tanks, pipeline, kiosks, and cattle trough	Mwingi North	Ngomeni	8,500,000	200	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
182	Lulu Sump well water supply	Construction of sump well at Thunguthu river, Equipping with solar pumping system, 50m3 evelated steel tank, pipeline, water kiosks, cattle trough.	Mwingi North	Ngomeni	20,000,000	265	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
183	Extension of Ngomeni Rock Catchment water to Kavaani, Mutairu.	Pipeline extension 10kms from nyamwenze to kavaani and muringani to mutairu, construction of 2 water kiosk with 10,000ltrs tank on top and 2 cattle troughs.	Mwingi North	Ngomeni	11,500,000	198	Water contamination from animal acces	Elevated tanks; fencing; community water point management

S/No.	Proposed Project	Project scope	Sub County	Ward	Estimated Cost (Kshs)	Beneficiaries (HHs)	Socio-Environmental Risks	Climate Proofing
184	Desilting of Mwangeni earthdam	desilting of mwangeni earthdam, fencing and repair of the hand pump	Mwingi North	Ngomeni	10,000,000	230	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
185	Upgrading of Ngomeni Rock Pumping System	repair of ngomeni rockcatchment,construction of a mosonary tank with a capacity 100m3 and installation of a surface pump with a capacity of pumping 20m3/hr, relocation of pipelines (8km)	Mwingi North	Ngomeni	19,000,000	500	Water contamination from animal acces	Elevated tanks; fencing; community water point management
186	Ukuni borehole drilling & equipping	Drilling of borehole, equipping with solar, Pumping and distribution pipeline, 50m3 Elevated steel water tank, water kiosks	Kitui West	Mutonguni	15,000,000	150	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
187	Muthamo earthdam desilting	Desilting, expansion of dam, fencing, drawoff system. Treatment system, pumping system, rising main, pipeline extension, distribution tanks and water kiosks	Kitui West	Mutonguni	85,000,000	400	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
188	Mulinduko Pipeline extension	Rising main, elevated steel tank , distribution line, water kiosks	Kitui West	Mutonguni	35,000,000	400	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structuresWater use efficiency programs (smart metering, water demand management)Storage tanks to buffer supply
189	Mutindi - Kakumuti Sumpwell	Sumpwell, pumping system, rising main, elevated steel tank, distribution line and water kiosks	Kitui West	Mutonguni	25,000,000		Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
190	Mutindi - Inyoeni Sumpwell	Construction of Sumpwell, pumping system, rising main, elevated steel tank, distribution line and water kiosks	Kitui West	Mutonguni	25,000,000	200	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
191	Kalambya borehole drilling and equipping	Drilling of borehole, equipping with solar, Pumping and distribution pipeline, 50m3	Kitui West	Mutonguni	15,000,000	100	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand

S/No.	Proposed Project	Project scope	Sub County	Ward	Estimated Cost (Kshs)	Beneficiaries (HHs)	Socio-Environmental Risks	Climate Proofing
		Elevated steel water tank, water kiosks						management) Storage tanks to buffer supply
192	Kivulu borehole drilling and equipping	Drilling of borehole, equipping with solar, Pumping and distribution pipeline, 50m3 Elevated steel water tank, water kiosks	Kitui West	Mutonguni	15,000,000	125	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
193	Desilting of Kwa Mbeta earthdam	Desilting, expansion and fencing	Kitui West	Mutonguni	15,000,000	100	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
194	Desilting of Kwa Kavuku earthdam	Desilting, expansion and fencing	Kitui West	Mutonguni	10,000,000	130	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
195	Desilting of Tulia Earthdam	Desilting, expansion and fencing	Kitui West	Mutonguni	15,000,000	150	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
196	Desilting of Muthale earthdam	Desilting, expansion and fencing	Kitui West	Mutonguni	12,000,000	130	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
197	Desilting of Kakeani earthdam	Desilting, expansion and fencing	Kitui West	Mutonguni	18,000,000	100	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination

S/No.	Proposed Project	Project scope	Sub County	Ward	Estimated Cost (Kshs)	Beneficiaries (HHs)	Socio-Environmental Risks	Climate Proofing
198	Desilting of Kwa Munzyu earthdam	Desilting, expansion and fencing	Kitui West	Mutonguni	15,000,000	90	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
199	Ngambi - KakunikeSumpwell	Construction of Sumpwell, pumping system, rising main, elevated steel tank, distribution line and water kiosks	Kitui West	Mutonguni	25,000,000	75	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
200	Mutendea Sumpwell - Kwa Ndonga sumpwell	Sumpwell, pumping system, rising main, elevated steel tank, distribution line and water kiosks	Kitui West	Matinyani	25,000,000	200	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
201	Kitimui dam	Construction of dam, fencing, drawoff system. Treatment system, pumping system, rising main, distribution lines. distribution tanks and water kiosks	Kitui West	Matinyani	90,000,000	400	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
202	Katheuni - Mwaani Pipeline extension	Risng main , elevated tanks , distribution lines, water kiosks	Kitui West	Matinyani	18,000,000	200	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structuresWater use efficiency programs (smart metering, water demand management)Storage tanks to buffer supply
203	Pipeline extension from Kavumbu - Muathe - Kauma Dispensary	Risng main , elevated tanks , distribution lines, water kiosks	Kitui West	Matinyani	22,000,000	100	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
204	Ndiangu Sumpwell - Kitunduni	Construction of Sumpwell, pumping system, rising main, elevated steel tank, distribution line and water kiosks	Kitui West	Matinyani	22,000,000	160	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
205	Kaayo - Kwa Kyenza sump well	Construction of Sumpwell, pumping system, rising main, elevated steel tank, distribution line and water kiosks	Kitui West	Matinyani	25,000,000	200	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods

S/No.	Proposed Project	Project scope	Sub County	Ward	Estimated Cost (Kshs)	Beneficiaries (HHs)	Socio-Environmental Risks	Climate Proofing
206	Kikanga borehole drilling and equipping	Drilling of borehole, equipping with solar, Pumping and distribution pipeline, 50m3 Elevated steel water tank, water kiosks	Kitui West	Matinyani	15,000,000	100	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
207	Desilting of Kyeni earth dam	desilting of earthdam & fencing	Kitui West	Matinyani	10,000,000	70	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
208	Desilting of Kwa Nzuki earth dam	Desilting of dam and fencing	Kitui West	Matinyani	10,000,000	65	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
209	Desilting of Kanzevyu earth dam	Desilting of dam and fencing	Kitui West	Matinyani	15,000,000	120	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
210	Mutindi sump well - Kivani	Construction of Sumpwell, pumping system, rising main, elevated steel tank, distribution line and water kiosks	Kitui West	Kithumula/Kwa Mutonga	25,000,000	200	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
211	Desilting of Kathanzu earth dam	desilting of earthdam & fencing	Kitui West	Kithumula/Kwa Mutonga	15,000,000	100	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
212	Desilting of Kwa Musyoka earth dam	desilting of earthdam & fencing	Kitui West	Kithumula/Kwa Mutonga	10,000,000	85	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination

S/No.	Proposed Project	Project scope	Sub County	Ward	Estimated Cost (Kshs)	Beneficiaries (HHs)	Socio-Environmental Risks	Climate Proofing
213	Desilting of Kwa Mwove earth dam	desilting of earthdam & fencing	Kitui West	Kithumula/Kwa Mutonga	18,000,000	125	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
214	Kauwi - Kalimbevo Sumpwell	Construction of Sumpwell, pumping system, rising main, elevated steel tank, distribution line and water kiosks	Kitui West	Kithumula/Kwa Mutonga	20,000,000	100	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
215	Kauwi - Kwa mutisya Sumpwell	Construction of Sumpwell, pumping system, rising main, elevated steel tank, distribution line and water kiosks	Kitui West	Kithumula/Kwa Mutonga	25,000,000	200	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
216	Kwa Silu borehole dirlling and equipping	Drilling of borehole, equipping with solar, Pumping and distribution pipeline, 50m3 Elevated steel water tank, water kiosks	Kitui West	Kithumula/Kwa Mutonga	18,000,000	85	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structuresWater use efficiency programs (smart metering, water demand management)Storage tanks to buffer supply
217	Kauwi -Kilimu Sumpwell	Construction of Sumpwell, pumping system, rising main, elevated steel tank, distribution line and water kiosks	Kitui West	Kithumula/Kwa Mutonga	25,000,000	155	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
218	Kwa Mutonga earthdam desilting	Desilting, expansion of dam, fencing, drawoff system. Treatment system, pumping system, rising main, distribution lines. distribution tanks and water kiosks	Kitui West	Kithumula/Kwa Mutonga	65,000,000	200	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
219	Wayani - Kalindillo - Maselele - Kwa Ndila pipleine extenseion	Distribution lines, water kiosks	Kitui West	Kithumula/Kwa Mutonga	18,000,000	125	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
220	Kiseveni Earthdam	Desilting, expansion of dam, fencing, drawoff system. Treatment system, pumping system, rising main, distribution lines. distribution tanks and water kiosks	Kitui West	Kauwi	75,000,000	230	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination

S/No.	Proposed Project	Project scope	Sub County	Ward	Estimated Cost (Kshs)	Beneficiaries (HHs)	Socio-Environmental Risks	Climate Proofing
221	Mikuyuni Earthdam	Desilting, expansion of dam, fencing, drawoff system. Treatment system, pumping system, rising main, distribution lines. distribution tanks and water kiosks	Kitui West	Kauwi	85,000,000	200	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
222	Matinga Dam	Desilting, expansion of dam, fencing, drawoff system. Treatment system, pumping system, rising main, distribution lines. distribution tanks and water kiosks	Kitui West	Kauwi	1,000,000,000	400	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
223	Kauwi - Kwa Kiluku - Kaluni Sumpwell	Construction of Sumpwell, pumping system, rising main, elevated steel tank, distribution line and water kiosks	Kitui West	Kauwi	25,000,000	155	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
224	Kauwi Kwa Malombe - Katoo Sumpwell	Construction of Sumpwell, pumping system, rising main, elevated steel tank, distribution line and water kiosks	Kitui West	Kauwi	35,000,000	180	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
225	Katutu - Kathiani - Kwa Ngotho Pipeline extension	Elevated water tanks, distribution line, water kiosk	Kitui West	Kauwi	15,000,000	150	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
226	Kivuani - Kyondoni Sec- Kalimba Pipeline extension	Distribution line, water kiosk	Kitui West	Kauwi	18,000,000	100	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
227	Pipeline extension from Muthumula - Kwa Ndambo tank	Distribution line, water kiosk and water tanks	Kitui West	Kauwi	18,000,000		Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
228	Kwa Mwambi borehole drillingi and equipping	Drilling of borehole, equipping with solar, Pumping and distribution pipeline, 50m3 Elevated steel water tank, water kiosks	Kitui West	Kauwi	15,000,000	80	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply

S/No.	Proposed Project	Project scope	Sub County	Ward	Estimated Cost (Kshs)	Beneficiaries (HHs)	Socio-Environmental Risks	Climate Proofing
229	Kataa borehole drilling and equipping	Drilling of borehole, equipping with solar, Pumping and distribution pipeline, 50m3 Elevated steel water tank, water kiosks	Kitui West	Kauwi	15,000,000	75	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
230	Kanzoni borehole drilling and equipping	Drilling of borehole, equipping with solar, Pumping and distribution pipeline, 50m3 Elevated steel water tank, water kiosks	Kitui West	Kauwi	15,000,000	75	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
231	Kivani borehole drilling and equipping	Drilling of borehole, equipping with solar, Pumping and distribution pipeline, 50m3 Elevated steel water tank, water kiosks	Kitui West	Kauwi	15,000,000	85	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structuresWater use efficiency programs (smart metering, water demand management)Storage tanks to buffer supply
232	Desilting of Kataa earth dam	earthdam repair,desilting and expansion,drawoff systems and fencing	Kitui West	Kauwi	18,000,000	150	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Ensure depth to volume ratio to reduce evaporationTree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
233	Desilting of Kitunini earth dam	earthdam repair,desilting and expansion,drawoff systems and fencing	Kitui West	Kauwi	15,000,000	85	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Tree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
234	Desilting of Kyeng'e earth dam	earthdam repair,desilting and expansion,drawoff systems and fencing	Kitui West	Kauwi	15,000,000	100	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Tree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
235	Desilting of Katutu earth dam	earthdam repair,desilting and expansion,drawoff systems and fencing	Kitui West	Kauwi	15,000,000	100	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Tree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
236	Desilting of Kavoo earth dam	earthdam repair,desilting and expansion,drawoff systems and fencing	Kitui West	Kauwi	18,000,000	90	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Tree planting around the catchment (green buffer zone), fencing to prevent livestock contamination

S/No.	Proposed Project	Project scope	Sub County	Ward	Estimated Cost (Kshs)	Beneficiaries (HHs)	Socio-Environmental Risks	Climate Proofing
237	Desilting of Muthumula earth dam	earthdam repair,desilting and expansion,drawoff systems and fencing	Kitui West	Kauwi	18,000,000	120	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Tree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
238	Kwa Titus Kitheka sumpwell along kamuwongo river	Sumpwell constuction, equipping with solar Pumping and distribution pipeline, $50m^3$ Elevated steel water tank, water kiosks & Cattle troughs	Mwingi central	waita	20,000,000	450	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
239	Kwa ndemange sump well	Equiping with solar pumping and distirbution pipeline and kiosk to kwa musili mukungi	Mwingi central	Waita	10,000,000	400	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
240	Sump well at masaki river kwa musyimi kitau	sumpwell construction,equiping with solar pumping ,distribution pipeline and kiosk, water kiosk and cattle troughs	Mwingi central	waita	14,000,000	450	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
241	Kwa maiko earth dam	Distilling of earth dam, fencing with gate	Mwingi central	Waita	9,000,000	300	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Tree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
242	Kiriri bh	Borehole eqquiping,tower for storage tanks,water kiosks	Mwingi central	Waita	8,000,000	400	"	"
243	Sumpwell at mutomo river	Sumpwell construction,Equiping with solar and distribution of pipeline and water kiosk to waita market	Mwingi central	Waita	18,000,000	550	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
244	Borehole at katothya village	Drilling of borehole, equipping with solar, and distribution pipeline, 50m3 Elevated steel water tank, water kiosks & Cattle troughs	Mwingi central	Waita	13,000,000	350	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
245	Downtownsumpwell along tyaa river near muthainga academy	Sumpwell constuction,eqquiping with solar to be connected with exsting water tank at the market	Mwingi central	Central	12,000,000	600	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods

S/No.	Proposed Project	Project scope	Sub County	Ward	Estimated Cost (Kshs)	Beneficiaries (HHs)	Socio-Environmental Risks	Climate Proofing
246	Tyaa kangoka sumpwell long tyaa river	Sumpwell construction,eqquiping with solar,Elevated water tank ,kiosks at makutano,kauswini shopping center	Mwingi central	Central	16,000,000	450	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
247	Kyanika sumpwell along tyaa river	Sumpwell constuction,eqquiping with solar,elevated water tank 50m3,distribution pipeline ,water kiosks	Mwingi central	Kivou	20,000,000	550	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
248	Borehole at Kalung'a centre	Borehole drilling, eqquiping, distribution pipeline, storage tank, kiosks and cattle trough.	Mwingi central	Kivou	12,000,000	350	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structuresWater use efficiency programs (smart metering, water demand management)Storage tanks to buffer supply
249	Borehole along Kakea area	Borehole drilling, eqquiping, distribution pipeline, storage tank, kiosks and cattle trough.	Mwingi central	Kivou	11,000,000	300	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
250	Kakea earrdam installtaion with solar system	solar pumping system,distibution pipeline,storage water tanks,kiosk,cattle trough	Mwingi central	Kivou	3,000,000	300	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
251	Kolyani B bh repair	replacement of pump and motar	Mwingi central	Kivou	1,000,000	380	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
252	Nguni sumpwell along river enziu	sumpwell construction,eqquiping with solar,Elevated water tank,distibution pipeline ,water kiosk	Mwingi central	Nguni	20,000,000	600	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
253	Kavisu bh in imba village	Borehole drilling, equipping, distribution pipeline, storage tank, kiosks and cattle trough.	Mwingi central	Nguni	13,000,000	340	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply

S/No.	Proposed Project	Project scope	Sub County	Ward	Estimated Cost (Kshs)	Beneficiaries (HHs)	Socio-Environmental Risks	Climate Proofing
254	Levuni bh in mathyakani village	Borehole drilling, eqquiping, distribution pipeline, storage tank, kiosks and cattle trough.	Mwingi central	Nguni	12,000,000	300	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
255	Katangini bh sosoma village	Borehole drilling, eqquiping, distribution pipeline, storage tank, kiosks and cattle trough.	Mwingi central	Nguni	13,000,000	320	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
256	Nguka imwe earthdam repair and fencing	earthdam repair,desilting and expansion,drawoff systems and fencing	Mwingi central	Mui	10,000,000	350	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Tree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
257	Earthdam construction at kitise village	construction of earthdam ,solar pumping ,storage tanks and fencing	Mwingi central	Mui	27,000,000	500	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Tree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
258	Borehole drilling at itiko village	Borehole drilling, eqquiping, distribution pipeline, storage tank,kiosks and cattle trough.	Mwingi central	Mui	15,000,000	350	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
259	Kamulewa bh repair and hybridization	BH hybridization,pepiline reapir,water tank	Mwingi central	Mui	9,000,000	600	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
260	Mwola kathanze springs	Pipeline replacement of corrodedGi pipes with HDPE.	Mwingi central	Nuu	8,000,000	350	Water contamination from animal acces	Elevated tanks; fencing; community water point management
261	Kathanze eartdam desilting	Desilting and fencing of kathanze earthdam	Mwingi central	Nuu	9,000,000	350	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Tree planting around the catchment (green buffer zone), fencing to prevent livestock contamination

S/No.	Proposed Project	Project scope	Sub County	Ward	Estimated Cost (Kshs)	Beneficiaries (HHs)	Socio-Environmental Risks	Climate Proofing
262	Kavindu bh	bh drilling,eqquiping ,distribution pipeline,water tank and kiosks,cattle trough	Mwingi central	Nuu	8,000,000	400	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
263	Muthiani- katoteni pipeline extension phase II	pipeline extension of 5km, 2no water kiosks	Mwingi West	Nguutani	6,500,000	150	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
264	Ngutani-thitani pipeline extension (Masinga water)	pipeline extension5km and 3no water kiosks	Mwingi West	Nguutani	8,000,000	200	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structuresWater use efficiency programs (smart metering, water demand management)Storage tanks to buffer supply
265	scooping of muthumuta earth dam	de-silting, repair of embarkment, rehabilitation of spill way, sanitation facility, fencing & gate and silt trap	Mwingi West	Nguutani	15,000,000	120	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Tree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
266	Drilling of Muthithini borehole	drilling of borehole, equiping with solar pumping, distribution pipeline,100m3 masonary tank and water kiosk	Mwingi West	Nguutani	18,000,000	250	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
267	Pipeline extension from katutu-ututu (masinga water)	pipeline extension 4.5km, 2no water kiosks	Mwingi West	Nguutani	8,500,000	100	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
268	Scooping of mui earth dam	de-silting, embarkment repair, rehabilitation of spill way, silt trap,sanitation facility and fencing & gate	Mwingi West	Migwani	50,000,000	350	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Tree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
269	Operationalization of itheng'eli borehole	equiping with solar pumping ,distribution pipeline,construction of 100m3 masona tank, 4no water kiosk	Mwingi West	Migwani	30,000,000	180	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply

S/No.	Proposed Project	Project scope	Sub County	Ward	Estimated Cost (Kshs)	Beneficiaries (HHs)	Socio-Environmental Risks	Climate Proofing
270	Equipping of mumbuni borehole & extension	equiping with solar pumping & distribution pipeline	Mwingi West	Migwani	8,500,000	150	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
271	Pipeline extension kyamboo-itumbi (from Thitani-Migwani pipeline)	pipeline extension water kiosk	Mwingi West	Migwani	8,500,000	50	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
272	Scooping of kitema earth dam	desilting rehabilitation of embarkmentrepair of spill way	Mwingi West	Migwani	8,500,000	50	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Tree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
273	Equipping of Kairungu borehole	Equiping with solar pumping, distribution pipeline, 100m3 masonary tank and water kiosk	Mwingi West	Kiomo/Kyethani	17,000,000	100	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
274	Extension of Tyaa-Wimbondo water supply	Pipeline extension from masonry tank, 3no water kiosks	Mwingi West	Kiomo/Kyethani	9,000,000	150	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
275	Scooping of Kwa Kuvora Earth dam	desilting rehabilitation of embarkment repair of spill way & sanitation facility	Mwingi West	Kiomo/Kyethani	15,000,000	100	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Tree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
276	Drilling of Karura borehole	drilling of borehole, equiping with solar pumping, distribution pipeline, 50m3 elevated tank and water kiosk	Mwingi West	Kiomo/Kyethani	18,000,000	120	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
277	Construction of Kakawani earth dam	construction of embarkment, spillway, resoivoir and auxilliary works	Mwingi West	Kiomo/Kyethani	19,000,000	150	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Tree planting around the catchment (green buffer zone), fencing to prevent livestock contamination

S/No.	Proposed Project	Project scope	Sub County	Ward	Estimated Cost (Kshs)	Beneficiaries (HHs)	Socio-Environmental Risks	Climate Proofing
278	Construction of Muliluni sump well water supply	Construction of Sumpwell, pumping system, rising main, elevated steel tank, distribution line and water kiosks	Mwingi West	Kiomo/Kyethani	30,000,000	200	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
279	Construction of Samuel Kasovo sump well water supply	Construction of Sumpwell, pumping system, rising main, elevated steel tank, distribution line and water kiosks	Mwingi West	Kyome/Thaana	25,000,000	165	Drought, land disputes, conflict over water access during dry spells	Construction of aquifer recharge structures, ensure public sensitization, installation of reseirvoir tanks to buffer supply during dry periods
280	Drilling of Kwa Kaseki borehole	drilling of borehole, equiping with solar pumping, distribution pipeline, 50m3 elevated tank andwater kiosk	Mwingi West	Kyome/Thaana	18,500,000	150	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structuresWater use efficiency programs (smart metering, water demand management)Storage tanks to buffer supply
281	Construction of Mumbo Mutui earth dam	construction of embarkment, spillway, resoivoir and auxilliary works	Mwingi West	Kyome/Thaana	15,000,000	75	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Tree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
282	Drilling of kwa kivindu Nzika borehole	drilling of borehole,equiping with solar pumping,distribution pipeline,50m3 elevated tank andwater kiosk	Mwingi West	Kyome/Thaana	18,000,000	200	Drought, land disputes, conflict over water access during dry spells	Use of aquifer recharge structures Water use efficiency programs (smart metering, water demand management) Storage tanks to buffer supply
283	Scooping of Winzyeei Earth dam	desilting rehabilitation of embarkment repair of spillway & sanitation facility	Mwingi West	Kyome/Thaana	15,000,000	100	Drought, Floods, Pollution and High Temperatures	Spillway construction and maintenance, Tree planting around the catchment (green buffer zone), fencing to prevent livestock contamination
284	Construction of sewerage networks to Kabati, Mutomo, Mwingi town, Kyuso, Kwa Vonza, Migwani and completion of Kitui Town sewer networks	Installation of new sewer lines, construction of treatment facilities, sewer pumps, sewer houses and other facilities	All	Kitui West, Kitui South, Kitui Central, Kitui Rural, Mwingi Central, Mwingi North	300,000,000	50,000	Land Disputes, Flooding and drought	Ensure community sensitization on land agreement prior to project implementation, Proper siting of the sewer pipeline away from flooding zones, Ensure installation of water storage tanks to buffer supply during dry periods.

S/No.	Proposed Project	Project scope	Sub County	Ward	Estimated Cost (Kshs)	Beneficiaries (HHs)	Socio-Environmental Risks	Climate Proofing
Total					**6,797,100,000**			

b) KIMWASCO Proposed Projects (2025-2030)

Table 48: KIMWASCO Potential Bankable Projects (2025-2030)

S/No.	Project	Technical Solutions	Capital Expenditure (Ksh)	O&M Costs per Annum (Ksh)	Revenue Streams	Profitability	Key Environmental & Social Risks	Safeguards
1.	Phase II of Kiambere Water Supply Project	- Expanding the treatment works - Construction of a new distribution tank at Kyoea hill - Installation of a new pipeline from Kyoea to Mwingi	1,400,000,000	500,000	- Increase billable water by increasing production - Revenue increase of Ksh. 188,697,600 annually	- Payback period: 7.4 years - Sensitive to water source availability	- Temporary disruptions during pipeline installation. - Temporary disruption of ecosystems during the construction.	- Environmental Impact Assessment (EIA) - Community Engagement Plan to address disruptions and concerns
2.	Rehabilitate & expand phase I of Kiambere-Mwingi Water Supply Project	- Rehabilitation of 12Km rising main and 54Km distribution main. - Last mile connectivity	300,000,000	500,000	- Increase billable water by reducing non-revenue water from 35% to 30% and increasing number of customers - Revenue increase of Ksh. 39,747,760 annually	- Payback period: 7.55 years - Sensitive to water source availability	- Temporary disruptions during pipeline installation and rehabilitation - Temporary disruption of ecosystems during the rehabilitation	- Environmental Impact Assessment (EIA) - Community Engagement Plan to address disruptions and concerns
3.	Implement Kiomo – Kyethani water supply project	- Construction of an intake at Kindaruma dam - Construction of a 10.3 Kilometres rising main - Construction of 3 distribution tanks. - Construction of 3 booster stations. - Establishment of irrigation infrastructure for the	1,200,000,000	500,000	- Increase billable water by increasing production by 10,000m3/day - Revenue increase of Ksh. 907,200,000 annually	- Payback period: 1.3 years - Sensitive to water source availability	- Temporary disruptions during pipeline installation and rehabilitation - Temporary disruption of ecosystems during the rehabilitation	- Environmental Impact Assessment (EIA) - Community Engagement Plan to address disruptions and concerns

S/No.	Project	Technical Solutions	Capital Expenditure (Ksh)	O&M Costs per Annum (Ksh)	Revenue Streams	Profitability	Key Environmental & Social Risks	Safeguards
		targeted irrigation area.						
4.	Install solar power plant at Kiambere T/Works	- Construction of a solar support structure to support solar modules - Purchase of high capacity monocrystalline solar modules	505,000,000	200,000	- Reduce operation cost by Ksh. 25,200,000 annually	- Payback period: 20 years - Sensitive to solar efficiency fluctuations and high capital investment	- Minimal environmental impact from solar panel installation - Possible land displacement	- Land Acquisition Plan - Biodiversity Assessment to ensure minimal disruption
5.	Automated Water Dispensing Kiosks	- Install 36 solar-powered water kiosks - Prepaid card systems for clean water access	12,600,000	50,000	- Increase revenue billed at water kiosks by Ksh. 6,480,000 annually	- Payback period: 1.94 years - Sensitive to prepaid system adoption and potential technical issues	- Minimal environmental risks - Potential resistance to prepaid water systems	- Social Impact Assessment - Customer Education Program to encourage prepaid system use and kiosk adoption

c) KITWASCO Proposed Investments

Table 49: KITWASCO Investment Plan (2025-2030)

S/No.	Investment Description	Investment Amount	Annual Additional Revenues	Annual Cost Savings	Payback Period (Yrs)
1.	Hybridization of boreholes and booster stations	25,000,000		4,700,000	5
2.	Procure and install 57 no. zonal meters of assorted sizes and 3,500 15mm consumer meters	31,539,443	7,500,000		4
3.	Rehabilitate 30kms of distribution lines of assorted sizes	36,000,000	11,250,000		4
4.	Automation of water kiosks and smart metering of major consumers	8,000,000	2,400,000		4
5.	Procure and operationalize toll free line	400,000	3,040,000		1
6.	Review, implement and disseminate human resource policies	500,000			
7.	Improve employee capacity, skills and competencies	5,000,000	1,000,000	500,000	3
8.	Carry out staff rationalization and placements	2,000,000			
9.	Train staff on culture change	1,000,000	7,500,000		1
10.	Door to door customer identification survey	1,100,000	1,800,000		1
11.	Portable meter testing equipment	700,000	1,500,000		1
12.	Install Pressure management equipment	1,700,000		750,000	3
13.	Enhance NRW reduction measures (billing, metering, etc.)	1,500,000	520,500		3
14.	Carry out meter accuracy testing, replacement, relocation, and resizing	2,000,000	520,500		4
15.	Conduct regular tariff reviews and engage with regulators to ensure tariffs are adjusted to reflect rising costs	5,000,000	7,500,000		1
16.	Develop and implement customer retention programs and marketing strategies to boost service uptake	5,000,0000	1,500,000		3
17.	Map major facilities such as water treatment plants, storage tanks, bulk meters, pipelines, and gate valves on GIS	4,000,000			
18.	Develop expansion plan	2,000,000			
19.	Carry out preventive maintenance planning (regular servicing, stocking of spare parts)	171,100,744		26,023,000	7
20.	Develop a debt management policy	500,000			
21.	Strengthen debt recovery processes by implementing early intervention strategies for overdue accounts	6,000,000	9,000,000		1
22.	Engage professional debt collection services for long-overdue accounts to improve recovery rate	5,000,000	10,000,000		1
23.	Implement a proactive debt monitoring system to identify and address potential bad debts early	500,000		1,500,000	1
24.	Procure and install high efficiency pumping units at Masinga production site.	30,000,000			
25.	Review and enhance billing processes to ensure accurate and timely revenue collection from both water and sewer services	6,000,000	9,000,000		1
	TOTALS	**410,540,187**	**74,031,000**	**33,473,000**	

5.8.2 Consideration of MUS/WASH+ Approaches in Design and Implementation

In Kitui County, the adoption of Multiple Use Water Services (MUS) and WASH+ approaches is critical to enhancing the efficiency, equity, and sustainability of water and sanitation interventions. As a predominantly arid and semi-arid region, Kitui faces significant challenges in water scarcity, competing water demands, and climate variability. Integrating MUS into the design and implementation of water infrastructure enables the County to respond more holistically to the diverse needs of rural and peri-urban communities—including domestic use, livestock watering, small-scale irrigation, and other livelihood-supporting activities. This approach maximizes the socio-economic returns on water investments, reduces the burden on women and children who often travel long distances to access water, and supports food security and income generation.

Similarly, the WASH+ approach emphasizes the integration of water, sanitation, hygiene, and related health and nutrition outcomes. By combining hardware (infrastructure) and software (behavior change, community education, and capacity building), WASH+ ensures more comprehensive and lasting improvements in public health and wellbeing. In Kitui, where access to improved sanitation remains a challenge in several wards and hygiene-related illnesses are still prevalent, adopting these approaches will help tailor interventions to the specific socio-economic and environmental realities of communities.

The CWSSIP will therefore promote MUS and WASH+ in project planning, community engagement, budgeting, and monitoring, ensuring that water and sanitation services are responsive to multiple users needs while contributing to broader development goals across sectors.

5.9 Sanitation and Hygiene Services Investment Plan

Table 50: Priority Sanitation Projects

S/No.	Name of the Proposed Project/Investment	Summary Description of the Project Scope	Project Location	Estimated Beneficiaries	Estimated Budget
1.	Construction of Child friendly latrines in ECD centers	Construction of 480 Child friendly latrines in ECD centers.	All Sub-Counties	24,000 ECD Pupils	360,000,000
2.	Construction of DDVIP pit latrines in 308 health facilities (2 blocks in each facility)	Construction of sanitation facilities in health facilities – 308 sanitation blocks	All Sub-Counties	200,000 Patients	231,000,000
3.	Capacity building of technical staff on safely managed sanitation	Training of technical officers on safely managed sanitations	All Sub-Counties	92 Officers	6,716,000
4.	Conduct institutional triggering to areas with >10% OD	Conducting triggering sessions in learning institutions especially primary schools	All Sub-Counties	1,312,600 pupils	8,560,000
5.	Training of local artisans on non-collapsible latrines and latrine upgrading skills	Conduct training for artisans in all the 40 wards	All Villages	4,940 artisans	51,870,000
6.	Capacity building sessions (PHOs, artisans, CHVs and local administrations)	Workshop for dissemination of hygiene protocols	All Sub-Counties	3,168 (CHPs,PHOs,Ward Administrator,Village Administrators,Deputy County Commissioners,Chiefs and Assistant Chiefs	10,500,000
7.	Provision of burial pits for disposal of non-infectious waste	Excation of burial pits	All Sub-Counties		
8.	Construction of 2 blocks of sanitation facilities in 150 primary schools	Construction of 6 door 300 No. sanitation facilities in primary schools putting into consideration menstrual hygiene management	All Sub-Counties		270,000,000
9.	Promotion of menstrual hygiene management in 200 schools	Promotion of menstrual hygiene management in 200 schools by providing dignity kits for girls	All Sub-Counties	30,000 girls	66,036,800
10.	Procurement of healthcare waste collection vehicles	Procurement of 2 healthcare waste collection vehicles	All Sub-Counties	311 health facilities	20,000,000

S/No.	Name of the Proposed Project/Investment	Summary Description of the Project Scope	Project Location	Estimated Beneficiaries	Estimated Budget
11.	Provision of waste treatment microwave	Procurement and installation of waste treatment microwave in Mwingi level 4 hospital	All Sub-Counties	311 health facilities	20,000,000
12.	Training and capacity building on infection control management and environmental management	Training of healthcare workers on IPC	All Sub-Counties	1555 healthcare workers	5,785,800
13.	Provision of public toilet at Nguni, Mbondoni, Migwani and Kamuwongo markets in Mwingi	Construction of 4 public toilets in market places	Nguni, Mbondoni, Migwani & Kamuwongo Markets	9,000	28,000,000
14.	Promotion of rain water harvesting in health facilities and primary schools	Procure water storage tanks for 301 health facilities and 200 schools	All health centres and dispensaries	855,556	5,110,000
15.	Enhancement of Healthcare waste management to adhere to WHO standards	Procure sets of colour coded bins and bin liners	All health centers and dispensaries (308)	855,556	10,426,416
16.	Incentivization of sanitation and hygiene products to people living with disabilities	Procure sanitation and hygiene products for support to people living with disabilities	All sub-Counties	127,500	191,250,000
17.	Monitoring of project activities and reporting on environmental and social safe guards	Conduct supportive supervision to ensure the projects are done as per the set standards and observing environmental and social safeguards	All sub-Counties		19,000,000
TOTAL					**1,304,255,016**

5.9.1 Plans for Improving Household and Public Sanitation across the Sanitaion Value Chain

Containment

Household toilets with safe containment addresses the requirement for safe on-site disposal of excreta, but does not address what happens if faecal sludge is removed from the containment system, or discharged into communal systems. In these cases, where faecal sludge or wastewater leaves the containment system, further checks are required to verify whether emptying and related sanitation services are safely managed, including surveys of households, service providers and local authorities (where appropriate).

Safe Management of Household Faecal Sludge

There are five main options for safe management of household faecal sludge:

a) **Safe excreta containment with no emptying:** faecal sludge remains in the pit, and the full pit is closed and replaced with a new pit.
b) **Safe on-site management with burial:** faecal sludge is emptied into a covered pit in the household compound.
c) **Safe on-site management with alternating pits:** only one pit is in use at any time; when this pit is full, the other pit is connected, and the faecal sludge is stored in the full pit for more than 2 years before being emptied for use on fields or in the garden.
d) **Safe off-site disposal**: faecal sludge is safely emptied and transported to a safe disposal site.
e) **Safe off-site treatment:** faecal sludge is safely emptied and transported to a safe treatment site.

Safely emptied: faecal sludge is emptied from the containment system without spillage or contamination of the local environment. Any spilled faecal sludge is contained and cleaned up, and the faecal sludge is either immediately buried in a nearby pit or transported off-site. All containers and equipment used to empty the faecal sludge are thoroughly cleaned in a location that avoids contamination of the local environment (including the household compound, areas around water points or water bodies, and other communal areas).

Safely transported: Faecal sludge is transported in a vehicle or storage container that does not leak or spill faecal sludge during transportation off-site. Any spilled faecal sludge is contained and cleaned up. All vehicles, containers and equipment used to transport the faecal sludge are thoroughly cleaned in a location that avoids contamination of the local environment (including the household compound, areas around water points or water bodies, and other communal areas).

Safe disposal site: Faecal sludge disposal sites (e.g. disposal pits or trenches) should be located away from settlements and other facilities that might be affected by the burial of faecal sludge, in areas with a low risk of groundwater contamination. Where the disposal sites are in communal areas of the community (or a nearby community), the local administration should supervise, monitor and regulate faecal sludge disposal practices.

Safe treatment site: Treatment sites should be appropriate for the treatment of the faecal sludge from local sanitation facilities, and the products and effluents from the treatment processes should meet National standards for waste management

5.9.2 Household Sanitation Improvements

a) Access to Sanitary Toilets

Promote construction of improved, gender-sensitive toilets (flush/pour-flush, ventilated pit latrines). Communities with low income can be offered subsidies or linked to microfinancing for sanitation products.

b) Waste Management

Safe containment should be assessed by observation of the pit (or other type of excreta containment system). Where evidence of outflows is observed (e.g. continuous flows from overflow pipes, holes or leaks; or significantly increased vegetation growth around the pit), the toilet should be classed as having unsafe containment. A household head should be asked whether the pit (or other type of excreta containment system) has ever been emptied either partially or fully (e.g. emptying of faecal sludge or supernatant liquid), and whether there have been any surface outflows from the pit (or other containment). Where any (occasional, regular or continuous) surface alternating twin pit latrines must provide storage in a closed pit for at least two years before emptying, with no surface outflows, to be certified as toilets with safe containment.

c) Hygiene Behavior Change

All members of the household should practice handwashing with soap at critical times.

- **Critical toilet times:** individual members of the household should wash their hands with water and soap after toilet use and after anal cleansing,
- **Critical food times:** members of the household who handle, prepare, cook or serve food should wash their hands with water and soap before food preparation or cooking; caregivers should wash their hands with water and soap before feeding infants or young children, and all members of the household should wash their hands with water and soap before eating.
- **Critical infant care times**: caregivers should wash their hands with water and soap after cleaning an infant of excreta, after handling child faeces, or after washing or disposing of aused diaper.
- **Critical animal times**: members of the household who have contact with animals should wash their hands with water and soap after contact with animals, animal products or animal wastes (e.g. manure or other materials containing fresh animal excreta), and before and after milking (in households that milk animals). Animal wastes: comprise animal, spilled feed and water, animal parts, blood, skin, feathers, and other contaminated wastes Households should use permanent handwashing stations such as piped water supply i.e. tap with continuous water supply, wash basin and drainage. Other permanent facility may be manufactured handwashing station with closed water storage, tap or handsfree water drawing system (e.g. foot pedal), and drainage. Handwashing facilitities

should be made of durable materials, with a piped water connection or adequate water storage, and located in a fixed place that is appropriate for handwashing at critical times.

5.9.3 Safe Management of Household Drinking Water

Drinking water is collected in clean, covered containers (free of visible contamination) and Drinking water should be stored in clean, covered containers with spigots and taps, or from narrow-separate from the water used for other purposes'

5.9.4 Safe Management of Household and Communal Water Sources

Water sources should be clean: free from debris, solid waste, human or animal faeces, and any other potential sources of contamination including human excreta and animal wastes (e.g. by the exclusion of animals and the prohibition of unsafe activities, such as the use of manure or chemical fertilizers, in areas around water supply sources. Groundwater sources (e.g. springs, wells, handpumps, boreholes) need to be protected from contamination, wastes and pollutants (e.g. by the construction of a spring box, raised parapet wall and cover, wellhead protection and a sealed borehole casing)

5.9.5 Public Sanitation Improvements

Public Toilets Infrastructure

- **School Toilets**: All schools (primary, secondary and other) in the community shall provide safely managed and usable toilets for students, with separate toilets for girls and boys, and at least one toilet for every 25 girls enrolled, and one toilet for every 35 boys enrolled. Schools should provide at least one toilet unit for girls and one for boys that are designed for access and use by children with disabilities. Separate disability-friendly toilets should be provided for male and female teachers. All school toilets should be designed to consider the security, privacy and hygiene needs of girls, female teachers and female workers, and enable them to manage their hygiene needs during menstruation.
- **Healthcare Facility Toilets:** All healthcare facilities (including health posts and dispensaries) in the community shall provide safely managed and usable toilets for health staff, patients, other workers and other visitors. Separate toilets should be provided for males and females, and all toilets should be disability-friendly, with female toilets designed to consider the security, privacy and hygiene needs of women and girls, including during menstruation.
- **Other Institutional Toilets:** All public and private institutions (hotels, restaurants, guest houses, garages, centres of worship, factories, nursing homes, camps, office premises, prisons and other centres of learning) in the community shall provide an appropriate number safely managed and usable toilets.
- **Public Toilets:** all markets, fairs, recreational areas (playgrounds, beaches, halls), transport centres (train stations, bus stations), , mining camps, warehouses, and fuel stations shall provide an appropriate number of safely managed and usable public toilets.

5.9.6 Environmental Sustainability and Climate Resilience

Use climate-resilient toilet designs (e.g., flood-proof, drought-tolerant) by use of waste treatment through eco-friendly technologies (e.g., biogas digesters, composting toilets). This should aim at preventing contamination of water bodies through proper drainage and sewer systems.

5.9.7 Community Engagement and Education

Involve local communities in planning, monitoring, and behavior change initiatives by empowering women and youth groups to be sanitation champions. Create feedback mechanisms like user satisfaction surveys or sanitation committees.

5.9.8 Governance and Policy

Strengthen enforcement of sanitation policies, bylaws and building codes,develop a city/town-wide sanitation plan integrating public and household systems and ensure funding mechanisms for O&M, awareness campaigns, and infrastructure upgrades.

5.9.9 Marketing and Awareness

Create demand and educate households about sanitation benefits by se of local vernacular radio stations to inform communities on where they can access sanitation products. Communities can partner with microfinance institutions for affordable payment plans.

5.10 Public Sanitation Improvement Plans

a) Infrastructure Development

The County strategy is focused on ensuring that households and institutions build and maintain clean, gender-sensitive public and community toilets. Sanitation facilities will be availed at markets, bus terminus, schools, and health centers.

b) Operation and Maintenance (O&M)

The County is committed to training artisans and technical officers in order to establish sustainable systems for regular cleaning, water supply, and repairs.

c) Monitoring and Accountability

For effective implementation of the planned sanitation interventions in the County, the County department of Public Health and Sanitation employ proper monitoring through use of digital tools to track usage and cleanliness of public toilets. This will be achieved by continuous follow up by the relevant Government officials and Community Health Promoters (CHP), community monitoring or sanitation committees, to ensure compliance.

5.11 Cross-Cutting Strategies across the Value Chain

- **Education and Advocacy-**Engage local leaders, religious groups, and media to promote sanitation norms and train sanitation workers with dignity and safety protocols
- **Policy and Regulation-**Enforce sanitation standards and building codes as well as integrating sanitation into local development and health planning
- **Innovation and Incentives-**Encourage businesses to develop affordable sanitation technologies and avail sanitation commodities to the communities.

5.12 Behavioral Change and Market-Based Sanitation Initiatives

5.12.1 Strategies for Promoting Improved Sanitation Practices

a) Public Awareness and Education

- **Hygiene Campaigns:** Promote handwashing, toilet use, and safe water practices through schools, media, and community events.
- **Behavior Change Communication (BCC):** Tailored messages that address cultural beliefs and local behaviors.
- **School Programs:** Teach children good sanitation practices early so they become lifelong habits.

b) Community-Led Total Sanitation (CLTS)

Empower communities to identify and solve their own sanitation issues. This is done to trigger behavoiur change and taking a collective responsibility by the communities with focus on ending open defecation through social pressure and community sanctions.

c) Infrastructure Development

Build and maintain safe, accessible toilets in homes, schools, and public spaces. Improve sewage and waste management systems to prevent contamination.
Promote affordable, eco-friendly sanitation solutions like composting toilets in low-income areas.

d) Integration with Health Services

Link sanitation efforts with public health campaigns e.g. vaccination drives, and maternal health programs and training of health workers to educate households on hygiene and sanitation.

e) Policy and Governance

Establish clear policies and regulations on sanitation standards. Encourage local Government involvement in planning and monitoring sanitation projects. Enforce penalties for environmental violations (e.g., illegal dumping or open defecation).

f) Technology and Innovation

Use real time monitoring (RTMIS) to monitor sanitation coverage and progress. Innovate with low-cost, sustainable sanitation technologies. Promote waterless toilets, greywater recycling, and smart waste management.

g) Partnerships and Collaboration

The County department of Public Health and Sanitation is committed to work with the National Government, relevant development partners, such as NGOs, with a view to leverage on their financial resources and technical capacities.

5.13 WASH Investments for Schools and Healthcare Facilities

5.13.1 WASH in Schools

The status of WASH infrastructure in Kitui Cointy is wanting, with rain water being the main source of water, which is not reliable at all times. Most of the sanitation facilities in the County are pit latrines with slabs and no feacal emptying of the pits is available. The latrines are dilapidated with vandalism being reported of toilet doors, hinges and taps for handwashing facilities. Menstrual hygiene is also a major challenge with no provision of waste bins for disposal and changing rooms in the girls' sanitation facilities. This calls for concerted efforts by all stakeholders to invest in the schools' sanitation and hygiene infrastructure. This will improve school attendance and ultimately the learning outcomes in the schools across the County. The County Government of Kitui is therefore committed to investing in the following strategies to improve WASH in schools;

a) **Infrastructure development:** The County will construct latrine infrastructure, especially in the Early Child Development (ECD) Centres in the County, laying special emphasis on the recommended ratios of 1 door to 30 boys with provision of a urinal and one door to 25 girls. The latrines will be gender segregated with clear markings for ease of access. For comprehensive schools in the County, disability friendly latrine facilities will be provided with inclusion of ramps, supporting rails and enhanced toilet dimensions to ensure access and usability by PWDs.
b) **Social Behavior Change Approaches (SBC)**: Kitui County has embraced SBC approaches to guide learners in adopting sustainable behavior change towards sanitation and hygiene. These approaches include, Children Hygiene and Sanitation Training (CHAST), training of School Health Clubs and sanitation champions and sensitization on School Led Total Sanitation (SLTS).
c) **Policy and Funding Advocacy:** The learning institutions are being encouraged to ensure full implementation of the school health policy, which has WASH as one of the thematic areas. It gives a clear guideline on promotion of WASH activities in schools. The National Government should continue allocations/capitation of schools by ensuring funds dedicated to WASH infrastructure are fully utilized.

d) **Public-Private Partnerships**: The County is encouraging stakeholders in the education sector to invest in the improvement of WASH in schools. This will enhance scaling up of programs and lead to sustainability of WASH projects.

5.13.2 Menstrual Hygiene and Health Management Investment Plans for Schools and Healthcare Facilities

Most of the healthcare facilities and schools in Kitui County have not embraced or have got minimal provision for menstrual hygiene management. Most of the institutions lack menstrual hygiene disposal bins, bathroom or changing rooms in schools for girls, and also a full mirror for the girls' latrines. Kitui County intends to promote good menstrual health and hygiene practices among women and girls, and ensure their access to a safe and healthy environment, and improved menstrual sanitation facilities at all levels. To achieve this objective, the County department of Public Health and Sanitation, in collaboration with the relevant stakeholders shall:

- Ensure integration of menstrual hygiene management issues in the schools and healthcare facilities as per the policy guidelines.
- Sensitize women clients at the healthcare facilities, girls and teachers in schools on the benefits of a safe and healthy environment, and improved menstrual hygiene and sanitation practices. This will include proper disposal through provision of waste bins.
- Support vulnerable girls from poor background who cannot afford to buy sanitary towels in schools through ensuring enough stocks in the schools for the entire learning calendar.
- Ensure that toilet facilities in schools and health institutions are designed and constructed in a way that considers the security, privacy and hygiene needs of women and girls during menses.
- Ensure that appropriate mechanisms are put in place for safe collection and disposal of menstrual waste.
- Sensitize WASH and health practitioners on the various issues associated with menstrual hygiene management to promote good menstrual management practices at all levels.

5.13.3 WASH In Healthcare Facilities

In Kitui County, WASH infrastructure in healthcare facilities is generally inadequate, with many lacking basic services like reliable water and adequate sanitation. Majority of the facilities rely on rainwater harvesting and storage which is not reliable throughout the year. In order to improve this status, the County plans to undertake the following:

- **Infrastructure Development:** The County will ensure construction of adequate sanitation facilities which are gender segregated and in appropriate recommended ratios for clients attending the facilities. Separate latrines will also be provided for staff working in the healthcare facilities in addition to disability friendly sanitation facilities. Handwashing facilities are also critical for improvement of Infection Prevention and Control (IPC) in the healthcare facilities.
- **Policy Integration and Financing:** The County will ensure adherence to policies and guidelines which have been developed by the County and the National Governments for the improvement of WASH in healthcare facilities. The County will continue enhancing budget allocation for implementation of the policies and guidelines.

- **Improve Water Supply, Sanitation and Hygiene in Healthcare Facilities:** The County will ensure that all healthcare facilities have reliable water supply, environmental sanitation and hygiene facilities as part of the initial construction components.
- **Capacity Building and Training:** The County will ensure that all healthcare staff are trained on medical waste management and effective sanitation and hygiene practices in healthcare institutions during their regular Continuous Medical Education (CME) sessions.

5.13.4 Sanitation and Hygiene in Public Places

Kitui County has experienced rampant rural-urban migration in the revent years. People have been moving to towns and fast growing market centers in search for jobs and greener pastures. Hence, the demand for sanitation infrastructure in the urban and peri-urban areas has increased. This is more so in informal settlements where majority have settled due to cheaper housing. The market centres, bus parks, recreational areas and trade fairs require public toilets for the growing population. In order to address the growing need in sanitation and hygiene infrastructure in the public places, the County plans to uundertake the following:

- **Infrastructure Development**: The County, through the department of Public Health and Saniatation will facilitate provision of adequate sanitary facilities, including hygienic toilets, urinals, and handwashing facilities (with soap, toilet paper and solid waste disposal facilities such as sanitary bins) in public places.
- **Public-Private Partnership**: The County will foster collaboration of various actors to promote sanitation and hygiene, and ensure that solid and liquid wastes in all public places are properly collected, stored and disposed. The County will encourage the private sector to participate in the provision and maintenance of sanitary facilities in public places.
- **Policy, Laws and Regulations**: The County shall enforce policy, laws and regulations on sanitation to ensure proper disposal of liquid and solid waste.
- **Community Sensitization for Behavior Change**: The County will enhance hygiene promotion campaigns to sensitize the community on proper sanitation and hygiene practices.

5.14 Water Resources Management and Catchment Conservation Investment Plan

Water resources in Kitui County face increasing pressure from over-extraction, land degradation, erratic rainfall patterns, and pollution. To ensure the sustainability and resilience of water supply systems, the County Government recognizes the need for robust investment in water resource management and catchment conservation.

This section outlines strategic interventions to protect and enhance surface and groundwater resources, promote environmental integrity, and improve water security through integrated water resource management (IWRM) principles. It aims to restore and maintain healthy watersheds, enhance aquifer recharge, and mitigate water pollution across rural and urban areas.

5.14.1 Planned Investments in Watershed Protection, Groundwater Recharge and Pollution Control

The County will prioritize the following investment areas to enhance the resilience of its water resources:

Watershed Protection and Catchment Restoration

- Tree Planting and Reforestation Initiatives:
- Establishment of green buffer zones along Rivers, streams, and water catchments.
- Promotion of agroforestry practices to reduce land degradation and enhance soil moisture retention.
- Riverbank and Wetland Rehabilitation:
- Construction of gabions, check dams, and riparian vegetation restoration to control erosion and siltation.
- Protection of seasonal wetlands and springs through fencing and community-led conservation.

Construction of Ground water Recharge Structures

- Development of infiltration pits, retention basins, and sand dams in strategic locations.
- Use of floodwater diversion and rainwater harvesting techniques to enhance aquifer recharge.

Mapping and Zoning of Groundwater Conservation Areas

- Identification of critical aquifer recharge zones and regulation of drilling and land use in these areas.
- Integration of hydrogeological studies in borehole development to avoid over-exploitation.

Water Quality and Pollution Control-Pollution Mitigation from Domestic and Agricultural Sources

- Promotion of ecological sanitation (EcoSan) and improved pit latrines in rural areas.
- Public sensitization campaigns on safe waste disposal and use of agrochemicals.

Water Quality Monitoring

- Installation of water quality testing kits in strategic water points.
- Periodic sampling and analysis of surface and groundwater to track contamination risks.

Capacity Building and Community Engagement

Community Training on IWRM and Conservation Techniques

- Support to Water Resource Users Associations (WRUAs) and Community Forest Associations (CFAs).
- Training programs on sustainable land management and catchment stewardship.

Interagency Collaboration

- Strengthen partnerships with National Environment Management Authority (NEMA), Water Resources Authority (WRA), NGOs, and CBOs in implementing integrated catchment initiatives.

Water Catchment Investment Plan (2025-2030)

Table 51: List of Proposed Mega Dams (2025-2030)

S/No	Name of dam	Sub-County	Ward	Village	No. beneficiaries (HHs)	Project cost (Kshs)	Climate/Socil Risk	Climate Proofing
1	Kwa Mutonga Mega dam	Kitui West	Kithumula/ Kwa Mutonga	Kwa Mutonga	7000	80,000,000	- Drought: Prolonged dry spells reducing recharge - Floods: Breaching from flash floods - High temperatures: Increased evaporation	- Desiltation and embankment reinforcement - Spillway construction and maintenance - Tree planting around the catchment (green buffer zone) - Solar-powered - Fencing to prevent livestock contamination
2	Kasomo Mega dam	Kitui Rural	Yatta/Kwa Vonza	Kanyonyoo	3400	55,900,000	- Drought: Prolonged dry spells reducing recharge - Floods: Breaching from flash floods - High temperatures: Increased evaporation	- Desiltation and embankment reinforcement - Spillway construction and maintenance - Tree planting around the catchment (green buffer zone) - Solar-powered fencing to prevent livestock contamination
3	Kyuso Rock Catchment site	Mwingi North	Kyuso	Kyuso	7800	70,500,000	- Drought: Prolonged dry spells reducing recharge - Floods: Breaching from flash floods - High temperatures: Increased evaporation	- Desiltation and embankment reinforcement - Spillway construction and maintenance - Tree planting around the catchment (green buffer zone) - Solar-powered fencing to prevent livestock contamination

S/No	Name of dam	Sub-County	Ward	Village	No. beneficiaries (HHs)	Project cost (Kshs)	Climate/Socil Risk	Climate Proofing
4	Imiw'a mega dam	Kitui South	Ikutha	Ngwate	850	79,000,000	- Drought: Prolonged dry spells reducing recharge - Floods: Breaching from flash floods - High temperatures: Increased evaporation	- Desiltation and embankment reinforcement - Spillway construction and maintenance - Tree planting around the catchment (green buffer zone) - Solar-powered fencing to prevent livestock contamination
5	Manguva dam	Mwingi West	Nguutani		570	50,000,000	- Drought: Prolonged dry spells reducing recharge - Floods: Breaching from flash floods - High temperatures: Increased evaporation	- Desiltation and embankment reinforcement - Spillway construction and maintenance - Tree planting around the catchment (green buffer zone) - Solar-powered fencing to prevent livestock contamination
6	Kwa Kasango dam	Kitui Central	Mulango	Katulani	12000	60,000,000	- Drought: Prolonged dry spells reducing recharge - Floods: Breaching from flash floods - High temperatures: Increased evaporation	- Desiltation and embankment reinforcement - Spillway construction and maintenance - Tree planting around the catchment (green buffer zone) - Solar-powered fencing to prevent livestock contamination
7	Kwa Mbiti Museli dam	Mwingi Central	Waita		1420	65,000,000	- Drought: Prolonged dry spells reducing recharge - Floods: Breaching from flash floods - High temperatures: Increased evaporation	- Desiltation and embankment reinforcement - Spillway construction and maintenance - Tree planting around the catchment (green buffer zone) - Solar-powered fencing to prevent livestock contamination
8	Kauti Earthdam/Imuumba	Kitui East	Voo/Kyamatu	Muthungue	2000	78,000,000	- Drought: Prolonged dry spells reducing recharge - Floods: Breaching from flash floods	- Desiltation and embankment reinforcement - Spillway construction and maintenance

S/No	Name of dam	Sub-County	Ward	Village	No. beneficiaries (HHs)	Project cost (Kshs)	Climate/Socil Risk	Climate Proofing
							- High temperatures: Increased evaporation	- Tree planting around the catchment (green buffer zone) - Solar-powered -fencing to prevent livestock contamination
TOTAL COST						**570,000,000**		

Table 52: List of Proposed Large Dams (2025-2030)

S/No.	Name of Dam	Sub-County	Ward	Village	No. Beneficiaries(HHs)	Project Cost (Kshs)	Climate/Socil Risk	Climate Proofing
1	Kwa Isiki	**Kitui Rural**	Mbitini	Ngangani	300	15,000,00		
2	Kalala	"	Kisasi	Kavisuni	264	17,000,000	- Drought: Dam dries up early - Floods: Inlet/outlet damage - Temperature extremes: Water quality degradation - Animal-human conflict over access	- Regular maintenance and dredging - Community-led fencing and designated access points - Incorporate drought-resistant fodder grass for embankment stabilization
3	Makondo	"	Kanyangi	Kiseuni	217	15,000,000	- Drought: Prolonged dry spells reducing recharge - Floods: Breaching from flash floods - High temperatures: Increased evaporation	- Desiltation and embankment reinforcement - Spillway construction and maintenance - Tree planting around the catchment (green buffer zone) - Deepen dam to reduce surface area-to-volume ratio
4	Kaundua	"	Yatta/Kwa Vonza	Kanyonyoo	210	18,500,000	- Floods	- Spillways and flood bypass channels
5	Katutu	**Kitui West**	Kauwi	Katutu	300	13,000,000	- Floods	- Strengthened embankments with stone pitching
6	Kamavindi	"	Mutonguni	Mutonguni	270	14,000,000	- Floods	- Strengthened embankments with stone pitching
7	Kwa Meja Nganda	"	Kithumula/Kwa Mutonga	Mithikwani	187	17,000,000	- Drought: Prolonged dry spells reducing recharge - Floods: Breaching from flash floods - High temperatures: Increased evaporation	- Desiltation and embankment reinforcement - Spillway construction and maintenance - Tree planting around the catchment (green buffer zone) - Solar-powered fencing to prevent livestock contamination
8	Kwa Nzuki/ Kanzevyu	"	Matinyani	Kalimani	235	14,000,000	- Drought: Dam dries up early - Floods: Inlet/outlet damage - Temperature extremes: Water quality degradation	- Regular maintenance and dredging - Community-led fencing and designated access points

S/No.	Name of Dam	Sub-County	Ward	Village	No. Beneficiaries(HHs)	Project Cost (Kshs)	Climate/Socil Risk	Climate Proofing
							- Animal-human conflict over access	- Incorporate drought-resistant fodder grass for embankment stabilization
9	Konyu earth dam	**Mwingi North**	Muumoni	Mukong'a	280	15,000,000	- Drought: Prolonged dry spells reducing recharge - Floods: Breaching from flash floods - High temperatures: Increased evaporation	- Desiltation and embankment reinforcement - Spillway construction and maintenance - Tree planting around the catchment (green buffer zone) - Deepen dam to reduce surface area-to-volume ratio
10	Syanoni earth dam	"	Ngomeni	Kavaani	400	17,000,000	- Drought: Dam dries up early - Floods: Inlet/outlet damage - Temperature extremes: Water quality degradation - Animal-human conflict over access	- Regular maintenance and dredging - Community-led fencing and designated access points - Incorporate drought-resistant fodder grass for embankment stabilization
11	Maikune earth dam	"	Tharaka	Kathungu	230	14,000,000	- Drought: Prolonged dry spells reducing recharge - Floods: Breaching from flash floods - High temperatures: Increased evaporation	- Desiltation and embankment reinforcement - Spillway construction and maintenance - Tree planting around the catchment (green buffer zone) - Deepen dam to reduce surface area-to-volume ratio
12	Kwa Kyungu earth dam	"	Tseikuru	Kaivirya/Mwengea	178	15,000,000	- Drought: Prolonged dry spells reducing recharge - Floods: Breaching from flash floods - High temperatures: Increased evaporation	- Desiltation and embankment reinforcement - Spillway construction and maintenance - Tree planting around the catchment (green buffer zone) - Deepen dam to reduce surface area-to-volume ratio
13	Kevila earth dam	"	Kyuso	Kyuso	430	18,000,000	- Drought: Prolonged dry spells reducing recharge - Floods: Breaching from flash floods	- Desiltation and embankment reinforcement

S/No.	Name of Dam	Sub-County	Ward	Village	No. Beneficiaries(HHs)	Project Cost (Kshs)	Climate/Socil Risk	Climate Proofing
							- High temperatures: Increased evaporation	- Spillway construction and maintenance - Tree planting around the catchment (green buffer zone) - Solar-powered fencing to prevent livestock contamination
14	Kaiyu	**Mwingi Central**	Nuu	Wingemi	290	17,000,000	- Drought: Prolonged dry spells reducing recharge - Floods: Breaching from flash floods - High temperatures: Increased evaporation	- Desiltation and embankment reinforcement - Spillway construction and maintenance - Tree planting around the catchment (green buffer zone) - Deepen dam to reduce surface area-to-volume ratio
15	Kwa Kalengeta Musili	"	Waita	Waita	300	14,500,000	- Drought: Prolonged dry spells reducing recharge - Floods: Breaching from flash floods - High temperatures: Increased evaporation	- Desiltation and embankment reinforcement - Spillway construction and maintenance - Tree planting around the catchment (green buffer zone) - Solar-powered fencing to prevent livestock contamination
16	Syumikuku	"	Kivou		400	13,500,000	- Drought: Dam dries up early - Floods: Inlet/outlet damage - Temperature extremes: Water quality degradation - Animal-human conflict over access	- Regular maintenance and dredging - Community-led fencing and designated access points - Incorporate drought-resistant fodder grass for embankment stabilization
17	Makelekele (Matia)	"	Nguni		230	18,000,000	- Drought: Prolonged dry spells reducing recharge - Floods: Breaching from flash floods - High temperatures: Increased evaporation	- Desiltation and embankment reinforcement - Spillway construction and maintenance - Tree planting around the catchment (green buffer zone) - Solar-powered fencing to prevent livestock contamination

S/No.	Name of Dam	Sub-County	Ward	Village	No. Beneficiaries(HHs)	Project Cost (Kshs)	Climate/Socil Risk	Climate Proofing
18	Kwa Kyungu/ Maluki Mailu	"	Central		178	14,500,000	- Drought: Dam dries up early - Floods: Inlet/outlet damage - Temperature extremes: Water quality degradation - Animal-human conflict over access	- Regular maintenance and dredging - Community-led fencing and designated access points - Incorporate drought-resistant fodder grass for embankment stabilization
19	Maomoka	"	Mui	Ngiluni	430	17,000,000	- Drought: Prolonged dry spells reducing recharge - Floods: Breaching from flash floods - High temperatures: Increased evaporation	- Desiltation and embankment reinforcement - Spillway construction and maintenance - Tree planting around the catchment (green buffer zone) - Deepen dam to reduce surface area-to-volume ratio
20	Ngandeni	**Kitui East**	Mutitu/ Kaliku	Manyoeni/Masasini	400	17,000,000	- Drought: Dam dries up early - Floods: Inlet/outlet damage - Temperature extremes: Water quality degradation - Animal-human conflict over access	- Regular maintenance and dredging - Community-led fencing and designated access points - Incorporate drought-resistant fodder grass for embankment stabilization
21	Kalikuvu earth dam	"	Endau/ Malalani	Ndetani	230	17,000,000	- Drought: Prolonged dry spells reducing recharge - Floods: Breaching from flash floods - High temperatures: Increased evaporation	- Desiltation and embankment reinforcement - Spillway construction and maintenance - Tree planting around the catchment (green buffer zone) - Deepen dam to reduce surface area-to-volume ratio
22	Kangoi kwa Mwanzia	"	Zombe/ Mwitika	Ngungi/Kasunguni	178	17,000,000	- Drought: Dam dries up early - Floods: Inlet/outlet damage - Temperature extremes: Water quality degradation - Animal-human conflict over access	- Regular maintenance and dredging - Community-led fencing and designated access points - Incorporate drought-resistant fodder grass for embankment stabilization

S/No.	Name of Dam	Sub-County	Ward	Village	No. Beneficiaries(HHs)	Project Cost (Kshs)	Climate/Socil Risk	Climate Proofing
23	Kwa Nzungu earth dam	"	Voo/ Kyamatu	Muthungue	430	15,000,000	- Drought: Prolonged dry spells reducing recharge - Floods: Breaching from flash floods - High temperatures: Increased evaporation	- Desiltation and embankment reinforcement - Spillway construction and maintenance - Tree planting around the catchment (green buffer zone) - Solar-powered fencing to prevent livestock contamination
24	Kwa Kivondo earthdam	"	Nzambani	Ikuyuni	400	13,000,000	- Drought: Dam dries up early - Floods: Inlet/outlet damage - Temperature extremes: Water quality degradation - Animal-human conflict over access	- Regular maintenance and dredging - Community-led fencing and designated access points - Incorporate drought-resistant fodder grass for embankment stabilization
25	Nzangathi earthdam	"	Chuluni	Kyalele	230	12,000,000	- Floods	- Spillways and flood bypass channels
26	Kwa Mwava-Katuyu	**Mwingi West**	Nguutani	Kakululo/Nzalae	178	15,000,000	- Floods	- Strengthened embankments with stone pitching
27	Mui/ Migwani	"	Migwani	Migwani/Itoloni	430	15,000,000	- Drought: Dam dries up early - Floods: Inlet/outlet damage - Temperature extremes: Water quality degradation - Animal-human conflict over access	- Regular maintenance and dredging - Community-led fencing and designated access points - Incorporate drought-resistant fodder grass for embankment stabilization
28	Ngomeni	"	Kyome/ Thaana	Thokoa	400	15,000,000	- Drought: Dam dries up early - Floods: Inlet/outlet damage - Temperature extremes: Water quality degradation - Animal-human conflict over access	- Regular maintenance and dredging - Community-led fencing and designated access points - Incorporate drought-resistant fodder grass for embankment stabilization
29	Kakahawani	"	Kiomo/ Kyethani	Kairungu	230	15,000,000	- Drought: Dam dries up early - Floods: Inlet/outlet damage - Temperature extremes: Water quality degradation	- Regular maintenance and dredging - Community-led fencing and designated access points

S/No.	Name of Dam	Sub-County	Ward	Village	No. Beneficiaries(HHs)	Project Cost (Kshs)	Climate/Socil Risk	Climate Proofing
							- Animal-human conflict over access	- Incorporate drought-resistant fodder grass for embankment stabilization
30	Ikangaani	**Kitui South**	Mutha		240	15,000,000	- Drought: Dam dries up early - Floods: Inlet/outlet damage - Temperature extremes: Water quality degradation - Animal-human conflict over access	- Regular maintenance and dredging - Community-led fencing and designated access points - Incorporate drought-resistant fodder grass for embankment stabilization
31	Muvuko	"	Kanziko		310	15,000,000	- Drought: Prolonged dry spells reducing recharge - Floods: Breaching from flash floods - High temperatures: Increased evaporation	- Desiltation and embankment reinforcement - Spillway construction and maintenance - Tree planting around the catchment (green buffer zone) - Deepen dam to reduce surface area-to-volume ratio
32	Winzelela	"	IKutha	Nzamba	278	13,000,000	- Drought: Prolonged dry spells reducing recharge - Floods: Breaching from flash floods - High temperatures: Increased evaporation	- Desiltation and embankment reinforcement - Spillway construction and maintenance - Tree planting around the catchment (green buffer zone) - Deepen dam to reduce surface area-to-volume ratio
33	Tangai	"	Athi		254	12,000,000	- Drought: Prolonged dry spells reducing recharge - Floods: Breaching from flash floods - High temperatures: Increased evaporation	- Desiltation and embankment reinforcement - Spillway construction and maintenance - Tree planting around the catchment (green buffer zone) - Deepen dam to reduce surface area-to-volume ratio
34	Kanzilu	"	Mutomo/ Kibwea	Kitoo	312	17,000,000	- Drought: Prolonged dry spells reducing recharge - Floods: Breaching from flash floods	- Desiltation and embankment reinforcement

S/No.	Name of Dam	Sub-County	Ward	Village	No. Beneficiaries(HHs)	Project Cost (Kshs)	Climate/Socil Risk	Climate Proofing
							- High temperatures: Increased evaporation	- Spillway construction and maintenance - Tree planting around the catchment (green buffer zone) - Deepen dam to reduce surface area-to-volume ratio
35	Kaveta	"	Ikanga/ Kyatune		371	14,500,000	- Drought: Prolonged dry spells reducing recharge - Floods: Breaching from flash floods - High temperatures: Increased evaporation	- Desiltation and embankment reinforcement - Spillway construction and maintenance - Tree planting around the catchment (green buffer zone) - Deepen dam to reduce surface area-to-volume ratio
36	Ithimani	**Kitui Central**	Kyangwithya West	Utooni/ Mbusyani	217	12,500,000	- Drought: Prolonged dry spells reducing recharge - Floods: Breaching from flash floods - High temperatures: Increased evaporation	- Desiltation and embankment reinforcement - Spillway construction and maintenance - Tree planting around the catchment (green buffer zone) - Deepen dam to reduce surface area-to-volume ratio
37	Kwa Mwiu	"	Miambani	Nzaaya	230	15,000,000	- Drought: Prolonged dry spells reducing recharge - Floods: Breaching from flash floods - High temperatures: Increased evaporation	- Desiltation and embankment reinforcement - Spillway construction and maintenance - Tree planting around the catchment (green buffer zone) - Deepen dam to reduce surface area-to-volume ratio
38	Kauluni	"	Kyangwithya East	Museve	216	13,000,000	- Drought: Prolonged dry spells reducing recharge - Floods: Breaching from flash floods - High temperatures: Increased evaporation	- Desiltation and embankment reinforcement - Spillway construction and maintenance - Tree planting around the catchment (green buffer zone)

S/No.	Name of Dam	Sub-County	Ward	Village	No. Beneficiaries(HHs)	Project Cost (Kshs)	Climate/Socil Risk	Climate Proofing
								- Deepen dam to reduce surface area-to-volume ratio
39	Kwa Kanuku	"	Township	Kaveta/ Syongila	207	12,000,000	- Drought: Prolonged dry spells reducing recharge - Floods: Breaching from flash floods - High temperatures: Increased evaporation	- Desiltation and embankment reinforcement - Spillway construction and maintenance - Tree planting around the catchment (green buffer zone) - Deepen dam to reduce surface area-to-volume ratio
40	Maaini Kwa Maliti	"	Mulango	Katulani		17,000,000	- Drought: Prolonged dry spells reducing recharge - Floods: Breaching from flash floods - High temperatures: Increased evaporation	- Desiltation and embankment reinforcement - Spillway construction and maintenance - Tree planting around the catchment (green buffer zone) - Deepen dam to reduce surface area-to-volume ratio
	TOTAL COST							**470,000,000**

Table 53: Sand Dams Investment Plan (2025-2030)

S/No.	Sub-County	Ward	Site Name	River Name	Estimated Cost (Kshs)	Climate/Socil Risk	Climate Proofing
1	Mwingi North	Ngomeni	Katse	Katse	5,000,000	- Land ownership and boundary disputes - Downstream water access conflict	- Early stakeholder engagement and participatory planning - Design dams with regulated overflows or spillways - Conduct upstream/downstream impact assessments
2		Kyuso	Gai	Thunguthu	5,000,000	- Land ownership and boundary disputes - Downstream water access conflict	- Early stakeholder engagement and participatory planning - Design dams with regulated overflows or spillways - Conduct upstream/downstream impact assessments
3		Muumoni	Mwangaza	Katse	5,000,000	- Land ownership and boundary disputes - Downstream water access conflict	- Early stakeholder engagement and participatory planning - Design dams with regulated overflows or spillways - Conduct upstream/downstream impact assessments
4		Tseikuru	Nziitu/ Tseikuru	Nziitu	5,000,000	- Land ownership and boundary disputes - Downstream water access conflict	- Early stakeholder engagement and participatory planning - Design dams with regulated overflows or spillways - Conduct upstream/downstream impact assessments
5		Tharaka	Gatoroni/ Kanyengya	Katse	5,000,000	- Land ownership and boundary disputes - Downstream water access conflict	- Early stakeholder engagement and participatory planning - Design dams with regulated overflows or spillways - Conduct upstream/downstream impact assessments
6	Mwingi West	Kyome/ Thaana	Wikithuki	Tyaa	5,000,000	- Land ownership and boundary disputes - Downstream water access conflict	- Early stakeholder engagement and participatory planning - Design dams with regulated overflows or spillways - Conduct upstream/downstream impact assessments
7		Nguutani	Jua Kali	Kithyoko	5,000,000	- Land ownership and boundary disputes - Downstream water access conflict	- Early stakeholder engagement and participatory planning - Design dams with regulated overflows or spillways

S/No.	Sub-County	Ward	Site Name	River Name	Estimated Cost (Kshs)	Climate/Socil Risk	Climate Proofing
							- Conduct upstream/downstream impact assessments
8		Migwani	Itoloni	Dam	5,000,000	- Land ownership and boundary disputes - Downstream water access conflict	- Early stakeholder engagement and participatory planning - Design dams with regulated overflows or spillways - Conduct upstream/downstream impact assessments
9		Kiomo/ Kyethani	Kavuvwani	Tyaa	5,000,000	- Land ownership and boundary disputes - Downstream water access conflict	- Early stakeholder engagement and participatory planning - Design dams with regulated overflows or spillways - Conduct upstream/downstream impact assessments
10	Mwingi Central	Mwingi Central	Ngunini	Ngunini	5,000,000	- Land ownership and boundary disputes - Downstream water access conflict	- Early stakeholder engagement and participatory planning - Design dams with regulated overflows or spillways - Conduct upstream/downstream impact assessments
11		Kivou	Mulanga	Kivou	5,000,000	- Land ownership and boundary disputes - Downstream water access conflict	- Early stakeholder engagement and participatory planning - Design dams with regulated overflows or spillways - Conduct upstream/downstream impact assessments
12		Nguni	Mwasuma	Enziu	5,000,000	- Land ownership and boundary disputes - Downstream water access conflict	- Early stakeholder engagement and participatory planning - Design dams with regulated overflows or spillways - Conduct upstream/downstream impact assessments
13		Nuu	Yatwa/ Kyangati	Enziu	5,000,000	- Land ownership and boundary disputes - Downstream water access conflict	- Early stakeholder engagement and participatory planning - Design dams with regulated overflows or spillways - Conduct upstream/downstream impact assessments
14		Mui	Itiko	Mui	5,000,000	- Land ownership and boundary disputes	- Early stakeholder engagement and participatory planning

S/No.	Sub-County	Ward	Site Name	River Name	Estimated Cost (Kshs)	Climate/Socil Risk	Climate Proofing
						- Downstream water access conflict	- Design dams with regulated overflows or spillways - Conduct upstream/downstream impact assessments
15		Waita	Kitwa/ Mikeu	Kitwa/Mikeu	5,000,000	- Land ownership and boundary disputes - Downstream water access conflict	- Early stakeholder engagement and participatory planning - Design dams with regulated overflows or spillways - Conduct upstream/downstream impact assessments
16	Kitui West	Mutonguni	Kanitha	Mithini	5,000,000	- Land ownership and boundary disputes - Downstream water access conflict	- Early stakeholder engagement and participatory planning - Design dams with regulated overflows or spillways - Conduct upstream/downstream impact assessments
17		Kauwi	East of Hospital	Kauwi	5,000,000	- Land ownership and boundary disputes - Downstream water access conflict	- Early stakeholder engagement and participatory planning - Design dams with regulated overflows or spillways - Conduct upstream/downstream impact assessments
18		Matinyani	Kunikila	Ngethwa	5,000,000	- Land ownership and boundary disputes - Downstream water access conflict	- Early stakeholder engagement and participatory planning - Design dams with regulated overflows or spillways - Conduct upstream/downstream impact assessments
19		Kithumula/ Kwa Mutonga	Mutindi	Mutindi	5,000,000	- Land ownership and boundary disputes - Downstream water access conflict	- Early stakeholder engagement and participatory planning - Design dams with regulated overflows or spillways - Conduct upstream/downstream impact assessments
20	Kitui Rural	Kisasi	Katumba	Tiva	5,000,000	- Land ownership and boundary disputes - Downstream water access conflict	- Early stakeholder engagement and participatory planning - Design dams with regulated overflows or spillways - Conduct upstream/downstream impact assessments
21		Mbitini	Ilangilo	Mwiwe	5,000,000	- Land ownership and boundary disputes	- Early stakeholder engagement and participatory planning

S/No.	Sub-County	Ward	Site Name	River Name	Estimated Cost (Kshs)	Climate/Socil Risk	Climate Proofing
						- Downstream water access conflict	- Design dams with regulated overflows or spillways - Conduct upstream/downstream impact assessments
22		Yatta/ Kwa Vonza	Yatta Irrigation	Mwitasyano	5,000,000	- Land ownership and boundary disputes - Downstream water access conflict	- Early stakeholder engagement and participatory planning - Design dams with regulated overflows or spillways - Conduct upstream/downstream impact assessments
23		Kanyangi	Kiseuni	Tiva	5,000,000	- Land ownership and boundary disputes - Downstream water access conflict	- Early stakeholder engagement and participatory planning - Design dams with regulated overflows or spillways - Conduct upstream/downstream impact assessments
24	Kitui Central	Miambani	Mikuyuni	Ikoo	5,000,000	- Land ownership and boundary disputes - Downstream water access conflict	- Early stakeholder engagement and participatory planning - Design dams with regulated overflows or spillways - Conduct upstream/downstream impact assessments
25		Township	Mulundi	Mutendea	5,000,000	- Land ownership and boundary disputes - Downstream water access conflict	- Early stakeholder engagement and participatory planning - Design dams with regulated overflows or spillways - Conduct upstream/downstream impact assessments
26		Changwithya West	Sooma Farmers	Tiva	5,000,000	- Land ownership and boundary disputes - Downstream water access conflict	- Early stakeholder engagement and participatory planning - Design dams with regulated overflows or spillways - Conduct upstream/downstream impact assessments
27		Mulango	Kyangunga	Nzeeu	5,000,000	- Land ownership and boundary disputes - Downstream water access conflict	- Early stakeholder engagement and participatory planning - Design dams with regulated overflows or spillways - Conduct upstream/downstream impact assessments

S/No.	Sub-County	Ward	Site Name	River Name	Estimated Cost (Kshs)	Climate/Socil Risk	Climate Proofing
28		Changwithya East	Misewani	Nzeeu	5,000,000	- Land ownership and boundary disputes - Downstream water access conflict	- Early stakeholder engagement and participatory planning - Design dams with regulated overflows or spillways - Conduct upstream/downstream impact assessments
29	Kitui East	Zombe/ Mwitika	Makutano Kwa Mbaya	Mui	5,000,000	- Land ownership and boundary disputes - Downstream water access conflict	- Early stakeholder engagement and participatory planning - Design dams with regulated overflows or spillways - Conduct upstream/downstream impact assessments
30		Nzambani	Kyanika	Nzeeu	5,000,000	- Land ownership and boundary disputes - Downstream water access conflict	- Early stakeholder engagement and participatory planning - Design dams with regulated overflows or spillways - Conduct upstream/downstream impact assessments
31		Chuluni	Ngungi	Thua	5,000,000	- Land ownership and boundary disputes - Downstream water access conflict	- Early stakeholder engagement and participatory planning - Design dams with regulated overflows or spillways - Conduct upstream/downstream impact assessments
32		Voo/Kyamatu	Kyukuni	Thua	5,000,000	- Land ownership and boundary disputes - Downstream water access conflict	- Early stakeholder engagement and participatory planning - Design dams with regulated overflows or spillways - Conduct upstream/downstream impact assessments
33		Endau/ Malalani		Enziu	5,000,000	- Land ownership and boundary disputes - Downstream water access conflict	- Early stakeholder engagement and participatory planning - Design dams with regulated overflows or spillways - Conduct upstream/downstream impact assessments
34		Mutitu/Kaliku	Masasini	Ikoo	5,000,000	- Land ownership and boundary disputes - Downstream water access conflict	- Early stakeholder engagement and participatory planning - Design dams with regulated overflows or spillways - Conduct upstream/downstream impact assessments

S/No.	Sub-County	Ward	Site Name	River Name	Estimated Cost (Kshs)	Climate/Socil Risk	Climate Proofing
35	Kitui South	Ikanga/ Kyatune	Vote	Nzeeu	5,000,000	- Land ownership and boundary disputes - Downstream water access conflict	- Early stakeholder engagement and participatory planning - Design dams with regulated overflows or spillways - Conduct upstream/downstream impact assessments
36		Mutomo/ Kibwea	Kitoo & Kawelu	Thua & Kalua-Itumba	5,000,000 5,000,000	- Land ownership and boundary disputes - Downstream water access conflict	- Early stakeholder engagement and participatory planning - Design dams with regulated overflows or spillways - Conduct upstream/downstream impact assessments
37		Mutha	Yakilindi	Thua	5,000,000	- Land ownership and boundary disputes - Downstream water access conflict	- Early stakeholder engagement and participatory planning - Design dams with regulated overflows or spillways - Conduct upstream/downstream impact assessments
38		Ikutha	Maaini	Tiva	5,000,000	- Land ownership and boundary disputes - Downstream water access conflict	- Early stakeholder engagement and participatory planning - Design dams with regulated overflows or spillways - Conduct upstream/downstream impact assessments
39		Kanziko/ Simisi			5,000,000	- Land ownership and boundary disputes - Downstream water access conflict	- Early stakeholder engagement and participatory planning - Design dams with regulated overflows or spillways - Conduct upstream/downstream impact assessments
40		Athi	Maluma	Tiva	5,000,000	- Land ownership and boundary disputes - Downstream water access conflict	- Early stakeholder engagement and participatory planning - Design dams with regulated overflows or spillways - Conduct upstream/downstream impact assessments
TOTALS					**200,000,000**		

5.15 Collaborative Initiatives with Water Resources Authority and Other Stakeholders

Kitui County Government commits to strengthening collaboration with the Water Resources Authority (WRA), Water Resource Users Associations (WRUAs), National Government agencies, civil society organizations, and development partners in the protection, monitoring, and sustainable utilization of water resources.

Table 54: Planned Collaborative Actions

No.	Initiative	Key Partners	Expected Outcomes
1	Joint Catchment Management Committees	WRA, WRUAs, Community-Based Organizations (CBOs)	Improved water governance and conflict resolution
2	Annual Water Resource Status Reporting	WRA, County Environment Department	Data-driven decision-making and transparency
3	WRUA Strengthening & Capacity Building	WRUAs, NGOs, WSTF, WRA	Enhanced community participation in water resource management
4	Groundwater Monitoring Network Expansion	WRA, Universities, Development Partners	Real-time groundwater level and quality data
5	Co-financing Conservation Interventions	Kenya Water Towers Agency, UNDP, NGOs	Joint investment in reforestation, erosion control, and recharge infrastructure

5.16 Integrated Approach to Water Resource Planning across Different Sectors

Kitui County recognizes adoption of an integrated, cross-sectoral approach to water resource management, identifying water as a shared resource vital to agriculture, health, environment, urban planning, and economic development.

Strategic Objectives

- Mainstream water resource considerations in all County sectoral plans.
- Promote integrated water resource management (IWRM) at the County and ward levels.
- Develop cross-sectoral coordination platforms and information-sharing mechanisms.
- Align the County planning with basin-level water allocation and usage principles.

Table 55: Integrated Planning Actions

No.	Intervention	Sectors Involved	Integration Strategy
1	County Water-Energy-Food Nexus	Agriculture, Energy, Water, Environment	Joint resource mapping, seasonal planning, and investment alignment
2	Incorporation of Hydrological Data into Land Use Plans	Lands, Environment, Water	Zoning and land suitability based on aquifer and River basin data
3	Integrated Drought Preparedness Framework	Agriculture, Disaster Management, Water	Joint drought response protocols and water storage planning
4	Climate-Smart Agriculture Linkages to Water Planning	Agriculture, Water, Environment	Shared planning for irrigation schemes, recharge zones, and runoff control
5	Harmonized Investment Prioritization	Finance, Economic Planning, Water	Multi-sector resource allocation that avoids duplication and maximizes impact

5.17 Institutional Reforms and Service Delivery Models

The Kitui CWSSIP acknowledges the need for robust institutional reforms and adaptive service delivery models to ensure inclusive, equitable, and sustainable water and sanitation services. This section outlines the strategic approaches that the County Government of Kitui will adopt to realign institutional mandates, enhance service efficiency, and optimize resource utilization in the water and sanitation sector.

5.17.1 Institutional Reforms

To strengthen the capacity and effectiveness of water and sanitation service provision in Kitui County, the following institutional reforms are being pursued:

a) **Separation of Roles**: Clear distinction between policy formulation (County Government), regulation (WASREB and County Water Boards), and service provision (Water Service Providers).

b) **Legal and Policy Frameworks**: Alignment of County laws with the National Water Act 2016, including operationalization of the Kitui County Water Act and policy guidelines to support private sector participation and community engagement.

c) **Capacity Building**: Strengthening the technical and managerial capacities of the Department of Water, Water Service Providers (WSPs), and Water Resource Users Associations (WRUAs).

d) **Decentralized Service Management**: Establishment of Sub-County Water Desks and Ward-based Water Committees to enhance community-level coordination, oversight, and response.

e) **Digital Transformation**: Adoption of digital tools for asset management, billing systems, GIS mapping, and real-time monitoring of infrastructure.

5.17.2 Service Delivery Models

Kitui County supports a hybrid approach to service delivery tailored to local contexts. Key models include:

a) **Public Utility Model**: Strengthening the capacity of existing WSPs such as KITWASCO to serve urban and peri-urban centers.

b) **Community-Based Management**: Empowering rural communities to operate and maintain their own water systems through registered Water User Associations or Community Water Projects.

c) **Public-Private Partnerships (PPP)**: Engaging private sector actors in, management contracts, and leasing arrangements for high-potential water schemes.

d) **School and Healthcare Facility WASH Programs**: Implementing WASH programs through collaboration with Ministries of Health and Education for sustainable service provision in public institutions.

Kitui County's institutional reforms and diversified service delivery models are designed to create a resilient, inclusive, and efficient water and sanitation system. These reforms will enable the County to meet its development targets, fulfill constitutional mandates, and progress towards universal access in line with SDG 6.

Challenges

Despite notable progress, Kitui County has faced several challenges in implementing its hybrid service delivery models:

a) **Institutional Weaknesses**: Public utilities such as KITWASCO and KIMWASCO have experienced capacity constraints in management, billing systems, infrastructure maintenance, and revenue collection.
b) **Limited Technical Skills in Rural Communities**: Community-managed water systems often suffer from inadequate technical expertise, financial mismanagement leading to frequent breakdowns and unreliable services.
c) **Sustainability of Community-Based Systems**: Community management commmittees usually suffers; weak governance structures and financial mismanagement which undermines the sustainability of community-run schemes.
d) **Private Sector Engagement**: Private operators have been slow to venture into water and sanitation service deliverly due to perceived risks and lack of regulatory frameworks.
e) **WASH in Schools and Healthcare Facilities**: Many WASH initiatives have lacked long-term maintenance plans, resulting in system failures after project handover.
f) **Climate Variability:** Increasing droughts and floods have stressed traditional service delivery models, especially in marginal areas, exacerbating water scarcity and damaging infrastructure.
g) **Infrastrure vandalism by some of the community members.**
h) Low community-agreed tariffs for Private Operator model often necessitate supplementary donor funding to sustain operations.

Lessons Learnt

From the County's experience, several important lessons have emerged:

a) **Strengthening Institutional Capacity is Critical**: Continuous investment in human resources, technology systems, and financial management tools is necessary to build effective utilities like KITWASCO and KIMWASCO.
b) **Community Ownership Drives Sustainability:** When communities are genuinely involved in planning, construction, and management, there is a stronger sense of ownership and improved maintenance of facilities.
c) **Tailored Support to Water User Associations**: Providing structured training, governance templates, and technical backup improves the performance and durability of community-based water projects.

d) **Private Operator Success Requires an Enabling Environment and Clear Regulatory Framework:** Clear contracts, risk-sharing mechanisms, existence of regulatory framework and incentives are critical to attracting credible private operators.
e) **Integrated WASH Programs Work Best:** Coordination between the health and education sectors enhances the sustainability of school and healthcare facility WASH services.
f) **Building Climate Resilience Early is Vital:** Designing infrastructure to be drought- and flood- resilient minimizes long-term risks and protects investments.

Best Practices

Kitui County's diversified approach has also produced several replicable best practices:

a) **Hybrid Model Flexibility**: Allowing a mix of public, community-based, and private delivery mechanisms has enabled service customization based on local needs and capacities.
b) **Performance-Based Utility Management:** Introducing performance targets and accountability frameworks for public utilities is gradually improving service quality and financial sustainability.
c) **Capacity Building as a Continuous Process:** Institutionalizing regular training programs for Water User Associations, WSP staff, and community leaders ensures ongoing skill enhancement.
d) **PPP Framework Development:** Establishing standardized Private Operator contract templates and stakeholder guidelines has helped de-risk private sector involvement.
g) **Intergrated WASH Implementation Program:** Coordination between the health and education sectors enhances the sustainability of school and healthcare facility WASH services.
e) **Climate-Smart Water Infrastructure:** Incorporating rainwater harvesting, sand dams, solar-powered boreholes, and flood-resilient structures into service models has enhanced system resilience.
f) **Community Engagement**: Ensure communities are genuinely involved in planning, construction, and management for a stronger sense of ownership and improved maintenance of facilities.
g) Align community tariffs with the approved WSP tariffs regulated and gazetted by the WASREB, ensuring full operation and maintenance cost recovery.

5.18 Governance and Accountability Mechanisms for Water Service Providers

To ensure transparency, accountability, and continuous improvement in the water sector, Kitui County is institutionalizing robust governance mechanisms for its Water Service Providers. A central component of this framework is the introduction of performance-based contracts between the County Government and WSPs. These contracts are structured around clear Key Performance Indicators (KPIs) as defined by WASREB, covering areas such as service coverage, customer satisfaction, financial performance, and operational efficiency.

Public participation is embedded in the governance structure to promote inclusive decision-making and social accountability. Water users are involved in the planning and budgeting processes through public forums, stakeholder consultations, and user surveys, ensuring that services reflect local priorities and realities. An independent oversight mechanism is being strengthened through the County Water Regulatory Board, which is mandated to monitor compliance, conduct performance audits, and address grievances from consumers.

Transparency is further reinforced through the publication of annual performance reports, financial statements, and tariff structures by WSPs. Governance reforms also include the restructuring of WSP boards to ensure merit-based appointments, gender inclusion, and professional independence from political interference. To deepen accountability at the grassroots level, Kitui County is piloting social accountability tools such as community scorecards. These instruments provide platforms for communities to provide feedback on service quality and hold providers accountable for commitments made.

5.19 Strategies for Improving Financial Viability and Operational Efficiency

Achieving sustainable service delivery requires a financially viable and operationally efficient water sector. The Kitui CWSSIP outlines the following strategies:

a) Financial Viability

- **Cost-Recovery Tariffs**: Gradual introduction of tariffs that reflect the true cost of service provision, while protecting the poor through lifeline blocks and targeted subsidies.
- **Revenue collection efficiency**: Digitization of billing and payment systems (mobile money, smart meters), customer enumeration, and reduction of non-revenue water.
- **Capital Mobilization**: Leveraging donor funding, blended finance, and PPPs to reduce dependency on public funds and expand investment opportunities.
- **Asset Management Plans**: Development of updated asset inventories and long-term maintenance plans to guide reinvestment and avoid infrastructure depreciation.
- **Cost Leadership**: Diminish non-core costs especially in operations to reduce unnecessary OPEX costs

b) Operational Efficiency

- **Energy Efficiency**: Transition to solar-powered pumping for off-grid schemes to reduce operational costs.
- **Standardization of Systems**: Harmonization of design standards, procurement practices, and spare parts management to enhance economies of scale.
- **Staff Training and Motivation**: Continuous professional development for technical and customer service staff; performance-based incentives.
- **Leak Detection and NRW Management**: Deployment of pressure management tools, metering, and zone-based monitoring to reduce losses.
- **Peer Learning**: Participation in National WSP peer learning programs and inter-County learning platforms to share best practices.

5.20 Sector Financing Requirements and Sourcing Plan

Realizing universal access to safe water and improved sanitation services in Kitui County requires a well-defined and adequately resourced investment roadmap. The CWSSIP identifies strategic investments aimed at increasing service coverage, improving water security, and enhancing resilience to climate change. This section outlines the total sector financing requirements and the proposed sourcing plan to meet the goals outlined for the short-term (2025–2026), medium-term (2025–2027), and long-term (2025–2030) periods.

5.20.1 Financial Projections for Sector Development

Based on an analysis of identified projects under the CWSSIP, including water supply systems (boreholes, sumpwells, earth dams), sanitation infrastructure, catchment conservation, and institutional capacity development, the total investment requirement over the strategy period is estimated at approximately KES 21.1 billion as tabulated below for the mapped and unmapped projected projects:

Table 56: Financial Projections for Sector Development

Sub-sector	Estimated Cost (KES)
Rural water supply and Environmental and Social Impact Assessment (ESIA)	12 billion
Urban and Peri-Urban water infrastructure and Environmental and Social Impact Assessment (ESIA)	3.8 billion
Sanitation and hygiene (public and household)	1.4 billion
Water resources management and conservation and Environmental and Social Impact Assessment (ESIA)	1.3 billion
Institutional strengthening and capacity building	1.5 billion
Sector governance, regulation, ICT and innovation	600 million
Monitoring and Evaluation	500 million
Total	**21.1 billion**

Table 57: Budgetary needs for short-, medium-, and long-term plans

Planning Horizon	Timeframe	Focus Areas	Estimated Budget (Kshs)
Short-Term	2025-2026	- Project survey and Designs - Boreholes drilling and equipping - Construction/Desilting of rock catchments - Construction/Desilting of medium /Large Dams - Hybridization of boreholes & intakes - Construction and supply of water storage tanks - Network expansion - Emergency drought response - County-level sanitation campaigns	3.0 billion
Medium-Term	2025-2027	- Project survey and Designs - Boreholes drilling and equipping - Construction/Desilting of rock catchments - Construction/Desilting of Large /Medium Dams/Mega dams - Springs and rock catchments protection/Rehabilitation - Solarization of boreholes & intakes - Construction and supply of water storage tanks - Water storage construction - Market-based sanitation infrastructure - Smart metering - Groundwater recharge & catchment conservation	10.5 billion
Long-Term	2025-2030	- Universal WASH access - Climate-resilient infrastructure - Sewerage development in towns - Policy and regulatory reform	5.5 billion
Total Estimated Budget	**2025-2030**		**21.1 billion**

5.21 Strategies to Mobilize Funding from Public, Private and Donor Sources

Access to safe, reliable, and affordable water and sanitation services requires sustainable and predictable financing. In Kitui County, the implementation of the CWSSIP calls for a well-structured approach to mobilize financial resources from diverse actors. This section outlines the strategies the County Government will adopt to harness funding from public, private, and donor sources to ensure full implementation of planned investments and long-term sustainability of the sector.

a) Public Sector Financing

The County Government will enhance its internal financing mechanisms to ensure consistent investment in the water sector. Annual budgetary allocations will be increased to reflect the CWSSIP priorities. Additionally, the County will leverage interGovernmental fiscal transfers by

collaborating with National agencies such as the Ministry of Water, Sanitation and Irrigation and the Water Resources Authority (WRA) to access National conditional grants and subsidies.

b) Donor and Development Partner Engagement

Kitui County will proactively engage development partners and donors to attract grants and technical assistance. A donor coordination forum will be established to align external support with CWSSIP priorities. The County will build capacity to develop competitive proposals and seek financing opportunities. Special focus will be placed on accessing global climate funds for climate-resilient and nature-based water and sanitation projects.

c) Private Sector Participation

Kitui County will promote Public-Private Partnerships (PPP) as a key strategy to mobilize resources for large-scale water supply and sanitation infrastructure projects. The County is committed to establishing an enabling environment for PPPs by developing a supportive framework that incorporates risk-sharing mechanisms, viable revenue models, and clear operational guidelines.

At the National level, Kenya's PPP Policy 2012 and the PPP Act 2021 demonstrate a strong commitment to boosting economic growth and infrastructure development through private sector participation. These frameworks provide an instrumental environment that supports the realization of Vision 2030 objectives, including reducing infrastructure deficits and enhancing service delivery across sectors. The National Treasury, in collaboration with key stakeholders, has further developed sector-specific PPP guidelines, including for the water sector, applicable at both National and County levels.

Recognizing the critical role of private sector financing, Kitui County plans to:

- Organize sensitization forums to raise awareness and attract private investors.
- Foster strong collaborations between the County Government, private operators, and development partners to jointly plan, finance, and implement water and sanitation initiatives.
- Develop bankable project proposals to attract external funding for key water sector investments.
- Strengthen policy frameworks and enact supportive legislation to facilitate sustainable and accountable private sector engagement.

Investment Promotion Efforts

In March 2025, Kitui County hosted a local Investor Sensitization Forum to showcase investment opportunities in the water and sanitation sector. With a current water and sanitation service coverage significant investment potential exists to achieve universal coverage by 2030.

Additionally, Kitui County has successfully piloted blended financing arrangements by partnering with non-state actors i.e. the Kyuso Rock Catchment Project was co-financed with the Water Sector Trust Fund (WSTF), where the County contributed 13% of the total project cost. These blended financing models have demonstrated the value of strategic partnerships in mobilizing additional resources for the County's water and sanitation programs. Through these initiatives,

Kitui County aims to scale up private sector participation as a critical pillar for sustainable financing and service delivery in the water sector.

d) Community-Based Financing

Community involvement in financing local water and sanitation projects will be strengthened through Water Users Associations (WUAs) and Village Savings and Loan Associations (VSLAs).

5.22 Financial Sustainability Plans

Ensuring the long-term financial sustainability of water and sanitation services in Kitui County is vital to achieving universal access, improving service quality, and maintaining infrastructure over time. The County Government, through the Kitui CWSSIP, acknowledges the importance of aligning financial policies with operational realities and social equity considerations. The strategy outlines key measures to strike a balance between cost recovery, affordability for vulnerable populations, and attracting investment for expansion and modernization of water and sanitation systems.

a) Tariff Adjustments for Cost Recovery

To ensure full-cost recovery while maintaining affordability, CWSSIP recommends a structured tariff adjustment approach. This involves:

- **Periodic Tariff Reviews**: Collaborating with the WASREB and licensed water service providers to undertake regular tariff reviews that reflect inflation, operational costs, and capital investment requirements.
- **Performance-Based Tariffs**: Linking tariff levels with performance indicators such as non-revenue water (NRW) reduction, service coverage, and efficiency improvements to incentivize prudent financial and technical management.
- **Tiered Tariff Structure**: Implementing progressive tariff blocks where basic water use (e.g., lifeline consumption) is charged at a subsidized rate, while higher usage is priced to reflect true costs and discourage wastage.

b) Subsidy Mechanisms for Equity and Inclusion

Recognizing that not all households can afford full cost-recovery tariffs, especially in rural and peri-urban areas, CWSSIP proposes targeted subsidy mechanisms:

- **Pro-Poor Subsidies**: Direct subsidies for connection fees and lifeline tariffs for low-income households, funded through the County budget and National programs.
- **Cross-Subsidization**: Encouraging urban-rural cross-subsidies where higher-income users or commercial entities contribute a portion of their water payments toward expanding rural services.
- **Conditional Cash Transfers**: Partnering with social protection programs to support vulnerable households with monthly water vouchers or conditional cash transfers linked to water and sanitation access.

c) Institutional Strengthening for Financial Management

- **Capacity Building**: Strengthening the financial planning and billing systems of water service providers (WSPs) to reduce inefficiencies and improve revenue collection.
- **Digital Payment Platforms**: Promoting mobile money and digital payment systems to reduce collection costs and increase customer convenience.
- **Reduction of Non-Revenue Water (NRW)**: Investing in metering, leak detection, and infrastructure audits to curb losses that erode financial sustainability.

d) Blended Financing and Revenue Diversification

- **Public-Private Partnerships (PPPs)**: Structuring revenue-generating projects that attract private investment in water kiosks, solar pumping systems, and decentralized sanitation services.
- **Commercial Financing**: Exploring micro-loans and concessional financing through Kenya Pooled Water Fund (KPWF) and other blended finance models.

e) Community Engagement and Willingness-to-Pay

- **Sensitization Campaigns**: Conducting public education to build awareness on the value of water, the cost of service provision, and the need for user contributions.
- **Participatory Tariff Setting**: Involving community water management committees and civil society in tariff consultations to improve acceptance and compliance.

6 ENVIRONMENTAL AND SOCIAL ASSESSMENT

6.1 Environmental, Occupational Health and Safety in the WASH Sector

6.1.1 Situational Analysis of the Existing Environmental, Occupational Health and Safety Risks in the WASH Sector

The Kitui County WASH sector's environmental, health and safety risks stem from inadequate sanitation, poor water quality and improper hygiene practices. Lack of improved sanitation infrastructure, inadequate waste management systems, and lack of access to safe water and sanitation facilities are major concerns.

A significant portion of Kitui residents lack access to safe drinking water, with many relying on surface water sources. Poor water quality and sanitation practices contribute to the spread of waterborne diseases like cholera and diarrhea. Moreover, water infrastructure, including treatment and distribution systems is often inadequate, leading to water scarcity and poor hygiene practices.

Kitui County residents suffer from poor sanitation and hygiene practices. The County's open defecation stands at 5.3% (Kenya Demographic Health Survey, 2023). However, currently latrines are sinking because of heavy rains and poor soil structures in the County, leading to an increase in open defecation, hence posing a major health and environmental risk. Many households and schools, especially in the rural areas lack access to basic sanitation facilities, including toilets and handwashing facilities. Poor sanitation and hygiene practices have led to malnutrition, especially in children, and absenteeism in schools, especially girls during menstruation. Lack of access to toilets and handwashing facilities, and poor hygiene practices poses significant health risks to communities, especially in the rural parts of the County.

Kitui County lacks modern waste management system. Poor waste management practices, including improper disposal of liquid waste contributes to environmental pollution and health risks. Additionally, open burning of waste contributes to air pollution, impacting human health and the environment.

The existing environmental, health and safety risks in the County's WASH sector include:

a) Environmental Risks

The environmental risks in the Kitui County WASH sector are multifaceted, stemming from both the sector's activities and broader environmental challenges such as climate change. Implementing WASH activities and the continued usage and maintenance of WASH infrastructure lead to negative environmental impacts such as pollution, natural resources depletion, loss of biodiversity, ecosystem degradation, and land and soil degradation. Climate change has exacerbated these risks by impacting water availability and quality, increasing the risk of water-related diseases, and affecting sanitation systems. The specific environmental risks in the County include;

- **Water Pollution:** Improper sanitation and sewage disposal, particularly in major and upcoming towns such as Kitui and Mwingi towns, and Kwa-Vonza and Mutomo markets, contaminate water sources, making them unsafe for drinking and other uses. On the other hand, open defecation in the rural parts of the County, due to increased collapse of latrines, following heavy storms, has contaminated groundwater and surface water, polluting drinking water sources and harming aquatic life.
- **Pollution to Residents:** Poorly managed human excreta and wastewater pollute settlements, leading to environmental hazards and health risks.
- **Soil Contamination:** Inappropriate waste disposal and sanitation practices, such as leaking latrines, and oil spillage from leaking machinery and generators during construction and operation of WASH infrastructure have led to soil contamination, negatively impacting agricultural productivity and contaminating groundwater.
- **Water Resource Depletion:** Over-extraction of water resources for WASH activities, especially in drought-prone areas of the County, such as Kitui Rural, Kitui South and Mwingi North Sub-Counties leads to water scarcity and environmental degradation.
- **Loss of Biodiversity and Ecosystem Degradation:** Lack of sanitation and sewerage infrastructure in some areas, and poorly managed sanitation and sewerage systems, especially in major and upcoming towns within the County, and oil spillage from leaking machinery and generators during construction and operation of WASH infrastructure pollute water sources and contaminate soil, harming flora, fauna, and soil and aquatic ecosystems.

b) Occupational Health Risks

Many schools and healthcare facilities in Kitui County suffer from inadequately functioning WASH infrastructure. Common problems include inadequacies in water supply and storage, poorly maintained infrastructure (for example broken water tanks and blocked latrines), inadequate protective equipment for staff, poor handwashing practices, and improper management of medical waste. Poor WASH conditions in schools and healthcare facilities within the County poses significant health risks to schoolchildren, patients, healthcare facility workers, and nearby communities. Below are the key health risks in the Kitui County WASH sector;

- **Waterborne Diseases:** Contamination of water sources and lack of access to safe drinking water and sanitation facilities leads to increased rates of waterborne illnesses such as diarrheal, cholera, dysentery and typhoid. Poor WASH conditions in some occasions have led to chronic diarrheal illnesses in children, especially infants because they are more susceptible to diarrheal, leading to significant malnutrition and stunted growth. Moreover, exposure to contaminants in drinking water has contributed to non-communicable diseases.
- **Hygiene-Related Infections:** Poor hygiene practices, such as inadequate handwashing due to lack of access to soap and clean water, have increased the risk of infections, both in schools and healthcare facilities. High risks of respiratory and fungal skin infections, such as ringworms and scabies, have been recorded, especially in schoolchildren.
- **Healthcare-Associated Infections (HCAIs):** Poor WASH conditions in healthcare facilities contribute to the spread of HCAIs, posing a serious threat to patients and healthcare workers.
- **Fecal-Oral Transmissions:** Inadequate sanitation and hygiene practices allow pathogens in human waste to contaminate food and water, leading to enteric infections.

Moreover, poor sanitation has led to the spread of parasitic worms through contaminated soil.

- **Vector-borne Diseases:** Poor sanitation and inadequate water resource management, particularly during wet seasons, has created breeding grounds for disease vectors like mosquitoes, increasing the risk of malaria and other vector-borne diseases.

c) Occupational Safety Risks

- **Exposure to Hazardous Chemicals:** WASH infrastructure and operations sometimes involve the use of hazardous chemicals, posing risks of exposure to workers and the community. Water treatment, disinfection and sanitation processes often utilize chemicals that can be harmful if not handled properly. Additionally, sanitation work, such as cleaning and maintenance of waste disposal systems exposes workers to various biological and chemical hazards. Exposure to hazardous chemicals and biological hazards lead to various health problems, including respiratory issues, skin irritation, and long-term health effects like cancer.
- **Infectious Diseases:** Sanitation workers may be exposed to pathogens in faecal sludge, infectious agents in contaminated water and other waste streams, leading to various infectious diseases and health issues.
- **Physical Hazards:** Physical hazards such as slips, trips and falls, heavy lifting, and working in confined spaces are common in the WASH sector.
- **Structural Failures:** The rural parts of the County have poorly maintained and deteriorating water infrastructure and sanitation facilities, which are unsafe, as they pose risks of accidents, especially during intense storms and flooding.
- **Security Risks:** Somietimes conflicts arise when members of the public are not happy with the WASH facilities or from polical influence, hence, the facilities become targets for violence as the communities vandalize them, posing security risks. Slightly, more than half (50.27%) of the buildings housing WASH infrastructures in schools are broken down or missing or have some components damaged, mainly due to vandalism by the community or by schoolchildren. On the other hand, extreme climatic events such as strong winds, high intensity storms and flash floods cause damage to WASH infrastructure.
- **Psychosocial Risks:** Job dissatisfaction and high workloads contribute to stress and burnout.
- **Lack of Privacy and Accessibility:** Considerable parts of the County have inadequate or poorly designed WASH facilities that pose safety concerns, particularly for women, children, and people with disabilities. Many challenges remain, including the lack of accessible infrastructure, limited adaptable facilities, and inadequate communication and education materials. Specific challenges include:

    - **Physical Barriers:** Many WASH facilities lack ramps, handrails, wider doorways, and assistive technologies, making them inaccessible to people with physical impairments.
    - **Limited Adaptable Facilities:** There are not enough adaptable toilets and sanitary disposal facilities that cater to the diverse needs of people with disabilities.

- **Inadequate Communication:** Education materials on WASH and menstrual hygiene often lack visuals or accessible formats for those with visual or cognitive impairments.
- **Lack of Consultation:** WASH planning and decision-making processes frequently exclude people with disabilities, leading to facilities that don't meet their specific needs.

6.1.2 Measures to Manage and Mitigate the Existing Environmental, Occupational Health and Safety Risks in the WASH Sector

Table 58 below outlines the plan to manage and mitigate the existing environmental, occupational health and safety risks in the WASH sector.

Table 58: Plan to Manage and Mitigate the Existing Environmental, Occupational Health and Safety Risks in the WASH Sector

Risk Category	Description	Mitigation Measures	Responsible Department(s)	Impact Rating	Monitoring Indicators	Frequency of monitoring
Environmental Risks	**1. Water Pollution:** Improper sanitation and sewage disposal, particularly in major and upcoming towns such as Kitui and Mwingi towns, and Kwa-Vonza and Mutomo markets, contaminate water sources, making them unsafe for drinking and other uses. On the other hand, open defecation in the rural parts of the County, due to increased collapse of latrines, following heavy storms, has contaminated groundwater and surface water, polluting drinking water sources and harming aquatic life. **2. Pollution to Settlements:** Poorly managed human excreta and wastewater pollute settlements, leading to environmental hazards and health risks.	• **Proper Wastewater Management:** Implement proper waste management systems to prevent contamination of water sources. • **Effective Sewage Treatment Plants:** Upgrade and maintain sewage treatment plants to effectively treat wastewater before discharging it back into water bodies and the environment. • **Water Quality Monitoring:** Regularly monitor water quality to identify and address potential hazards. • **Proper Waste Disposal Systems:** Ensure proper collection, treatment and disposal of waste, including sewage and sludge, to minimize the risk of pollutants entering water sources and the environment. • **Rural Sanitation Solutions:** Implement appropriate sanitation solutions for rural areas, such as stabilization lagoons or septic tanks, to manage wastewater in a safe and effective manner. • **Invest in Sustainable Sanitation Solutions:** In some situations, consider composting toilets - a sustainable alternative to traditional flush toilets. This will reduce water usage and minimize sewage pollution. • **Avoid Open Defecation:** Eliminate open defecation and promote the use of safe sanitation facilities. • **Public Education:** Educate the public about the importance of proper sanitation and waste disposal, highlighting the health and environmental risks associated with improper practices. • **Community Involvement:** Encourage community participation in waste management initiatives, such as beach cleanups and storm drain stenciling projects.	County Departments responsible for: • Water • Public Health and Sanitation • Environment • Lands and Physical Planning	High	• Water quality analysis results (based on the WHO Standards, and the legal notice No. 120, Environmental Management and Coordination (Water Quality) Regulations, 2006). • % open defecation in the County. • Number of cases of untreated effluent discharge to water sources reported. • Number of cases of untreated effluent discharge to settlements reported.	• Periodically • Periodically • Daily • Daily

Risk Category	Description	Mitigation Measures	Responsible Department(s)	Impact Rating	Monitoring Indicators	Frequency of monitoring
	3. Soil Contamination: Inappropriate waste disposal and sanitation practices, such as leaking latrines, and oil and grease spillage from leaking machinery and generators during construction and operation of WASH infrastructure lead to soil contamination, negatively impacting agricultural productivity and contaminating groundwater.	• **Promote Sustainable Practices:** Encourage the adoption of sustainable practices, such as waste water recycling. • Use new machinery and generators or service the machinery and generators regularly. • Maintain sanitation infrastructure regularly to avoid leakages. • **Public-Private Partnerships:** Encourage partnerships between the County Government and the private sector to improve waste management infrastructure and services. • **Enforce Strict Waste Disposal Regulations:** Enforce regulations to prevent illegal waste disposal and ensure proper waste handling practices. • **Regular Inspections:** Conduct regular inspections of sanitation and waste management facilities to ensure compliance with regulations. • **Penalties for Non-Compliance:** Implement penalties for non-compliance with waste disposal regulations to deter future violations.			• Number of cases of untreated effluent disposal to the environement reported. • Number of leaking latrines • Oil and grease spills on the ground	• Daily • Periodically • Daily, during construction & operation of WASH infrustructure & facilities.
	4. Water Resource Depletion: Over-extraction of water resources for WASH activities, especially in drought-prone areas of the County, such as Kitui Rural, Kitui South and Mwingi North Sub-Counties leads to water scarcity and environmental degradation.	**1. Community-Based Solutions** • **Rainwater Harvesting:** Capture rainwater from roofs and other surfaces to create a sustainable drinking water source. • **Water Meters:** Encourage the use of water meters to track usage and promote awareness of water consumption. • **Public Awareness Campaigns:** Educate the public on water conservation techniques, like taking shorter showers and fixing leaks. **2. Improved Water Management** • **Dams and Reservoirs:** Construct dams and reservoirs to store water during periods of high rainfall and provide access during dry periods. • **Groundwater Storage:** Invest in groundwater storage solutions to ensure a reliable supply of water.	County Departments responsible for: • Water • Public Health and Sanitation • Environment, Climate Change and Forestry • Lands and Physical Planning	High	• Water fluctuation levels in the resources	• Periodically

Risk Category	Description	Mitigation Measures	Responsible Department(s)	Impact Rating	Monitoring Indicators	Frequency of monitoring
		• **Water Reuse:** Implement greywater recycling systems for non-potable uses, such as irrigation or toilet flushing. • **Wastewater Treatment:** Improve wastewater treatment facilities to prevent pollution, and reuse treated wastewater for non-potable purposes, such as irrigation. • **Efficient and sustainable use of water:** Implement strategies to reduce water consumption and promote water conservation practices. These include using water-efficient technologies such as water-saving fixtures, by installing low-flow showerheads, toilets and faucets, and promoting water conservation techniques such as early leak detection and repair, and Water metering. • **Sustainable Infrastructure:** Promote the use of natural resources and sustainable materials for WASH infrastructure construction. Also, consider composting toilets as a sustainable alternative to traditional flush toilets to reduce water usage. **3. Community Engagement** • Engage communities in planning and decision-making processes to ensure the sustainability of WASH interventions. **4. Education and Awareness** • **Water Education:** Incorporate water education into school curricula and community outreach programs to raise awareness of water conservation and its importance. • **Water-Wise Behaviors:** Promote water-wise behaviors, such as turning off the tap while not in use and fixing leaks promptly to ensure efficient water usage.				

Risk Category	Description	Mitigation Measures	Responsible Department(s)	Impact Rating	Monitoring Indicators	Frequency of monitoring
		• **Livelihood Recovery:** Link WASH interventions to livelihood recovery by promoting sustainable agriculture and income-generating activities. **5. Sustainable Water Resource Management Practices** • **Nature-Based Solutions:** Implement water-related nature-based solutions like green roofs and wetlands to manage stormwater, reduce flooding, and improve water quality. Nature-based solutions help to sustain (clean) water supplies by increasing water infiltration and storage capacity of wetlands/soils and the recharge of aquifers, and mitigate drought by releasing water from natural storage features, including soil and groundwater, surface water and aquifers. • **Integrated Water Resource Management:** Embrace integrated water resource management to ensure sustainable use of water resources. • **River Sand Conservation:** Kitui County is undertaking measures to curb unsustainable sand harvesting practices from the County River basins; ***Tiva, Thua, Nziitu, Enziu*** and ***Tyaa***, by implementing regulations on sustainable sand harvesting. These include the Kitui County River Basins Sand Utilization and Conservation Policy and Act of 2023. The County has also established relevant institutions for effective implementation of the Sand Policy and Act, 2023. • **Indigenous Knowledge:** Incorporate Indigenous Peoples' traditional knowledge into modern conservation practices. **6. Habitat Restoration and Conservtion**				

Risk Category	Description	Mitigation Measures	Responsible Department(s)	Impact Rating	Monitoring Indicators	Frequency of monitoring
		• ***Museve, Nuu, Mutito*** and ***Muumoni Hill Forests*** are some of the water catchment areas in the County, which have been adversely affected by overexploitation in the face of climate change, hence their restoration and conservation effeorts need to be strengthened to enhance their potentials.				
	5. Loss of Biodiversity and Ecosystem Degradation: Lack of sanitation and sewerage infrastructure in some areas, and poorly managed sanitation and sewerage systems, especially in major and upcoming towns within the County, and oil spillage from leaking machinery and generators during construction and operation of WASH infrastructure pollute water sources and contaminate soil, harming flora, fauna, and soil and aquatic ecosystems.	**1. Sustainable Sanitation Solutions** • **Wastewater Treatment:** Implement effective wastewater treatment plants to remove pollutants and prevent contamination of waterways and soil. • **Sanitation Infrastructure:** Invest in robust sanitation infrastructure, including proper sewage systems and treatment facilities, to manage wastewater effectively and prevent overflows. • **Public Awareness:** Educate the public about proper sanitation practices and the importance of responsible waste disposal to reduce pollution and improve public health. **2. Pollution Control and Monitoring** • **Pollution Control:** Enforce strict regulations on wastewater discharge to prevent the release of harmful chemicals and pollutants into the environment. • **Pollution Monitoring:** Establish robust monitoring programs to track water quality and identify sources of pollution, allowing for timely intervention and corrective measures. **3. Habitat Restoration and Conservation** • **Habitat Restoration:** Restore degraded habitats to improve water quality, support biodiversity, and provide ecosystem services: The rehabilitation of River ecosystems such as	County Departments responsible for: • Water • Public Health and Sanitation • Environment • Lands and Physical Planning	Medium, but potentially high	• Water quality analysis results (based on the WHO Standards, and the legal notice No. 120, Environmental Management and Coordination (Water Quality) Regulations, 2006). • Number of cases of untreated effluent discharge to the environment & water sources reported. • Oil and grease spills on the ground	• Periodically • Periodically • Daily, during construction & operation of WASH infrustructure & facilities.

Risk Category	Description	Mitigation Measures	Responsible Department(s)	Impact Rating	Monitoring Indicators	Frequency of monitoring
		Kalundu River, which have been polluted by illegal sewage disposal need to be enhanced. • **Community Engagement:** Engage local communities in conservation efforts to foster a sense of ownership and responsibility for protecting the environment. • **Policy and Legal Frameworks:** Implement strong environmental policies and legal frameworks to enforce regulations and ensure accountability in protection of water resources and biodiversity. **4. Waste Water Recycling** • Implement waste water recycling initiatives to minimize the environmental impact of WASH activities.				
Occupational Health Risks	**1. Waterborne Diseases:** Contamination of water sources and lack of access to safe drinking water and sanitation facilities leads to increased rates of waterborne illnesses such as diarrheal, cholera, dysentery and typhoid. Poor WASH conditions in some occasions have led to chronic diarrheal illnesses in children, especially infants because they are more susceptible to diarrheal, leading to significant malnutrition and	**1. Improve Access to Safe Water** • **Improved water sources:** Ensure access to safe drinking water sources, such as treated piped water, or improve existing water sources through treatment and purification. • **Safe Water Practices:** Encourage the safe storage of drinking water to prevent contamination, and the use of safe water sources. • **Water quality monitoring:** Regularly monitor water quality to identify and address potential contamination. **2. Improve Sanitation Systems** • **Proper sanitation facilities:** Provide access to safe and hygienic sanitation facilities, such as pit latrines with slabs, pour-flush toilets, or connections to piped sewer systems, to prevent the spread of waterborne diseases. Provide access to menstrual hygiene products and facilities, especially for women and girls.	County Departments responsible for: • Water • Public Health and Sanitation • Environment • Lands and Physical Planning	High	• Water quality analysis results (based on the WHO Standards, and the legal notice No. 120, Environmental Management and Coordination (Water Quality) Regulations, 2006). • % open defecation in the County. • Number of cases of untreated effluent discharge to water sources reported. • Number of recorded cases of waterborne infections in the healthcare facilities	• Periodically • Periodically • Daily • Daily

Risk Category	Description	Mitigation Measures	Responsible Department(s)	Impact Rating	Monitoring Indicators	Frequency of monitoring
	stunted growth. Moreover, exposure to contaminants in drinking water has contributed to non-communicable diseases.	• **Wastewater management:** Implement safe and effective wastewater management systems, including wastewater treatment facilities, to prevent contamination of water sources and reduce transmission of waterboene diseases. **3. Community Involvement and Collaboration** • **Community Health Clubs:** Establish community health clubs to promote hygiene, sanitation, and disease prevention. • **Partnerships:** Foster partnerships between WASH organizations, Government agencies, and local communities to ensure sustainable solutions. • **Disaster Preparedness:** Consider the impact of disasters on WASH systems and implement strategies to ensure resilience and access to safe water and sanitation during and after emergencies.				
	2. Hygiene-Related Infections: Poor hygiene practices, such as inadequate handwashing due to lack of access to soap and clean water, have increased the risk of infections, both in schools and healthcare facilities. High risks of respiratory and fungal skin infections, such as ringworms and scabies, have been recorded, especially in schoolchildren.	**Promote Proper Hygiene Practices** • **Handwashing promotion:** Promote handwashing with soap at critical moments, such as before eating, after using the toilet, and after contact with potentially contaminated surfaces. • **Handwashing facilities:** Provide access to handwashing facilities with soap and clean water in public areas, schools and healthcare facilities. • **Hygiene education:** Educate communities about the importance of hygiene practices and how to prevent the spread of diseases.	County Department responsible for Public Health and Sanitation	Medium to low	• Number of hygiene-related infections recorded in the healthcare facilities	• Daily

Risk Category	Description	Mitigation Measures	Responsible Department(s)	Impact Rating	Monitoring Indicators	Frequency of monitoring
	3. Healthcare-Associated Infections (HCAIs): Poor WASH conditions in healthcare facilities contribute to the spread of HCAIs, posing a serious threat to patients and healthcare workers.	**1. WASH in Healthcare Facilities** • **Improved WASH services:** Ensure that healthcare facilities have adequate access to safe water, sanitation and hygiene services to prevent infections in patients and staff. • **Menstrual hygiene**: Provide access to menstrual hygiene products and facilities, especially for women and girls. • **Hand hygiene protocols:** Implement strict hand hygiene protocols for healthcare staff to prevent the spread of infections. • **Infection prevention and control:** Implement measures to prevent the spread of infections in healthcare facilities. • **Education and Awareness:** Conduct public health campaigns to educate communities about sanitation, hygiene, and safe water practices. **2. Monitoring and Evaluation** • **Regular monitoring:** Regularly monitor WASH services and practices to identify areas for improvement. • **Evaluation of interventions:** Evaluate the effectiveness of WASH interventions to ensure they are achieving their intended goals. • **Data collection and analysis:** Collect and analyze data on WASH services and health outcomes to inform decision-making.	County Department responsible for Public Health and Sanitation	Low	• Number of HCAIs recorded in the healthcare facilities	• Daily
	4. Fecal-Oral Transmissions: Inadequate sanitation and hygiene practices allow pathogens in human waste to contaminate food and water, leading to enteric infections.	**1. Improve Sanitation Systems** • **Proper sanitation facilities:** Provide access to safe and hygienic sanitation facilities, such as pit latrines with slabs, pour-flush toilets, or connections to piped sewer systems, to prevent the spread of diseases. • **Wastewater management:** Implement safe and effective wastewater management systems, including wastewater treatment facilities, to	County Departments responsible for: • Public Health and Sanitation • Environment • Lands and Physical Planning	Low	• Number of fecal-oral transmitted infections recorded in the healthcare facilities	• Daily

Risk Category	Description	Mitigation Measures	Responsible Department(s)	Impact Rating	Monitoring Indicators	Frequency of monitoring
	Moreover, poor sanitation has led to the spread of parasitic worms through contaminated soil.	prevent contamination of the environment and reduce disease transmission. **2. Promote Proper Hygiene Practices** • **Handwashing promotion:** Promote handwashing with soap at critical moments, such as before eating, after using the toilet, and after contact with potentially contaminated surfaces. • **Handwashing facilities:** Provide access to handwashing facilities with soap and clean water in public areas, schools and healthcare facilities. • **Hygiene education:** Educate communities about the importance of hygiene practices and how to prevent the spread of diseases.				
	5. Vector-borne Diseases: Poor sanitation and inadequate water resource management, particularly during wet seasons, has created breeding grounds for disease vectors like mosquitoes, increasing the risk of malaria and other vector-borne diseases.	**1. Environmental Management and Water Source Control** • **Environmental Management:** Regularly remove and manage accidental containers that may hold water, such as discarded tires, bottles, and avoid allowing water to collect in puddles, as these can become breeding sites for mosquitoes. • **Mosquito-Proofing (Where Possible):** Ensure that shelters and other structures are mosquito-proof to prevent vectors from entering and biting residents. • **Improve water storage:** Encourage the use of covered and properly sealed water storage containers to prevent mosquito breeding in stagnant water. • **Control water sources:** Address areas where water stagnates, like uncovered water tanks, as these can be breeding grounds for mosquitoes. • **Promote piped water:** Introducing piped water systems can reduce the reliance on open water sources, which can be breeding grounds for vectors.	County Departments responsible for: • Water • Public Health and Sanitation • Environment • Lands and Physical Planning	Low	• Number of vector-borne diseases recorded in the healthcare facilities	• Daily

Risk Category	Description	Mitigation Measures	Responsible Department(s)	Impact Rating	Monitoring Indicators	Frequency of monitoring
		• **Proper waste disposal:** Promote proper waste disposal, including solid waste and sewage, to prevent the breeding of vectors. • **Water Quality:** Implement measures to ensure water quality, as polluted water can be a breeding ground for some vectors. **2. Hygiene and Community Engagement** • **Improve sanitation:** Promote proper sanitation practices, including latrine construction and disposal of human waste, to prevent the spread of pathogens and reduce vector breeding sites. • **Community education:** Educate communities about vector-borne diseases, their transmission and prevention measures. • **Support community-based interventions:** Empower communities to actively participate in vector control measures. **3. Multisectoral Approach** • **Collaboration among sectors:** Involve relevant sectors like health, water and environmental agencies to address vector-borne diseases effectively. • **Integration with other disease control measures:** Link vector control efforts with other health interventions and disease control programs. • **Evidence-based decision making:** Use data and research to guide vector control strategies and ensure they are effective. **4. Legal and Regulatory Frameworks** Establish and enforce legal and regulatory frameworks that protect the health of WASH workers to ensure that they are not exposed to unnecessary risks.				

Risk Category	Description	Mitigation Measures	Responsible Department(s)	Impact Rating	Monitoring Indicators	Frequency of monitoring
Occupational Safety Risks	**1. Exposure to Hazardous Chemicals:** WASH infrastructure and operations sometimes involve the use of hazardous chemicals, posing risks of exposure to workers and the community. Water treatment, disinfection and sanitation processes often utilize chemicals that can be harmful if not handled properly. Additionally, sanitation work, such as cleaning and maintenance of waste disposal systems exposes workers to various biological and chemical hazards. Exposure to hazardous chemicals and biological hazards lead to various health problems, including respiratory issues, skin irritation, and long-term health effects like cancer.	**1. Risk Assessment** • **Identify Hazards:** Determine the specific chemicals used in WASH activities and their potential hazards (e.g., flammability, toxicity, reactivity). • **Assess Exposure:** Evaluate how workers and the public are exposed to these chemicals (e.g., inhalation, skin contact, ingestion). • **Evaluate Risks:** Determine the severity and likelihood of harm from each exposure. • **Prioritize Controls:** Implement control measures based on the assessed risks, focusing on the most hazardous situations first. **2. Control Measures** • **Elimination/Substitution:** Replace hazardous chemicals with safer alternatives whenever possible. • **Engineering Controls:** ***Ventilation:*** Ensure adequate ventilation to remove chemical vapors or gases. ***Enclosure:*** Isolate or enclose processes to prevent the release of hazardous substances. • **Administrative Controls:** ***Training:*** Educate workers on safe handling, storage and emergency procedures for hazardous chemicals. ***Work Practices:*** Establish clear procedures for handling, storage and disposal of chemicals. ***Limited Access:*** Restrict access to areas where hazardous chemicals are used to only authorized personnel. • **Personal Protective Equipment (PPE):** ***Respirators:*** Provide respirators to protect against inhalation of hazardous fumes or vapors.	County Departments responsible for: • Water • Public Health and Sanitation	Low	• Number of injuries from exposure to hazardous chemicals recorded by WASH workers in the work places & healthcare facilities	• Daily

Risk Category	Description	Mitigation Measures	Responsible Department(s)	Impact Rating	Monitoring Indicators	Frequency of monitoring
		▪ **Gloves:** Ensure the use of appropriate gloves to protect against skin contact with chemicals. ▪ **Eye Protection:** Provide safety glasses or goggles to protect against splashes or sprays. • **Storage:** ▪ **Secure Storage:** Store chemicals in designated, well-ventilated and secure areas. ▪ **Labeling:** Ensure all chemical containers are clearly labeled with hazard warnings and handling instructions. ▪ **Separation:** Segregate incompatible chemicals to prevent reactions or fires. • **Waste Disposal:** Establish proper procedures for the collection, storage, and disposal of chemical waste. **3. Ongoing Monitoring and Improvement** • **Regular Inspections:** Periodically inspect storage areas, work areas and equipment to ensure compliance with safety procedures. • **Review and Update:** Periodically review the risk assessment and control measures to ensure they remain effective. • **Emergency Procedures:** Develop and implement emergency procedures for chemical spills, leaks and exposures. • **Worker Health Surveillance:** Consider implementing health surveillance programs to monitor worker exposure and identify any health effects.				
	2. Infectious Diseases: Sanitation workers may be exposed to pathogens in faecal	• **Hygiene and Personal Protective Equipment (PPE):** Workers should consistently practice hand hygiene, especially after handling faecal sludge or potentially contaminated water, and use appropriate PPE such as gloves, boots	County Departments responsible for: • Water • Public Health and Sanitation	Low	• Number of cases of infectious diseases & health issues recorded by sanitation workers	• Daily

Risk Category	Description	Mitigation Measures	Responsible Department(s)	Impact Rating	Monitoring Indicators	Frequency of monitoring
	sludge, infectious agents in contaminated water, and other waste streams, leading to various infectious diseases and health issues.	and masks to minimize direct contact with pathogens. • **Training and Education:** Sanitation workers require comprehensive training on recognizing risks associated with faecal sludge and contaminated water, understanding safe work practices, and properly using PPE. • **Vaccination:** In areas with high prevalence of certain diseases, ensure vaccination programs to provide an additional layer of protection against specific infectious agents. • **Health surveillance programs**: Implement health surveillance programs to monitor the health of workers and identify potential health problems early on. • **WASH Infrastructure and Waste Management:** Improve WASH infrastructure, including sanitation systems and wastewater treatment facilities, to help reduce the overall risk of pathogen exposure. • **Risk Communication:** Communication about potential hazards and safe work practices clearly to ensure that workers understand the importance of infection prevention and control measures. • **Monitoring and Evaluation:** Regularly monitor and evaluate the effectiveness of mitigation strategies, making adjustments as needed to ensure they remain effective and tailored to the specific context. • **Safe Work Procedures:** Implement and enforce safe work procedures for tasks like manual sewer cleaning and waste handling to reduce the risk of disease infections.	• Lands and Physical Planning		in the healthcare facilities	
	3. Physical Hazards: Physical hazards such as slips, trips and falls,	**1. Workplace Design and Maintenance**	County Departments responsible for: • Water	Low	• Number of cases of physical injuries recorded by WASH	• Daily

Risk Category	Description	Mitigation Measures	Responsible Department(s)	Impact Rating	Monitoring Indicators	Frequency of monitoring
	heavy lifting, and working in confined spaces are common in the WASH sector.	• Ensuring that workplaces are well-designed, maintained, and free from hazards can reduce the risk of accidents and injuries; **Housekeeping:** Regularly clean spills, remove debris, and ensure walkways are free of clutter. **Surface Maintenance:** Repair or replace damaged flooring, ensure adequate lighting, and install slip-resistant mats or flooring in wet or oily areas. **2. Safe Work Practices** • **Footwear:** Enforce the use of appropriate footwear with slip-resistant soles. • **Safe Movements:** Walk slowly and deliberately, pay attention to surroundings, and use railings where available. • **Training:** Provide training on identifying and preventing slips, trips, and falls. • **Proper Lifting Techniques:** Teach and enforce proper lifting techniques, including bending at the knees, keeping the back straight, and holding objects close to the body when lifting heavy objects. • **Mechanical Aids:** Use carts, dollies or other lifting equipment to minimize the need for manual lifting. • **Team Lifting:** Encourage and train workers on proper team lifting techniques, especially for heavier loads. • **Risk Assessments:** Conduct regular risk assessments to identify heavy lifting hazards and implement appropriate controls. • **Permit-to-Work Procedures:** Implement a permit-to-work system to ensure proper planning, controls, and training before entering confined spaces.	• Public Health and Sanitation • Lands and Physical Planning		workers at work places.	

Risk Category	Description	Mitigation Measures	Responsible Department(s)	Impact Rating	Monitoring Indicators	Frequency of monitoring
		• **Ventilation:** Ensure adequate ventilation in confined spaces to prevent oxygen deficiency and the accumulation of hazardous gases. • **PPE:** Provide and enforce the use of appropriate PPE, such as helmets, gloves, safety harnesses and respiratory protection. • **Emergency Procedures:** Develop and communicate clear emergency procedures, including rescue procedures and communication protocols. • **Competent Person:** Designate a competent person to oversee confined space work and ensure safety procedures are followed.				
	4. Structural Failures: The rural parts of the County have poorly maintained and deteriorating water infrastructure and sanitation facilities, which are unsafe, as they pose risks of accidents, especially during intense storms and flooding.	**1. Prevention** • **Design and Construction:** ◦ **Resilient Design:** Implement designs that can withstand local hazards like floods, earthquakes and extreme weather conditions. ◦ **High-Quality Materials:** Use durable materials and construction techniques that meet safety standards. ◦ **Vulnerability Assessments:** Conduct thorough vulnerability assessments to identify potential weaknesses in existing systems. • **Regular Maintenance and Inspection:** ◦ **Proactive Maintenance:** Establish regular maintenance schedules for all WASH infrastructure, including water tanks, pumps and sanitation facilities. ◦ **Inspections:** Conduct regular inspections to identify potential problems early on and address them before they escalate. ◦ **Early Warning Systems:** Implement early warning systems for potential hazards, allowing for timely interventions.	County Departments responsible for: • Water • Public Health and Sanitation • Lands and Physical Planning • Public Works	Low to medium	• Number of cases of physical injuries or deaths related to WASH structural failures.	• Daily

Risk Category	Description	Mitigation Measures	Responsible Department(s)	Impact Rating	Monitoring Indicators	Frequency of monitoring
		• **Community Engagement:** **Education:** Educate the community on safe water and sanitation practices, including the proper use and maintenance of WASH facilities. **Involvement:** Involve the community in the planning and implementation of WASH projects to ensure ownership and sustainability. • **Policy and Regulations:** **Standards:** Establish and enforce clear building codes and standards for WASH infrastructure. **Insurance:** Encourage insurance coverage for WASH infrastructure to provide financial support in case of damage or failure. **2. Preparedness** • **Emergency Plans:** Develop and maintain comprehensive emergency preparedness plans for WASH systems, outlining roles and responsibilities, communication protocols and resource allocation to address potential accidents, incidents and disasters. • **Training:** Train staff and community members on emergency response procedures, including how to safely shut down systems, use emergency kits and provide first aid. • **Stockpiles:** Maintain adequate stockpiles of essential supplies, such as spare parts, water purification materials and sanitation equipment. • **Collaboration:** Establish strong collaborations between Government agencies, non-Governmental organizations (NGOs), and the community to ensure effective coordination during emergencies. **3. Response**				

Risk Category	Description	Mitigation Measures	Responsible Department(s)	Impact Rating	Monitoring Indicators	Frequency of monitoring
		• **Rapid Assessment:** Conduct rapid assessments of damage to WASH infrastructure following an emergency. • **Priority Restoration:** Prioritize the restoration of essential WASH services, such as safe drinking water and sanitation, to prevent the spread of waterborne diseases. • **Temporary Solutions:** Implement temporary solutions, such as water trucking and mobile latrines, while permanent repairs are being made. • **Communication:** Establish clear communication channels to keep the community informed about the status of WASH services and emergency response efforts. **4. Recovery** • **Damage Assessment:** Conduct thorough assessments of damage to WASH infrastructure and the impact on the community. • **Reconstruction:** Plan and implement reconstruction or rehabilitation of damaged WASH infrastructure, incorporating lessons learned from the disaster and building back better. • **Community Participation:** Ensure community participation in the recovery process to foster ownership and ensure sustainability. • **Long-Term Resilience:** Integrate WASH disaster risk reduction into long-term planning and development strategies to build more resilient systems and communities.				
	5. Security Risks: Sometimes conflicts arise from polical influence or when members of the public are not happy with the	**1. Understanding and Addressing Threats** • **Risk Assessments:** Conduct thorough risk assessments to identify potential security threats to WASH infrastructure, operations and personnel.	County Departments responsible for: • Water • Public Health and Sanitation	Low	• Number of insecurity cases in the WASH sector.	• Daily

Risk Category	Description	Mitigation Measures	Responsible Department(s)	Impact Rating	Monitoring Indicators	Frequency of monitoring
	WASH facilities, hence, the facilities become targets for violence as the communities vandalize them, posing security risks. On the other hand, extreme climatic events such as strong winds, high intensity storms and flash floods cause damage to WASH infrastructure.	• **Conflict Analysis:** In fragile contexts, analyze the link between conflicts and WASH services, considering how conflicts can disrupt WASH delivery and exacerbate existing tensions. • **Prioritize Security:** Ensure that security considerations are integrated into all stages of WASH planning and implementation, including project design, resource allocation, and operational procedures. • **Capacity Building:** Develop the capacity of local communities and WASH providers to identify, assess and manage security risks. **2. Strengthening WASH Systems** • **Improved Service Delivery:** Ensure that WASH services are reliable, sustainable and accessible to all, regardless of their location or socio-economic status. • **Water Resource Management:** Promote sustainable water resource management practices, including water monitoring, early warning systems and equitable water use. • **Infrastructure Protection:** Implement measures to protect WASH infrastructure from damage, theft or vandalism, such as fencing, security patrols and community watch programs. • **Conflict-Resilient Design:** Design WASH facilities and systems that are robust and resilient to conflicts, including consideration of physical security and protection from violence. • **Climate Resilience:** Integrate climate resilience into WASH planning and operations, addressing the potential impacts of climate change on WASH infrastructure. • **Climate proofing WASH infrastructure**: Integrate climate change adaptation and mitigation measures into the design, construction and operation of WASH infrastructure projects. This will ensure that	• Lands and Physical Planning			

Risk Category	Description	Mitigation Measures	Responsible Department(s)	Impact Rating	Monitoring Indicators	Frequency of monitoring
		WASH infrastructure can withstand present and future climate impacts, reducing risks and vulnerabilities. **3. Fostering Community Involvement** • **Community Participation:** Engage communities in the design, implementation and management of WASH services to foster ownership and accountability. • **Community-Based Monitoring:** Involve communities in monitoring the quality and quantity of WASH services, including water quality testing and facility maintenance. • **Early Warning Systems:** Establish community-based early warning systems for natural disasters or other events that may disrupt WASH services. • **Protection from Gender-Based Violence (GBV):** Implement strategies to prevent GBV and mitigate in and around WASH facilities, including ensuring safe and inclusive spaces. **4. Addressing Specific Risks** • **Water Contamination:** Implement robust water quality monitoring and treatment programs to ensure the safety of drinking water supplies. • **Sanitation Deficiencies:** Promote improved sanitation facilities and practices to prevent the spread of waterborne diseases. • **Hygiene Practices:** Promote good hygiene practices, such as handwashing with soap and water, to reduce the risk of infections. • **Disasters and Emergencies:** Develop contingency plans to respond to natural disasters or other emergencies that may disrupt WASH services.				

Risk Category	Description	Mitigation Measures	Responsible Department(s)	Impact Rating	Monitoring Indicators	Frequency of monitoring
	6. Psychosocial Risks: Job dissatisfaction and high workloads contribute to stress and burnout.	**1. Risk Assessment and Controls** • **Identify Hazards:** Conduct regular psychosocial risk assessments to identify potential hazards within WASH programs. • **Implement Controls:** Establish policies and procedures to mitigate identified risks, following a hierarchy of control that prioritizes elimination or reduction of hazards. • **Review and Improve:** Regularly review the effectiveness of risk controls and make necessary adjustments. **2. Creating a Supportive Environment** • **Foster a Culture of Care:** Promote a culture where individuals feel safe, valued and supported in reporting concerns or seeking help. • **Ensure Accessibility:** Make WASH activities and services accessible to all, including those with mental health conditions, and consider their specific needs. • **Promote Open Communication:** Encourage open and honest communication about psychosocial risks and well-being. • **Promoting Worker Well-being:** Address psychosocial risks through measures like stress management programs, job satisfaction surveys, and fair work practices to improve worker well-being and reduce absenteeism. **3. Integrating Mental Health And Psychosocial Support (MHPSS) into WASH Activities** • **Train Staff:** Provide frontline workers and community leaders with basic psychosocial support skills, including identifying and referring individuals in need. • **Disseminate Messages:** Incorporate key MHPSS messages into WASH activities and communication materials.	County Departments responsible for: • Water • Public Health and Sanitation	Medium to high	• Number of psychosocial hazards recorded in the WASH sector.	• Daily

Risk Category	Description	Mitigation Measures	Responsible Department(s)	Impact Rating	Monitoring Indicators	Frequency of monitoring
		• **Collaborate with MHPSS Experts:** Partner with MHPSS experts to ensure the quality and effectiveness of interventions. **4. Addressing Violence and Gender** • **Establish Feedback Mechanisms:** Ensure safe channels for reporting concerns, including violence and other forms of abuse. • **Develop Protection Policies:** Implement institutional commitments to address violence and promote protection. • **Integrate into Monitoring:** Integrate the issue of violence and protection into monitoring and learning processes. **5. Workplace Considerations** • **Consult with Workers:** Involve workers in the identification and management of psychosocial hazards. • **Redesign Job Roles:** Consider redesigning job roles or providing more support to employees facing psychosocial risks. • **Promote Social Interaction:** Emphasize management's responsibility in combating isolation and fostering social interactions. • **Legal and Regulatory Frameworks:** Establishing and enforcing legal and regulatory frameworks that protect the health and safety of WASH workers is crucial for ensuring that they are not exposed to unnecessary risks. • **Safety culture**: Foster a strong safety culture where employees are encouraged to report hazards and participate in safety initiatives.				
	7. Lack of Privacy and Accessibility: Considerable parts of the County have inadequate or poorly	**1. Inclusive Design and Universal Access** • **Universal Design:** Design WASH facilities with universal design principles, making them accessible to all, including people with disabilities and those with mobility limitations.	County Departments responsible for: • Water • Public Health and Sanitation	Medium to high	• Modern WASH facilities & infrastructure with safety concerns for women, children	• Daily

Risk Category	Description	Mitigation Measures	Responsible Department(s)	Impact Rating	Monitoring Indicators	Frequency of monitoring
	designed WASH facilities that pose safety concerns, particularly for women, children, and people with disabilities. Many challenges remain, including the lack of accessible infrastructure, limited adaptable facilities, and inadequate communication and education materials.	This includes features like ramps, handrails, wider doorways, and assistive technologies. • **Accessibility Standards:** Adhere to accessibility standards for all WASH facilities, ensuring they are reachable, entered, circulated within and used by people with diverse needs. • **Gender-Neutral Facilities:** Consider gender-neutral facilities, particularly for those with mobility limitations, to promote dignity and reduce the risk of harassment. • **Location:** Ensure WASH facilities are located within reasonable walking distance of homes and communities. • **Safety and Security:** Prioritize safety and security, especially for children, women and girls, with adequate lighting, secure locks and privacy fencing. **2. Community Participation and Inclusion** • **Involve People with Disabilities:** Engage people with disabilities in all stages of the WASH planning process, from needs assessments to design and implementation. • **Disaggregate Data:** Disaggregate data by disability to identify specific needs and barriers, and include disability-related indicators in monitoring and evaluation. • **Awareness Campaigns:** Conduct awareness campaigns to educate communities about the importance of accessible and inclusive WASH facilities and the rights of people with disabilities. • **Capacity Building:** Train WASH practitioners in inclusive development approaches, emphasizing the importance of disability inclusion and how to design and implement accessible programs. **3. Policy and Advocacy**	• Lands and Physical Planning		and people with disabilities.	

Risk Category	Description	Mitigation Measures	Responsible Department(s)	Impact Rating	Monitoring Indicators	Frequency of monitoring
		• **Advocacy:** Advocate for increased funding and policy changes that prioritize disability inclusion in the WASH sector. • **Legal Frameworks:** Promote legal frameworks that protect the rights of people with disabilities to access WASH services. • **Data Collection:** Improve data collection on disability and WASH access to inform planning and advocacy efforts. **4. Innovative Solutions** • **Technology:** Explore the use of mobile and internet-based applications for reporting WASH issues, tracking access, and providing real-time data. • **Innovative Financing:** Develop innovative financing models to increase access to WASH services for marginalized communities. **5. Legal and Regulatory Frameworks** Establish and enforce legal and regulatory frameworks that protect the safety of WASH workers.				

6.1.3 A Plan to Obtain Water Abstraction Permits from the Water Resources Authority (WRA) for all Planned and Existing Water Sources

The County Government of Kitui, in its projects implementation, recognizes the importance of water resource management and the need to comply with Kenyan water regulations.

The Water Act, 2016 vests all water resources in the National Government. The Water Resources Authority (WRA) is the Kenyan Government agency mandated to regulate the management and use of these resources across the country, to ensure proper water resource management, and safeguard the right to clean water for all. Any use of water from a water resource requires a water permit issued by the WRA. The Water Resources Regulations, 2021, further reinforces the requirement for obtaining permits before commencing any activity involving the use of water from a water resource.

Pursuant to the Water Act, 2016 and the Water Resources Regulations, 2021, the County Government of Kitui plans to obtain water abstraction permits from the WRA for all planned and existing water sources. This action demonstrates the County's commitment to manage water resources sustainably and in accordance with the law.

To obtain water abstraction permits from the WRA for all planned and existing water sources, The County has outlined a comprehensive plan, including assessing all water sources, preparing necessary documentation, submitting applications, and monitoring permits. The process will align with the Water Resources Regulations, 2021. By following this plan, all planned and existing water sources will be brought into compliance with water regulations and ensure sustainable water resource management. Below is the outline of the County plan to obtain water abstraction permits from the WRA for all planned and existing water sources;

a) Water Sources Assessment and Inventory

- **Identify all water sources:** This will include the existing and planned boreholes, wells, dams, Rivers and other sources from which water will be abstracted.
- **Categorize water sources:** Determine whether sources are groundwater or surface water, and whether they are Category A, B, C, or D water use activities.
- **Document existing water use:** For existing sources, gather information on current abstraction rates, types of use and any existing permits.

b) Preparation of Applications

- **Gather required documentation:** This will vary depending on the type of water source and the category of water use.
- **Complete application forms:** Use the appropriate forms provided by the WRA, which include Form WRA 001 for groundwater applications.
- **Prepare supporting documentation:** This will include borehole completion records, water quality analysis reports, and other relevant information.

c) Submission of Applications

- **Submit applications to the WRA:** Ensure that all required documentation is included with the application.
- **Pay application fees:** Fees are determined by the category of the water use application.
- **Track application progress:** Follow up with the WRA to ensure applications are being processed.

d) Monitoring and Compliance

- **Review permit conditions:** Once permits are issued, carefully review the conditions and ensure compliance.
- **Regularly monitor water use:** Keep records of abstraction rates and water quality.
- **Report changes to water sources:** Notify the WRA of any changes to water sources, such as upgrades or new installations.
- **Maintain records:** Keep records of all permit-related activities for compliance purposes.

6.1.4 A Plan to Obtain Appropriate Environmental and Social Impact Licenses for the County Schemes and Projects

Kitui County is committed to Environmental, Social, Health and Safety (ESHS) performance in all its planned programmes and projects through the County Integrated Development Plan III, 2023-2027.

The County aims to implement the WASH projects in accordance to the relevant environmental regulations and standards, so as to minimize and mitigate adverse risks and impacts of the project's activities to the environment. In that regard, the County plans to obtain appropriate environmental and social impact licenses for the project's schemes and investments, pursuant to the Environmental Management and Coordination Act (EMCA), 1999. Moreover, the County shall implement material measures and actions in order to implement the schemes and projects in accordance with the Environmental and Social Standards (ESS), and comply with the provisions of other Environmental and Social (E&S) documents required under projects' Environmental and Social Management Frameworks (ESMFs). The WASH projects will be implemented in adherence to the National, County and donor guidelines that already exists in matters pertaining to the environment, social, health and safety risks management.

1. **Establishment of a County Environmental, Social, Health and Safety Risk Management structures**

Below are the proposed County Environmental, Social, Health and Safety Risk Management (ESHSRM) structures in the WASH sector;

a) A Countywide Environmental, Social, Health and Safety Committee

A Countywide Environmental, Social, Health and Safety (ESHS) Committee will be constituted, including County Government officers and the National Government lead agencies. The ESHS committee will consist of at least 10 members from relevant County departments such as public health, public works, physical planning, water and sanitation, a representative of participating WSPs, among others. The committee will be chaired by the County Director of Environment. The Environmental specialist and the Social specialist recruited by the County for the K-WASH Program will be the secretariat to the committee. The committee will conduct monthly meetings at the County offices to plan and discuss ESHS matters in the WASH sector. Moreover, the committee will oversee the formation of the ESHS teams or EHS committees (as per Health and safety committee rules) at the sub-project levels. The roles of the ESHS committee will be to:

- Establish a structured approach to overseeing all ESHSRM activities in the County
- Adapt the project tools developed at the National level for use by the County
- Support the establishment of project ESHSRM sub-Committees or appointment of Staff
- Support the training of all the committees and project team members on SRM
- Review all project proposals for environmental and social risks
- Assess and guide the implementation of ESMPs at the County and sub-project levels
- Support the stakeholder consultation activities
- Support the channelling of the complaints and feedback to the complaints
- Support the project monitoring activities
- Report regularly to the National ESHS committee.

b) Sub-Project Level Environmental, Social, Health and Safety units

At the sub-project level, there will be an ESHS unit headed by the environmental or social officer/public relations officer of the WSP where the various PforR projects will be implemented. The unit will include EHS and Social/Community Liaison Officers of the various contractors engaged. The unit will ensure ESHS performance of the contractors at the site. Before establishment of the unit, the EHS/Social Officer at the WSP will ensure all the contractors engaged have qualified a Environmental Health and Safety Officer and a Social /CLO officer. If the workers will be more than 20 people, the contractor shall establish a health and safety committee as per the health and safety committee rules of 2004. The ESHS unit at the project site will be responsible for:

- Overseeing the implementation of the ESHSRM Manual at sub-project level
- Overseeing the training of sub-project teams on ESHSRM
- Undertaking ESHS initial screening for sub-projects
- Ensuring that the contractor undertakes ESHS risk assessment for the sites and submits the reports to DOSHS
- Proposing changes to the sub-projects in view of the assessments
- Facilitate stakeholder engagement in the sub-project site
- Receive and address, or channel/escalate complaints to the County team
- Monitor the implementation of the ESMP at sub-project level
- Provide regular reports to the County level ESHSRM Committee.

2. Assessment of the Proposed Projects' Environmental and Social Risks

The proposed projects will be designed, procured (where applicable) and constructed in accordance with the applicable Kenyan ESHS regulations and Good Industry Practice. This will involve screening, identification of impacts, acquisition of required permits and approvals, involvement of the qualified ESHS, supervision and reporting.

The Environmental Management Coordination Act (EMCA), 1999 as amended in 2015 provides for Environmental Impact Assessment of all subprojects that are likely to have a negative effect on the environment. The Legal Notice 31 & 32 of 2019 EMCA, classifies developement projects into three groups, according to the seriousness of their likely effects, namely: Low Risk, Medium Risk, and High-Risk projects. Subsequently the Legal Notice provides a full list of projects classified under these three categories and the type of impact assessment studies to be undertaken. These provisions will be applied to guide the screening of each subproject.

a) Initial Screening

The proposed projects will be subjected to an initial E&S screening process by the sub-projects' ESHS units, to assess whether they are in line with the ESHS requirements. Further, the screening process will involve determining:

- The categorization of the proposed projects as Low Risk, Medium Risk and High-Risk projects, based on the Environmental Impact Assessment and Audit (Amendment) Regulations of 2019.
- Evidence of landownership documents or proof of communal/ancestral ownership
- Tolerance or not of sexual harassment and abuse either due to poverty or traditional/cultural norms
- Potential impacts on VMGs.

The initial E&S screening process will include:

- **Step 1:** Identification of a project. If the project is located in one specific site, one screening exercise will suffice. If the project has multiple sites, different screenings may have to be conducted as per site. This step will include interview with the technical team to understand project construction and operation details and reconnaissance site visit.
- **Step 2:** After assessing the site and gathering project details, the County level Environmental, Social Specialists and County Level ESHS committee will fill an E&S screening checklist. Further, the NEMA County Field Officers will review the completed E&S checklist and advise on the E&S categorization of the proposed project.
- **Step 3:** A decision will be made on the scale of the Impact Assessment required i.e. whether investigations will target Summary Project Report (SPR), Comprehensive Project Report (CPR) or full ESIA study.
- **Step 4:** The County ESHS experts will prepare the TORs for the specific studies to be undertaken, and recruit a qualified and a licensed ESIA lead expert to undertake the studies.

b) Environmental and Social Impacts Assessment

Table 59 below outlines the environmental and social impact assessment process in the WASH sector.

Table 59: Environmental and Social Impact Assessment Process

Environmental and Social Impact Assessment Process	Expected Output
• All the projects will require an environmental and social impact assessment study to be completed and submitted to NEMA for review and issuance of environmental impact assessment license as required by Legal Notice 31 of EMCA. • The County will ensure a competent and NEMA licensed ESIA expert is engaged to undertake the ESIA.	• Environmental and social impact assessment plan based on E&S Risk category (SPR, CPR and SR) • SPR, CPR and SR studies reviewed by relevant departments/agencies and final report submitted to NEMA
• Development of the ToR for the environmental and social impact assessment, and engagement of a NEMA registered and licensed lead expert • Review of the SPR, CPR and SR by the E&S team before submission to NEMA • Addressing comments from NEMA on the submitted reports by the County E&S experts	• Letter of acknowledgement from NEMA • Official response to NEMA, in case of comments • EIA license with conditions • Commitment to adhere to the EIA license conditions
• For low risks projects, a Summary Project Report (SPR) will be carried out and submitted to NEMA County offices in accordance with the Legal Notice 31 & 32 of 2019 EMCA. Below is the outline of the SPR: - Project description - Location of the project, proof of land ownership and conformity to zonation plan - Identification of any environmental and social sensitive areas to be affected - Stakeholder engagement to include identification and consultation with immediate neighbours, National Government Administration Officers, public and other relevant stakeholders. - Identification of impacts, proposed mitigation measures and ESMP during and after the implementation of the project.	• A list of the project sensitive areas • Stakeholders engagement list • An ESMP developed • An SPR
• For medium risk projects, a Comprehensive Project Report (CPR) will be prepared and submitted to NEMA County offices by a NEMA registered lead expert. The CPR will be developed in accordance with the provisions of the Legal Notice 31 & 32 of 2019 EMCA. • The following plans will be developed in the CPR: - An Environmental and Social Management plan (ESMP) - An action plan for the prevention and management of possible accidents during project cycle - A plan to ensure the health and safety of the workers and the community - A strategic communication plan to ensure inclusive participation during the study, and a summary of issues discussed at the public participation forum - A resettlement action plan, where applicable.	• A CPR Report • An ESMP • Copies of Land agreement / titles • Stakeholders engagement list • Action plan for prevention and management of accidents • Safety management plan for workers and communities • A strategic communication plan • Resettlement action plan, where possible

Environmental and Social Impact Assessment Process	Expected Output
• For High Risk projects, an Environmental Impact Assessment Study Report (SR) will be prepared and submitted to NEMA Head offices in Nairobi by a NEMA registered lead expert in accordance with LN 101 of EMCA. • The following plans will be developed in the SR - An Environmental and Social Management Plan (ESMP) - An action plan for the prevention and management of possible accidents during project cycle - A plan to ensure the health and safety of the workers and the community - A strategic communication plan to ensure inclusive participation during the study, and a summary of issues discussed at the public participation forum - A resettlement action plan, where applicable	• A study report • An ESMP • Copies of land agreement / titles • Stakeholders engagement list • Safety management plan for workers and communities • A strategic communication plan • Resettlement action plan, where possible

6.1.5 A Plan to Monitor the Environmental, Health and Safety Performance of Proposed Water and Sanitation Investments

In order to effectively track the environmental, health and safety performance of WASH program, and ensure accountability and improvement of the program outcomes, the County plans to implement a comprehensive monitoring and evaluation plan of the program implementation. Below are clear objectives, indicators, data collection methods and analysis procedures to track the environmental, health and safety performance of water and sanitation investments in the County.

a) Objectives and Indicators

- **Environmental:** Identify environmental impact indicators such as water quality (e.g., presence of pollutants), water consumption, wastewater treatment effectiveness, and impact on ecosystems (e.g., biodiversity).
- **Health:** Track health outcomes associated with WASH interventions, including disease prevalence (e.g., diarrhea, waterborne illnesses), access to safe water, and hygiene behaviors.
- **Safety:** Monitor the safety of WASH infrastructure, including infrastructure integrity (e.g., leaks, maintenance needs), and safety procedures for water treatment and handling.

b) Data Collection Methods

- **Regular Monitoring:** Implement routine data collection on key indicators, such as water quality testing, surveys on hygiene practices, and infrastructure inspections.
- **Periodic Evaluations:** Conduct in-depth evaluations at regular intervals (e.g., quarterly, annually) to assess the effectiveness and impact of WASH interventions.
- **Community Participation:** Engage community members in data collection and monitoring activities to ensure ownership and relevance of the information.
- **Technology:** Utilize tools like water quality testing kits, GPS mapping for infrastructure locations, and data collection apps to streamline data collection.

c) Implement Data Analysis and Reporting

- **Data Analysis:** Analyze collected data to identify trends, patterns and areas for improvement.
- **Reporting:** Regularly report findings to relevant stakeholders, including Government agencies and the community.
- **Learning and Adaptation:** Use data and reports to inform decision-making, improve program design, and adapt interventions based on emerging issues.

d) Ensure Accountability and Transparency

- **Establish Clear Roles and Responsibilities:** Define who is responsible for data collection, analysis and reporting.

- **Develop a Communication Plan:** Ensure that relevant information is communicated to all stakeholders, including the community.
- **Implement a Feedback Mechanism:** Allow for feedback from stakeholders to improve monitoring and evaluation processes.

e) Integrate M&E into the Overall WASH Program

- **Link M&E with Program Objectives:** Ensure that the monitoring and evaluation framework is aligned with the overall goals of the WASH program.
- **Use M&E Data to Inform Program Design and Implementation:** Use data to identify challenges and opportunities for improvement.
- **Track Progress Towards Key Outcomes:** Use indicators to monitor progress towards specific goals and targets.

6.1.6 Social Assessment for the County-Situation Analysis on Social Risks in the WASH Sector

In Kitui County, inadequate WASH facilities and practices pose significant social risks, including increased disease transmission, gender inequality and economic hardship, particularly affecting children and marginalized communities. The following is a situational analysis of the social risks in the WASH sector in Kitui County;

a) Health Risks and Disease Transmission

- **Waterborne Diseases:** Lack of access to clean water and sanitation facilities leads to the spread of waterborne diseases like cholera, typhoid, and diarrhea, which affect vulnerable populations.
- **Hygiene Practices:** Poor hygiene practices, such as inadequate handwashing, contribute to the spread of infectious diseases.
- **Sanitation:** Lack of proper sanitation facilities and open defecation practices contaminate water sources and soil
- **Maternal and Child Health:** Inadequate WASH facilities in healthcare facilities can increase the risk of healthcare-associated infections (HCAIs) and undermine efforts to improve maternal, neonatal, and child health.

b) Social and Economic Impacts

- **Gender Inequality:** Women and girls are disproportionately affected by inadequate WASH facilities, facing increased risks of water collection burdens, lack of privacy, and potential for sexual violence.
- **Education:** Girls who lack adequate sanitation facilities in schools can lead to absenteeism and poor academic performance.
- **Economic Hardship:** Time spent collecting water, dealing with illnesses, and managing sanitation can lead to lost productivity and economic hardship for families.
- **Poverty:** Poor WASH facilities can perpetuate cycles of poverty by hindering economic development and exacerbating health challenges.
- **Social Stigma:** Open defecation and lack of access to proper sanitation can lead to social stigma and discrimination.

c) Specific Vulnerabilities

- **Children:** Children are particularly vulnerable to the health risks associated with inadequate WASH facilities, including malnutrition and increased risk of disease.
- **Marginalized Communities:** Socioeconomically disadvantaged communities often lack access to adequate WASH services, leading to greater health and social risks.
- **People with Disabilities:** WASH facilities are often not accessible to people with disabilities, further marginalizing this group.
- **Elderly:** The elderly are also vulnerable to the health risks associated with inadequate WASH facilities, especially in the context of limited mobility.

6.1.7 Measures to Manage and Mitigate the Existing Social Risks in the WASH Sector

Land Ownership and Documentation for Water and Sanitation Infrastructure

Secure land ownership and documentation are crucial for mitigating social risks associated with water and sanitation infrastructure in Kitui, Kenya. The following are benefits of secure land ownership and documentation.

a) **Security and investment:** Secure land tenure encourages investment in water and sanitation infrastructure, as individuals and communities are more likely to invest in assets, they know they can retain and benefit from it.

b) **Equitable access:** Clear land documentation helps ensure that water and sanitation infrastructure is accessible to all, regardless of their land ownership status.

c) **Conflict reduction**: In the absence of secure land tenure, disputes over land use and access to water and sanitation resources can arise.

d) **Sustainability:** Secure land tenure promotes sustainable land use practices, including water resource management

e) **Social inclusion:** Secure land tenure and access to water and sanitation services are essential for social inclusion, as they contribute to improved health, livelihoods, and overall well-being, particularly for vulnerable populations.

Grievance Resolution Mechanism within the County

A County-level Grievance Resolution Mechanism (GRM) is crucial in Kitui County, as a measure to manage and mitigate social risks in WASH projects. The GRM should provide a structured, accessible, and transparent process for receiving, assessing, and resolving community concerns, ensuring accountability and promoting positive community relations. The purpose and objectives of the GRM in Kitui County are to:

a) **Address Social Risks:** it aims to identify, manage, and mitigate social risks associated with WASH projects, ensuring that community concerns are heard and addressed promptly.

b) **Facilitate Dispute Resolution:** It provides a formal mechanism for communities to raise grievances and seek redress for any negative impacts of WASH projects.

c) **Enhance Transparency and Accountability:** it promotes transparency in project implementation and holds the County Government and project teams accountable for their actions.

d) **Build Trust and Improve Relationships:** it fosters trust and improves relationships between the project and the community.

The following steps will be followed in the process of implementation of a GRM in the County:

- ***Step 1.*** Establish a GRM Desk: to create a dedicated GRM desk at the County level to serve as a single point of contact for receiving complaints.
- ***Step 2.*** Designate a GRM Committee: to form a GRM committee comprising representatives from the County Government, project teams, and community members.
- ***Step 3.*** Develop a Clear Procedure: to establish a clear and documented procedure for receiving, assessing, and resolving grievances.
- ***Step 4.*** Communicate the GRM: to publicize the GRM to ensure that all members of the community are aware of its existence and how to use it.
- ***Step 5.*** Provide Training: to train all relevant staff on the GRM process and how to handle grievances effectively.
- ***Step 6.*** Monitor and Evaluate: to regularly monitor and evaluate the GRM to ensure its effectiveness and identify areas for improvement.

6.1.8 Management of the Water and Sanitation Infrastructure during Operation

Effective management of water and sanitation infrastructure during operation is crucial for mitigating existing risks in the WASH sector. This can be achieved by ensuring the continuous delivery of safe and reliable services, and preventing contamination and disease outbreaks. The following are simplified aspects of management of water and sanitation infrastructure:

a) **Maintenance and Repair:** Regular maintenance and prompt repairs of water and sanitation infrastructure such as pipes, tanks, pumps, latrines, etc. is essential to prevent breakdowns and ensure functionality.

b) **Water Quality Monitoring and Treatment:** Continuous monitoring of water quality for contaminants and pathogens, along with appropriate treatment and disinfection measures, is crucial for ensuring safe drinking water.

c) **Sanitation Management:** Proper management of wastewater and solid waste, as well as regular emptying and cleaning of latrines and septic tanks, is vital for preventing environmental contamination and disease transmission.

d) **Hygiene Promotion:** Complementing infrastructure improvements with hygiene promotion and education programs can help communities adopt and maintain good hygiene practices, hence reducing the risk of waterborne diseases.

e) **Community Engagement:** Involving local communities in the management and maintenance of water and sanitation infrastructure can foster ownership and ensure long-term sustainability.

f) **Emergency Preparedness:** Having plans and resources in place to respond to emergencies, such as droughts, floods, or contamination incidents, is crucial for maintaining WASH services during crises.

g) **Water Usage:** Avoid overuse of water. Consider getting a water meter to be aware of your water usage. Make sure to close the tap when washing dishes, take short showers.

h) **Sustainable Sanitation:** Sustainable sanitation is a simple approach: the most basic principle is that it considers wastewater and excreta not as a waste, but as a resource, that sanitation has to be must socially acceptable and should be as economically viable as possible.

6.1.9 Management of Community Health Issues during Project Implementation

Addressing community health and safety risks may require measures in all phases of the project life cycle, for example, incorporating safe road crossings into project design; establishing workers camps separated from local communities with strict protocols for interaction with local communities.

A health impact assessment can be conducted as part of the environmental and social assessment as shown below:

a) Some groups within a community may be particularly vulnerable to health and safety risks from a project due to; their age, health, level of education, occupation, socioeconomic conditions, status, gender and/or disability.

b) Identifying individual groups considered to be vulnerable is an important part of the environmental and social assessment and enables inclusive measures to be incorporated into projects to avoid harm to vulnerable groups and improve project performance.

c) Attention should be given to the health and safety risks posed by the influx of workers or people providing support services into an area because of the project.

d) Where an assessment identifies risks, for example Gender-Based Violence (GBV); Sexual Exploitation and Abuse (SEA) of children, or communicable diseases, which may arise from the interaction of project workers with local communities, the environmental and social documents for the project describe such risks and measures to address them. Such measures can include;

- The use of skilled trainers to raise awareness among project workers of the risks, expected behaviors, and consequences of violations, communicated through training, and publicized codes of conduct.
- Addressing community health and safety risks may require measures in all phases of the project life cycle, for example, incorporating safe road crossings into project design.
- Establishing workers camps separated from local communities with strict protocols for interaction with local communities in order to avoid project impacts from labor influx.
- Implementing sensitization and specific mitigation measures for social impacts from labor influx during construction or service provision of the project.

- Establishing emergency-response planning and monitoring for pollution or other incidents during operation.
- Putting in place protocols for temporary blasting during demolition at the reinstatement or restoration phase.
- Establishing health clinics.
- Local health authorities should ensure appropriate processes are in place for community feedback and taking any necessary action.

6.1.10 Analysis of Users' Willingness to Pay for WASH Services, Considering the Impact of New Investments on Water Tariffs

In Kitui County, analyzing users' willingness to pay for WASH services reveals a positive trend, particularly when new investments are made in water infrastructure. This willingness is often reflected in higher water tariffs, with users generally accepting increased costs in exchange for improved water quality and reliability (Water policy, politics, and practice: The case of Kitui County, Kenya, 2022).

In Kitui County also, users' willingness to pay for improved WASH services is high, suggesting that water user charges could be implemented. However, the current payment behaviors are irregular, and users only cover a small portion of the service costs.

To address this, a funding mechanism like the Kitui County Water Service Maintenance Trust Fund (WSMTF) is being used to pool resources from various sources, including Government, donors, and private investors. This approach aims to improve waterpoint functionality and encourage user payments based on performance.

6.1.11 Impacts of New Investments on Water Tariffs

a) **Increased Costs:** Investments in infrastructure, technology, and personnel are necessary for improving water and sanitation services, but they also increase the overall cost of service delivery.
b) **Tariff Adjustments:** Water utilities often pass these increased costs onto consumers through higher water tariffs.
c) **User Impact:** Higher tariffs can impact users, particularly those with lower incomes, leading to affordability challenges and reduced service access.

Analyzing User Willingness to Pay

a) **Factors influencing WTP:** Socioeconomic factors like income, household characteristics, and water-use habits significantly impact a user's willingness to pay for WASH services.
b) **User perceptions:** User perceptions of service quality, reliability, and the overall value of WASH services play a crucial role in their willingness to pay.
c) **Behavioral responses:** Understanding user behavior in response to different tariff structures is essential for designing effective pricing strategies.

Considerations for equitable and sustainable tariff structures

a) **Affordability:** Tariffs should be affordable for all users, especially vulnerable and poor households, to ensure equitable access to WASH services.
b) **Financial sustainability:** Tariffs should be designed to ensure the financial sustainability of water utilities and allow them to cover the costs of service delivery.
c) **Incentives for efficient use:** Tariffs can be designed to incentivize efficient water use and reduce water wastage.

Importance of data and research

a) **Data collection:** Gathering data on user preferences, behavior, and willingness to pay is crucial for informed decision-making.
b) **Research:** Research on the impact of different tariff structures on user behavior and consumption patterns can help optimize tariff design.
c) **User engagement:** Engaging with users and stakeholders is essential for building trust and ensuring the successful implementation of tariff reforms.

In conclusion, understanding the relationship between new investments, water tariffs, and user willingness to pay is crucial for developing sustainable and equitable WASH service delivery strategies. This requires a comprehensive approach that considers both financial sustainability and social equity, as well as the diverse needs and behaviors of users in Kitui.

6.1.12 Institutions Dealing with Social Issues during Project Implementation within the County

In Kitui County, several institutions play a role in addressing social issues during project implementation. Key players include the County Government Departments, especially those related to social services, public health, and gender. National offices, like the State Department for Social Protection and NEMA, also contribute. Community-based organizations and NGOs, including those focused on development and social support, also play a vital role (Kitui Municipality Gender Inclusion and Participation Framework, 2024; Strategy implementation in community-based projects in Kitui County of Kenya, 2013).

County Government Departments

a) **Gender and Social Services:** Responsible for addressing gender-based issues, promoting social justice, and providing social support services.
b) **Public Health:** Addresses health-related social issues, such as access to healthcare, sanitation, and hygiene
c) **Lands and Housing:** Addresses issues related to land tenure, housing, and access to shelter.
d) **Water:** Focuses on water access, sanitation, and water-related health issues.

National Offices

a) **State Department for Social Protection:** Implements social protection programs, such as the Hunger Safety Net Program, and addresses the needs of vulnerable populations.
b) **NEMA (National Environment Management Authority):** Ensures environmental sustainability and addresses environmental issues that may have social implications.
c) **National Council for Persons with Disability:** Advocates for the rights and inclusion of people with disabilities.

Other Key Players

a) **Community-Based Organizations (CBOs):** Engage in community development, social mobilization, and the delivery of social services.
b) **Non-Governmental Organizations (NGOs):** Contribute to social development through various projects and programs, often focusing on specific social issues.
c) **Churches and Religious Institutions:** Play a role in social development, community mobilization, and providing social support.
d) **Schools and Colleges:** Provide educational opportunities and can be involved in social awareness campaigns.
e) **Private Institutions:** May contribute to social development through corporate social responsibility initiatives.

6.1.13 Presence of an Integrated Unit Dealing with Environmental and Social Issues within the County

Kitui County has an integrated approach to addressing environmental and social issues. This is evidenced by the County Integrated Development Plan (CIDP), the Kitui County Environment and Climate Change Policy 2023, and various projects focusing on environmental conservation, climate resilience, and community development. Other areas showing the integrated approach to environmental and social issues is in the Kitui County Climate Change Action Plan, 2023 and the Kitui County PCRA Report, 2023.

The following are examples of integrated units' approach:

a) **County Integrated Development Plan (CIDP):** The CIDP serves as a comprehensive framework for development, addressing various sectors including environment, energy, and social services. It outlines specific programs and projects to improve these areas, like the tree growing and forest conservation project.
b) **Kitui County Environment and Climate Change Policy 2023:** This policy recognizes the impacts of climate change on key development sectors like water, health, and agriculture. It aims to build the County's resilience against these impacts.
c) **Projects and Programs:** Kitui County is implementing various projects that address environmental challenges and social issues, such as alternative livelihoods for communities affected by the charcoal ban and water catchment conservation.
d) **Integrated Approach:** The County's efforts are characterized by an integrated approach, where environmental and social issues are addressed in a holistic manner, considering their interconnections and impacts on various sectors.

e) **Collaboration and Partnerships:** Kitui County works with various stakeholders, including National and interNational organizations, to implement its development plans and projects.
f) **Focus on Climate Resilience:** The County is actively working on building climate resilience through initiatives like tree planting and promoting drought-tolerant crops.
g) **Addressing Social Issues:** The County is also addressing social issues like poverty, food insecurity, and access to basic services through various programs and projects.

6.1.14 County Budget Provision for Implementation of Social Issues

Kitui County's budget provisions for social issues like community engagement, stakeholder involvement, and capacity building are typically allocated within the County's Annual Development Plan (ADP) and Integrated Development Plan (CIDP) in the financial year. These provisions are designed to support initiatives that enhance public participation, build local capacity, and foster sustainable development. This is discussed as shown below:

a) **Community Engagement:** Kitui County prioritizes public participation in all stages of budget planning and implementation, including the development of the CIDP and ADP in the financial years. This involves engaging with community representatives, local authorities, and other stakeholders to ensure that their needs and priorities are reflected in the budget and development plans.
b) **Stakeholder Engagement:** The County Government actively engages with various stakeholders, including National Government agencies, development partners, and local organizations, to collaborate on projects and programs. This includes establishing partnerships to secure external funding and foster consensus around shared goals.
c) **Capacity Building:** Kitui County allocates resources for capacity building programs aimed at strengthening the capacity of local communities, Government officials, and other stakeholders to effectively manage development projects and implement policies. This may include training on project management, monitoring and evaluation, and other relevant skills.
d) **CIDP and ADP Integration:** The CIDP and ADP are the primary tools for translating the County's development vision into concrete projects and programs. These plans provide a framework for prioritizing investments in social development and ensuring that resources are allocated effectively.
e) **Monitoring and Evaluation:** Kitui County also invests in establishing and implementing robust monitoring and evaluation systems to track the progress of development projects and ensure that they are achieving their intended outcomes.

Overall, Kitui County's budget provisions for social issues reflect a commitment to participatory development, local empowerment, and sustainable development. By engaging with communities, building local capacity, and utilizing strategic planning tools, the County aims to achieve its development goals effectively and equitably.

7 IMPLEMENTATION ROADMAP, MONITORING AND EVALUATION, AND COMMUNICATION PLAN

7.1 Conceptual Framework

The Conceptual Framework guiding the Kitui County Water and Sanitation Strategy and Investment Plan (CWSSIP) is informed by a clear understanding of the county's current water, sanitation, and hygiene (WASH) challenges, as well as national and global commitments.

Kitui County, with a growing population of approximately 1.3 million people distributed across 40 wards, faces significant deficits in access to improved water sources and basic sanitation services. Only 56% of the population has access to improved water, while sanitation coverage remains low, particularly in rural areas where open defecation and the use of unimproved sanitation facilities are still prevalent. The Kitui CWSSIP is therefore aligned with key policy frameworks, including Sustainable Development Goal 6 (SDG 6) on Clean Water and Sanitation, the Constitution of Kenya (2010), the National Water and Sanitation Investment Plan (NAWASIP), and the Kitui County Integrated Development Plan (CIDP) III (2023-2027).

The diagrammatic representation of the Kitui CWSSIP conceptual framework is shown below.

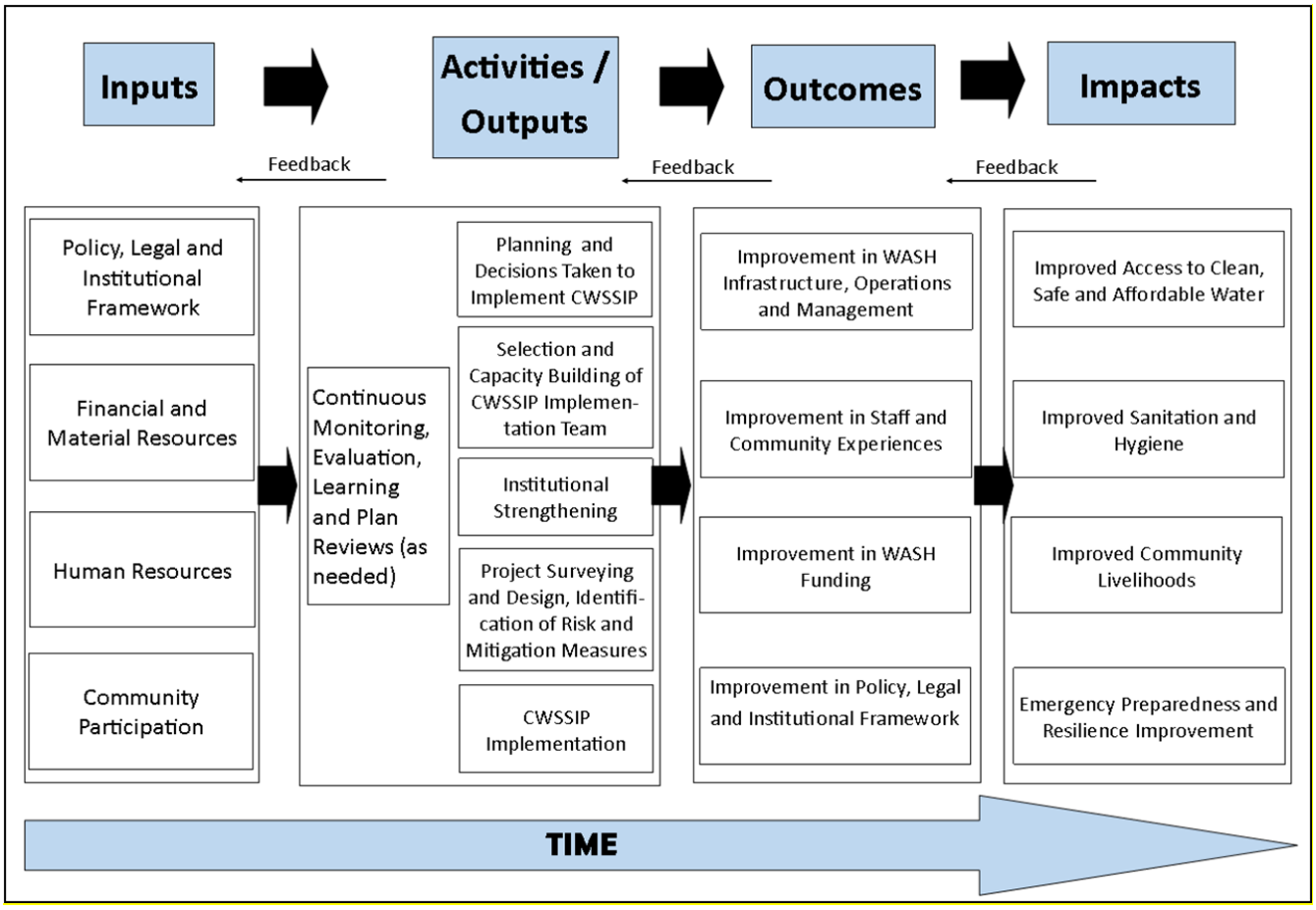


Figure 11: Kitui CWSSIP Conceptual Framework

7.2 Investments Implementation Plan

The successful realization of the Kitui County Water and Sanitation Strategy and Investment Plan (CWSSIP) (2025–2030) requires a clearly defined and well-coordinated implementation roadmap. This section outlines the step-by-step action plan, responsibilities of key stakeholders, institutional coordination mechanisms, capacity-building needs, and a phased timeline for the delivery of water and sanitation interventions across the County.

7.2.1 Step-by-Step Action Plan for Executing the Strategy

The implementation of the CWSSIP will follow a sequenced, adaptive approach aligned to County development priorities and funding availability. The plan will proceed through the following key steps:

a) Project Prioritization and Resource Mobilization

- Finalize project selection criteria and investment prioritization.
- Mobilize financial resources from the County Government, development partners, private sector, and community contributions.

b) Institutional Strengthening and Capacity Enhancement

- Conduct institutional assessments and design tailored training programs.
- Strengthen governance, procurement, and financial systems.

c) Procurement and Contracting

- Prepare bidding documents; procure works, goods, and services in accordance with County and National regulations.

d) Construction, Supervision, and Commissioning

- Implement infrastructure projects, monitor quality and timelines, and officially hand over completed facilities.

e) Operations, Maintenance, and Monitoring

- Build capacity of local operators, establish maintenance schedules, and integrate systems for routine performance monitoring.

7.2.2 Responsibilities of Key Institutions and Stakeholders

The successful implementation of the CWSSIP hinges on clearly defined and coordinated stakeholder engagement, including the public, private, and community sectors.

Table 60: Roles and Responsibilities of Key Institutions and Stakeholders

Stakeholder	Roles and Responsibilities
County Department of Water & Sanitation	Overall coordination, resource allocation, technical oversight, and progress reporting.
Kitui County Treasury	Budgetary planning, disbursement, and financial compliance.
Ward and Sub-County Administrations	Local-level coordination, beneficiary engagement, and feedback collection.
Private Sector Partners	Investment co-financing, service provision, technological innovation, and O&M partnerships.
Community-Based Organizations (CBOs)	Mobilization of community support, participation in project implementation, and local oversight.
Development Partners/NGOs	Technical assistance, co-financing, monitoring support, and innovation sharing.
National Government Agencies	Policy support, regulatory guidance, and linkage to National programs and funding windows.
County Private Sector Liaison Desk	Facilitation of private sector dialogue, investment matchmaking, and public-private partnerships.

7.2.3 Capacity-Building Requirements

To enhance the effectiveness and sustainability of CWSSIP implementation, the following capacity-building interventions are proposed:

a) Training in project management, financial management, and procurement for County staff.
b) Technical training for community-based operators in system maintenance and customer service.
c) Governance, leadership, and accountability training for WRUAs and Water Utilities.
d) ICT training to support digital monitoring and data collection systems.

7.3 Timeline for Implementation

The Kitui CWSSIP 2025 – 2030 is designed for phased implementation. Activities are organized into short-term, medium-term, and long-term milestones to ensure systematic delivery of water and sanitation services.

The table below provides a visual timeline of key activities, highlighting when each investment will be initiated and completed. This phased approach promotes effective resource use, strengthens climate resilience, and builds sustainable water and sanitation systems and services across the County.

The schedule is informed by priority needs, institutional readiness, and environmental factors, ensuring a practical and impactful rollout of the CWSSIP.

Table 61: Timeline and Implementation Schedule

Short-Term (2025–2026)- Surveys, Urgent Water Needs, Small Infrastructure, Capacity Building		
Activity	**Timeline**	**Key Milestones**
Conduct Water Needs Assessment Surveys in 40 Wards	2025 (complete by mid-2026)	Survey reports, updated ward-level water plans
Construction and extension of key water pipelines (Phase 1)	2025–2026	50% of pipelines laid in high-priority zones
Construction/Desilting of small rock catchments	2025–2026	At least 60% of planned small catchments completed
Start construction of sump well supplies (Phase 1)	2025-2026	50 wells constructed
Protection and basic distribution of critical springs	2025–2026	50% of targeted springs protected
Installation of green energy systems (Solarization Phase 1)	2025–2026	Solarization of 30% of existing water supplies
Construction of shallow wells in water-stressed areas	2025	10–15 shallow wells completed
Construction of bulk water storage tanks (Pilot)	2026	3 tanks constructed
Roll out of sanitation and hygiene programs	2025	50% of Hygiene programs rolled out.
Boreholes drilling and equipping (Phase 1)	2025–2026	25 boreholes completed
Start desilting 2 mega dams and construction of 2 new	Late 2025–2026	2 mega dam works started
sand dam construction	2025–2026	50 sand dams completed
Formation/Training of Community Water Management Committees (WMCs)	2025	40 WMCs trained
Environmental & Social Impact Assessments (ESIA) for infrastructure projects	2025–2026	60% ESIA completed
Establish County-level Water Monitoring & Evaluation framework and system	2026	Real-time M&E database
Medium-Term (2027–2028)- Priorities: Scale up Infrastructure, Reinforce Maintenance, and Climate Proofing		
Activity	**Timeline**	**Key Milestones**
Continue construction and extension of pipelines (Phase 2)	2027–2028	Additional 40% coverage achieved
Expansion of sump well construction	2027–2028	60 new wells completed
Complete protection of remaining springs and expand distribution	2027 - 2028	All targeted springs protected
Further installation of solar energy systems (Phase 2)	2027–2028	70% of supplies solarized
Expand shallow wells, particularly in marginal areas	2027	Another 20 shallow wells done
Bulk storage tanks construction (Phase 2)	2027	5 additional tanks built
Boreholes drilling and equipping (Phase 2)	2027–2028	Additional 50 boreholes
Continue mega dam construction (4 more)	2027–2028	Major structures completed (60%)
Desilting and rehabilitation of 40 large dams	2027–2028	50% of large dams completed
Construction of 100 sand dams in seasonal Rivers	2027–2028	100 more sand dams done
Expand hygiene and sanitation campaigns	2027	Universal hygiene promotion coverage
Water Supplies maintenance, repairs & rehabilitations	2027–2028	Full-scale preventive maintenance program
Environmental & Social Impact Assessments (ESIA) for large projects	2027–2028	100% ESIA completed for mega projects
Carry out Monitoring & Evaluation on project implementation	2027-2028	M&E database updated
Mid-Term Review and Strategy Adjustment	End of 2027	Strategy revised based on evaluation
Long-Term (2029–2030): Consolidation and Sustainability Phase- Complete Mega Projects, Operationalize Systems, Handover to Communities		
Activity	**Timeline**	**Key Milestones**
Final construction and extension of pipelines	2029	Full network coverage
Final batch of sump wells and shallow wells	2029	100% project targets achieved
Full solarization of water supplies	2029–2030	100% of supplies green-powered
Final construction and equipping of bulk storage tanks	2029	All tanks operational
Completion of all mega dams and large dams	2029–2030	8 mega dams and 80 large dams operational
Final sand dams construction	2029	All 240 sand dams completed
Roll out of remaining remaining 50% sanitation and hygiene programs	2029	100% sanitation coverage
Water Supplies rehabilitation and sustainability audits	2029	All facilities audited for functionality
Community WMCs transition to County Water Utility oversight	2030	Full governance transition achieved
Post-Implementation Evaluation	End of 2030	Final impact evaluation done

7.3.1 Performance Benchmarks

Performance will be measured using the following benchmarks:

a) Percenatge of projects implemented on time and within budget.
b) Increase in population with access to safe water and improved sanitation.
c) Level of stakeholder satisfaction (based on annual surveys).
d) Reduction in non-revenue water (NRW) and improved functionality of water systems.
e) Private sector investment leveraged through public-private partnerships.

7.4 Monitoring and Evaluation Plan

A robust Monitoring and Evaluation (M&E) framework is essential to track progress, measure outcomes, and ensure accountability in the implementation of the Kitui CWSSIP 2025 – 2030. The M&E plan provides a structured approach to assess the effectiveness, efficiency, and impact of interventions across all components of the strategy.

7.4.1 Framework for Tracking Progress Against Strategic Objectives

The M&E framework is aligned with the strategic objectives outlined in this plan and is designed to facilitate continuous learning, adaptive management, and timely decision-making. It adopts a results-based approach, linking inputs and activities to outputs, outcomes, and long-term impacts. The framework will utilize a mix of qualitative and quantitative tools, including baseline surveys, progress reports, and stakeholder consultations, to track implementation performance and evaluate results. Key elements of the M&E framework include:

a) A comprehensive Results Matrix that maps strategic objectives to indicators and targets
b) A performance monitoring schedule tied to annual work plans
c) Use of digital platforms and GIS tools for real-time data tracking and reporting
d) Integration with the County Integrated Monitoring and Evaluation System (CIMES)

7.4.2 Key Performance Indicators (KPIs) and Targets for Each Component

KPIs have been developed for each investment component of the plan. These indicators will serve as benchmarks for assessing progress and measuring success. These include:

Table 62: Key Performance Indicators

Component	Key Performance Indicators (KPIs)	Baseline	Targets (By 2030)
Water Supply	% of population with access to safe and reliable water	56%	90%
Sanitation and Hygiene	% of households with access to improved sanitation facilities	37.1%	80%
Institutional Strengthening	Number of trained water sector personnel	100Personnel	500 personnel
Climate Resilience	Number of water projects climate-proofed	40%	100% of new projects
Sustainability and Financing	% of operational cost covered by user fees and County allocation	37%	85%

Each indicator will be disaggregated by gender, age, location, and vulnerability status where applicable, to promote inclusivity and equity.

7.4.3 Roles and Responsibilities for Data Collection, Reporting and Evaluation

Effective M&E requires clear definition of institutional roles and coordination mechanisms. The roles and responsibilities include:

a) **Departments of Water and Sanitation (CDWS), Kitui County:** Lead agencies responsible for coordinating data collection, compiling periodic reports, and leading evaluations. CDWS will also facilitate stakeholder reviews and ensure data integration into County systems.
b) **County M&E Unit (CM&E Unit):** Provides oversight, ensures compliance with County M&E guidelines, and supports capacity building in data management.
c) **Implementing Agencies (e.g., WRUAs, Water Utilities, CBOs):** Responsible for routine data collection at the community/project level and submitting reports to CDWS.
d) **Development Partners and NGOs:** Provide technical assistance, participate in joint reviews, and contribute data from supported initiatives.
e) **Community Representatives and Beneficiaries**: Engage in participatory M&E, provide feedback on service delivery, and validate data during community forums.

This M&E plan will be reviewed periodically to incorporate lessons learned and align with evolving sector priorities and technological advances.

7.5 Communication and Advocacy Plan

Effective communication and strategic advocacy are essential to ensure inclusive stakeholder participation, raise public awareness, and secure the political and financial support required for the successful implementation of the Kitui CWSSIP 2025–2030. The County Government of Kitui is committed to transparent, timely, and participatory communication that promotes accountability and sustains community ownership of water and sanitation initiatives.

7.5.1 Objectives of Communication and Advocacy Plan

a) To strengthen stakeholder engagement and participatory dialogue throughout the strategy implementation.
b) To increase public awareness on water conservation, sanitation practices, and climate resilience.
c) To mobilize political goodwill and financial investments through evidence-based advocacy.
d) To institutionalize two-way communication channels that promote accountability and citizen feedback.

7.5.2 Strategic Approaches

Stakeholder Engagement and Public Awareness

- Conduct structured stakeholder forums at County, sub-County, and community levels to facilitate inclusive participation in planning, monitoring, and feedback.
- Develop and disseminate user-friendly information, education, and communication (IEC) materials in both English and local languages.
- Leverage existing community structures (e.g., WRUAs, WASH Committees, religious leaders, youth and women groups) as communication intermediaries.
- Implement targeted campaigns during key dates (e.g., World Water Day, Global Handwashing Day) to reinforce positive behavior change.

Information Dissemination Mechanisms

- Establish a centralized Water and Sanitation Information Portal on the County Government website to host project data, investment plans, reports, and updates.
- Utilize local radio stations, community barazas, mobile SMS alerts, and social media to share real-time information on projects, emergencies, and opportunities.
- Develop County Water and Sanitation Bulletin published quarterly to update stakeholders on progress, lessons learned, and emerging issues.
- Introduce feedback boxes and suggestion mechanisms at water points, health facilities, and public offices to capture citizen input.

Advocacy for Political and Financial Support

- Develop an advocacy toolkit with key messages, infographics, and data briefs tailored for County leadership, members of County assembly (MCAs), and National agencies.
- Conduct high-level policy roundtables with political leaders, private sector actors, and development partners to showcase strategic priorities and funding gaps.
- Profile successful community-led initiatives and innovations in newsletters, media, and donor platforms to attract funding and replication.
- Build alliances with civil society organizations, research institutions, and the media to amplify calls for policy and financial commitments.

7.5.3 Institutional Arrangements and Responsibilities

a) **County Departments of Water and Sanitation:** Lead implementer of the communication strategy and custodian of the Water Information Portal.
b) **County Communications Office:** Supports media relations, branding, and policy messaging.
c) **Ward and sub-County Administrators:** Coordinate grassroots engagement and feedback collection.
d) **Development Partners and NGOs:** Support resource mobilization, materials development, and campaign rollouts.
e) **Community-Based Organizations (CBOs):** Act as communication ambassadors and local monitors.

7.6 Monitoring and Review

The communication and advocacy plan will be reviewed annually to assess effectiveness, adapt to new platforms, and incorporate stakeholder feedback. Key performance indicators will include media reach, engagement levels, feedback received, and stakeholder satisfaction.

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