



THE NAIVASHA SUB-COUNTY VISION

**COUNTY WIDE INCLUSIVE SANITATION PLAN FOR NAIVASHA
SUB-COUNTY, ENSURING SANITATION FOR ALL**

COMMISSIONERS



PROJECT FACILITATORS



PROJECT FINANCIERS



PROJECT CONTRIBUTORS



IMPRINT

CONSULTANT

Larissa Duma

EDITORS

Andreas Schmidt

Andrew Foote

Catherine Berner

Effie Akinyi

LAYOUT

Kate Bohnert

Kelvin Malombe

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ABBREVIATIONS

BORDA

Bremen Overseas Research and Development Association

CBD

Central Business District

CGN

County Government of Nakuru

CWISP

City Wide Inclusive Sanitation Plan

DEWATSs

Decentralized Water Treatment Solution

DOHS

Department of Health Services

FSM

Fecal Sludge Management

FSTP

Fecal Sludge Treatment Plant

GIS

Geographic Information System

MRF

Material Recovery Facility

NACOSTEC

Nakuru Countywide Steering Technical Committee

NAIVAWASS

Naivasha Water and Sanitation Company

NEMA

National Environment Management Authority

NSSC

Naivasha Sanitation Steering Committee

ODF

Open Defecation Free

PPP

Public Private Partnerships

SFD

Shit Flow Diagram

SWM

Solid Waste Management

WASH

Water Sanitation and Hygiene

WSUP

Water and Sanitation for the Urban Poor

WWTP

Waste Water Treatment Plant

FOREWORD**MESSAGE FROM
THE COUNTY EXECUTIVES**

It is established that an integrated approach to planning water, sanitation, solid waste, and drainage management is fundamental in improving environmental sanitation. The Department of Health and Sanitation and the Department of Water, Environment, Energy and Natural Resources have launched the Nakuru Countywide Sanitation Technical Steering Committee (NACOSTEC), a lead committee in the environmental sanitation sector. The County Government of Nakuru, through the support of NACOSTEC, commits and recognizes the importance of an integrated plan as it can provide a critical lever for improved accessibility and coverage to environmental sanitation; thus improving quality of life.

NACOSTEC prides itself in supporting and strengthening the effective and efficient management of the environmental sanitation system. It is pivotal that we find ways to improve access to environmental sanitation and continue to develop and implement innovative approaches to our work in order to deliver results-based outcomes to maintain clean and healthy status for all. In this regard, we are pleased and honored to introduce the Countywide Inclusive Sanitation Plan for Naivasha Sub-County by the NACOSTEC Sub-Committee. This Plan is a culmination of a highly participatory and inclusive process aimed to increase access to adequate and equitable environmental sanitation.

This plan reaffirms the strategic priorities and commitment of NACOSTEC, envisioning inclusive sanitation for all. This is the strategic direction of NACOSTEC with clear linkage to the national strategies and Our Governor, H.E. Hon. Lee Kinyanjui, the Sanitation Champion for Nakuru County. As the sanitation patrons, we declare our commitment, full support, and best wishes for the successful implementation of this strategic Plan.

It is our sincere hope that this report will go a long way in guiding environmental sanitation stakeholders to make informed decisions as well as investors on the bankable and potential environmental sanitation technologies investment opportunities in Naivasha Sub-County. In Nakuru County, we look to set the example for possible replication in other locations across Kenya. We are confident that together NACOSTEC can achieve this strategic direction and contribute significantly to these national outcomes.

I look forward to seeing the results of the committee's efforts to make a stronger environmental sanitation system. I wish to take this opportunity to thank and pay tribute to the Naivasha Sanitation Steering Committee and all our stakeholders for their great support and continuing efforts to work together with NACOSTEC to promote inclusive Sub-Countywide environmental sanitation for all.

We have much pleasure in endorsing this Plan.



Eng. Festus K. Ng'eno
**CECM - Water, Environment, Energy
 and Natural Resources**
 Patron of NACOSTEC
 County Government of Nakuru



Dr. Zakayo Gichuki
CECM - Health
 Patron of NACOSTEC
 County Government of Nakuru

FOREWORD**MESSAGE FROM THE CHAIRS
OF THE STEERING COMMITTEE**

Naivasha Sub-County has a diversity of settlement types, ecosystems, and growing economic opportunities. The population is growing rapidly which increases strain on already overstretched environmental sanitation systems and creates additional demand for essential services. The low coverage of sanitation services affects disease prevalence and morbidity and mortality rates. There is a lack of an integrated approach in the sub-county making it difficult to tackle environmental sanitation related challenges. Traditional solutions are insufficient to meet Naivasha's environmental sanitation needs and there is a great necessity to improve coordination by promoting an integrated planning approach that cuts across disciplines and service departments to ensure stakeholders are aligned behind sanitation solutions.

The County Government of Nakuru is committed to ushering Naivasha into the future by providing environmental sanitation solutions that will make Naivasha a clean and healthy place for all residents. As a result, Naivasha Sanitation Steering Committee was formed with the purpose of creating a Countywide Inclusive Sanitation Plan for Naivasha Sub-County in alignment with the Nakuru Countywide Sanitation Technical Committee (NACOSTEC). We wish to thank the committee for their valuable contributions and participation and are proud of the knowledge and insights gained through this highly participatory process. It's been an honor and privilege to work with NACOSTEC on the forefront of sanitation agenda. We look forward to implementation of the sanitation plan by inviting the private sector partners in this sanitation journey.

A special thanks to the NACOSTEC co-chairs: Johnstone Kamau, Director Water and Sanitation, and Samwel King'ori, Chief Officer Health, for their support, leadership and guidance in this process.

Message from Managing Director NAIWASS

Naivasha Water Sewerage and Sanitation Company (NAIWASS) is a private utility currently providing water, sewerage and sanitation services in Naivasha sub-county. NAIWASS is aiming at growing onsite sanitation services in Naivasha as part of achieving SDG 6.2. It is in this spirit that in July 2017, NAIWASS and Sanivation signed a MOU to work together in the realization of that goal. The MOU stipulated developing a sanitation plan for Naivasha as one of its key milestones. I am happy and humbled to see the collaboration from diverse departments to put this together with the support of County Government of Nakuru. I believe this document is going to steer forward the sanitation agenda in Naivasha.



Caroline Vata
Chairperson - Naivasha Sanitation
Steering Committee

Naivasha Sub-County Public Health Officer



Harry Njunge
Co-Chair - Naivasha Sanitation
Steering Committee

Distribution and Sales Manager,
NAIWASS



Eng. Nahashon Wahome

AG. Managing Director,
NAIWASS

NACOSTEC

A MULTI-SECTORAL COMMITTEE



Eng. Johnson Kamau, Director of Water & Sanitation,
Chairman of NACOSTEC



Samuel King'ori, AG. Director Public Health & Sanitation,
Co-Chairman of NACOSTEC

Nakuru County-Wide Sanitation Technical Steering Committee (NACOSTEC) with the World Bank Team



Responsibilities for sanitation within Nakuru County Government are not clearly defined and there are both overlaps and gaps between two main departments with sanitation responsibilities: Department of Health and Sanitation; and the Department of Water, Environment, Energy and Natural Resources. To mitigate the lack of coordination of sanitation management within the county government, the Department of Health and Sanitation and the Department of Water, Environment, Energy and Natural Resources launched the Nakuru Countywide Sanitation Technical Steering Committee (NACOSTEC) with the purpose of developing and implementing a Countywide Inclusive Sanitation Strategy and subsequent Strategic Plan.

Key Functions

NACOSTEC play a key role in advising and contributing to formulation of enabling inclusive sanitation policies, regulations, norms and standards, overseeing and coordinating implementation of sanitation activities in Nakuru, resource mobilization for sanitation activities and establish countywide inclusive sanitation and reporting framework also forms part if their roles.

They also facilitate collaboration and partnerships among various department in the County. These functions play a major role to ensure Naivasha Sub-County Vision and strategic plans are realized to achieve inclusive environmental sanitation.

THE LEADERSHIP AND REPORTING STRUCTURE



GOVERNOR OF NAKURU COUNTY
SANITATION CHAMPION



COUNTY EXECUTIVES OF WATER AND HEALTH
PATRONS



CHIEF OFFICERS WATER AND HEALTH
ADVISORS



NAKURU COUNTYWIDE SANITATION TECHNICAL STEERING COMMITTEE (NACOSTEC)
ADVISED BY WORLD BANK



NAIVASHA SANITATION STEERING COMMITTEE (NSSC)
REPORTING THROUGH NACOSTEC
ADVISED BY BORDA AND SANIVATION

INTRODUCTION

A VISION OF CHANGE

Leaders in Nakuru County recognized an urgent need to improve the environmental sanitation services in their community. They envisioned steering a process to gather information on existing services and gaps, coordinate multi-sector stakeholders, and identify and prioritize solutions. This report shares the Sub-County Vision for inclusive sub-countywide environmental sanitation, developed by the Naivasha Sub-County Sanitation Steering Committee (NSSC) a subsidiary of the Nakuru Countywide Sanitation Technical Committee (NACOSTEC).

The Naivasha Sanitation Steering Committee's purpose was to:

- Align stakeholders behind a vision for improved environmental sanitation in Naivasha Sub-County to cultivate a clean and healthy place for all.
- Contextualize and document the existing environmental sanitation situation in Naivasha.
- Identify and propose viable and sustainable solutions to sanitation, solid waste, water, and stormwater management challenges.
- Develop a Countywide Inclusive Sanitation Plan (CWISP) that could be implemented to improve services and the health of Naivasha sub-county residents.

This report presents the Naivasha Sub-County Sanitation Plan, which includes an overview of the planning process, a shortlist of solutions and prioritized interventions and locations. It outlines appropriate solutions according to each Sub-County settlement type, as well as solutions that are appropriate Sub-Countywide. The solutions identified should be capable of meeting the projected population growth, industrial development, and household demand forecasts efficiently, effectively, and sustainably.



The committee sees this plan as a first of many steps towards improving environmental sanitation in Naivasha.

The Setting

Naivasha Sub-County lies in the heart of the rift valley; it is the national epicenter for the horticulture industry and one of the 11 sub-counties within Nakuru County, Kenya. With its close proximity to Nairobi, prominent environmental tourism, and expanding horticultural industry, Naivasha Sub-County is one of the fastest urbanizing areas in Kenya. Administratively, Naivasha Sub-County is divided into 8 administrative wards containing some pockets of middle income residents but dominantly occupied by low income residents. The Sub-County has an estimated population of 314,052 people, with an annual estimated growth rate of 3.05% as of 2009, living in an area covering 1960.2 km² (Figure 1.0 above on settlements).

The area is distinguished by several iconic features including Lake Naivasha, Mount Longonot, Hells Gate National Park, and more, attracting an array of national

and international tourists. Employment opportunities are founded on the tourism and horticulture sectors, both of which contain peak seasons driving significant population fluxes.

Climatically, Naivasha is a semi-arid Sub-County with an annual rainfall varying from less than 500mm to more than 1900 mm distributed between one short and one long rainy season. Geologically, it is characterised by generally deep groundwater tables which are difficult to track due to shifting sub-surface volcanic dynamics which cause the frequent development of new fissures. The Sub-County has an estimated forest cover of only 4% composed of primarily indigenous trees, with the remaining natural land cover dominated by shrublands, arid grasslands, and a rich riparian zone bordering Lake Naivasha, a freshwater crater lake covering 139 km².

Figure 1.0

Settlement types in Naivasha. (clockwise from top right) settlement, peri-urban and rural areas

A NEW APPROACH**GOING BEYOND SANITATION TO ENVIRONMENTAL SANITATION**

Environmental sanitation can be understood as a set of activities required to achieve a sanitary physical environment. Based on the Bellagio Principles for Sustainable Sanitation, environmental sanitation was developed by a team of WASH experts in 2000 in response to the shortfalls of conventional sanitation policies and practices in meeting the needs of the developing world. Environmental sanitation goes one step further than the traditional notion of “sanitation” to include a more holistic approach which considers all aspects directly linked to human health and quality of life. Cross-cutting measures were also considered, such as legal and regulatory frameworks, institutional arrangements, skills and capacities, financial arrangements, social-cultural acceptance, and government support.

Environmental Sanitation Challenges in Naivasha

The dynamic and diverse landscape of Naivasha Sub-County poses several environmental sanitation challenges, primarily centered around the varying population densities and settlement types (Figure 1.0 depicts settlement types). The financial, technical, and social viability of potential solutions is limited by low population densities in rural areas, far distances between individual communities, and far distances between unserved communities and centralized services. This is combined with additional pre-existing challenges including: 1) low access to sanitation and solid waste services, 2) limited sewerage coverage 3) lack of capital to build and improve household sanitation systems, 4) land-degradation and insufficient drainage and 5) water quality challenges especially due to high fluoride levels.

ENVIRONMENTAL SANITATION COMPONENTS**SANITATION, EXCRETA, AND WASTEWATER MANAGEMENT****SOLID WASTE MANAGEMENT****WATER SUPPLY****STORMWATER AND DISCHARGE OF TREATED WASTEWATER****CROSS-CUTTING MEASURES****RE-THINKING SOLUTIONS**

In many rapidly populating countries, significant disparities exist between and within urban, peri-urban, and rural environmental sanitation service provision, tending to disadvantage informal and lower-income communities. Globally, conventional services have focused on centralized approaches which struggle to meet demands in rapidly populating areas and often lack economic and technical viability.

Decentralized and semi-centralized hybrid services and service models can progressively provide solutions for the service deficiencies across a variety of settlement, socio-economic, and geophysical dynamics. Centrally managed inclusive services such as universal scheduled latrine emptying, fully treated decentralized water kiosks with localized distribution networks, and simplified sewers connected to small and medium scale wastewater treatment solutions are a few examples of these hybrid solutions.

The Naivasha Sub-County Sanitation Steering Committee actively explored a combination of infrastructure and service options with different operational models to identify the most viable solutions to achieve inclusive environmental sanitation with the greatest coverage possible.

Therefore, the subsequent shortlisted potential solutions should not be viewed in isolation but rather as a piece of a larger puzzle to systematically and holistically enable Sub-Countywide improvements.

ROADMAP

A CALL TO ACTION

The Naivasha Sub-County Sanitation Planning Process was initiated with an MOU from Sanivation and NAIWASS in June 2017 to develop a clear plan to increase the amount of fecal sludge safely managed. Due to government leaders recognizing the impact of poor sanitation, they sought a planning approach that highlighted coordination across Nakuru County. The NSSC was established as a sub-committee to NACOSTEC in July, 2018. NACOSTEC is a cross-disciplinary committee that is advised by the World Bank. Both committees aim to bring inclusive sanitation planning to Nakuru County.

The NSSC brings Government, utility, and civil society stakeholders from across the environmental sanitation sector participated in the planning process. The stakeholders represented different settlement dynamics within Naivasha Sub-County (i.e. rural, peri-urban, town). During the 8 months following committee initiation, 5 two-day workshops and numerous bilateral meetings were held. The process involved over 30 people and included 11 stakeholder organizations.

Informed Choices

The Multi-Stakeholder Planning Process

The main objective of the planning process is to develop a common understanding amongst stakeholders about feasible solutions and associated operational requirements. The process sets a solid foundation for local capacity development and future project ownership amongst stakeholders. These same stakeholders will later be involved in decision making, implementation, and operation for relevant governmental and non-governmental interventions.

Collectively information was gathered to understand the complexity of the diverse

sub-county settlement types, environmental sanitation gaps and explore potential solutions and opportunities.

The planning process paired technical assessments and GIS mapping with local knowledge to identify both novel environmental sanitation solutions and existing solutions that should be replicated. The interdisciplinary and experienced nature of the Steering Committee members promoted diverse dialogue, enhancing the critique process about the applicability and viability of each potential solution. The Steering Committee collectively defined appropriate solutions according to each settlement type (Figure 1.0) through guidance by an external sanitation expert from BORDA.

Solutions were initially screened for technical, environmental, social, political, and economic viability. Then solutions were further evaluated for their applicability for each settlement type found in the Sub-County. The following sections provide a shortlist of the identified solutions according to each settlement type. These outcomes are intended to act as decision support tools in identifying and prioritizing future interventions.

THE NAIVASHA SUB-COUNTY VISION

AN IMPROVED QUALITY OF LIFE

In the year 2030, Naivasha will have a clean and safe environment improving the quality of life for all residents.

Specifically Naivasha is aiming to:

- Enhance safe excreta management by 50% throughout the sanitation value chain (ensuring >70% is safely managed).
- Improve solid waste management practices.
- Ensure access to clean and safe water for all Naivasha residents.
- Mitigate flooding and flood risks through improved stormwater management.
- Strengthen the enabling environment to promote partnership, collaboration, and private sector participation.

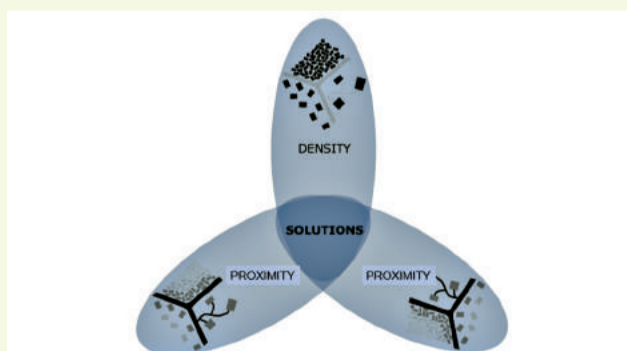
Figure 2.0

The planning process was conducted in three distinct phases utilizing the BORDA City Sanitation Planning Guide as the foundation;



PHASE ONE
July- September, 2018

Situation Analysis written by the Steering Committee



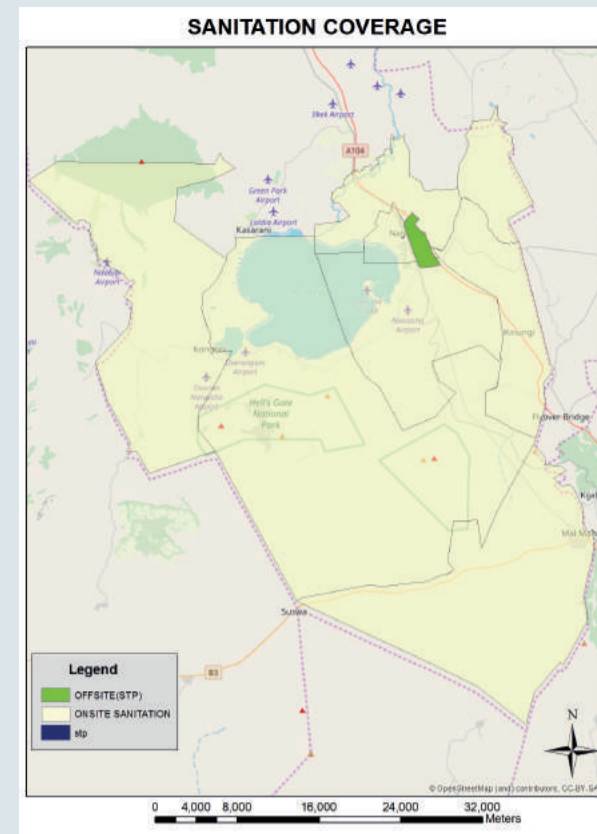
PHASE TWO
September- October, 2018
GIS and Technical Assessment



PHASE THREE
September 2018 - February 2019
Capacity Development and Planning Workshops



SANITATION, EXCRETA AND WASTEWATER MANAGEMENT



SITUATION OVERVIEW

- 95% of the total population has access to basic sanitation
- ODF rates are low at 1.8%
- Centralized sewerage only covers 10% of Naivasha Sub-County
- Sewer network is 25.7 km long and serves Naivasha Town Central Business District (CBD)
- One wastewater treatment plant which is overcapacity
- 78% of the Sub-County sanitation is not safely managed resulting in a prevalence of waterborne disease

Table 1.1

Recommended Sanitation, excreta and wastewater management interventions categorize by settlement type

INDIVIDUAL

Build/Improve existing toilet types				
Line Pit Latrine (watertight *high groundwater)				
Line Pit Latrine (not watertight *low groundwater)				
Double Leach Pit				
On-Site Septic Tank				
On-Site DEWATS				

PUBLIC SERVICE AND GOVERNMENT

Communal toilets/showers with its own storage/wastewater treatment, connecting nearby households				
Clustered households connected through a conveyance system to nearby storage/wastewater treatment				
Regular sewer network to centralized treatment capacity				
Simplified sewer network to centralized treatment capacity				
On demand FSM services with additional treatment plants nearby				
Scheduled FSM services with additional treatment plants within certain distance				

KEY

- URBAN
- PERI-URBAN
- SETTLEMENT
- RURAL
- PARTIALLY APPLICABLE INTERVENTIONS

The majority of the Sub-County population relies on on-site sanitation solutions and on-demand services such as latrine emptying, construction, and upgrading. Committee agreed-upon standards (see Cross Cutting Factors section) and legal minimum standards are the baseline requirements for all interventions. Previous investment has successfully reduced the rate of open defecation, setting a strong foundation to achieve the next stage of sanitation improvements - realizing universal safely managed sanitation. NSSC identified that toilet construction and improvements are still required in some communities. The NSSC agreed that a mix of centralized, semi-centralized, and decentralized solutions would be the most successful in achieving inclusive improved coverage. One potential solution for sub-countywide safely managed sanitation is scheduled universal FSM. This service would include; collecting a monthly sanitation levy, conducting scheduled

pit/septic tank emptying, watertight pit lining in areas with high groundwater, and the establishment of FSTPs within economically viable proximity to services. The combination of the scheduling, pit lining, and establishment of more FSTPs would improve the operational and economic efficiency of services while the incremental fee would ensure affordability. The universal fee collection, with those producing more wastewater paying higher fees, could provide some cross-subsidy. The NSSC agreed to explore this solution in greater detail for all unserved areas. Another potential solution identified for small settlements was cluster wastewater conveyance and treatment concepts using small to medium wastewater treatment systems. This solution consists of connecting existing toilets to simplified and/or solid-free sewer systems which convey the wastewater to a shared treatment plant. This solution requires paying a small fee for system operation and maintenance.

SOLID WASTE MANAGEMENT



SITUATION OVERVIEW

- 21,052 tonnes of solid waste generated per year averaging 0.19kg/day per capita
- Lack of a sanitary landfill and an insufficient number of dumpsites
- Primary waste collection is conducted in 6 zones contracted to private sector service providers and one zone, the CBD, collected by Nakuru County
- High rates of illegal solid waste dumping, burning, and pollution
- Low awareness of improved solid waste management practices
- Lack of regulatory frameworks to engage private sector to fill SWM gaps

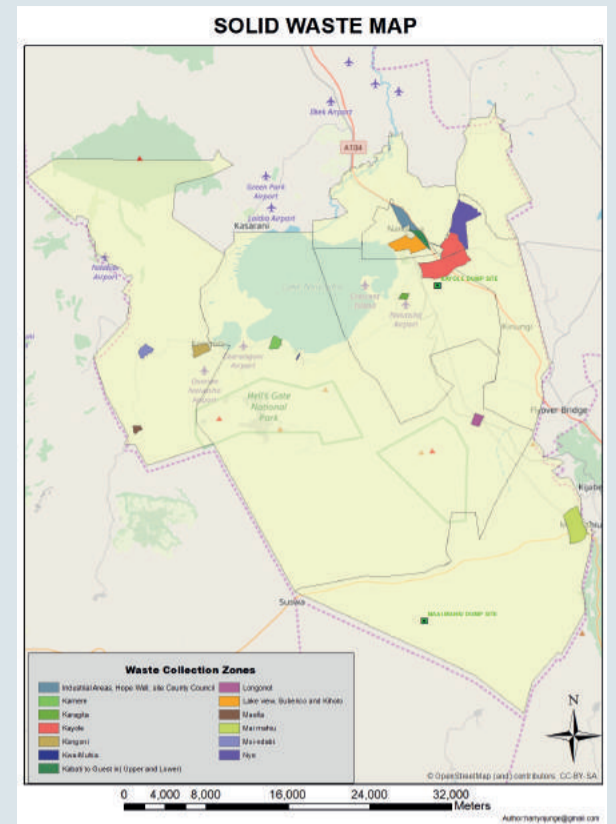


Table 1.2

Recommended water supply interventions categorize by settlement type

HOUSEHOLD SEPARATION ORGANIC AND NON-ORGANIC

Household waste separation and composting, individuals carry inorganic waste to a transfer point/station emptied bi-weekly or monthly	○	●	●	●
Household waste separation and composting, inorganic waste collected by local waste collector to transfer point/station emptied bi-weekly or monthly	○	●	●	○
Household waste separation, all waste collected by truck and managed at MRF with basic open air composting and a recycling depot (rural household inorganic waste could be managed here)	●	●	●	●
Household waste separation, all waste collected by truck and managed at MRF with high tech composting/black soldier fly organic waste processing, recycling depot and/or on-site processing for rural inorganic waste	●	●	●	●
Awareness Raising Program for household waste management	●	●	●	●
No waste separation - Walk to transfer station/point	●	●	●	○
No waste separation - Door-to-door collection	●	●	○	○
Dumpsite/landfill creation and management	●	●	○	○
Waste requiring new management regimes: Hazardous waste (health waste, corpses, carcasses, asbestos, chemical waste, e-waste)	●	●	○	○
Other waste needing new management - Construction waste	●	●	○	○

KEY

- URBAN
- PERI-URBAN
- SETTLEMENT
- RURAL
- PARTIALLY APPLICABLE INTERVENTIONS

Achieving comprehensive coverage of SWM services for the sub-county is a challenge. Providing solid waste collection services is particularly challenging for populations far from established dumpsites as they are uneconomical and unattractive to private service providers. Subsidy models, zoning to promote cross-subsidy, and the establishment of new landfills/dumpsites and transfer stations could provide financial incentives to support services for challenging areas. More detailed analysis is required to identify the most suitable solutions. The NSSC also identified waste streams that require new regulations, collection services, management, treatment and safe disposal services. These waste streams include healthcare waste, electronic waste, asbestos, corpses, carcasses, chemical waste, and construction waste. One potential solution to make SWM more economical is household waste separation and composting.

This requires separating organic and inorganic waste at a household level, which requires minimum behaviour change in areas where separation for farming practices is commonplace. Beyond improving economics, this solution could; reduce the organic waste volumes, provide compost as soil enhancement, and permit less frequent waste collection. Further investigation needs to be done to determine the extent of behaviour change required and overall feasibility of this solutions. Another innovative approach could include a MRF to manage and obtain additional value for collected solid waste. Solid waste processing at the MRF could consist of a basic option (open air composting and recycling separation) or a more advanced, high tech option (black soldier fly organic waste processing and on-site recyclable processing based on plastic fabrication into new items).

WATER SUPPLY



SITUATION OVERVIEW

- 84% of Naivasha Sub-County is supplied with treated water; 41% by NAIVAWASS through centralized piped networks sourced from groundwater and 43% by water kiosks
- NAIVAWASS plans to expand water supply services to Mai Mahiu Town and Kanamba Settlement (in Biashara Ward)
- Illegal and over abstraction of water by households as well as flower farmers and hotels is prevalent in unserved areas
- Lack of integrated water resource management and insufficient water source protection
- Water borne disease prevalence
- Water sources, primarily boreholes, have high fluoride content
- Lack of chemical and biological water quality monitoring

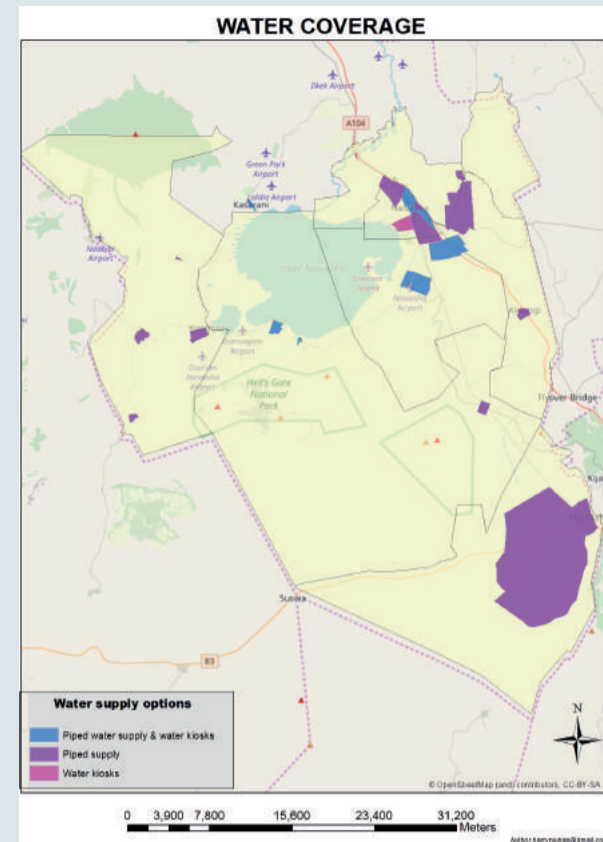
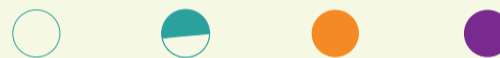


Table 1.3

Recommended water supply interventions categorize by settlement type

INDIVIDUAL

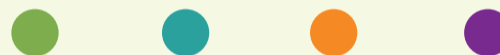
Individual Supply - Shallow Wells or Boreholes



PUBLIC SERVICE AND GOVERNMENT

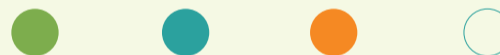
Water Kiosk/Stand/Point Treated

(Shallow wells/Boreholes people collect themselves)



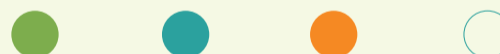
Water Kiosk/Stand/Point Treated

(Shallow wells/Boreholes with delivery service by vehicle)

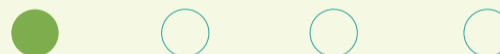


Water Kiosk & full Treatment with Distribution pipping

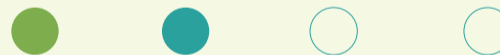
(Shallow wells/Boreholes dependent on well capacity)



Extend central water supply network - Individual household connection



Extend central water supply network - Kiosk for community sharing



KEY

- URBAN
- PERI-URBAN
- SETTLEMENT
- RURAL
- PARTIALLY APPLICABLE INTERVENTIONS

Currently, approximately 84% of Naivasha Sub-County has access to treated water supply, significantly superseding the coverage of the other environmental sanitation components. Centralized water supply network and water kiosk expansion plans are being implemented in underserved areas of the Sub-County through replicating proven service models. The primary water source utilized in Naivasha Sub-County is groundwater which is abstracted through drilling boreholes, though surface water, shallow wells, and springs are also used. Groundwater depths tend to be greater than 15m throughout the Sub-County and reach beyond 200m in some areas.

This provides an excellent buffer against contamination in areas with poor sanitation infrastructure, but requires higher infrastructure investment and operation costs. Most water sources contain high levels of fluoride requiring expensive defluorination processes to meet the legal safe limits. The NSSC aims that all water supply in Naivasha Sub-County meets a minimum water treatment standard which is currently suggested to be chlorination. Given the high need to have treated and specifically defluorinated water, the business case for the water supply interventions suggested above have shown financial viability for most settlement types, allowing for easy replication.

STORMWATER AND DISCHARGE OF TREATED WASTEWATER



SITUATION OVERVIEW

- Insufficient coverage of stormwater management and drainage systems
- Lack of drainage system management plans and structures
- Solid waste and eroded sediment clog open drains
- Loss of agricultural production due to flooding events such as El Nino floods in 2015
- Surface flooding causes erosion, siltation, and the flow of untreated effluent to the lake

IDENTIFIED STORMWATER AND DISCHARGE OF TREATED WASTEWATER INTERVENTIONS:

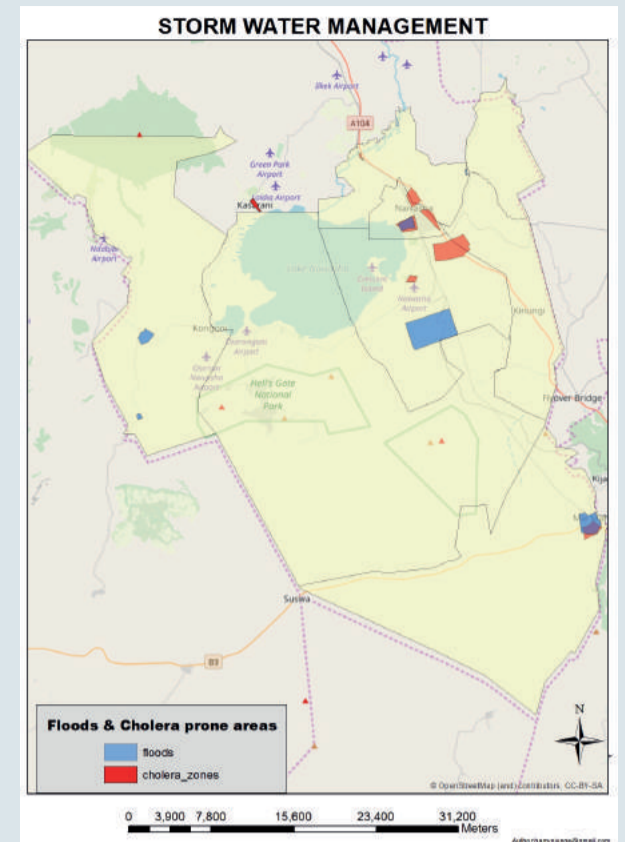
All potential interventions are applicable for all settlement types.

- Grey Drainage Solutions: open constructed drains with check dams or closed/covered drains with check dams
- Blue-Green Drainage Solutions: open drainage with plants and optional subsurface infrastructure
- Retention Ponds: ponds/pools to capture and slowly release surface runoff during rainfall events
- Stormwater and drainage management systems including- drain cleaning, lining, cover replacement and bollard replacement

KEY TAKEAWAYS

Several communities experience annual flooding and flood events, especially during the rainy seasons. Flash floods are primarily caused by deforestation, land degradation, and poor/poorly managed drainage systems. Given the arid nature of Sub-County, land degradation resulting in low vegetation and high soil surface cover results in rapid surface runoff that can exacerbate flood events. High levels of surface soils paired with heavy rainfall events can cause

significant soil erosion rates which can block existing drains, cause sediment accumulation in Lake Naivasha, and in extreme cases even collate with other factors to trigger landslides. In Mai Mahiu Ward, Narok Road and Logonot settlement have previously experienced landslides. The Sub-County lacks stormwater and drainage management and maintenance plans for most existing systems. Consequently, existing infrastructure is often filled with solid waste and/or sediment, which block water flow and can even be the source flooding. Several interventions could significantly help reduce the frequencies and impacts of flood events including; 1) increasing vegetation cover, especially in settlements with steeper slopes 2) implementing stormwater and drainage management and maintenance systems for existing infrastructure paired with 3) the construction of water retention ponds for high risk areas. Infrastructure-based drainage solutions should be prioritized for settlements with flooding and landslide events.



CROSS CUTTING FACTORS



AN ENVIRONMENT THAT PROMOTES PARTNERSHIP, COLLABORATION, AND NEW OPPORTUNITIES

Dialogue throughout the planning process emphasized the importance of adhering to minimum intervention and implementation standards including; public participation, gender, social inclusion, disability, improved toilets, climate sensitivity and resilience, and more. It was agreed that these and other legal minimum standards are the unstated baseline requirements that must be considered for all interventions. Cross-cutting and enabling environment components including awareness raising, behaviour change communication, sustainability planning, capacity development, knowledge generation and

management, and monitoring and evaluation were identified as foundational elements for almost all interventions. Fostering political goodwill through inclusive action planning and implementation processes was also identified as an important undertaking. For current and future planning, preference will be given to green and blue solutions, solutions enhanced by incorporating information technology and technology, and solutions offering private sector partnership opportunities. The NSSC identified the need for policy changes to facilitate and support private sector engagement in environmental sanitation, similar to the sanitation levy that is being enacted by the County Government of Nakuru.

CONCLUSIONS

SUB-COUNTYWIDE PRIORITY INTERVENTIONS

Given the dynamic settlement types in Naivasha Sub-County, no single solution is recommended to achieve the vision of inclusive sub-countywide sanitation coverage or solve any individual environmental sanitation challenge. Through analytical exercises, the planning process was able to prioritize sub-countywide and location specific interventions. Here these interventions are categorized by environmental sanitation component and implementation timeframe. Short-term interventions can be achieved in 0-2 years, medium-term interventions can be achieved in 2-5 years and long-term interventions can be achieved in 5+ years.



SANITATION, EXCRETA, AND WASTEWATER MANAGEMENT

- Short-Term Interventions:**
- Increase Wastewater and Fecal Sludge Treatment Capacity - establish a new plant in Mai Mahiu and expand treatment capacity of the existing WWTP in Naivasha Town
 - Promote and support septic tank construction
 - Sanitation Marketing
- Medium to Long-Term Interventions:**
- Establish scheduled universal FSM



WATER SUPPLY

- Short-Term Interventions:**
- Community Water Project Regulation
 - Water source quality protection
 - Continue Water Kiosk Construction
- Ongoing Priorities:**
- Continue regulation and water source quality protection



STORMWATER AND DISCHARGE OF TREATED WASTEWATER

- Short-Term Interventions:**
- Construct Open Drains
- Medium and Long-Term Interventions:**
- Establish Water Retention Ponds - for areas where stormwater management will eventually discharge into Lake Naivasha (e.g Kihoto, Karagita, Kamere)



SOLID WASTE MANAGEMENT

- Short-Term Interventions:**
- Sub-Countywide SWM Awareness Program - improve household SWM, promote waste separation, and promote the 4Rs (reduce, reuse, recycle, and refuse)
 - Healthcare Waste Management Capacity Development Program - to build capacity and awareness for healthcare professionals to manage waste at the new specialized facility
 - Public Beach SWM - install dustbins and skip containers paired with regular emptying and maintenance services
- Medium and Long-Term Interventions:**
- Dumpsite Upgrade Program - transform current dumpsites to meet compliance
 - Establish Transfer Stations and Points - increase regulated waste disposal transfer stations and/or points sites for improved transfer to final dumpsites
 - Establish New Waste Management Regimes - establish and implement new policies, regulations and management solutions for the safe disposal of challenging waste (asbestos, construction waste, corpses etc.)



CROSS-CUTTING MEASURES

- Short-Term Interventions:**
- Promote Opportunities for Private Sector Engagement - across the sub-county to meet service demands
 - Improve Regulation Enforcement - across all areas of existing regulations
- Medium and Long-Term Interventions:**
- Policy Advocacy - to create an enabling environment for environmental sanitation solutions and specifically to improve the financial sustainability of FSM



INSTITUTIONS

- Short-Term Interventions:**
- On-site decentralized wastewater treatment systems
 - On-site pit composting
 - Establish more communal toilets

CONCLUSIONS

LOCATION SPECIFIC PRIORITY INTERVENTIONS



Table 2.0

Location Specific Priority Interventions by Settlement Type

KEY

- URBAN
- PERI-URBAN
- SETTLEMENT
- RURAL

HELLSGATE	●	KARAGITA, KIWANJA NDEGE, SANCTUARY, MIRERA	<ul style="list-style-type: none"> ◦ Stormwater and drainage maintenance plan ◦ Sanitation marketing and behaviour change communication programs
MAI MAHIU	●	MAI MAHIU	<ul style="list-style-type: none"> ◦ WWTP/FSTP and FSM Services ◦ Water supply through kiosks or centralized distribution
	●	MAI MAHIU PERI-URBAN AREA	<ul style="list-style-type: none"> ◦ WWTP/FSTP and FSM Services ◦ (extensions from the Mai Mahiu Town) ◦ Water supply through kiosks or centralized distribution
LAKEVIEW	●	CBD (NAIVASHA)	<ul style="list-style-type: none"> ◦ Stormwater and drainage maintenance ◦ Increase FSTP capacity at existing WWTP ◦ Rehabilitate sewer lines and encourage extension in the CBD
	●	CCCR, KABATI, HOPEWELL, SITE AND SERVICE	<ul style="list-style-type: none"> ◦ Promote septic tank construction ◦ Clustered household toilet connections ◦ to decentralised treatment in Hopewell
	●	KIHOTO, KAYOLE, LAKEVIEW	<ul style="list-style-type: none"> ◦ Prioritize pit lining in Kihoto ◦ Create and manage dumpsite/landfill
OLKARIA	●	KAMERE, KWAMUHIA, KARUTURI	<ul style="list-style-type: none"> ◦ Improved SWM Services ◦ Public Beach SWM through installing skip containers



Participants at the fourth steering committee meeting held on 27 September 2018 at Astorian Hotel Naivasha

THE TIME HORIZON

SHORT TERM

(PRESENT THROUGH 2022)

Detailed action planning and implementation for quick-win priority interventions should be achieved in this timeframe. These interventions include new services and systems which do not require significant institutional or legal changes and cross-cutting solutions requiring minimum financial resources. An enabling environment and appropriate resource allocation are key to enacting these changes within the time horizon.

MEDIUM TERM (2022 - 2025)

AND LONG-TERM (2025-2030)

These two time horizons and their respective interventions have been combined until detailed action plans are completed. These time horizons include interventions that take longer to enact, but have potential to significantly improve environmental sanitation improvements. These interventions are more complex, investment intensive, or otherwise require significant changes to the enabling environment to be implemented.

NEXT STEPS

THE WAY FORWARD

This report is the first of many steps the NSSC is taking to improve environmental sanitation in Naivasha. The Naivasha Sub-Countywide Inclusive Sanitation Plan provides the foundation for sanitation interventions in the sub-county and informs the strategy and resource allocation in Nakuru County. This plan integrates into the Nakuru Countywide Sanitation Plan to align with a countywide vision of inclusive sanitation for all.

The next steps to achieve these sanitation visions are:

- Develop detailed investment action plans and implementation plans. Specifically seek support for feasibility studies, investment planning, and technical assistance.
- Continue integration of this work with NACOSTEC regional planning.
- Extend impact beyond Naivasha by sharing lessons learned through workshops and other means.

The unique nature of the Naivasha Sub-County CWISP, which pairs potential solutions according to categorized settlement types, provides a flexible foundation for continuous plan enhancement and amendment as the Sub-County evolves.

The NSSC is committed to continuing to manage this sanitation plan and use it to establishment a multi-annual implementation program to attract project finances and catalyze Sub-Countywide change.

Continuing the existing project momentum and commitment, the Naivasha Sub-County Sanitation Steering Committee and its respective CWISP project partners welcome collaboration, partnership, and finance to achieve the Naivasha Sub-County vision.

REFERENCES

Home - Kenya National Bureau of Statistics, Nairobi, Kenya.
Retrieved February 14, 2019, from <https://www.knbs.or.ke/>

Nakuru County Integrated Development Plan 2013-2017. Accessed February 14, 2019. <https://www.nakuru.go.ke/wp-content/uploads/2014/03/Nakuru-COUNTY-INTERGRATED-DEV-PLAN-2013-2017.pdf>.

Lake Naivasha - Wikipedia." Accessed February 14, 2019.
https://en.wikipedia.org/wiki/Lake_Naivasha.

Supply, Water, and Sanitation Collaborative Council.
"Summary report of Bellagio expert consultation on environmental sanitation in the 21st century, 1e4 February 2000." Duebendorf: Swiss Federal Institute for Environmental Science and Technology (2000).

Lüthi C, Morel A, Tilley E, Ulrich L. Community-led urban environmental sanitation planning: CLUES. Complete guidelines for decision-makers with 30 tools. Dübendorf, Switzerland: Swiss Federal Institute of Aquatic Science and Technology (Eawag); 2011.

City Sanitation Planning | 1. Accessed February 14, 2019.
<http://citysanitationplanning.org/downloads/BORDA%20CSP%20guide%20-%20part2-sml.pdf>.

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Let us keep the joint effort going to achieve the
Naivasha Sub-County Vision.

**THE COUNTY GOVERNMENT
OF NAKURU**

County Government Headquarters,
Government Road/Moi Road,
P. O. Box 2870-20100 Nakuru, Kenya
Tel: +254 051 221 6379/80
Direct Line: +254 051 221 4142
E-mail: info@nakuru.go.ke
www.nakuru.go.ke

NAIVAWASS

Naivasha Water, Sewerage and Sanitation Company Ltd,
Jonka building, 1st floor, Prisons Road/Biashara Street
Junction
P. O. Box 321 Naivasha, Kenya
Tel: +254 020 234 807
Mobile: +254 0 705 877 770
E-mail: info@naivashawater.co.ke
www.naivashawater.co.ke

BORDA

Bremen Overseas Research and Development Association,
BORDA e.V., Am Deich 45, 28199 Bremen, Germany
Tel: +49.421.408952-0
Fax: +49.421.408952-50
E-mail: office@borda.org
www.borda.org

SANIVATION

P. O. Box 262-20117 Naivasha, Kenya
E-mail: info@sanivation.com
www.sanivation.com

