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MINISTRY OF WATER, SANITATION AND IRRIGATION

2021 ANNUAL STATUS REPORT

ON

WATER, SANITATION AND IRRIGATION



Water is Life
Maji ni Maisha

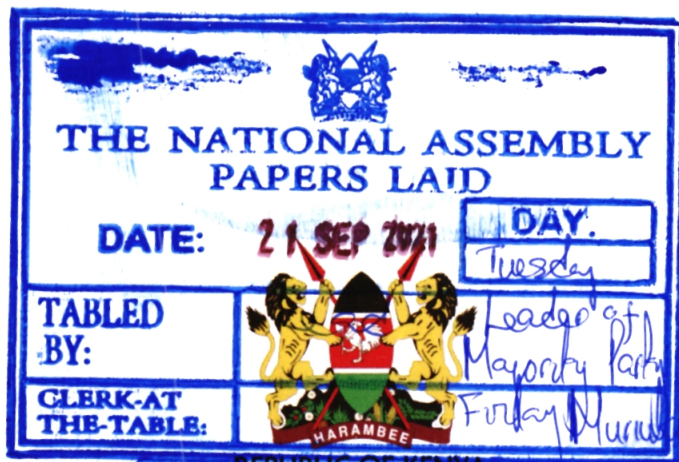


Sanitation is Dignity
Sanitation ni Digniti



Irrigation is Livelihood

JUNE 2021



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Water is Life
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Sanitation is Dignity
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Irrigation is Livelihood

JUNE 2021



H.E the President Uhuru Kenyatta Commissioning Kabiria Community Water Supply Project in Dagoreti Sub-County, Nairobi County. This Project is among 193 Water Supply Projects constructed in the Nairobi Metropolitan Area to mitigate effects of Covid-19 Pandemic.

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FOREWORD



The Constitution of Kenya under Article 43 accords every Kenyan to the right to water and reasonable standards of sanitation among other economic and social rights. Further, the Constitutional architecture provides for two levels of government and demands of them to work in consultation and cooperation.

The Ministry's mandate entails the development and management of Water Resources, drainage and land reclamation, Sanitation and Irrigation. In discharging the mandate, the Ministry is guided by key policy documents which include the Constitution of Kenya, the Jubilee Manifesto, the Third Medium Term Plan 2018-2022 (MTP III) of the Kenya Vision 2030, Big Four Agenda and Ministry Strategic Plan 2018-2022, the Water Act, 2016 and the Irrigation Act, 2019.

To align the sector with the Constitutional provisions, SDG 6, AU Agenda 2063 and to entrench devolution, right to water and sanitation services, national values and principles of governance in the sector and to the imperatives of the National Climate Change Action Plan, the Ministry finalized the Sessional Paper No. 1 of 2021 on National Water Policy which is currently before Parliament. Further, during the subject period the ministry developed four (4) sets of Regulations being Water Resources, Water Harvesting and storage, Water Services and Irrigation Regulations. These Regulations are meant to operationalize the implementation of the Water Act, 2016 and the Irrigation Act, 2019. The Irrigation Guidelines 2020 were also finalized and published. Water and Irrigation Strategies were also finalized.

The Ministry targets to increase access to safe and clean water to 80% from 63% in 2019 and move access to reasonable standards of sanitation services to 40% from 26% in 2019 by end of 2022. In addition, under MTP III, the Ministry also targets to increase area under irrigation by 190,000 acres from 510,000 acres in 2019 to 700,000 acres by 2022. To realize these targets, the ministry has prioritized projects which are at different stages of implementation and a number of programs, policies, legal and institutional reforms are underway.

Presently, access to water is at 65.5% while urban sewerage is at 27.7% and area under irrigation stands at 552,000 acres. This falls short of the envisioned targets in view of the time remaining to 2022. However, the Ministry is currently implementing 685 projects aimed at achieving the desired targets.

Irrigation is a major contributor to the achievement of food security for Kenya as well as improving peoples' livelihoods and economic welfare. The irrigation potential is estimated at 1.913million acres (765,575 ha) as per the National Water Master Plan 2030 without water storage and can go up to 3 million acres (1.2 million ha). Out of this total potential only 552,000 acres has been developed accounting for 29% coverage while out of the country's total arable land only 5.8% is equipped with irrigation infrastructure. This calls for concerted efforts towards increasing irrigation water use in a bid to increase yield to support food and nutrition security efforts and support growth in manufacturing vide agro-processing of surplus produce and value addition.

This second Annual Status report as a statutory document tracks the state of the sector's development and key achievements towards realization of universal access to water and sanitation services, increase food security and its sustainable management through implementation of the developed policies and strategies. Equally, it provides an opportunity to understand the challenges and emerging issues in the water, sanitation and irrigation sector.

The report keeps the sector and stakeholders informed on progress and the bottlenecks to the sector's development. The Ministry and the sector institutions therefore, have to ensure that the challenges bedeviling the sector are adequately addressed towards realization of rights envisaged under Article 43 of the Constitution for progressive national development.

In recognition of the need to make tangible impact in the water sector and in line with the Jubilee Government priorities, the Ministry implemented the 3rd Wave of Rapid Results Initiative (RRI) aimed at fast tracking completion of 77 critical projects across the country which led to the realization of 41 completed projects. This and other efforts have led to the Ministry's improved performance as evidenced by the 2019/20 ranking where it was ranked at position five with a score of 3.1500 (Good category) by the Ministry of Public Service and Gender.

During the year under review, the country faced the challenge of COVID-19 pandemic. The Ministry put in place robust approach to adhere to health protocols to address the threats posed by COVID-19 as well as advance its projects implementation. The Ministry in collaboration with other Government Agencies implemented Emergency Water Works to help contain spread of COVID-19 by installation of water service infrastructure for Independent Community Projects across the Country especially the informal settlements. After post COVID 19, the Ministry mobilized Ksh. 5 billion to support the Water Service Providers in the Country.

In conclusion, we remain focused to realize the ultimate goal by His Excellency the President; implement projects, programs, policies, legal and institutional reforms that will ensure increased provision of water and sanitation services, food and nutrition security and the realization of the “Big Four” Agenda.

A handwritten signature in black ink, consisting of a circular initial 'SK' followed by a long, horizontal, slightly wavy line.

Sicily K. Kariuki (Mrs), EGH
Cabinet Secretary
Ministry of Water, Sanitation and Irrigation

PREFACE

The Kenya Vision 2030 goal and SDG 6 on water and sanitation under the social pillar is universal access by 2030. Despite Kenya being a water scarce country, the Ministry has an obligation to put in place plans, systems and mechanisms to achieve gradual realization of the universal access to water and sanitation and food security. This can be achieved through increasing water harvesting and storage, sewerage system coverage, expansion water supply networks, drainage and more irrigation schemes. In discharging its mandate, the Ministry is guided by key policy documents which include the Constitution of Kenya 2010, the Water Act 2016, Irrigation Act 2019, and the Big Four Agenda among other subsidiary regulatory frameworks. These policies emphasize the need for efficiency and better management in the utilization of water, sanitation and irrigation resources to enable the government achieve its economic growth, food security, poverty reduction through employment creation and social stability.



In recognizing the challenges faced, the Government is engaged in the implementation of over 685 projects across the country that are intended to upscale access to water, sanitation and irrigation. The projects earmarked for completion in different parts of the country are; Northern Collector Water Extension project targeting to increase water in Nairobi by 140,000 cubic meters per day to serve an additional 1,200,000 people, Construction of new sewerage schemes in Chepareria, Mandera, Marsabit, Oyugis and Kapenguria. Others include; Embu Sewerage Project to improve sanitation in Embu town, Nyeri Sewerage Project to improve sanitation in Nyeri town, Garissa Sewerage Project, Mavoko Water Supply Project to serve 500,000 people in Mavoko area in Machakos County, Narok Sewerage Project, Oloitokitok Water and Sewerage Project to serve the people of Oloitokitok in Kajiado County. This will also lead to reduction of the Health budget and promote Human and Environment Health. Completion of these projects will be a key enabler for the attainment of the Government's Big Four Agenda as water is a principal component in all the elements of the agenda. In addition, the Ministry targets to increase the area under irrigation to about 2 million acres by the year 2030.

To upscale the country's irrigation capacity, the Ministry in the last one year has completed Riamukurwe irrigation development project in Nyeri County benefiting 500 farmers, Muringa Banana Irrigation Project Phase 3 in Tharaka Nithi County benefiting 3,000 farmers, Mweru Umoja Irrigation Project in Meru County benefiting 1,000 farmers, Oldonyiro Irrigation Development Project Phase 2 in Isiolo County benefiting 300 farmers among others.

Finally, the Ministry is committed to enhance completion rates of all ongoing projects and programs to increase water and sanitation coverage as well as food security. This will be achieved through strengthening performance measurement and management in implementation of project. In addition, synergies will be enhanced between Departments at the headquarters, Sector Institutions, other Government Agencies and key stakeholders to fast-track these projects and reap maximum returns.



Dr. Andrew Tuimur, CBS
Chief Administrative Secretary
Ministry of Water, Sanitation and Irrigation

ACKNOWLEDGEMENT

The expanded mandate to the Ministry through Executive Order No. 1 of 2019 (Revised 14th January 2020), demonstrates the government's commitment to accelerate the development in the water, sanitation and irrigation sector.

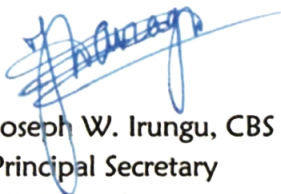
The Ministry was able to complete 41 projects during the review period with 22 being water projects, 4 sewerage project and 15 being irrigation projects. During the same period, a total of 20 projects were started with 18 being water projects and 2 being sewerage projects. The last mile connectivity was also undertaken connecting 97,000 people to water and 40,000 people to sewerage respectively.



To support monitoring, evaluation and reporting of the implementation of projects, the Ministry will ensure that the information submitted is accurate, adequate and reliable for use in making informed policy decisions. To streamline reporting for this annual status process, the preparation will start early with contribution from all the stakeholders.

I would like to express sincere appreciation to the water, sanitation and irrigation sector players. Specifically, I wish to acknowledge the roles and contributions of all stakeholders, including our water sector institutions and technical staff. I urge all key stakeholders to own this second status report as it will inform some of the policy guidelines that will be issued by the Ministry from time to time for effective service delivery to the Kenyan citizens.

I sincerely thank all those who participated in the preparation of this report. In particular, I would like to appreciate the invaluable contribution of the technical working group that was coordinated by the Water Secretary, Eng. SAO Alima comprising of Eng. James Muturi, Rolex Kirui, Georgia Musau, Nancy Koech, Daniel Odero, Esther Musavi, Derrick Ojuku, Heads of the departments in the Ministry and Chief Executive Officers of State Corporations. I also wish to appreciate the office of the Cabinet Secretary and Cabinet Administrative Secretary for providing leadership and direction on the preparation of this second annual status report.



Joseph W. Irungu, CBS
Principal Secretary

Ministry of Water, Sanitation and Irrigation

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LIST OF ACRONYMS

ACA	Athi Catchment Area
AfDB	Africa Development Bank
AWWDA	Athi Water Works Development Agency
AMCOW	African Ministers' Council on Water
ASALs	Arid and Semi-Arid Lands
BADEA	Arab Bank for Economic Development in Africa
BCM	Billion Cubic Metres
BWRCs	Basin Water Resources Committees
CAACs	Catchment Advisory Committees
CEO	Chief Executive Officer
CBO	Community Based Organization
CoK	Constitution of Kenya
COVID	Corona Virus Disease
CWWDA	Coast Water Works Development Agency
EAC	East African Community
ECDPs	Effluent Discharge Control Plans
ENNCA	Ewaso Ng'iro North Catchment Area
GDP	Gross Domestic Product
GOK	Government of Kenya
GIS	Geographic Information System
HYCOS	Hydrological Cycle Observing System
IGAD	Intergovernmental Authority on Development
IHP	International Hydrological Programme
IWRM	Integrated Water Resources Management
KEWI	Kenya Water Institute
KFS	Kenya Forest Service
KfW	German Development Bank
LADA	Land Degradation Assessment
LDN	Land Degradation Neutrality
LVNCA	Lake Victoria North Catchment Area
LVNWWDA	Lake Victoria North Water Works Development Agency
LVSCA	Lake Victoria Catchment Area
LVSWWDA	Lake Victoria South Water Works Development Agency
MAR	Managed Aquifer Recharge
MCM	Million Cubic Metres
MoUs	Memorandum of Understandings
MW	Mega Watts
NAS	Nairobi Aquifer Suite
NBI	Nile Basin Initiative
NDICCC	National Development Implementation and Communication Cabinet Committee
NIA	National Irrigation Authority
NMS	Nairobi Metropolitan Services
NRW	Non-Revenue Water
NRWWDA	North Rift Water Works Development Agency
NWCPC	National Water Conservation and Pipeline Corporation
NWHSA	National Water Harvesting and Storage Authority

NWMP2030	National Water Master Plan 2030
NWRS	National Water Resources Strategy
PSC	Public Service Commission
PPPs	Public Private Partnerships
RCGW	Regional Centre on Groundwater
RCMRD	Regional Centre for Mapping of Resources for Development
RQOs	Resource Quality Objectives
RRI	Rapid Results Initiative
RVCA	Rift Valley Catchment Area
SAGA	Semi-Autonomous Government Agency
SDGs	Sustainable Development Goals
SCMPs	Sub catchment Management Plans
SEZ	Special Economic Zone
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
USD	United States Dollar
USGS	United States Geological Survey
WAB	Water Appeal Board
WASREB	Water Services Regulatory Board
WRA	Water Resources Authority
WRMA	Water Resources Management Authority
WRUAs	Water Resource Users Associations
WSB	Water Services Board
WSPs	Water Service Providers
WSTF	Water Sector Trust Fund
WT	Water Tribunal
WWDAs	Water Works Development Agencies

EXECUTIVE SUMMARY

This annual report is a detailed assessment status of the water, sanitation and irrigation sector. It provides the ministry situation analysis with highlight of the key achievements, lessons learnt, challenges, emerging issues and recommendations. The key projects including the “Big Four” to be implemented in the medium-term period are also outlined in the report.

During the review period, the Ministry completed the development, public participation and Pre-Publication consultations with committees of Delegated Legislation on both houses for Water Services, Water Harvesting and Storage and Water Resources, and Irrigation (General) Regulations 2020. The Ministry also developed Key Policy documents including the National Water Policy being the Sessional Paper No. 01 of 2021 which is in Parliament awaiting debate; National Irrigation Services Strategy and Water Act (Amendments) Bill aimed at bridging gaps and addressing inconsistencies in Water Act, 2016; draft Sanitation policy which has been developed and a stakeholder consultation done. The Irrigation Guidelines 2020 were finalized and published. In addition, the Ministry undertook Asset and Liabilities verification exercise resulting in a comprehensive consolidated report from all the Agencies which is awaiting validation prior to its Gazettement as required by the Water Act 2016.

On the implementation of programmes, the Ministry increased water coverage from 53.3% in 2013 to 65.5% in 2021 while sewerage coverage in urban areas increased by 3.9% from 22.1% in 2013 to 26% in 2021. To achieve universal access by the year 2030, a road map was developed to undertake key projects and programs that will connect 200,000 people to water and 350,000 to sewerage system annually throughout the country. To progressively achieve right to clean and safe water in adequate quantities among the people of Kenya and ensure no Kenyan is left behind, twenty eight water projects have been completed in marginalised areas benefitting 100,000 people and about 3.5 million livestock through the Equalization Fund .

Under the Kenya Towns Sustainable Water and Sanitation Programme, a total of 8 projects are earmarked for last mile water connectivity while three are for last mile sewerage connectivity. When complete, 192,000 people will be connected to water while 80,000 people will be connected to sewerage. Three water projects and one sewerage project have been completed connecting 97,000 people to water and 40,000 people to sewerage respectively.

On water harvesting and storage, the Ministry is fast tracking construction of large multipurpose dams namely Karimenu II and Ruiru II in Kiambu, Thwake in Kitui/Makueni, fast-tracking of RAP implementation for Mwache Dam in Kwale/Mombasa to pave way for construction works to commence and Soin-Koru multipurpose dam is also being processed for implementation. The Ministry is also constructing Medium Sized dams including Yamo in Samburu County and Siyoi-Muruny Dam and Water Supply in West Pokot County. The Ministry also identified and constructed three peace dams namely Kases in West Pokot, Forolle in Marsabit and Naku'etum in Turkana.

On Irrigation programme, the Ministry developed 48,000 acres under public schemes and community-based smallholder irrigation schemes contributing an average 66,000 tons of rice and 17,000 tons of maize annually, directly benefiting over 108,077 farmers. Further, the Ministry constructed 25,091 household water pans by end of June 2021 across 47 counties. This translates to 28.09 million m³ of storage to irrigate about 14,980 acres of land.

The Ministry authorized staff establishment is one thousand and twelve (1,012) employees against an in post of six hundred and thirty-five (635) which give variance/gap of three hundred and seventy-seven posts (-377). Out of the 635 in post, technical departments constitute 62.4% of staff while shared services are 37.6%. In the Water Sector Institutions, the total authorized establishment is three thousand one hundred and sixty-two (3,162) employees against an in post of one thousand nine hundred and fifty-six (1,956) giving a variance/ gap of one thousand two hundred and six (-1,206). To bridge these gaps and enhance human capacity, the Ministry recruited 63 new staff and trained 100 in both and long courses during the period under review.

In terms of budget implementation performance, the Water, Sanitation and Irrigation sub sector budgetary allocation increased from Ksh. 49.61 billion to Ksh. 70.43 billion in the financial years 2018/19 and 2019/20 respectively. During the same financial years, actual expenditures were Kshs. 42.31 billion and Kshs. 58 billion translating to absorption levels of 85% and 83% respectively. However, in the financial year 2020/21 the Ministry was allocated a budget of Ksh.79.4 billion but suffered development budget cut amounting to Kshs 2.6 billion for 16 projects which includes the 'Big Four' while 12 projects gained a total amount of Kshs 4.2 billion.

Despite these achievements, there were some challenges faced during the review period that include; Governance challenges in the management of Water Services Providers, Investment in the water sector is not matching the population growth, dilapidated infrastructure because no funds are allocated for maintenance of these water supplies and sanitation facilities, inadequate funds due to budgetary cuts, disputes in land acquisition,

inadequate framework, low capacity of farmers in irrigation farming and land reclamation mandate is not clearly stipulated as a national government or county government function.

A number of lessons were also learnt, these were: Collaborative framework between the National and County governments is essential for sustainable water resource, sanitation, land Reclamation and irrigation management; formulation of appropriate grievance redress mechanisms for handling disputes affecting projects assist in fast-tracking project implementation ;it is essential to reduce water resources sharing conflicts through Trans county water resources framework and financing of irrigation development through cost sharing model with project beneficiaries improves the rate of irrigation development, ownership and sustainability.

The Ministry has put in place mechanisms to overcome these challenges by: Fast-tracking the finalization of three strategies which have been submitted to National Development Implementation and Communication Cabinet Committee (NDICCC)namely; National Water Services and Sanitation Strategy, National Water Resources Management Strategy, National Water Harvesting and Storage Strategy and integrated Irrigation Development. In addition, the Ministry will also fast-track finalization of Water Services Regulations, Water Harvesting and Storage Regulations, Water Resources Regulation and Irrigation Regulations with the AG for processing.

To address the inadequate financial resources, the Ministry will continue to rationalize its activities to match the expected exchequer releases. In addition, the Ministry will continuously engage the National Treasury and Parliament with a view to enhance allocation for the projects, ensure prompt disbursement and provide funds for implementation of resettlement action plans in time.

1.0 INTRODUCTION

The Ministry of Water, Sanitation and Irrigation was formed after the merger of the former Ministry of Water and Sanitation and State Department for Irrigation through Executive Order No. 6 of 22nd August 2019. The mandate of the Ministry was further revised through the Executive Order No. 1 of 2020 issued on 14th January, 2020 (Revised). The Ministry's mandate is guided by key laws and policies as provided by the Constitution of Kenya 2010, Water Act 2016, Irrigation Act 2019, Kenya Water Institute (KEWI) Act 2001, legal notice number 252 of 2015, Agenda 2063, SDGs No. 2, 6, and 15, Kenya Vision 2030, MTP III (2018-2022), and the 'Big four' agenda. The Ministry faces a number of global, regional and national challenges that include: climate change, rapid technological advancement, Covid-19 Pandemic, transboundary water resource issues, population growth, human settlements, poverty, pollution, acquisition of land to implement projects and degradation of catchment areas.

The Ministry's mandate is to develop policies and strategies to protect, conserve, and manage Water Resources, achieve progressive realization to right to water, sanitation and food security in accordance to article 43(b) (c) and (d) of the constitution for socio-economic development of the Nation. In addition, it is also mandated to offer consumer protection to water users, hydraulic engineering, sector coordination and resource mobilization. The functions of the Ministry are: Water Resources Management Policy, Water and Sewerage Services Management Policy, Waste Water Treatment and Disposal Policy, Water Catchment Area Conservation, Control and Protection, Water Quality and Pollution Control, restoring the rivers and lakes water balance, Sanitation Management of Public Water Schemes and Community Water Projects, Water Harvesting for Domestic and Industrial Use and Flood Control Management; National Irrigation policy and Management; Management of Irrigation schemes; Mapping, Designating and Developing areas ideal for irrigation schemes; and Water harvesting and storage for irrigation. This mandate is guided by laws and policies which emphasize the need for efficiency and better management in the utilization of natural resources to enable the government achieve its strategic goals of economic growth, poverty reduction and social stability.

Water is an important natural resource to all forms of life and their existence and is an essential prerequisite for inclusive economic growth, poverty reduction and sustainable socio-economic development. Sustainable use and management of water resources is key to the successful implementation of the Country's development agenda and achieving sustainable development goals. With Kenya classified as water scarce country while recognizing water as a key driver of all sectors of the economy, water requires serious attention.

Sustainable water resources use and management is key to successful implementation of the national development agenda. With Kenya classified as water scarce country while recognizing water as a key driver of all sectors of the economy, water requires serious attention and in particular allocation of the resources necessary for its management and development. However, allocation of enough resources for the water resources sector has been a challenge. Provision of adequate resources to this sector will also ensure the country realizes the benefits of the 'Big Four Agenda'. It will also lead to achievement of the Kenya Vision 2030 development agenda under the social pillar on attainment of universal access to water by 2030 and the economic pillar on food security. Further, it will assist in achievement of Sustainable Development Goals, especially Goal No. 6 on "Ensuring Availability and Sustainable Management of Water and Sanitation for all" in which the sector is targeting to increase the percentage of national population with access to safe water from 65.5% in 2021 to 80% by 2022 and 100% by 2030. The sector also targets to increase the percentage of the national population with access to sewerage from 27% in 2021 to 40% by 2022. Further, it will contribute towards achieving SDG 2 on hunger; food security and agriculture through implementation of livelihood enhancement activities. Provision and allocation of water for irrigation development will be key in the attainment of this goal. Similarly, conservation and protection of riparian land in Kenya has become increasingly important. This is to secure our water bodies from encroachment and pollution which have become serious threats in the recent past. On the same note, it is important that safety and stability of our water infrastructure is ensured. Regulating the development of the infrastructure is a matter of priority for the sustainability of investments.

Furthermore, enhancing the quality and utility of country's water information including water monitoring and data collection network; restoring the water catchment areas including the aquifers for water balance; restoring the river basins water balance; reducing pollution levels and enhancing water quality must be a matter of priority. There is need to support water resources programmes as this will create an enabling environment for other sectors to grow and also minimize the water scarcity shocks. The reliability and access to water resources is a fundamental human right under the economic and social rights Article 43, (1), (d), to clean and safe water in adequate quantities and the state has the obligation under the constitution to preserve and ensure the right is achieved. The well managed water resources will enhance the country's negotiating position with the other riparian countries on equitable sharing of transboundary resources will assist the country in negotiating with other countries that share trans-boundary waters. Further, the cost for water infrastructure development and maintenance will reduce significantly due to improved quality and quantity of water

In addition, it is important to note that water sources are not only affected by poor land use and land management practices but land degradation also cause an estimated annual economic loss of about 3% to the national GDP or about USD 390million annually (MTP 2008-2012). Land waste leads to dam siltation that is the norm in Kenya. GIS and remote sensing data (2012) obtained over a period of 20 years indicate, there is a serious and increasing level of severity of land degradation and land waste that is affecting the capacity of Kenya's land to conserve, store and release water resources sustainably thereby compromising water security, land productivity and increasing conflict among communities. Therefore, this calls for additional resources to achieve Sustainable Development Goal No. 15 to halt and reverse land degradation and target to achieve land degradation Neutrality (LDN) by 2030.

Irrigation is a major contributor to achievement of food security for Kenya as well as improving peoples' livelihoods and economic welfare. The irrigation potential is estimated at 1.913million acres (765,575 ha) as per the National Water Master Plan 2030 without water storage and can go up to 3 million acres (1.2 million ha). Out of this total potential only 552,000 acres has been developed accounting for 29% coverage while out of the country's total arable land only 5.8% is equipped with irrigation infrastructure. This calls for concerted efforts towards increasing access to agricultural water in a bid to increase yield to support food and nutrition security efforts and support growth in manufacturing vide agro-processing of surplus produce and value addition.

After the promulgation of the Constitution of Kenya, 2010 there was need to repeal the Water Act 2002 and promulgate a new law (Water Act, No. 43 of 2016). This was mainly due to introduction of devolved units (counties) to replace the earlier provinces and districts. The counties were given the responsibility of services delivery while the National Government retained the role of water resources conservation and management and infrastructure development. The Ministry developed and enacted Water Act 2016 to repeal Water Act 2002. The Water Act 2016 Section 10 (4) states that the Cabinet Secretary shall prepare and issue an annual report on the state of national water resource strategies in Kenya. This report is for the Financial Year 2020/2021 and it is the second Annual Status Report.

2.0 SITUATION ANALYSIS

2.1 Highlights of Significant Achievements

The following are the achievements for the last one year;

2.1.1 Projects and Programmes Implementation

During the review period, the Ministry has achieved the following:

- (i). On implementation of various programmes, the Ministry has increased water coverage by 5.6% from 59.9% in 2017 to 65.5% in 2021 while sewerage coverage in urban areas increased by 1.6% from 26.1% in 2013 to 27.7% in 2021.
- (ii). The Ministry was able to complete 40 projects during the review period with 21 being water projects, 4 sewerage project and 15 being irrigation projects. During the same period, a total of 22 projects were started with 18 being water projects and 2 being a sewerage project.
- (iii). Under the Water Infrastructure development, the Ministry rolled out a program for inspection to fast-track completion of ongoing works. One of the major projects being undertaken is the Kenya Towns Sustainable Water and Sanitation program targeting rehabilitation and expansion of water and sanitation infrastructure in 28 towns across the country, connecting 2.1 million people to clean water and 1.3 million to sewer systems.
- (iv). Under the Kenya Towns Sustainable Water and Sanitation Program, a total of 8 projects are earmarked for last mile water connectivity while three are for last mile sewer connectivity. After completion, 192,000 people and 80,000 people to water and sewerage respectively. Three water projects and one sewerage project have been completed connecting 97,000 people to water and 40,000 people to sewerage system respectively.
- (v). On water harvesting and storage, the Ministry is fast tracking construction of large multipurpose dams namely Karimenu II, Ruiru II in Kiambu and Thwake in Kitui/Makueni and is currently focused on fast-tracking RAP implementation for Mwache Dam in Kwale/Mombasa to pave way for construction works to commence. The Ministry is also constructing Medium Sized dams including Yamo in Samburu County and Siyoi Muruny Dam and Water Supply in West Pokot County. The Ministry also identified and constructed three peace dams namely Kases in West Pokot, Forolle in Marsabit and Naku'etum in Turkana.
- (vi). Under the Big Four Agenda, the Ministry is undertaking projects to supply water to sites identified by drivers including Special Economic Zones (SEZs) in Naivasha

and Mombasa, Level 4, 3 and 2 hospitals across the country, Housing Projects in Nairobi and Athi River, Livestock holding Grounds in seven counties, and Fish Markets and Fish Landing Sites at the Coast.

- (vii). Developed Non-Revenue Water Standards to be used by Water Service Providers under the supervision of County Governments to reduce Non-Revenue Water to acceptable levels of 20% by 2030.
- (viii). On Irrigation programme, the Ministry developed 48,000 acres under public schemes and community-based smallholder irrigation schemes contributing an average 66,000 tons of rice and 17,000 tons of maize annually directly benefiting over 108,077 farmers. Further, the Ministry constructed 25,091 household water pans by end of June 2021 across 47 counties. This translates to 28.09 million m³ of storage to irrigate about 14,980 acres of land.
- (ix). In order to provide water and food security for schools, the Ministry drilled 10 boreholes to supply water to 10 public schools to support commercial irrigation using drip irrigation in greenhouses. Contracts for 15 more boreholes were awarded during the period.
- (x). Contracts were awarded for land degradation assessment for Upper Kerio Valley and Upper Ewaso Nyiro North watersheds. However, the project could not be executed fully due to budget cuts during the year. 200ha were reclaimed during the year bringing the total area reclaimed to an estimated 15,200 hectares into productive lands mainly in Turkana, Garissa, West Pokot, Baringo, Laikipia, Isiolo, Tana River, Kwale, TaitaTaveta, Kajiado, Narok and Busia Counties.
- (xi). Under Water Resources Monitoring, the Ministry has enhanced data and information collection by rehabilitating 46 monitoring stations and upgrading 16 telemetric hydromet stations. Also, it has developed and implemented 20 sub catchment management plans.
- (xii). Sustainable management of transboundary water resources under joint framework agreements has resulted in development and implementation of joint water projects with neighbouring countries. For example, the Government of Kenya and Government of Uganda is currently implementing the joint Angololo multipurpose dam on Sio Malaba Malakisi river border along the border. Five sub-catchment management plans were developed and some activities of the two plans were implemented. Also, transboundary water policy and bill are at the

stakeholder's participation level. Five telemetric stations were installed in Malakisi river basin and Turkana basin.

- (xiii). To enhance Water Sector Intergovernmental relations and improve the management of water services, the Ministry has built capacity in 9 Water Services Providers in Kisumu, Uasin Gishu, Nakuru, Kilifi, Machakos, Embu, Meru, Laikipia and Kiambu Counties. The MOU between Republic of Kenya and Republic of Uganda for joint management and development of water resources in Sio – Malaba - Malakisi River Basin is at the negotiation stage.

2.1.2 Legal

The Ministry completed the development, public participation and pre-publication consultations with committees of Delegated Legislation of both houses on Water Services Regulations, Water Harvesting and Storage Regulations, Water Resources Regulation and Irrigation (General) Regulations 2020 (with the AG for processing). The Water Act (Amendments) Bill and KEWI Bill have also been formulated.

On the implementation of the Water Act, the Ministry undertook Asset and Liabilities verification exercise resulting in a comprehensive consolidated report from all the Agencies which is awaiting validation prior to its Gazettement as required by the Act. In addition, handing over instruments have been developed as per the requirement of Article 69 of Water Act 2016.

2.1.3 Rapid Results Initiative

The third wave of 100 days Rapid result initiative (RRI) was undertaken by the Ministry fast track the completion of water projects across the sector. This was done between February and May 2021 and involved completion of 77 projects and fast-tracking legal, institutional and policy reforms. Within the period, a total of 41 projects were completed 29 being water and sanitation benefiting 1.86million people and 12 being Irrigation projects benefiting 37,150 households (32,285 acres).

2.1.4 Review of Strategic Plan

The Ministry has reviewed its strategic plan to incorporate strategies on Irrigation and Land Reclamation, post Covid 19 recovery, as well as other emerging issues facing the ministry. This was necessitated by the merger of Irrigation and Land Reclamation with the former Ministry of Water and Sanitation.

2.2 Regulatory Frameworks

The Ministry of Water, Sanitation and Irrigation has various Acts, Regulations, Policies and strategies. These are operational, under implementation, being amended or developed. These include:

2.2.1 Water Act 2016 and Water Amendment Bill

Water Act 2016 is an Act of Parliament to provide for the regulation, management and development of water resources, water and sewerage services; and for other connected purposes. It came in force on April 2017 when the Cabinet Secretary published notices in the Kenya Gazette, announcing the commencement of the Water Act, No. 43 of 2016.

However, Water Act 2016 has various gaps which call for its amendment. The draft Water Act 2016 amendment bill has been developed awaiting comments from stakeholders.

2.2.2 Irrigation Act 2019

The Irrigation Act 2019 is an Act of Parliament to provide for the development, management and regulation of irrigation, to support sustainable food security and socioeconomic development in Kenya, and for connected purposes. It was operationalized on 16th August 2019. Under the Irrigation Act 2019, the National Irrigation Authority has been established.

Some gaps and inconsistencies that hinder smooth and effective implementation of the Act have been identified necessitating some amendments to the Act especially in the appointment of the NIA Board. The Board of the National Irrigation Authority has not yet been appointed due to the proposed amendments of the Act. The amendments have been forwarded to the Attorney General for further processing.

2.2.3 Development of Policies and Strategies

The Ministry developed Key Policy documents including the National Water Policy being the Sessional Paper No. 1 of 2021 which is awaiting publication and Launch; Irrigation Strategy and Water Act (Amendments) Bill aimed at bridging gaps and addressing inconsistencies in Water Act, 2016; draft Sanitation policy which has been developed and a stakeholder consultation done.

The draft National Irrigation Services Strategy (NISS) 2021-2025 has been finalized, awaiting signing and publication. The Irrigation Guidelines 2020 was finalized and published. Also Water and Sanitation Strategy; Water Resources Management Strategy and Water Harvesting and Storage Strategy have been developed.

2.2.4 Hydrologists Act 2017

The Hydrologists Registration Board (HRB) is a State Corporation established under the Hydrologists Act No. 19 of 2017. The Board is mandated to regulate hydrologists profession and Practice in the country.

The HRB for the last one year has developed hydrologists rules and regulations which have been presented in series of local and regional stakeholders' forums. The rules and regulations are ready to undergo validation process. Also the board conducted induction training for the boards members in the Kenya School of Government. The draft strategic plan and Human resources instruments were developed by the board ready for approvals by the relevant authorities.

2.2.5 KEWI Act 2001

The KEWI Act 2001 established the Kenya Water Institute (KEWI) as a Semi-Autonomous Government Agency (SAGA). The institution is charged with the responsibility of capacity building for the water sector and it plays a key role of addressing the human resource needs and provides solutions to challenges facing the sector. KEWI currently has four campuses namely, Nairobi, Kisumu, Kitui and Chiakariga campuses located in Nairobi, Kisumu, Kitui, and Tharaka Nithi Counties, respectively with a total student population of 1,382.

The KEWI Act 2001 has been reviewed for the institution to execute its mandate effectively by aligning it to the Constitution 2010. The draft KEWI bill 2021 is currently undergoing public consultation.

2.2.6 RCGW Legal Notice No. 252

The Regional Centre on Groundwater Resources Education, Training and Research (RCGW) is established as a State Corporation under the State Corporations Act vide Legal Notice 252 of 18th December, 2015 and with a broad mandate of initiating and conducting research in mapping and assessment of aquifer systems; and management, conservation, protection and governance of groundwater resources.

Currently the Centre has a full Board of Directors and Management composed of a substantive CEO, 4 contracted staff and 3 deployed staff from the parent Ministry.

2.3 Status of Human Resources

With the release of Executive Order No. 1 of 2019 in which the State Department of Irrigation was brought back to form the current Ministry of Water, Sanitation and Irrigation, the Ministry undertook a review of the Organization structure and staff establishment. It has since been submitted to Public Service Commission (PSC) in March 2021 for approval.

The Ministry's current total number of staff is 635 against an authorized establishment of 1,012 officers, resulting in a variance of -377 staff. Out of the 635 in post, technical departments constitute 62.4% of staff while shared services is 37.6%. The breakdown is as summarized in in table 1.

Table 1: Current staffing levels per approved departments

S/No	Department	Authorised establishment	In post	Variance
1.	Water, Sewerage and Sanitation Development	113	154	41
2.	National Water Resources	134	114	-20
3.	Transboundary Waters	54	46	-8
4.	Water Infrastructure development	80	14	-66
5.	Irrigation Water Management	61	17	-44
6.	Irrigation and Drainage	59	21	-38
7.	Land Reclamation Department	61	22	-39
8.	Irrigation Water Harvesting and Storage	64	8	-56
9.	Sub -Total	626	396	-230
10.	Administration	257	157	-100
11.	Human Resource Management & Development and Records management	31	19	-12
12.	Finance	15	6	-9
13.	Planning	12	10	-2
14.	Supply Chain Management	26	19	-7
15.	Public Communications	6	6	0
16.	Accounts	27	16	-11
17.	Information Communication Technology	12	6	-6
18.	Sub-Total	386	239	-147
	Grand total	1,012	635	-377

To enhance human resources capacity and development, the Ministry during the review period recruited 63 new staff, and trained 100 staff in various institutions for both short term and long courses.

In the Water Sector Institutions, the total authorized establishment is three thousand and sixty-one (3,162) employees against an in post of one thousand nine hundred and fifty-six (1,956) giving a variance/ gap of one thousand one hundred and twelve (1,206) as presented in table 2.

Table 2: A Summary of Human Resources in Water Sector Institutions

Water Sector Institution	Required number of staff as per Establishment	In-Post	Variance / Gap	Remark
Water Resources Authority (WRA)	1,173	740	-433	The technical staff is only 261 (37%).
Water Services Regulatory Board (WASREB)	56	30	-26	Reviewing staff establishment in line with expanded mandate as provided for in Water Act 2016
Water Sector Trust Fund (WSTF)	175	71	-104	7 staff in permanent and pensionable terms of employment while others are in renewable 3-year contracts
Kenya Water Institute (KEWI)	314	72	-242	The organizational structure and Human Resource instruments have been partially implemented.
National Water Harvesting and Storage Authority (NWHSA)	212	196	-16	The organizational structure and Human Resource instruments are currently under review
Regional Centre on Groundwater Resources, Education and Research	80	9	-71	5 officers are in renewable 3-year contracts
National Irrigation Authority (NIA)	350	291	-59	Currently under review as per the Water Act 2016.
Tana Water Works Development Agency (TWWDA)	105	67	-38	
Athi Water Works Development Agency (AWWDA)	85	77	-8	
Northern Water Works Development Agency (NWWDA)	55	38	-17	
Coast Water Works Development Agency	173	170	-3	

Water Sector Institution	Required number of staff as per Establishment	In-Post	Variance / Gap	Remark
Lake Victoria South Water Works Development Agency (LVSWWDA)	80	58	-22	
Lake Victoria North Water Works Development Agency (LVNWWDA)	88	57	-31	
Tanathi Water Works Development Agency	72	44	-28	
Central Rift Water Works Development Agency (CRWWDA)	45	36	-9	17 officers are deployed from the Ministry (7) and three Agencies (LVNWWDA (6), CRWWDA (3) and LVSWWDA (1))
North Rift Water Works Development Agency (NRWWDA)	99	0	-99	
Totals	3,162	1,956	-1,206	

2.4 Covid-19 Response Emergency Works

The Ministry recognized its role in providing support to the general public in prevention of the spread of Covid-19. This was in terms of provision of adequate water for hand washing and domestic use in order to ensure the public are able to maintain social distance even when fetching water. Towards this, the Ministry drilled and equipped a total of 193 boreholes in Nairobi Metropolitan informal settlements at a cost of Kshs. 1.62Billion to serve a population of 1.2Million people. The World Bank with conditional liquidity support grant provided Kshs. 5 billion to support WSPs in the purchase of chemicals payment of electricity bills, spare, administration costs, regulatory levies and salaries of staff. The Government and JICA supported the Ministry with Kshs. 200M which was used to procure chemicals (1,500 tons of Alum, 300 tons of Chlorine and 600 tons of Soda Ash and 180 tons of Poly Aluminum Chloride) which were distributed across the country to 74 WSPs.

2.5 Sector Financing

The Water, Sanitation and Irrigation Sector has budgetary allocation has tremendously increased from Kshs. 38.2 billion in financial year 2013/2014 to Kshs. 79.8 billion in financial year 2020/21 translating to an overall percentage increase of 108% as shown in figure 1. During the same period, the expenditures has also increased from Kshs 26 billion to Kshs 57.9 billion translating an overall percentage increase of 122%. Further, the budget absorption rates in the same period has increased from 68% to 82%.

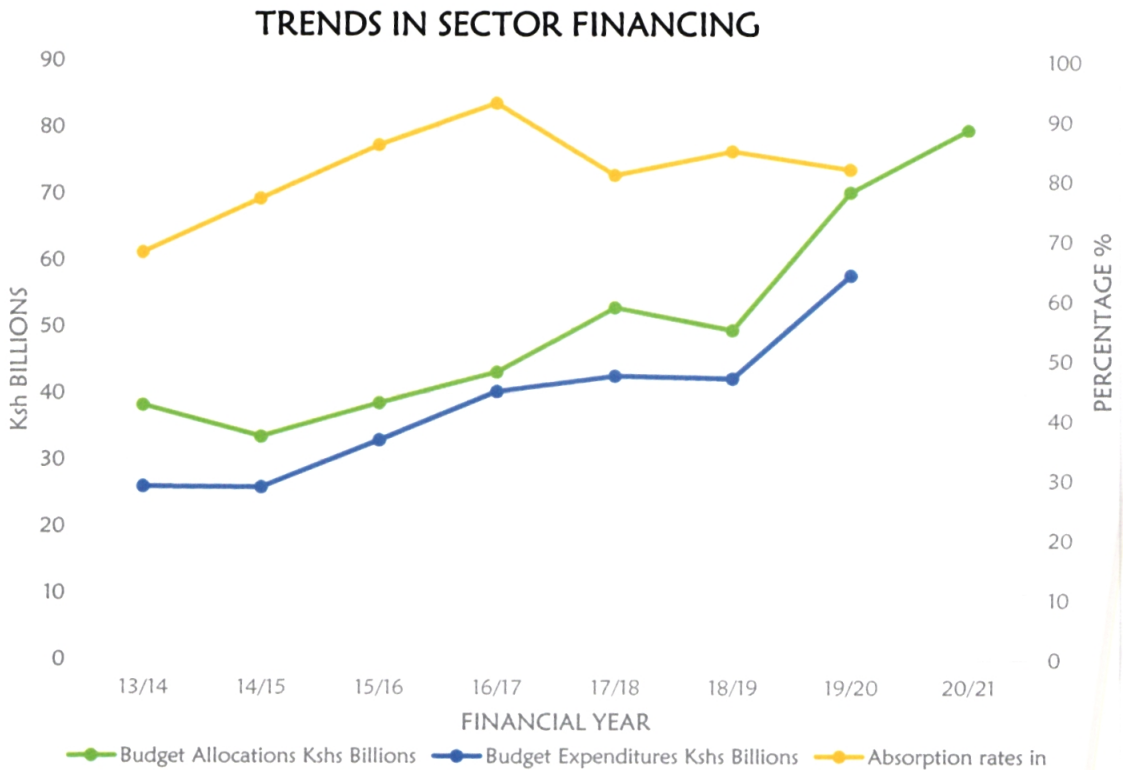


Figure 1: Trends in the Water, Sanitation and Irrigation Sector Financing from 2013/14 to 2020/21 Financial Years

2.5.1 Sector Investment Plan

The Ministry has formed a taskforce for gazette to develop the Sector Investment Plan. World Bank is providing upstream technical support in the development of the National Water Sector Investment Plan. A consultant has been brought on board and has prepared an inception report which has since been approved. He has also developed an inception report on Water Sector Reforms which is currently under review by the Ministry.

2.6 Status of Water Resources

2.6.1 Overview

Water Resources comprises both the surface and ground water. The distribution of Water Resources both spatially and temporally is not even. Currently, the per capita Water Resources is estimated at 450. This is way below the world recommendation of 1000, depicting that the country is water scarce. Despite Water scarcity scenario, both Surface and ground Water Resource are threatened by increasing demand by all sectors of the economy. Surface Water resource is continually threatened by pollution by both effluent and solid wastes in major rivers, catchment degradation and impacts of climate change. On the other hand, ground water has in the recent past been considered alternative and this has led to its over-exploitation-over abstractions in some areas. However, Groundwater potential is not fully understood in some areas leading to deliberate efforts to undertake mapping to ascertain its potential. Despite over abstraction, ground water is also threatened by pollution and destruction of its recharge zones. This has led to a deliberate effort to rehabilitate the recharge zones and exploit means to undertake managed aquifer recharge.

Water Resource drives all sectors of the economy and therefore, sustainable management coupled with adequate resource allocation to this subsector will ensure that the country realizes the benefits of the 'Big Four Agenda' and achieves the vision 2030 development agenda on achievement of universal access on water by 2030 and the economic pillar. Further, the reliability and access to water resources is a fundamental human right in the Constitution of Kenya, 2010, under the economic and social rights, Article 43, (1), (d), to clean and safe water in adequate quantities and it is the state's obligation under the constitution to preserve and ensure the right is achieved. The country has also obligation of achieving Sustainable Development Goals, especially Goal No. 6 on "Ensuring Availability and Sustainable Management of Water and Sanitation For all" under which WRA is required to undertake water allocation planning; Goal No. 13 on "urgent action to combat climate change and its impacts" where WRA undertakes catchment conservation and protection; and Goal No. 15 on "Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss" which is part of Authority's mandate on water resources protection. The well managed water resources will also assist the country in negotiating with other countries that share water resources with as trans-boundary waters.

Due to its National importance of Water Resources to the economy and the deliberate effort to meet National and international obligations, The Ministry of Water, Sanitation

and Irrigation developed the National Water Resources Strategy (NWR5) and implements water resources management strategies geared towards sustainable water resources management. The NWR5 seeks to strengthen the management of water resources with deliberate efforts to increase water availability through sustainable management, enhanced water resources monitoring and assessment by mapping surface and groundwater to quantify on availability of both the surface and groundwater resources and make it available for utilization and improve accuracy on water resources information; Strengthen water resources protection and conservation, catchment restoration, pollution control to enhance water quality; manage water related disaster and strengthen the financing in the water sub sector.

2.6.2 Water Resources Management

Water Resources Management is carried out at River basin level. The country is divided into six major catchment areas as shown in figure 2 with respective areas as follows

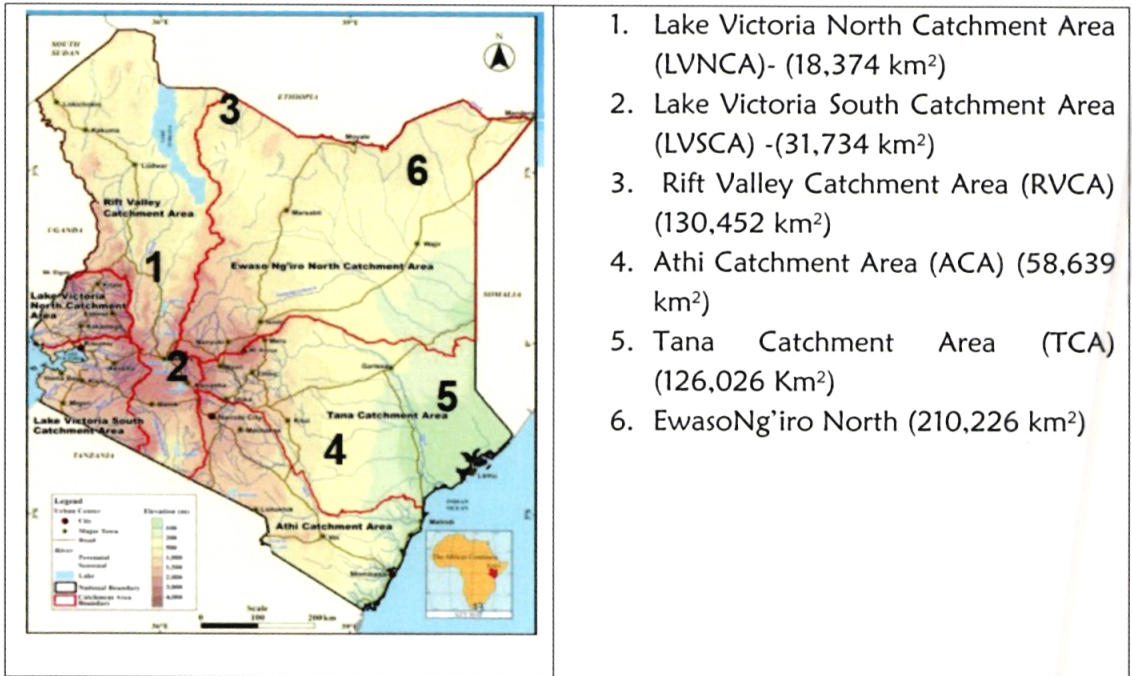


Figure 2: Water Resources Catchment Area

2.6.3 Water Resources Availability

According to the National Water Master Plan 2030, the renewable water resources is estimated at 42.1 BCM/year, which consists of 20.6 BCM/year of surface water and 21.5 BCM/year of groundwater recharge, assuming that the sustainable groundwater yield is

10% of the groundwater recharge, the available water resources was estimated at 22.5 BCM/year as indicated in Table 3. The available per capita water resource was estimated at 586m³/y/capita. The Available per capita is dwindling towards the projected years of 2030 and 2050. Table 3 below gives the projected water resources available and renewable for the years 2010, 2030 and 2050. The increase in available water resources in the six basins is attributed to the projected increased rainfall due to impacts of climate change.

The Water Resources Authority in the last few years have collected data from exploratory boreholes to validate groundwater resources availability in Turkana 6No., Marsabit 5 No, Garissa 4 No, Wajir 1 No, Tana River 2 No, Tharaka 2 No, Isiolo 3 No, Embu 2 No, Kajiado 2 No, Machakos 2 No and in the year 2020/2021 two boreholes were drilled and data collected in the Murang'a and Kitui Counties. These in total are 28 boreholes

Table 3: Renewable and Available Water Resources

Item	2010	2030	2050
Precipitation (P) *(BCM/y)	400.1	441.6	471.9
Evapotranspiration (E) **(BCM/y)	358.0	397.3	425.9
Renewable WR (P-E) (BCM/y)	42.1	44.3	46.0
Renewable SW (BCM/y)	20.6	24.9	26.7
GW Recharge (BCM/y)	21.5	19.4	19.3
Sustainable Yield of GW*** (BCM/y)	1.9	1.7	1.7
Available Water Resources (BCM/y)	22.5	26.6	28.4
Population Projected (million)	38.5	67.8	96.9
Per Capita RWR (m ³ /y/capita)	1,093	653	475
Per Capita Available WR (m ³ /y/capita)	586	393	293

Source: National Water Master Plan (NWMP 2030)

2.6.3.1 Groundwater Potential and Exploitation

According to the National Water Master Plan 2030, the total groundwater potential of the country is 1,740 MCM/year. Exploitation of groundwater is controlled through authorization/permitting system employed by Water Resources Authority. Currently there more than 23,500 registered boreholes throughout the country, majority of which have

been drilled in Nairobi Aquifer Suite (NAS). High density of boreholes is found in the areas of Karen, Langata, Embakasi and City Centre, Kiambu and Kajiado, Kitengela, Ongata Rongai and Ngong. It is worth noting that, there are additional boreholes (approximated to be more than 2,000) drilled without authorization from WRA, including those by County Governments.

The Nairobi aquifer suite (NAS) alone that straddles across several counties has over 7,000 boreholes. The counties include Nairobi City, Kajiado County, Kiambu County, Murang'a County and Machakos Counties and is classified as a strategic aquifer under the WRA Aquifer classification. It is significant as it augments the balance of the public water demand in its extent. In some parts of the Nairobi metropolitan, it is the only source of water. Table 4 shows estimates the groundwater use in each of the basins and the balance thereof.

Table 4: Summary of Groundwater Use Balance by Basin

Basin	Basin Area	Groundwater Potential	Estimated Use	Groundwater Use Balance	Area of over abstraction
	km ²	MCM/year	MCM/year	MCM/year	km ²
Lake Victoria North	18,500	216	13.3	202.7	7
Lake Victoria South	26,906	292	13.3	278.7	15
Rift Valley	131,423	400	35.1	364.9	2,515
Athi	66,559	559	84.6	474.4	3,147
Tana	126,208	693	18.2	674.8	484
Ewaso Ng'iro North	209,918	449	18.2	430.8	821
Total	579,514	2,608	182.7	2,426.3	6,989

Source: National Groundwater Balance Report, June 2021 WRA

Groundwater developments has increased overtime and density varies considerably. On the western side, Siaya sub region Eldoret sub region and Kisii sub region have a higher density of boreholes compared to other sub basins of Lake Victoria catchment area. Within the Rift Valley Basin, Naivasha sub region has the most boreholes. Upper Athi (Kiambu and Nairobi) has the most in the Athi Basin followed Mombasa sub-region along the coastline as shown in figure 4.

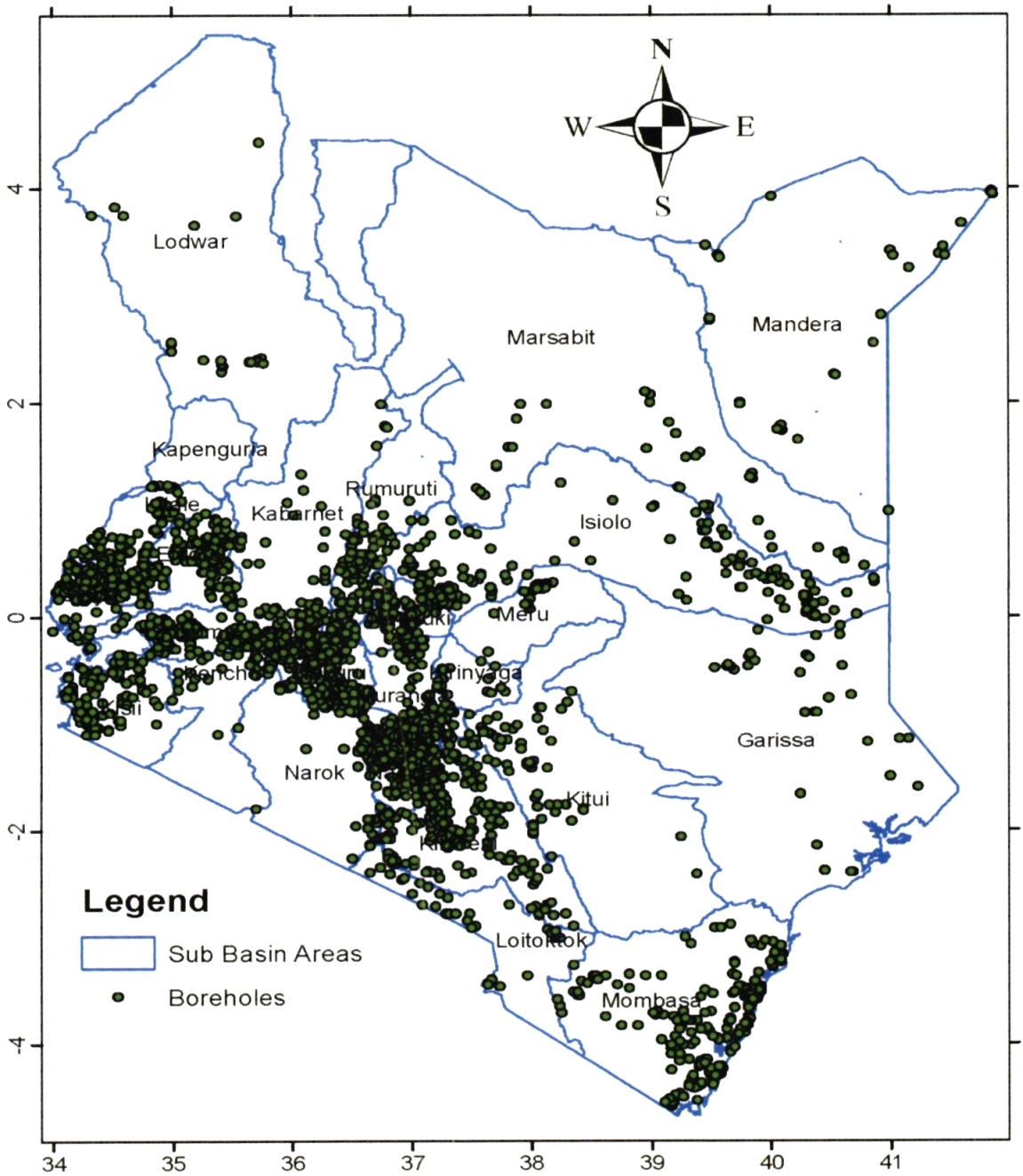


Figure 3: Map of boreholes spatial distribution and sub basin delineations across the country

Areas with high borehole density has negative water balance due to over abstraction. Coastal areas along the shoreline, a small section of upper Athi, small section of upper Tana and areas around Lake Victoria Catchment still have positive water balance due to

less abstraction as shown in figure 5. Areas with negative balance requires managed aquifer recharge because even capping cannot help as abstraction has exceeded the annual recharge.

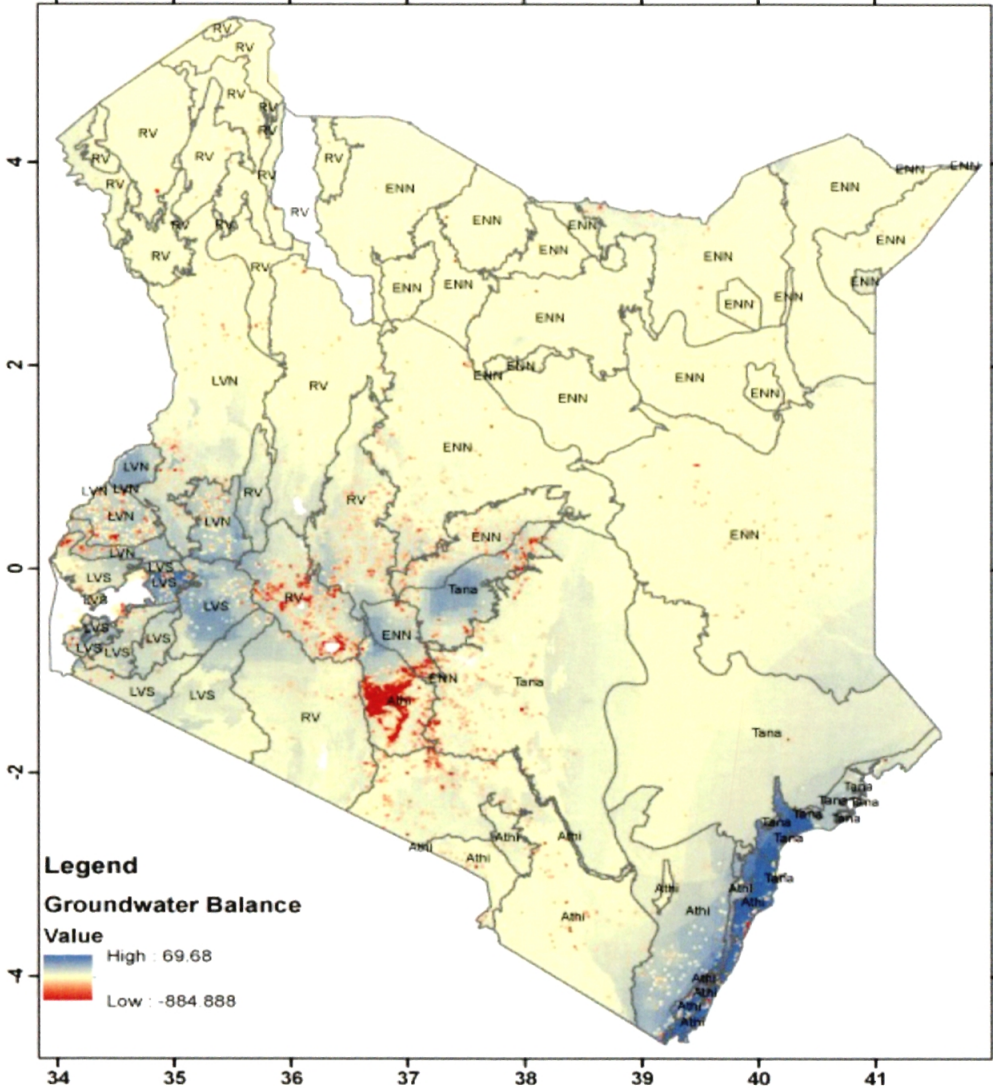


Figure 4: Groundwater balance map of Kenya with an overlay of aquifer boundaries

Groundwater applications has increased over time since WRA started its operations. While new applications and authorizations has increased uniformly over time, lack of converting authorization is clearly evident revealing that abstractions reported by WRA is clearly below the actual abstraction as shown in figure 6.

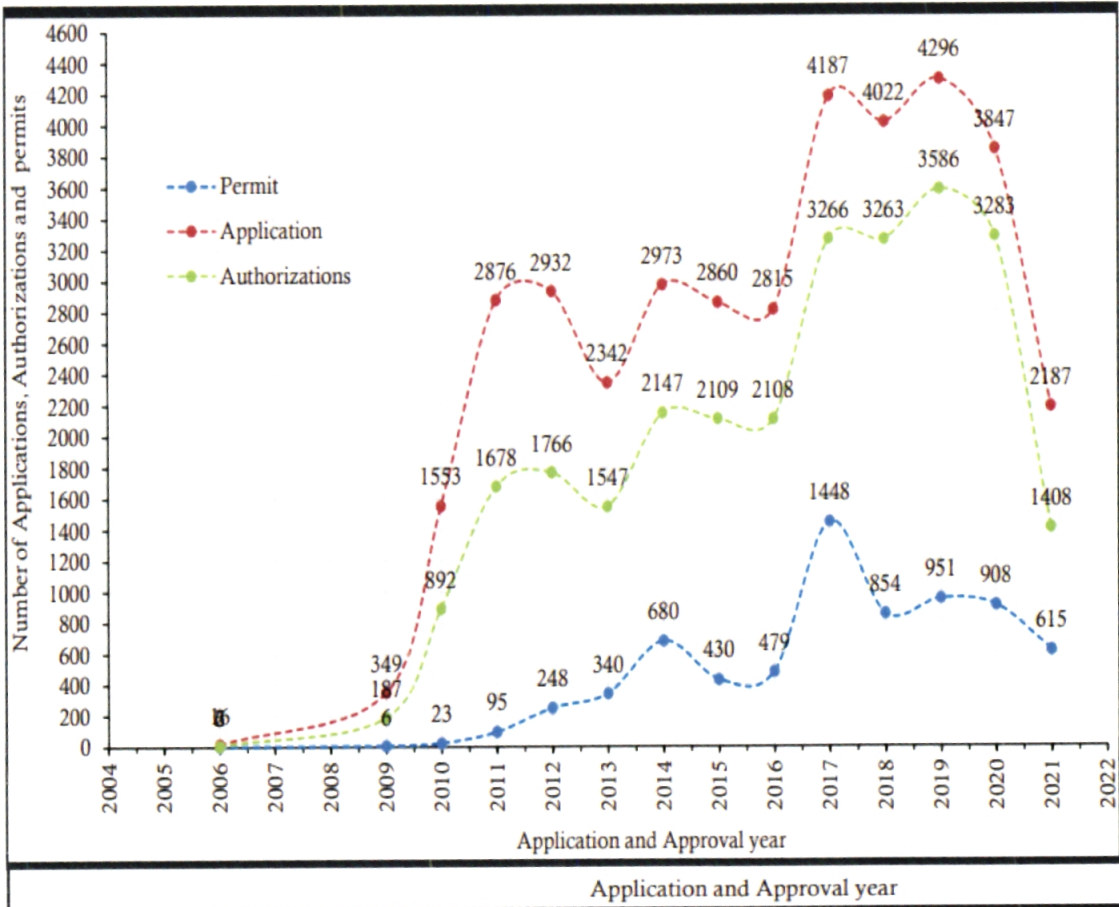


Figure 5: Groundwater applications and approvals from the year 2004 – 2021

Ground Water Mapping

The Ministry of Water Sanitation and Irrigation and Water Resources Authority is undertaking ground water Mapping in Wajir, Turkana, Marsabit and Mandera Counties to ascertain ground water potentials for development. A number of exploratory boreholes has been done. Whereby in Turkana 6 No., Marsabit 5 No, Garissa 4 No, Wajir 1 No, Tana River 2 No, Tharaka 2 No, Isiolo 3 No, Embu 2 No, Kajiado 2 No, Machakos 2 No and in the year 2020/2021 two boreholes were drilled and data collected in the Murang'a and Kitui Counties. These in total are 28 boreholes

2.6.4 Water Use

Water Resources Authority is mandated through the Water Act 2016 as a lead Agency to regulate the management and use of the water resources as both surface and groundwater with regard to quality and quantity. All water uses are regulated through the established Permitting System to ensure sustainable use of water resources in view of growing water needs and demands. In exercising its mandate, the Authority greatly adopts the Integrated Water Resources management (IWRM) principles. The Authority employs equity and

prioritizes the apportionment and allocation of the water resources. Similarly, the Authority protects and conserves the limited fresh water resources from pollution through the Waste Disposal Control Plans that include Effluent Discharge Control Plans (EDCPs). The Water Resources Authority undertakes enforcements on EDCPs.

Towards sustainable utilization of groundwater resources water allocation plan for Nairobi Aquifer Suite has been reviewed and awaits rolling it out to stakeholders. Concerted efforts have also been employed in determination of the abstraction boreholes through development and population of the WRA borehole database across the country.

The Authority has endeavored to develop waste management and water use efficiency guidelines for better utility of the groundwater resources in the Kikuyu Springs groundwater conservation areas

2.6.4.1 Groundwater Monitoring

The Ministry through Water Resources Authority has been undertaking groundwater resources monitoring since its establishment in 2005. This has mainly been an ad hoc arrangement with owners of production wells. Towards this end WRA has continued to get data from these boreholes and currently number 157 across the country. However, it is crucial that a dedicated groundwater monitoring network is set up to enable monitoring of groundwater levels and quality. Towards this the Authority has rolled out 21 monitoring wells equipped with telemetric equipment in the Nairobi aquifer suite, Tiwi aquifer and the Lamu sand dunes aquifer. These monitoring wells are already giving groundwater level data received in the water resources information system of WRA. A groundwater monitoring network design has been developed for the country has also been developed and is being actualized and improved upon towards further investment in groundwater monitoring infrastructure. The design is dependent on, and builds from the following sequential activities:

- Groundwater resource assessment which has been completed.
- Aquifer delineation of known aquifers based on groundwater potential.
- Aquifer classification based on level of use and groundwater potential.
- Monitoring network design - Identification of priority areas for monitoring in Strategic, Major, Minor and Special aquifers, and monitoring guidelines for the aquifer classes).

Groundwater Monitoring and management guidelines have been finalized; These will guide future investment in groundwater monitoring and management across the country.

The map over leaf gives prescriptive monitoring wells locations.

Table 5: Surface Water Monitoring Stations and Operational Status

	Category				Total	% Operational
	National	Management Unit	Intra Management Unit	Special		
LVNCA	5	6	10	7	28	78.6
LVSCA	5	14	26	2	47	60
RVCA	4	8	14	0	26	40
ACA	3	4	21	3	31	66
TCA	1	24	15	15	52	74
ENNCA	1	5	33	1	40	72.5
Total	22	48	122	31	223	

Source WRA Water Situation Report 2019-2020

2.6.5.1.1 Rehabilitation of the Surface Water Monitoring Station

Surface Water stations are periodically rehabilitated and upgraded to telemetry to improve on data collection and decision making. The upgrading of stations to automatic logging and telemetric transmission has ensured that accurate and timely data is captured. The automatic stations are configured to record data on hourly basis and transmit to a server which can be access via web-based portal.

A total of 46 RGS stations were rehabilitated across all the regions. For ACA, 8 No. stations, TCA 5 No. stations, RVCA 9 No. stations, LVSCA 6 No. stations, LVNCA 15 No. stations while at ENNCA, 9 No. stations. The installation and rehabilitation work at various sites including; Tsavo RGS at Mombasa, Kaptega river at Suam RGS 2B02A in Kapenguria and after rehabilitation at Awach Kajulu 1HA14 in Kisumu are displayed in figures 7-9.



Figure 7: Installation of Tsavo RGS at Mombasa



Figure 8: Rehabilitation at Kaptega River at Suam RGS 2B02A in Kapenguria



Figure 9: Rehabilitation at Awach Kajulu 1HA14 in Kisumu

Table 6: Rehabilitated Stations per Catchment Area

S/No.	Station Name	Station ID	Catchment
1.	Kibwezi	3F06	Athi
2.	Little Kiboko	3F11	Athi
3.	Athi	3DA2	Athi
4.	Thiririka	3BD 5	Athi
5.	kiu	3BB11	Athi
6.	Lotulelei	3GA11	Athi
7.	Enjorai	3GA04	Athi
8.	Tsavo	3GA05	Athi
9.	Rupingazi	4DC03	Tana
10.	4BE8	Gikigie	Tana

S/No.	Station Name	Station ID	Catchment
11.	4AB	Rongai	Tana
12.	4AA	Gatumbia	Tana
13.	Tana River at Hola	4G04	Tana
14.	Tana River at Garsen	4G02	Tana
15.	Kaptega at Suam	2B02A RGS	
16.	Sebit at Sebit	New RGS	
17.	2C06	Kessup	
18.	2EB5	Waseges	
19.	Gilgil	2GA1	
20.	Kawalase	2B10	
21.	Turkwel	2B21	
22.	Ewaso Ngiro (Magadi)	2K04	
23.	Kipsonoi	1JF07	
24.	1JG04	Sondu	
25.	1GD07	Nyando	
26.	1HA14	Awach Kajulu	
27.	1KB03	Gucha Migori	
28.	1KC07	Enkare Gituak river	
29.	Kapolet	1BC0New	
30.	Noigamaget	1BC01	
31.	Nzoia	1BB01	
32.	Kimilili	1BH06	
33.	Kamukuywa	1BH04	
34.	Sosio	1BH07	
35.	Yala at Bondo	1FG02	
36.	Wuoroya	1EG02	
37.	Nundoroto	1CB09	
38.	Isiolo	5DA07	
39.	Rugusu	5DA04	
40.	Likiundu	5DA05	
41.	Sirimon	5BE22	
42.	Nanyuki	5BE21	
43.	Masarbit	5EC01	
44.	Pesi	5AB04	
45.	Ewaso Narok	5AC10	
46.	Ewaso Narok	5AC15	

2.6.5.2 Weather Monitoring Stations.

Water Resources Authority operates a weather monitoring network comprising rainfall, evaporation and climate stations. A total of 125 rainfall stations, 47 evaporation and 16 climate stations were operational. The regional breakdown is given in the Table 7.

Table 7: Weather monitoring network

	Rainfall	No. Operational	Evaporation	No. Operational	Climate	No. Operational
ACA	45	25		3	5	2
ENNCA	26	6	4	2	9	2
LVNCA	72	30	10	3	5	0
LVSCA	47	36	20	18	12	10
RVCA	23	21	7	6	3	3
TCA	53	38	17	15	2	0
Total	266	156	65	47	36	17

Source: WRA Report 2019-2020

The weather monitoring stations operated by WRA are strategically located at various parts in the catchments. Data is also obtained from various stakeholders such as private institutions, government and learning institutions. The data collected from these stations is used for modelling and planning purposes. Figure 10 shows the distribution of weather monitoring stations.

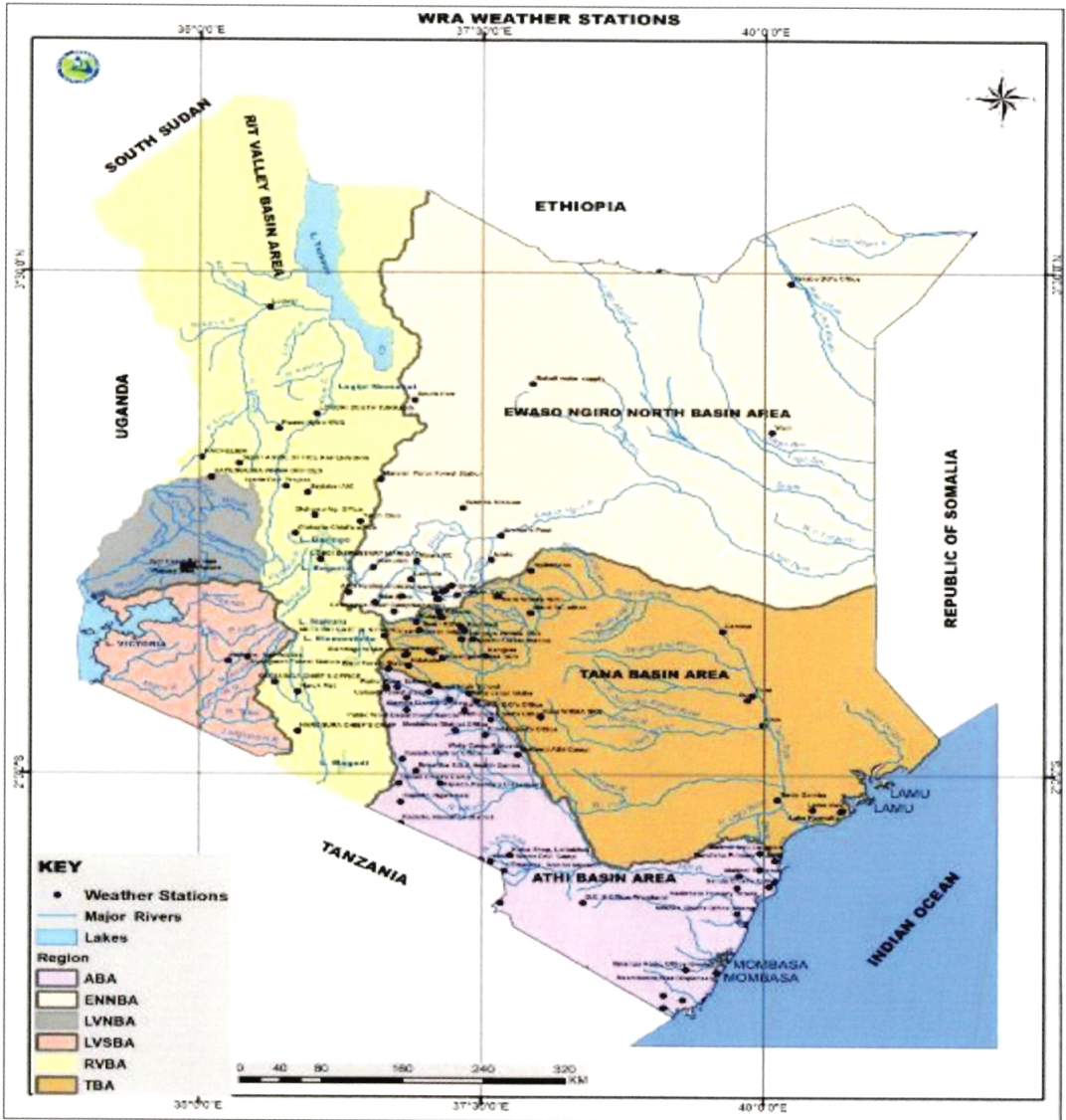


Figure 10: Rainfall monitoring network

Source: WRA Water Situation Report 2019-2020

Rehabilitation of New Weather Stations

During the review period, three (3No.) rainfall stations were rehabilitated at Elijah Mathitu rainfall station in Athi Catchment Tarakwai station for Evaporation and Bomet Water Company weather station.

2.6.6 Water quality and Pollution

Due to increased threat of pollution to the water resources, Water Resources Authority monitors water quality and pollution control, across all the catchments. The Monitoring is stations comprises of surface, Ground and effluents as shown in table 8.

Table 8: National Water Quality Monitoring Stations

Station Type Catchment Area	SW	GW	Effluent	Total	1 ST Priority Stations
LVNCA	44	19	39	102	24
LVSCA	77	29	26	132	54
RVCA	49	30	23	102	27
ACA	55	45	32	132	44
TCA	58	19	27	104	30
ENNCA	46	19	21	86	23
Grand Total	329	161	168	658	202

Source: WRA Water Situation Report 2018-2019

2.6.6.1 Water Quality and Pollution Control Strategies

Fresh water resources with surface water bodies being more susceptible to pollution has led the Ministry of Water, Sanitation and Irrigation together with its Agencies to reconsider the approaches to reverse the growing trend of water pollution. The identified biggest sources of pollution are:

1. Unsatisfactory liquid waste water management in urban centres. Most of the urban centres have low sewerage coverage (approximately average of 26%) and the matter is compounded with unsatisfactory discharges of wastewater from the wastewater treatment plants to the environment;
2. Informal settlements: Most informal settlements in urban centres have poor liquid and solid waste management;
3. Encroachment to the riparian land. The encroachment has denied the riparian land the opportunity to act as a buffer zone ecological functions that would minimize pollution from non-point sources to the surface water bodies;
4. Dumpsites. It is noted with concern that majority of the solid waste dumpsites are located along the riparian lands and are unsatisfactorily managed resulting into surface and groundwater pollution through leachates. This is illustrated in figure 11.



Figure 11: Kitale Town (Machinjoni) solid waste dump site and Salongo Dump site – Chavaakali.

5. Industrial waste. While a few entrepreneurs are complying, there are those who discharge and dispose waste at odd hours like during the night to the environment.

It against the above identified challenges that strategies have been put in place and they include:

1. Initiative on Rivers Protection and Pollution Management with a Sub-Committee in place coordinated by the Cabinet Secretary Ministry of Water, Sanitation and Irrigation and an Inter-Agency Technical Committee comprising of various stakeholders including the County Governments was formed. A Cabinet Paper with an Action Plan for Nairobi River Restoration and Protection has been developed and approved by the Cabinet and is under implementation.

The Multi agency team has thus far achieved the following:

- a) GIS Map prepared indicating the various actions taken and the existing gaps for all the stakeholders. Highlights:
 - i. Sewerage Network and gaps mapped
 - ii. Point sources of pollution identified
 - iii. Encroached riparian areas pegged
 - iv. Blocked/occupied sewerage wayleaves mapping ongoing.
- b) NMS has handed over 8 ablution blocks to Mazingira Yetu CBO in Kibera. 8 ablution blocks still under construction. Plans underway to replicate this in other informal settlements.
- c) Matrix of the actions that need to be taken by the various stakeholders with timelines and proposed budgets being finalized.
- d) NMS in the process of identifying illegal dumping sites for closure.

- e) WRA has carried out assessments of waste water treatment plants in the Athi Basin. Most are operating beyond their design capacity and not effective in handling the received waste.
- f) WRA has mapped dumpsite on the riparian reserves and given orders for their removal/relocation.
- g) WRUAs in the most critical sub catchments have been selected and the specific activities they can be involved in identified. Working frameworks with WRA and Thwake Program Implementation Team being developed.
- h) A River Basin Modelling project is being undertaken under Thwake Dam Project.
- i) A four-year Nairobi River Basin Water Quality Monitoring Consultancy has been awarded by Athi Water Works Development Agency (AWWDA).
- j) Restoration of River Motoine/Ngong (9km) undertaken by MazingiraYetu, a CBO. Phase I Status Report Prepared.
- k) Consultative Workshop on 'Guidelines for waste water discharge and efficient water use' for Kikuyu GCA held on 3rd March 2021.
- l) WRA in the process of installing 2 No. telemetry Water Quality Monitoring Stations, one at Ondiri and one at Thwake Dam, with the support of GNI^{Plus}. This will be finalized by February, 2022

2. Conducting water quality and pollution surveys in priority hotspot (pollution) areas;
3. Mapping of point and non-point sources of pollution;
4. Enhanced awareness creation prioritizing the hotspot areas of pollution in urban centres. In view of the Thwake multi-purpose dam, pollution control measures with focus to the Nairobi River Basin encompassing Nairobi, parts of Kajiado, Kiambu and Machakos Counties forming part of the entire Athi River Basin are in place (see the figure 18 below). Lake Victoria Basins (North and South) have also been prioritized due to the social-economic importance of the Lake and the water hyacinth threats.
5. Engagement and collaboration of stakeholders under the framework of Water Resource Users Associations (WRUAs) in developing and implementing Sub-Catchment Management Plans focusing on pollution controls;
6. Continue to modernize and operationalize the National, Regional Water Quality and Pollution Control Laboratories;
7. Participating in multi-sectoral Inter Agency for River Protection and Pollution Management coordinated by the Ministry of Water & Sanitation and Irrigation;
8. Development of Resource Quality Objectives (RQOs) that will help in classification of water resources;
9. Increased investment in sanitation: Nairobi Kshs. 12 billion and Kshs. from AFD and ADB respectively; Kisumu Kshs.7.6 billion from AFD. Also, physical cleaning of rivers from ondiri swamp.

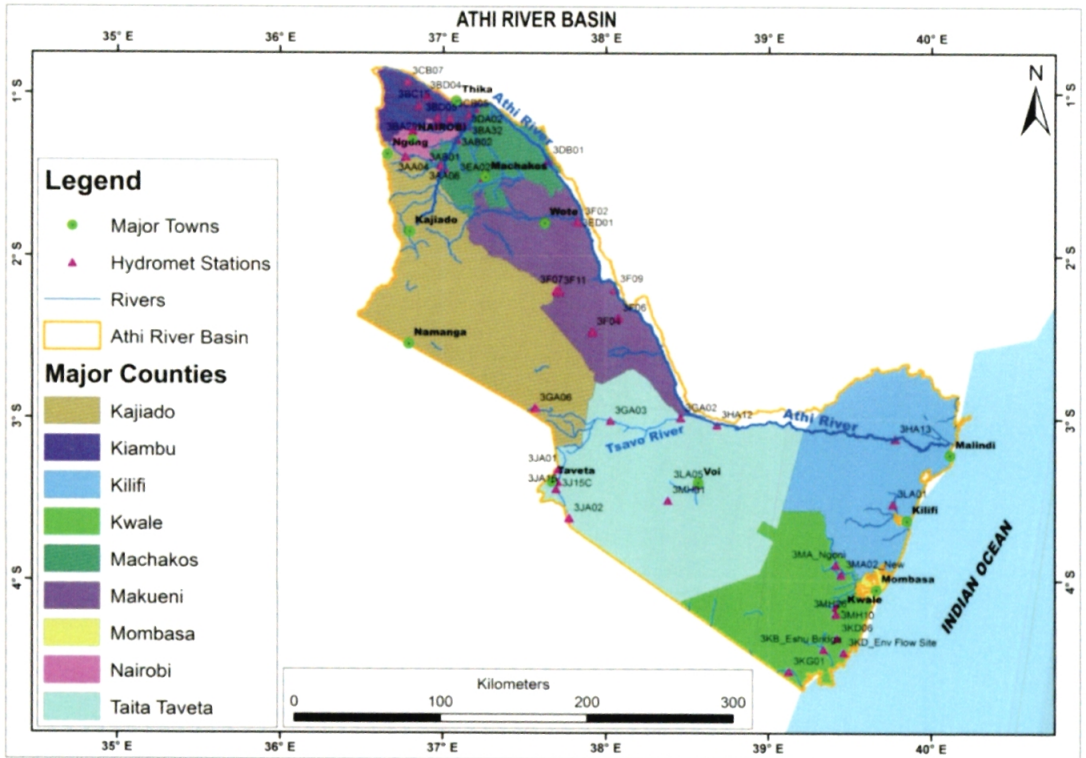


Figure 12: The Athi River Basin encompassing pollution hotspot Counties: Nairobi, Kiambu, Kajiado and Machakos.

2.6.7 Catchment Protection and Conservation

Significant strides have been made in regards to declaration and protection of catchment areas. A total of 144 critical catchment areas and wetlands were identified countrywide that require gazettement. Management plans have also been developed in respect to the Dik-Dik Wetland, Lamu Sand Dunes and the Kikuyu Groundwater Conservation areas. Catchment protection processes have also been initiated for Ngalaran in Loitoktok, Gathwariga in Nyeri and Kajulu Hills in Kisumu.

The process of protection and conservation of groundwater resources has been undertaken for the Lamu sand dunes Groundwater Conservation areas and the Kikuyu Springs Conservation areas has been initiated and well advanced. The request for gazettement was done through the Ministry and documentation submitted to the Attorney General.

Other areas that have been identified and initial processes undertaken include the Lake Kenyatta Groundwater Conservation area/Catchment area and Kajulu Groundwater Conservation area/Catchment area. In addition to this, a draft policy for the protection of groundwater has been developed.

2.6.8 Water Resources Assessment

Water resources assessment is a deliberate effort to quantify availability of water resources both at surface and ground for utilization. The assessment of both surface and groundwater resources is continuously undertaken. The Ministry of Water, Sanitation and Irrigation has mapped ASAL counties in Kenya including Wajir, Turkana and Marsabit to understand the groundwater potential in those areas. Equally Surface water resources are estimated at river basins using the gauging stations installed to ensure equitable allocation and use. Groundwater resource assessment resulted into provision of maps indicating groundwater recharge zones, Groundwater potential areas and water quality. A total of 26 boreholes were drilled in Turkana, Marsabit, Isiolo, Garissa, Kajiado, Embu, Tana River and Tharaka Counties to enrich the groundwater knowledge.

2.6.9 Hydrological extreme events

The hydrological extremes experienced in the country are droughts and floods. The mapped flood prone areas include: Nyando, Migori, Budalangi, Sabwani, Isiolo, Taita Taveta, East Rachuonyo, Garissa and Tana River amongst others. Flooding events were recorded in a number of places including; Nambajalala, Budalangi, Lower Yala, Lower R. Sio. In all places the water quality status was affected by pit latrines mixing with water for use. Outbreak of waterborne diseases were reported in Budalangi as a result of the floods. The County Government of Busia intervened by providing clean water using water trucks. Figure 13 show the extent of floods at Ruambwa.

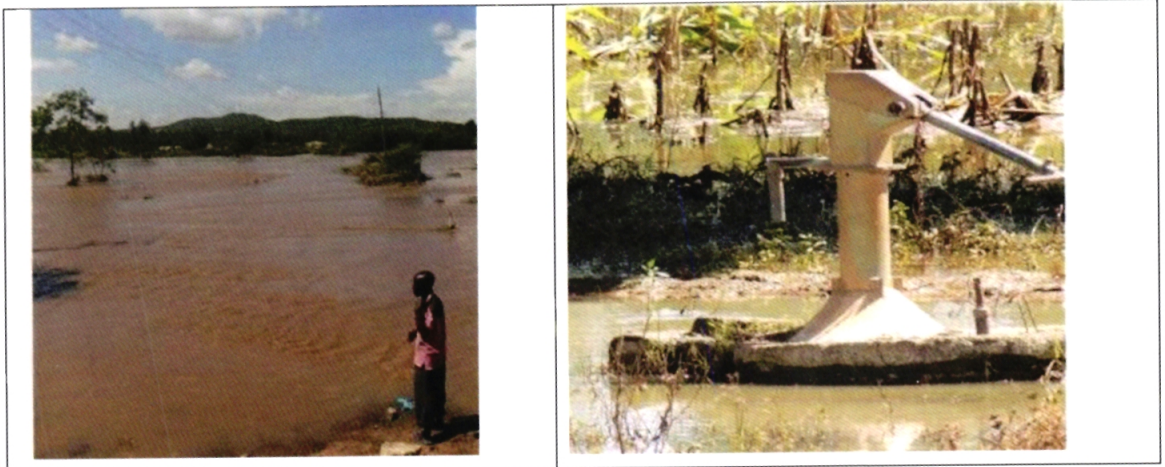


Figure 13: Flooded River Nzoia at Ruambwa and Flood covered community water point-source of water contamination.

2.6.10 Water Resources Management intervention measures

The water resources management intervention measures to improve water availability and reduce adverse effects on water resources include the following among others: Catchment areas restoration; riparian zone protection and conservation; control of soil erosion; construction of sand dams and earth dams; protection of wetlands and springs ;water harvesting and safe storage; Groundwater exploration; Installation and rehabilitation of water resources monitoring networks; Development and implementation of catchment management plans and strategies; Development and implementation of Water Allocation Plans; Pollution monitoring and control; Community sensitization programmes on water resources management; Exploring the innovative solutions for waste management through promotion of Circular Economy and Enforcement for compliance to the water resources regulations.

2.6.11 Transboundary Water Resources

Transboundary water resources are water resources that are shared between two or more countries. Kenya *shares about 54%* of its surface and groundwater resources with neighboring countries. These countries are Republic of Uganda, United Republic of Tanzania, Republic of South Sudan, Republic of Ethiopia and Republic of Somalia as shown in figure 20. These shared water resources need to be sustainably managed and developed in an equitable manner. In order to achieve sustainable management and equitable development of the shared water resources, the Kenya Government together with its riparian states has developed cooperative framework agreements, regional policies and Memorandum of Understandings (MoUs) among others. The shared water resources between Kenya and other neighbouring countries are as follows:

a) Lake Victoria Basin

The Lake Victoria Basin is shared by Kenya, United Republic of Tanzania and Republic of Uganda. In Kenya Lake Victoria is drained by nine main river basins. These river basins are Sondu-Miriu, Mara, Nyando, Yala, Nzoia, Sio, Malakisi, Lwakhakha and Malaba. Mara River basin is shared by Kenya at the upstream with United Republic of Tanzania at the downstream. Also, Lwakhakha, Sio, Malaba and Malakisi rivers are shared between Kenya and Uganda at the border. The surface water resources in the lake basin have been affected by increasing water demand and adverse climatic conditions such as prolonged droughts. Despite the fact that water abstractions and evaporation rates in the lake basin has been improving, water availability was projected to be increasing by approximately 1.25% annually (NWMP, 2030). In the year 2019 -2020 rainfall being recorded in the lake basin since April, 2019 to April, 2020 was high compared to previous years. This has led to flooding of the lake at the shores affecting shoreline communities. The water quality in the lake has been affected by communities living along the lake shore and agricultural activities

at the catchments. Hence joint efforts between the ministry and other stakeholders have developed different programmes to reduce inflow of nutrients, waste water and solid wastes into the lake. These include tracing of point and non-point source of water pollution, relocation of solid waste dumping sites, tree planting at the degraded areas in the catchments, gabion construction to reduce transfer of sediments into the water bodies and installation 10 telemetric hydromet stations to measure water levels and flows.

b) EwasoNgiro South River Basin

The Ewaso Ngiro South River originates from Kenyan side in Narok County and flows crossing the border to Lake Natron in the border of United Republic of Tanzania at the downstream. The Ewaso Ng'iro South River provides water to residents of Narok and Kajiado Counties. Water availability in the river basin has been enhanced by use of groundwater and rainwater harvesting using water pans and storage tanks.

c) Lake Challa Basin

Lake Challa is a crater lake that straddles the border between Republic of Kenya and United Republic of Tanzania. The lake is east of Mount Kilimanjaro, 8 kilometres (5.0 mi) north of Taveta, Kenya, and 55 kilometres (34 mi) east of Moshi, Tanzania. The lake is surrounded by a steep crater rim with a maximum height of 170 metres (560 ft). Approximately 80 percent of the lake's inflow comes from groundwater, which is derived mostly from rainfall in the montane forest zone of Mount Kilimanjaro at an elevation of 1,800 to 2,800 metres (5,900 to 9,200 ft). The fresh lake water has not been utilized and due to rainfall received in the basin, the lake levels has increased by about 0.5 m from May 2020 to April 2021. Through a signed MOU between the two countries, water allocation plan for the Lake Challa is part of the activities to be implemented in the joint framework agreement.

d) Lake Jipe Basin

Lake Jipe is an inter-territorial lake straddling the borders of Republic of Kenya and the United Republic of Tanzania. On the Kenyan side, it is located south of the village of Nghonji while on the Tanzanian side; it is situated within Mwanga District, in Kilimanjaro Region. The lake is fed mainly by the Lumi River, which descends from Mount Kilimanjaro and traverse Kenya in Taita-Taveta County, as well as streams from the North Pare Mountains, being on the leeward side. The lake's outlet forms the Ruvu River. Kenya's unfenced Tsavo West National Park protects part of the lake's northern shore, while on the Tanzania side Mkomazi Game Reserve is nearby. Rainfall received in Lumi River Basin is high during wet season causing flash floods at the downstream. The Lumi river being the only source of surface water in Loitokitok - Taveta experience low flows during dry periods due to over abstraction and lack of rainfall to refill the water channel. Hence the

communities depending on the Lumi River encounter water shortage caused by droughts. In order to curb water shortage, the ministry has initiated groundwater mapping to provide alternative water source and to implement of signed MOU between the two countries to manage the catchment areas.

e) Lake Turkana and its river basin

The Lake Turkana, formerly known as Lake Rudolf, is a lake in the Kenyan Rift Valley, in northern Kenya, with its far northern end crossing into Ethiopia. The lake is fed by River Omo from Ethiopia and Turkwel and Kerio rivers from Kenya. The lake level in Turkana has been receding since 1975. For example, the lake level fell by 10 m (33 ft) between 1975 and 1993. The construction of 250 m high Gilgel Gibe III Dam on Omo River in Ethiopia will increase the falls in lake water levels. In 2018-2019 it was realized that the lake levels had receded by about 2 m. Also, agricultural activities taking place in the catchments of the lake has increased inflow of sediments into the lake reducing the water quality. Despite the fact that the lake waters are saline, communities living around the lake relies on spring and boreholes water for domestic purposes. The rains received in 2019-2020 increased the lake levels in Rift Valley lakes including Lake Turkana. Identification of degraded hotspots areas in the Lake Basin in Kenyan side was done in 2020 and catchment rehabilitation measures will be conducted in the basin to reduce soil erosion. To regulate water abstraction in the catchment areas and at the lake 30 telemetric hydrometric stations was installed in 2019-2020 to monitor river and lake levels from upstream to downstream.

f) Daua and Laghdera River Basin

Daua and Laghdera River basin is shared by Kenya, Ethiopia and Somalia. The rivers which drain the Daua and Laghdera River Basin in Kenyan side are Daua River flowing through borders of Kenya and Ethiopia in Mandera County, River Kutulo that emanates from Mandera County during wet season, Lak Bor and LaghBogal originating from Marsabit County and flows through Wajir County, Ewaso Ng'iro North and Milgis flowing from Mt. Kenya and hills of Marsabit County at the upstream and flows through Wajir to Somalia. The river basin in Kenya is characterized by aridity and hence the rivers become seasonal during dry spells. This creates water and food shortage in the northern region and leaving the residents to rely on groundwater.

g) The Rift Valley Groundwater Aquifers

There are seven shared aquifers between Kenya and its neighbouring countries. At the northern part of the Kenya, North Rift Valley aquifer that starts from Menengai Crater in Nakuru and extends towards southern parts of Ethiopia. At the southern part of Kenya, South Rift Valley aquifers starts from Kenyan Rift valley extending towards Lake Eyasi in United Republic of Tanzania.

h) Mt. Kilimanjaro-Chyulu Hills Aquifer

Mt. Kilimanjaro-Chyulu Hills aquifer is shared between Kenya and United Republic of Tanzania. The aquifer is rich in groundwater due to continuous recharge of the aquifer by heavy rainfalls experienced in the Mt. Kilimanjaro and its slopes. The Mzima springs supplying Taita-Taveta and Mombasa Counties.

i) Kenyan Coastal Aquifers

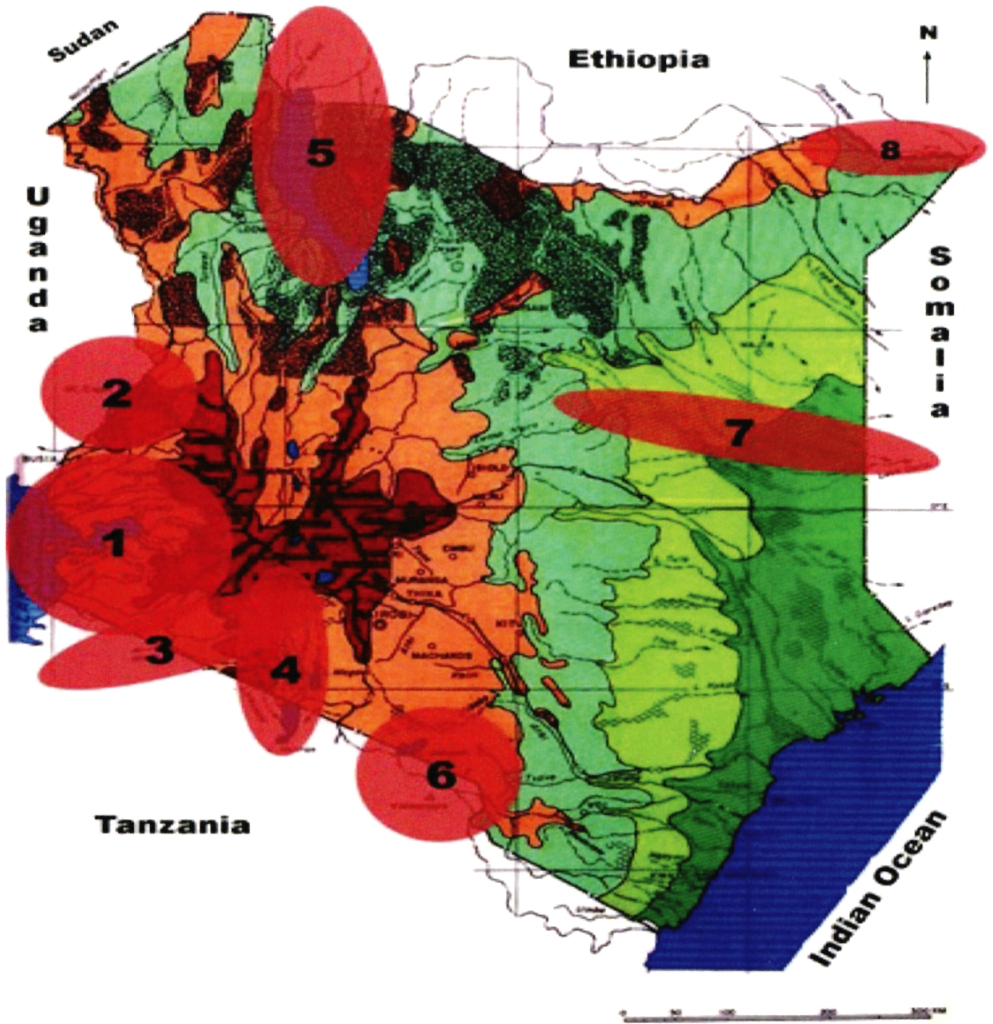
The sand aquifer in Lamu-Kiunga is shared between Kenya and Somalia at the north coastal areas of Indian Ocean. Tiwi aquifer located in south coast of Kenya is shared by Kenya and United Republic of Tanzania. The coastal aquifer is potential sources of water to meet demands of north and south coast communities.

j) Merti -Daua aquifers

The Merti Aquifer is located in northeast Kenya and provides water to the local population as well as a growing number of refugees in the area. Although it is the most important source of fresh water in the region, relatively little is known about the extent of the aquifer, its hydrogeological parameters and groundwater recharge. The aquifer extends from Kenyan part to Somalia. The Daua aquifer is located in Mandera County and southern parts of Ethiopia. The Merti-Daua groundwater is the main source of water to the northern inhabitants. Therefore, exploitation of the groundwater in the northern aquifers should be well controlled to avoid over abstraction and conflicts among water users.

k) Sudd aquifer

The Sudd aquifer is located in north western part of Turkana County. The aquifer is shared between Kenya, South Sudan and Ethiopia. The Sudd aquifer is a potential water resource to meet water demands in Turkana County.



KEY

1. Lake Victoria Basin - shared with Tanzania and Uganda
2. Sio-Malaba-Malakisi, Lwakhakha and Suam rivers and Mt. Elgon aquifer - shared with Uganda;
3. Mara River Basin – shared with Tanzania
4. EwasoNgiro South River and Lake Natron- shared with Tanzania
5. Lake Turkana - is shared with Ethiopia
6. Uмба, Lumi, Pangani rivers, Jipe and Challa lakes and *Chyulu Hills aquifer*– shared with Tanzania
7. The Merti aquifer and Lamu - Kiunga sand aquifer – shared with Somalia
8. River Daua surface and groundwater- shared with Ethiopia and Somalia;

Figure 14: Transboundary water resources in Kenya

2.6.12 Water Resources Management Projects/Programmes

The following water resources management projects and programmes are being implemented to ensure sustainability of safe and reliable water resources in the country.

(i). Kenya groundwater mapping programme

The aim of the programme is to identify areas of high groundwater potential in order to enhance the effectiveness of managing the resource for development. This entails the mapping of the ground and surface water and its delineation. In order to enhance water resources assessment, the Ministry has collaborated with other agencies including UNESCO and United States Geological Survey (USGS) to conduct groundwater assessment in some of the counties with an aim of understanding the groundwater potential in these counties. These Counties include: - the southern parts of Turkana County and whole of Marsabit County are being assessed by USGS, while the Ministry has engaged a Consultant to assess the groundwater potential in Wajir County.

(ii). Upgrading of countrywide Hydromet stations

The Project aims at providing adequate infrastructure for hydrological observations in the country. The project objective is to upgrade river gauging stations to record and transmit data in real time for proper water resources management. The economic and social benefits of the project include efficiently managed Water resources with sufficient knowledge and enable floods and drought to be predicted thereby providing adequate mitigation measures to be taken. The total number of Hydromet stations which have been upgraded in six catchments for the last three years are 235 stations as shown in table 10. In addition, 52 Regular (River) Gauging Stations were rehabilitated while 17 of them have been upgraded to Telemetry and 5 new stations established to improve data accuracy. To Strengthen and enhance water resource monitoring, the Ministry has installed 15 telemetric stations through IGAD HYCOS project to improve hydrological observation. The river gauging stations were upgraded to record and transmit data in real time for proper water resources management. Hence the economic and social benefits of the project included efficiently managed Water resources with sufficient knowledge and enable floods and drought to be predicted thereby providing adequate mitigation measures to be taken.

(iii). Sustainable management of Lake Turkana and its river basin:

Lake Turkana is the world's largest permanent desert lake and the largest alkaline lake. More frequent and prolonged droughts in the region, together with a rapidly growing population, have caused degradation. A history of tension over competition for water and grazing areas causes large losses of livestock and regular requirements for humanitarian aid. Currently, the region is facing the worst drought in decades, claiming many lives -both human and livestock- while escalating transboundary armed conflicts. In order to ensure

sustainable management and development of the Lake Turkana and its River Basins, the Government of Kenya and Government of Ethiopia formed and operationalized steering and technical committees in 2017/2018 financial year. Due to water development projects at the upstream of the lake, the lake levels have been receding over time especially in the Kenyan side. In 2018/2019, the Government of Kenya installed 10 telemetric Hydromet monitoring stations in the Lake Turkana to monitor the lake levels. By the end of 2019/2020 financial year additional 10 telemetric Hydromet stations will be installed to ensure adequate spatial distribution of the monitoring stations. Further, in 2020/2021 financial year additional 3 telemetric Hydromet stations were installed, assessment of water resources status in the catchments areas of the lake was conducted. Degraded hotspots in the basin identified and installed and operational a remote sensing monitoring system. The next phase of the project is to conduct basin wide isotope analysis to determine if surface and groundwater interactions exist within the basin.

(iv). Kocholia Multipurpose water resources project:

The Kocholia multipurpose project consists of a 43 m high dam with approximate capacity of 66.9million cubic metres of water. The project aims at supplying water for irrigating 2000 hectares horticultural lands, to generate electricity and water supply to communities. The project will boost food security, water supply and enhance socio-economic development in Busia and Bungoma Counties. The estimated total cost of the project is about Kshs. 5.7 billion. The project is under preparatory stage and the dam site was identified through pre-feasibility study conducted in 2017/2018 financial year. The location of the project is in Malakisi River Basin. Also community sensitization and stakeholders' forums have been ongoing since 2018 to date. In 2018/2019 financial year, the Environmental and Social impact assessments and Resettlement Action Plans were accomplished. Catchment restoration in Malakisi River Basin was among activities to be conducted before the project implementation phase to ensure sustainable flow of the Malakisi River. By the end of this financial year 2019/2020, two Sub Catchments Management Plans for Malakisi River Basin have been developed and designs of five hydromet networks will be completed. In 2020/2021 financial year 5 telemetric hydrolmet stations were installed in Malakisi River Basin, catchment rehabilitation activities such as soil conservation, tree planting, tree nursery prepared, spring protection and a 2km riparian pegging in Toloso Sub catchment. Also, tree planting, tree nursery preparation and rainwater harvesting in Kaposokipi sub catchment was done. The next phase of the project will be installation of the 5 additional telemetric hydromet stations, catchment restoration and rehabilitation in other sub catchments, detailed feasibility study and dam designs

(v). Angololo multipurpose water resources project:

Angololo multipurpose water resources project is a shared project between Kenya and Uganda. The Angololo project will contribute towards increased irrigated agriculture. It is targeting to irrigate 3,300 ha of land (1,180 ha in Kenya and 2,120 ha in Uganda) when fully developed, supply water to 20,000 people and generate 1.75MW of hydro power. The project also includes an upstream integrated watershed management of about 430 km². The project is expected to benefit at least 127,300 people from Tororo, Manafwa, and Namisindwa districts in Eastern Uganda and Busia and Bungoma Counties in Kenya through employment creation, irrigated agriculture, piped water supply, hydro power generation, and livestock and fisheries production. The estimated cost of the project is USD 1.65 million and it is being implemented by the two countries with the help of Nile Equatorial Lakes Subsidiary Action Plans. In 2020/2021 financial year, project inception report and detailed feasibility study was conducted. In the next phase of the project detailed dam designs and Environmental and social impact studies will be done.

2.7 Status of Water Supply and Sewerage

2.7.1 Introduction

The Water Act 2016 was developed in consultation with County Government and enacted in 2016. This Act caused transition of Water Sector Institutions and expanded their mandates as follows:

- **Water Services Regulatory Board (WASREB)** – is established under the Water Act, 2016 to regulate water and sewerage services provision, including issuing of licenses, setting service standards and guidelines for tariff and prices.
- **Regional Water Works Development Agencies (WWDAs)** - are established by Section 68 of the Water Act 2016 to undertake the development, maintenance and management of the national public water works within its area of jurisdiction; operate the waterworks and provide water services as a water service provider in certain circumstances; provide reserve capacity for purposes of providing water services during transfer of water services functions from a defaulting water services provider; provide technical services and capacity building to such county governments and water services providers within its area as may be requested; and provide to the Cabinet Secretary technical support in the discharge of his or her functions under the Constitution and this Act. They took are the successors of the Water Services Boards.
- **Water Sector Trust Fund (WSTF)** - is established under the Water Act, 2016 to provide conditional and unconditional grants to Counties, in addition to the Equalization Fund and to assist in financing the development and management of water services in marginalized and underserved areas. This includes community level initiatives for the

sustainable management of water resources, development of water services in under-served rural areas, development of water services in the under-served poor urban areas, and research activities in the area of water resources management, water services, sewerage and sanitation. It took over from the former Water Services Trust Fund.

- **Water Tribunal (WT)** - is established under Section 119 of the Water Act 2016 to hear and determine any dispute concerning water resources or water services where there is a business contract, unless the parties have otherwise agreed to an alternative dispute resolution mechanism. However, the WT has not been operationalized due to problem with the law where the Act gave the WT a chairman but no members of the Board. It is proposed that this be corrected through amendment of the Act. It is set to take over from Water Appeals Board.
- **National Water Harvesting and Storage Authority (NWHSA)** - is established under the Section 30 of the Water Act, 2016 with a countrywide mandate to undertake the development of national public water works for water resources storage and flood control on behalf of the national government; and maintain and manage national public water works infrastructure for water resources storage; collect and provide information for the formulation of the national water resources storage and flood control strategies; develop a water harvesting policy and enforce water harvesting strategies; undertake on behalf of the national government strategic water emergency interventions during drought; and, advise the Cabinet Secretary on any matter concerning national public water works for water storage and flood control. It took over from National Water Conservation and Pipeline Corporation

All the Institutions which were proposed under the Water Act 2016 have been established except Water Tribunal.

Other Water Institutions

- **Kenya Water Institute (KEWI)** which was transformed into a semi-autonomous institution in July 2002 through the Kenya Water Institute Act of 2001, provides training, research and consultancy services in the water and irrigation sector.
- **Regional Centre on Ground Water Resources Education, Training and Research** established under Legal Notice No.252 of 18th December, 2015, to build knowledge and information on ground water potential and undertake training and research on ground water resources.
- **Hydrologists Registration Board (HRB)** is established under the Hydrologists Act No. 19 of 2017. The Board's mandated is to regulate hydrologists profession and Practice in the country.

2.7.2 Analysis of Water Supply and Sanitation Projects in the Ministry

Over the last five years, the Ministry has been able to complete a total of 64 water and sanitation projects worth KShs. 46.7 billion. This has led to an increase of population with access to safe water by 7.2 million.

The Ministry is currently implementing a further 112 water and sanitation projects valued at KShs 561 billion. These projects are at different completion levels with 31 of them being more than 50% complete and are targeted to be complete by 2022.

The Ministry has planned to undertake 57 dams across the country in order to increase the water storage capacity by 2,250 million Cubic Meters. Out of these, four big dams have been completed including Kiserian, Maruba, Theta and Chemususu dams with a cumulative capacity of 37.8 million Cubic Meters. Four medium sized dams have also been completed including Thangatha, Ura, Kianjuri and Wamba with a cumulative storage of 750,000 cubic meters. Seven (7) of the Dams are under construction valued at KShs. 92.7 Billion with a cumulative storage of 839.8 Million Cubic Meters. Four of them are more than 50% which includes; Thwake and Siyoi Muruny, Karimenu II and Yamo Dams). Itare dam is under DCI Investigation, Umaa and Badasa have been revived and are currently under design review before construction commences. Details of dams are attached in Annex IV

2.7.3 Projects under the Big Four

The Government of Kenya has formulated and is implementing the Vision 2030 development blueprint aiming to transform Kenya into a newly industrializing, middle-income country providing a high quality of life to all its citizens by 2030. During its implementation, there were key areas that were identified as having challenges in implementation, which when unlocked would ensure that the other parts of vision would be realized faster. These areas were formulated into the Big “Four” Agenda in order to fast track their implementation.

The Ministry has been identified key enabler of the Big Four Agenda. The drivers for the agenda have identified the projects that will be implemented as well as the budgets and timelines for implementation. The projects that are key to achievement of the priority objectives are outlined for each of the four groups.

Manufacturing

The projects that will support Manufacturing have been identified by the driver and will mainly be in Nairobi, Mombasa and Machakos Counties. Constituency Industrial Development Centres will however be spread across the country. These projects include

supply of water to Naivasha Industrial Park; Kenanie Leather Industrial Park; Dongo Kundu SEZ; and Konza Technopolis Complex

The cumulative cost of the projects is Kshs. 4.4Billion. A total of Kshs. 3.5Billion has been utilized so far and KShs. 264Million allocated for the financial year 2020/21 for the Kenanie Leather Park and Naivasha Industrial Park phase II projects, while Kshs. 170Million has been allocated for the other projects in the FY 2021/22. The construction of water to Naivasha Industrial Park is currently 97% and phase I of Dongo Kundu has been completed. The Projects are tabulated in Annex I

Food Security and Nutrition;

Irrigation is considered a key enabler to Food Security and Nutrition and therefore a bulk of the Irrigation projects are part of the Big Four Agenda. The Projects under irrigation include National expanded irrigation Programme; Mwea Irrigation Development project (Thiba Dam and Irrigation Area), Rwabura Irrigation Development Project; Bura Irrigation Scheme; Community Based Irrigation Projects; Small Holder Irrigation Programme; Turkana Irrigation Development Project; Lower Kuja Irrigation Scheme, among others

The water projects that will support Food Security and Nutrition include connection of water supply to fish landing sites and fish markets at the coast and supply of water to livestock holding grounds located in various counties across the country.

The cumulative cost of the irrigation projects is Kshs. 202.9 Billion. A total of KShs. 10.7 Billion has been allocated for the current FY for irrigation projects, while Kshs. 10.5 Billion has been allocated for the FY 2021/22. The Projects are tabulated in Annex IV.

The cumulative cost of the water projects is Kshs. 495Million. A total of KShs. 265Millionhas been allocated for the current FY for water projects but there have not been any exchequer releases, while Kshs. 230Millionhas been allocated for the FY 2021/22. The Projects are tabulated in Annex II.

Affordable Housing:

The Driver has identified Housing Projects that will be implemented mainly in Nairobi and Machakos Counties. These projects will however require to be supplied water from Key Projects that have not been outlined by the driver as part of the Affordable Housing. Projects identified to support Affordable Housing include water and reticulation for Park Road, Starehe, Shauri Moyo, Utawala, Mihango, Ruai, Githunguri, Kibera B, Mariguini and East Africa Portland Housing Projects. Others include Mavoko water supply and sewerage projects.

The cumulative cost of the projects is Kshs. 15.3Billion. A total of Kshs. 2.8Billion has been utilized so far for Mavoko Drinking Water Supply Project, while Kshs. 1.125Billion has been allocated for all projects in the FY 2021/22. The allocated amounts in FY 2020/21 was not released for the projects. The project details are provided in Annex IV.

Universal Health Coverage:

The driver has identified 56 level 4 hospitals, 435 level 3 hospitals and 2576 level 2 hospitals that require to be supplied with reliable water supply. These hospitals will either be connected to existing water supplies or have individual projects developed for their water supply. The projects are located in all the counties countrywide.

The cumulative cost of the projects is Kshs. 25.9Billion. A total of Kshs. 759Million was allocated in FY 2020/21 for implementation of 102 priority facilities. By 28th June, 2021, nine (9) facilities are under assessment/dry boreholes, fifteen (15) under procurement, forty-nine (49) awarded and contract not signed, seven (7) with implementation status below 50%, nineteen (19) with implementation status above 50% and three (3) facilities completed. A total Kshs. 957Million has been allocated for all projects in the FY 2021/22. Project details are in Annex IV.

Other Key priority projects supporting the Big Four Agenda:

The Ministry is implementing other Key Projects that will supply water to the sites where the Big Four Projects are being implemented. These projects are considered as the drivers to the Big Four Agenda. These projects include Aberdare Bulk Water Project; Thwake Multipurpose Water Development Programme Phase I; Mwache Dam and Water Supply Project; Mzima II Pipeline; Northern Collector Tunnel; Ruiru II dam; Karimenu II dam; Ndarugu I Dam and Water Supply; Maragua IV Dam and Water Supply; and Kenya Towns Sustainable Water Supply and Sanitation Programme.

The cumulative cost of the projects is Kshs. 167.9Billion. A total of Kshs. 41Billion had been utilized so far and Kshs. 18.6Billion allocated for the 2020/21 FY, while Kshs. 24.5Billion has been allocated for all projects in the FY 2021/22. These Key Projects are listed in Annex V.

2.7.4 Trend in Water Coverage;

The Ministry has been undertaking monitoring of provision of water services nationally on an annual basis. This is in order to track the impact of the investment that the Government has been putting on increasing access to safe water.

The data obtained is mainly from WWDAs and WSTF who are the major implementers of water supply and sanitation bulk projects. It is important to note that the impact of each project is only realized once the project is completed and has started operating.

Over the last five years, the water coverage by population increased from 58.0% in FY 2014/15 to 65.5% in FY 2019/20. This is distributed in different Water Works Development Agencies as shown in table 9.

Table 9: Population and percentage coverage for WWDAs for the last 5 years

WwDA		LVS	R. Valley	LVN	Tanathi	Northern	Tana	Coast	Athi	Totals
2015/16	Pop. Within WwDA	7,538,489	7,784,423	6,461,963	4,368,882	3,305,213	3,669,515	4,055,860	7,373,989	44,558,334
	Pop. Served	3,314,139	5,162,144	3,797,078	1,785,614	2,037,622	2,543,329	2,140,208	5,503,529	25,832,883
	%age Pop. Served	44.0%	66.3%	58.8%	40.9%	61.6%	69.3%	52.8%	74.6%	58.0%
2016/17	Pop. Within WwDA	7,704,332	7,955,677	6,604,123	4,464,995	3,377,926	3,750,243	4,145,088	7,536,214	45,538,598
	National Pop. served	3,513,176	5,398,266	4,041,726	1,887,714	2,174,136	2,700,174	2,257,940	5,751,047	27,290,543
	%age Pop served	45.60%	67.85%	61.20%	42.28%	64.36%	72.00%	54.47%	76.31%	59.93%
2017/18	Pop. Within WwDA	7,873,824	8,130,698	6,749,411	4,563,223	3,452,239	3,832,746	4,236,278	7,702,007	46,540,427
	Pop. Served	3,566,433	5,731,048	4,163,852	2,025,987	2,408,140	2,682,575	2,800,701	6,009,646	28,854,561
	%age Pop. Served	45.29%	70.49%	61.69%	44.40%	69.76%	69.99%	66.11%	78.03%	62.00%
2018/19	Pop. Within WwDA	8,047,045	8,309,570	6,897,895	4,663,612	3,528,187	3,917,065	4,329,474	7,871,448	47,564,296
	Pop. Served	3,607,829	5,966,992	4,269,405	2,107,548	2,500,941	2,750,262	3,140,264	6,136,571	29,904,258
	%age Pop. Served	44.83%	71.81%	61.89%	45.19%	70.88%	70.21%	72.53%	77.96%	62.87%
2019/20	Pop. Within WwDA	8,224,080	8,492,381	7,049,649	4,766,211	3,605,807	4,003,240	4,424,722	8,044,620	48,610,711
	Pop. Served	3,707,829	6,111,992	4,489,405	2,420,548	2,550,941	2,800,262	3,270,264	6,504,571	31,855,811
	%age Pop. Served	45.09%	71.97%	63.68%	50.79%	70.75%	69.95%	73.91%	80.86%	65.53%
Additional People Served (5yrs)		393,690	949,847	692,327	634,934	513,318	256,933	1,130,056	1,001,042	5,572,148
Additional PopGrowth (5yrs)		685,591	707,958	587,686	397,330	300,594	333,726	368,862	670,631	4,052,377
%age Additional Pop. Served		1.12%	5.66%	4.92%	9.91%	9.10%	0.64%	21.14%	6.22%	7.56%

Table 9 shows the data that was used to compute percentage coverage by population for each of the WWDAs. The trend of growth in coverage is presented in Figure 15.

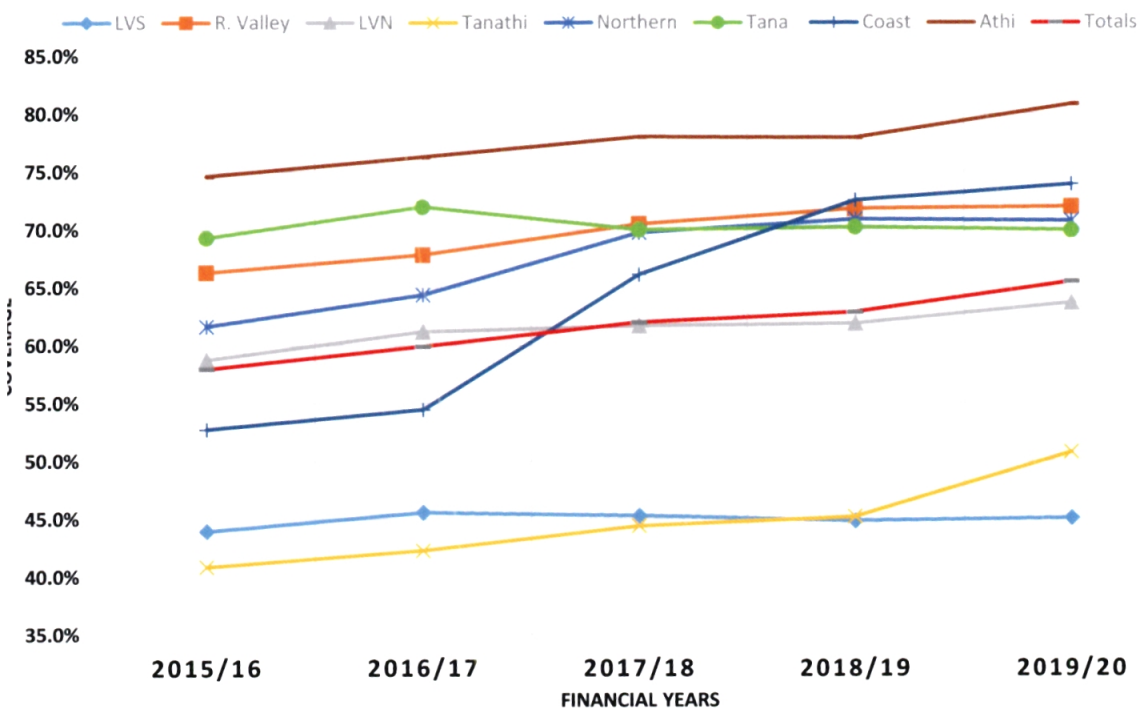


Figure 15: Comparison of water coverage by various WWDAs for the last 5 years

As shown in Figure 16, different WWDAs have achieved different results in the last five years. This is attributed to number of projects that have been completed in each over the duration. Athi WWDA has the highest coverage of 80.9% influenced mostly by better coverage in Nairobi. Tanathi and Lake Victoria North WWDAs have the lowest coverage at 50.8% and 45.0% respectively. This can be attributed to project completion rates. Some of the key projects completed in each Agency area are as follows:

- a) Athi WWDA: Ruiru Juja Water Supply Project, Kikuyu Urban Water Supply Project, Kiambu Urban Water Supply Project and Theta Dam Treatment Works and Distribution Water Project, Kigoro Treatment Plant, Kiambu town-Roysambu-JKIA transmission mains, Ithanga water supply, Murang'a last mile connectivity and Emergency Covid-19 boreholes. These projects are serving 1,500 households.
- b) Lake Victoria South WWDA: Isebania Water Supply Project, Keroka Water Supply Project Siaya - Bondo Water and Sanitation Project, Rangwe Water Supply Project phase I (Kosiga Dam) and Water Sector Development for Kericho, Kisii, Nyamira and Litien. These projects are serving 900 households.
- c) Rift Valley WWDA: Lotikip Well Field Development Project Iten Tambach Sabor Water Supply Project Phase I and II, Sengwer Community Water Supply Projects, Construction

of Ellegirini Pipeline and Expansion of Kapsoya Treatment Works, Marakwet West/Kapcherop Phase II Water Supply, Kases peace dam, Narok last mile and Leshau-Karagoini projects. These projects are serving 40,000 people.

- d) Lake Victoria North WWDA: Chesikaki - Cheptais - Sirisia Water Supply, Construction Chwele Water Supply Project, Rehabilitation Sotik - Water Supply System, Kericho Sewerage Improvement Project, Vihiga Cluster and Lake Victoria water supply initiative for Kericho, Keroka and Isebania. These projects are serving 45,000 people.
- e) Coast WWDA: Baricho Works Expansion & New Pipelines to Kilifi & Gongoni, Expansion of Taveta Lumi Supply, Mombasa Network Rehabilitation, Mkanda Dam Rehabilitation Project, Baricho boreholes and West Mainland phase I projects. These projects are serving 1,200 households.
- f) Northern WWDA: Masalani Water & Sanitation Project, Drilling and Equipping of 30 Boreholes, Eldas Enole Water Supply, Kursin Water Supply, Isiolo Water and Sanitation Project, Moyale Water Supply, Wamba water supply and Forolle peace dam. These projects are serving 32,000 people.
- g) Tana WWDA: Mukurwe-ini water Project, Maua Water Project II and Sewerage/ Drainage Project, Thangatha Dam and Othaya last mile connectivity. These projects are serving 1,400 households.
- h) Tanathi WWDA: Wote Water Supply & Sanitation Project, Masinga - Kitui Water Supply Project, Migwani Water Supply Project, Mavoko Drinking Water supply and sanitation, Masinga Cluster phase II, kakuyu water supply and boreholes equipping and rehabilitation. These projects are serving 53,000 people.

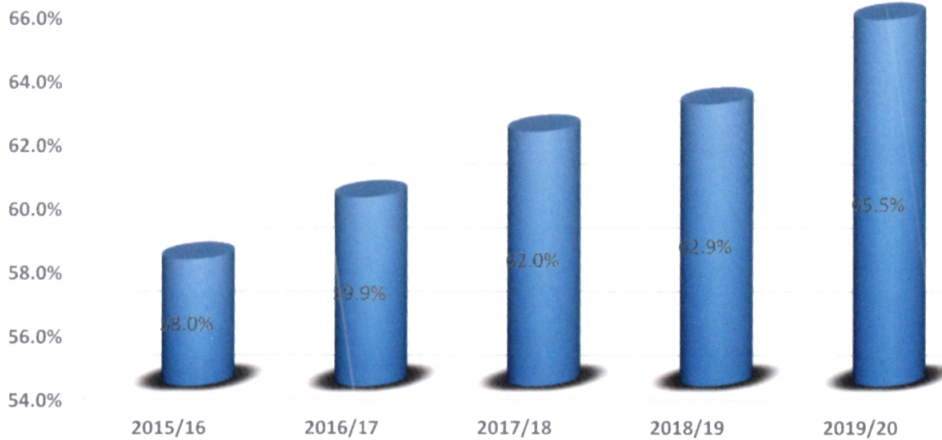


Figure 16: Trend of national water coverage for the last 5 years

As shown in Fig 16, the overall water coverage however has been on a steady rise from 55.9% in FY 2014/15 to 62.9% in FY 2018/19. The WWDA that has contributed most in this rise is Coast which has had a lot of intervention in major projects as shown in Annex I.

The Water Sector Trust Fund has been implementing various projects both in the Urban Poor and Rural Marginalized areas. This has been having impact in these areas. In the last 5 years, WSTF has been able to increase the population with access to safe water by 1.13Million through implementation of projects by water user associations and water utilities. This is shown in table 10.

Table 10: Population and percentage Water coverage by WSTF Rural Marginalized/ Underserved and Urban Poor in the last 5 years

	2016/2017	2017/2018	2018/2019	2019/20	2020/21	Totals
National Population	45,538,598	46,540,427	47,564,296	48,610,711	49,680,147	50,773,110
Rural Marginalized/ Underserved and Urban Poor Pop Served	319,536	248,160	336,496	163,455	58,597	1,126,244
% of Pop Served	0.7%	0.5%	0.7%	0.3%	0.1%	2.2%

2.7.5 Trend in Sewerage Coverage

For the last 5 years, the sewerage coverage has increased from 20.1% in 2014/15 to the current 27%. There was however a period where the population grew at a higher rate than the number of connections that were done indicating a slight reduction in the urban sewerage coverage.

2.7.6 Projected Water and Sewerage Coverage

The management of water services is a shared responsibility between the National Government and County Governments. The National Government through the Ministry majorly develops water supply infrastructure while each of the County Governments are charged with the responsibility of service provision including development distribution networks and actual services connections.

The Ministry is targeting to ensure universal coverage to water and sanitation services by 2030. The short-term targets to be achieved by 2022 are;

- Achieve a national coverage of 80% for water services by 2022 from 60% in 2017
- Achieve a national coverage of 80% for Sanitation services by 2022 from 67.2% in 2017
- Achieve a 40% coverage of Sewerage services in Urban areas by 2022 from 25% in 2017

The Ministry has adopted the following strategies to ensure achievement of the targets for water coverage;

1. Complete all the 91 ongoing projects by 2022 at an average cost of KShs. 49Billion annually.
2. Mobilize resources for the construction of 51 projects proposed at an average cost of KShs. 23Billion annually.
3. Reduce Non-Revenue Water from the current 41% to 35% by 2022

2.7.6.1 Projected Water Coverage

The water coverage will be achieved by actively carrying out last mile water connectivity to about 200,000 households per year. This will only be possible with close collaboration between the National Government (constructing major infrastructure) and County Governments (carrying out Service Provision and last mile water connectivity)

Based on the water coverage of 65.5% in mid-2021, projects were identified (Annex II) that will be completed on or before the year 2022. The list has been revised and updated to reflect the effects of Covid-19 on funding levels. Their impact was assessed at projected water coverage was carried out as shown in figure 17.

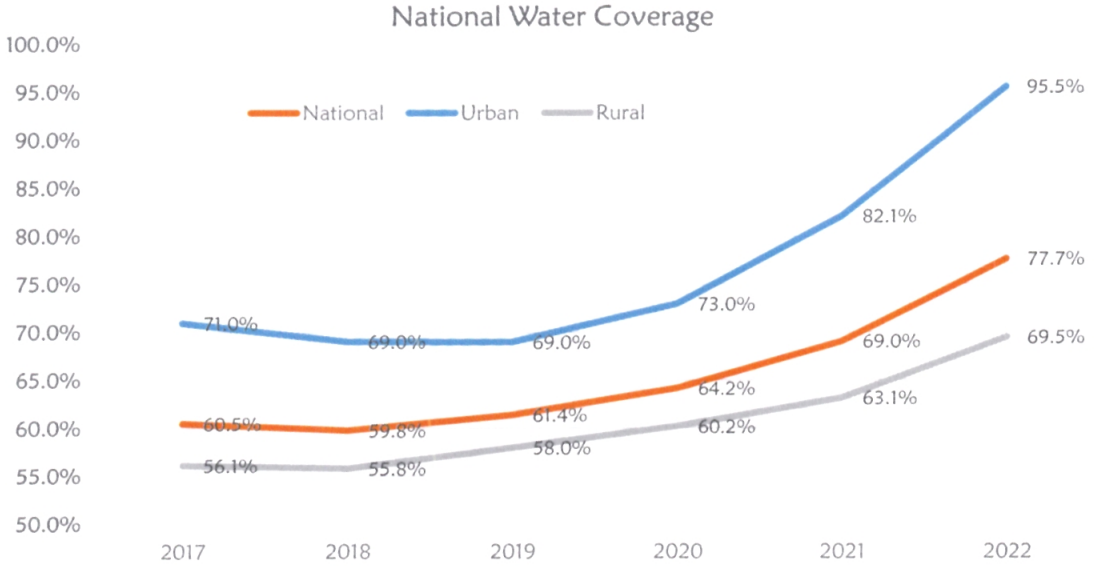


Figure 17: Projected Water coverage to be achieved on or before year 2022

The graph shows that there will be a slow growth in coverage owing to the small number of projects being completed in 2019 and 2020. The high growth rate of coverage in 2021 and 2022 is expected as most of the high impact projects will be complete and connected during that period.

It is important to note that the water that will be recovered from Non-Revenue Water when the dilapidated distribution systems of Water Services Providers are improved has not been factored in the above projections.

2.7.6.2 Projected Sewerage Coverage

Sewerage coverage in the country is targeted on urban areas where there is a higher density of population. Currently, about 27% of Kenyans live in urban areas, a proportion which is growing.

In order to achieve 33.2% sewerage coverage by 2022, the last mile sewerage connectivity will have to be done for 350,000 households annually. There is therefore need for National Government (which undertakes constructing major infrastructure) to closely

collaborate with and County Governments (which is tasked with carrying out Service Provision and last mile water connectivity)

Based on the urban sewerage coverage of 27.7% in mid-2021, projects were identified (annexed) that will be completed on or before the year 2022. Their impact was assessed and projected sewerage coverage was carried out as shown in figure 18.

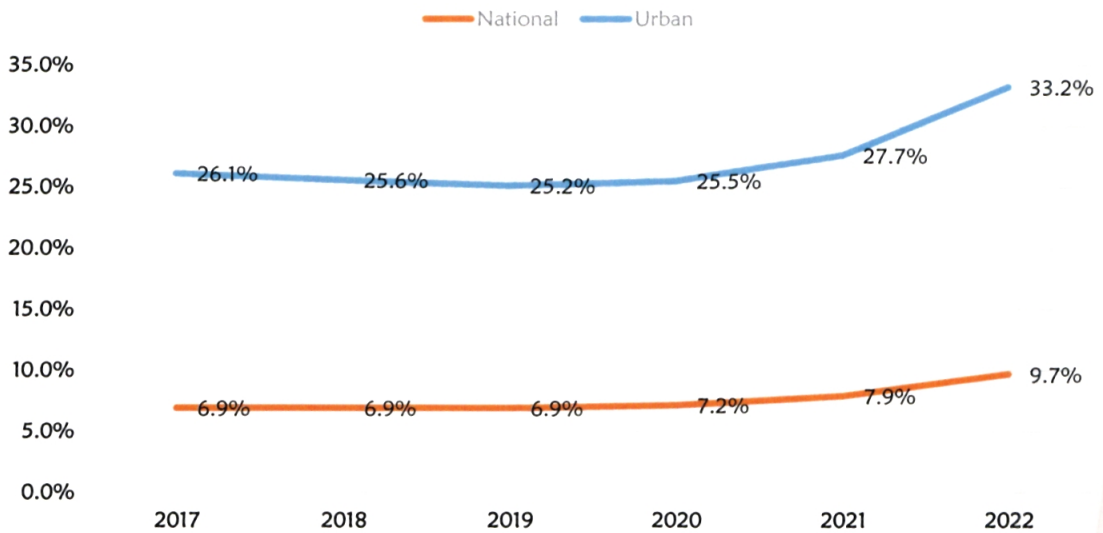


Figure 18: Projected Sewerage coverage to be achieved on or before 2022

Fig. 11 above shows a maintenance of sewerage coverage in 2018 and 2019 then a gradual increase up to 2022. Even though there are projects that were completed in the period between 2018 and 2019, the population grew almost at the same rate as the additional number of people that were served with sewerage services (average population growth rate of 2.2% per annum). The number of people to be connected in 2020 to 2022 will be much higher than the growth rate owing to the number of sewerage projects that will be completed by then.

These statistics were based on the following assumptions;

1. That when a project is completed, connections will be progressively made over three years after completion
2. The project designs are usually at an ultimate time in future, so even if all connections were made, they would not amount to the people served at ultimate design
3. That no person is served before the projects are completed

The risks identified that can make the above targets not be achieved are;

1. Most projects have a completion date of 2022 including those which have not been designed. Projects that are likely to delay will impact on the overall coverage.
2. Achievement of the coverage heavily relies on the number of connections made after project completion. Last Mile Water Connectivity must be mainstreamed.
3. Any delay in project implementation has a direct impact on achievement of the targets.
4. It is imperative that the budget and cash flow projections for these projects be increased to ensure that they are completed in time.

2.8 Status of Sanitation

To strengthen the coordination of Sanitation, the Ministry has created a fully-fledged Sanitation Department and is in the process of staffing it with the required human resources as per the approved establishment.

2.8.1 Sanitation in Rural marginalized/underserved and urban poor

The Ministry through Water Sector Trust Fund (WSTF) has been implementing various projects both in the Urban Poor and Rural Marginalized areas. This had positive impact in these areas. In the last 5 years, WSTF has been able to increase the population with access to safe water by 569,467 through implementation of projects by water user associations and water utilities. This is shown in table 11.

Table 11: Population reached with sanitation services by WSTF in rural marginalized/underserved areas and urban poor

	2016/2017	2017/2018	2018/2019	2019/20	2020/21	Totals
National Population	45,538,598	46,540,427	47,564,296	48,610,711	49,680,147	50,773,110
Rural Marginalized/ Underserved and Urban Poor Population Served	125,850	129,360	121,984	167,130	192,273	569,467
% of Population Served	0.3%	0.3%	0.3%	0.3%	0.4%	1.1%

2.9 Status of Irrigation and Land Reclamation

2.9.1 Irrigation

The irrigation potential is estimated at 1.913million acres (765,575 ha) as per the National Water Master Plan 2030 without water storage and can go up to 3 million acres (1.2 million ha). Out of this total potential only 552,000 acres has been developed accounting for 29% coverage while out of the country’s total arable land only 5.8% is equipped with irrigation infrastructure. It calls for concerted efforts towards increasing access to agricultural water in a bid to increase yield to support food and nutrition security efforts and support growth in manufacturing vide agro-processing of surplus produce and value addition. The opportunities for irrigation investments may be unpacked as in figure 19.

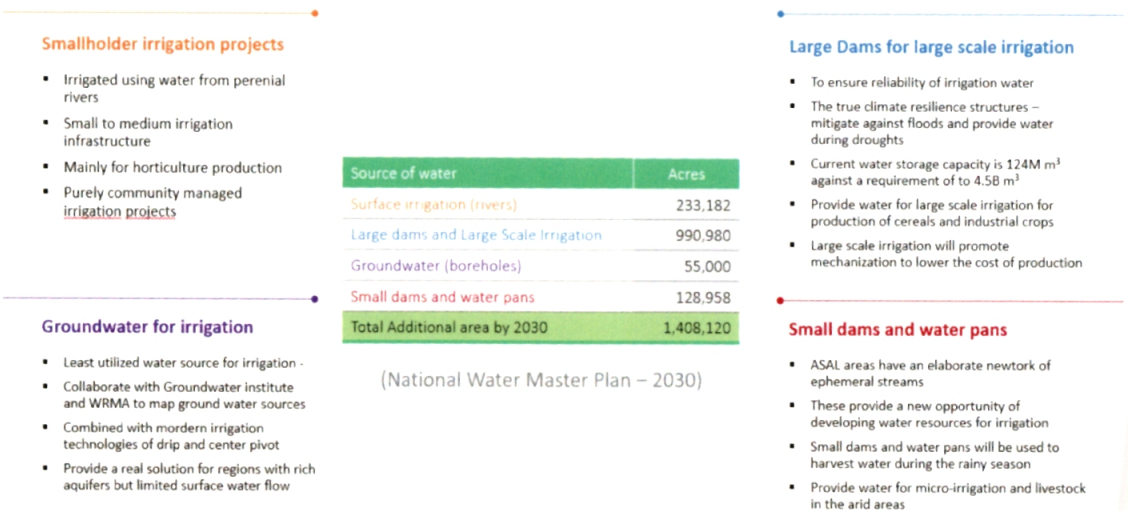


Figure 19: Opportunities for irrigation investments

2.9.1.1 Expanded Irrigation Programme

With the success of the Economic Stimulus Programme (2009-2011) directly and indirectly benefiting estimated 1.2million households, the government initiated the National Expanded Irrigation Programme. In the Budget Statement to Parliament for Financial Year 2011-2012, the Minister for Finance allocated KSh 8.5 billion for initiating a comprehensive country-wide Irrigation Expansion Programme.

The Programme involves provision of irrigation infrastructure for abstraction, conveyance, distribution and application of irrigation water for the various irrigation projects. The project targeted interventions in 610 projects across the country to bring an additional 531,574 acres. For sustainability and reliability of irrigation water, the sector also embarked on providing water storage for irrigation. In arid areas, development initiatives focused on provision of water storage reservoirs and installation of greenhouses. The water pans provide water for domestic and animal consumption while greenhouses supplement local community's nutritional needs and provide a source of income for women and youth groups.

Since 2011, the achievements under the National Expanded Irrigation Programme can be summarized as follows: -

- Rehabilitation, expansion and modernization of public irrigation schemes that has seen the irrigation area increase from 23,055 acres to 50,315 acres.
- Construction of over 202 irrigation projects across all the 47 Counties mainly under the Expanded National Irrigation Programme (ENIP) with cumulative total of 161,575 acres directly benefiting over 108,077 farmers at a cost of Kshs 29.21 billion translating to Kshs 180,805 per acre.
- Completed feasibility studies and detailed designs for over 38 projects covering 430,000 acres.

In addition, to increase reliability of irrigation water, water-harvesting initiatives have also been carried out under the programme that includes: -

- Completed feasibility studies and detailed designs for 11 water storage reservoirs with a cumulative total of 1.3billion m³
- Construction of 25,306 no water pans with a combined volume of 42.8Million m³ in arid areas for domestic, animal consumption and irrigation in greenhouses.

2.9.1.2 Micro-Irrigation for Schools

This is an intervention to build capacity of young Kenyans in schools to appreciate and actively participate in agriculture. The former 4K Clubs in schools created a mentality that agriculture and other farming investment is futile as it gave poor returns. This nearly led to less interest in agriculture in our learning institutions. Micro-irrigation programme for schools is intended to reverse this. Water sources from boreholes and water and small dams supply water to institutions and pilot commercial agriculture with intensive irrigation with greenhouses. With secured income and sustainable water availability the intervention has attracted a lot of interest. The Ministry has drilled 10 boreholes during the year giving a total of 78 boreholes to date; additional 11 contracts were awarded. 120 greenhouses have been installed so far with regular water supply.

2.9.1.3 Ongoing Irrigation projects

To extend these achievements, the sector is currently undertaking several irrigation development initiatives that include: -

- i. Construction of 15million cubic meters Thiba dam and irrigation infrastructure under Mwea irrigation development project that will see the area increase from 25,000 to 35,000 acres and support production of a second crop,
- ii. Construction of intake and gravity canal for Bura Irrigation Rehabilitation project financed by BADEA, Kuwait Fund and Ofid and a sizable component of GoK counterpart funding to convert the system from pump fed to gravity fed irrigation system and increase area from 6000 acres to 15,000 acres.
- iii. National Expanded Irrigation Programme and Community based irrigation projects targets to bring an additional 20,000 acres under irrigation annually.
- iv. Implementation of the 10,000 acres model farm for Galana Kulalu Food Security Project.
- v. Construction of the 1500 acres Rwabura Irrigation Development Project financed by the government of Kingdom of Spain.
- vi. Construction of 10,000 acres Lower Nzoia irrigation project under the lower Nzoia Irrigation Project under the Kenya Water Security Project financed by the World Bank and KFW.
- vii. Construction of the 19,290 acres Lower Kuja Irrigation Scheme in phases where 4,000 acres has been achieved.
- viii. Construction of the 1500 acres Lower Sabor Irrigation Development Project under gravity-fed sprinkler irrigation system.
- ix. Construction of the 30,000 acres Turkana Irrigation Development Programme in Naipa, through groundwater in Lotikipi aquifer where 2000 acres has been achieved.
- x. Operation of public irrigation schemes to optimize production.

In addition to this, the sector has purposed to invest in water storage facilities that will increase reliability of irrigation water and build resilience for communities against effects of climate change. Some of the key water harvesting programmes include.

- i. Thiba dam as mentioned earlier
- ii. Construction of water harvesting infrastructure for households with an aim of providing 125,000 households with localized reservoirs to supplement their irrigation needs.
- iii. Rehabilitation of existing small dams and water pans to increase their capacity to meet irrigation demand for neighbouring communities. Project aims at

rehabilitating over 4,000 water pans with a capacity of 400 million cubic meters across the country.

- iv. Implementation of four large dams for irrigation namely Thuchi, New Gogo, Kwa Kivyai, Rwabura and Thirirka

The details of ongoing projects are included in *Annex IV*. As detailed, there are opportunities of extending the ongoing programmes for quick wins.

From the past trends and current initiatives, it is clear that the government and development partners have contributed immensely towards irrigation development. As a result, the irrigation area has increased from 354,831 acres in 2010 (NWMP, 2030) to 552,000. This developed irrigation potential presents an opportunity for focused and enhanced agricultural production for strategic crops. This however requires an elaborate framework of engaging farmers to take up the production

2.9.1.4 Irrigation Development Opportunities

There is a lot to be done to develop the unexploited irrigation potential of 1.393 million acres. In this regard, the completed feasibility studies and detailed designs for projects provide the next frontier in irrigation development and will be the focus of the future plans. The sector is putting efforts towards development of extensive irrigation projects accompanied by irrigation water harvesting and storage initiatives. Besides, the sector has also embarked on catalysing farmer led irrigation development initiatives, which has high potential for increasing area under irrigation, through diagnostic studies in collaboration with the World Bank and Water Resource Group 2030. Some of the earmarked different categories of projects whose feasibility studies and detailed investigations and designs have been carried out include: -

a) Irrigation projects

i. Large scale irrigation projects

The Irrigation Act defines large-scale irrigation scheme as schemes whose area is above 3,000 acres. Towards this end, the sector has seen successful operation of the largest irrigation scheme in the name of Mwea irrigation scheme. Further to this, there are also good indications that all the large-scale projects are back in operation. Learning from this, the sector has in addition identified more large-scale projects for implementation. These projects eventually translate to strategic irrigation projects that will be the key food security projects in respective counties. These projects have been conceptualized around the available water resources to meet crop water requirements for projects covering a large area.

Feasibility studies and detailed designs for 22 projects have been carried out and are ready for implementation as detailed in *Annex V*. These projects will bring a total combined area of 398,731 acres and is estimated to cost Kshs 83.7billion. This will have huge impact in the food and nutrition pillar of the big four through projected annual production of 1,068,350 bags of rice paddy, 8,502,760 bags of maize, 52,100 MT of cotton and Kshs 75 billion worth of horticultural crops that includes irish potatoes. Further to this, the projects are projected to generate revenue amounting to Kshs 114 billion and create 1.9 million jobs both directly and indirectly.

Studies in irrigation development have identified some projects that would depend on transboundary waters. These projects include Daua in Mandera that will use Daua river that is shared between Kenya, Ethiopia and Somali, Umba valley project whose water source is Umba river shared between Kenya and Tanzania, expansion of Challa irrigation project through the use of lake Challa which is shared between Kenya and Tanzania, Kocholia-Amagoro-Amoni using river Sio that is shared between Kenya and Uganda. There is need to purpose to conclude the memorandums of understanding with the neighboring counties to enable progress in the projects.

ii. Small holder/community managed irrigation projects

These are schemes that are owned and managed by the communities with an aim of boosting their agricultural production. Smallholder Irrigation Schemes are either initiated by the government, development partners or farmers themselves. In line with the Irrigation Act, the sector at the national government level, is responsible for smallholder irrigation schemes with acreage range from 100 to 3000 acres with. The projects are quick wins in irrigation development because the implementation cycle is short from identification, design and construction. The structures are fairly small making them easy to build, operate and maintain. They can also be implemented in regions with fairly limited water resource and can use different water sources including major rivers, streams, and boreholes.

These projects are well distributed in various counties across the country. The sector has earmarked 610 projects with a total area of 531,574 acres. Currently, NIA has been implementing this cluster of projects under the National Expanded Irrigation Programme and the ministry under the Community Based Programme. As detailed in annex III, 228 projects have been identified that are at different levels of implementation. On implementation, 174,690 acres will be developed at a cost of Kshs 42.9 billion to benefit 219,539 farmers. This has the potential of increasing maize production to 2,600,000 bags and horticultural crops valued at Kshs 43.7 billion with proper capacity building and incentive for farmers.

iii. Expansion of Public Irrigation Schemes

To realize more acreage towards achieving food security proposed expansion and modernization of public irrigation schemes will see the irrigation area increase by an additional 12,500 acres from the current 48,842 acres. The areas targeted for expansion will utilize the same water resources abstracted and conveyed by the existing infrastructure as detailed in annex IV. The estimated cost for this expansion is Kshs 1.025 billion.

b) Water harvesting for irrigation projects

In recent years the water resources have been shrinking, a factor that has been attributed to climate change and other human activities hence less water is available for irrigation. To increase reliability and stabilize irrigation water, it is important to develop water storage reservoirs to store excess floodwaters for use during the dry spells.

i. Large dams for large irrigation projects

The sector has initiated studies for a number of dams for various irrigation projects and proposes to undertake more studies in a bid to have a dam for each irrigation project. Currently, the sector is executing construction of Thiba dam for Mwea irrigation scheme and will leverage on the construction of Thwake dam to irrigate the area downstream.

The sector in the medium term proposes to undertake 7 water harvesting and storage projects, construction of new water pans and small dams in areas that do not have perennial rivers and rehabilitation of existing water pans and small dams to increase water storage capacity by 1.14 billion cubic meters and irrigate an additional 408,400 acres at an estimated cost of Kshs 135 billion as detailed in annex V.

ii. Household Water harvesting for Irrigation

The objective of the project is to provide localized water access through construction of water harvesting and storage reservoirs for irrigation purposes at the household level by harnessing surface water (runoff) resulting from rainfall received in the reservoir areas in the arid counties. Project will be implemented across the arid areas where landowners are willing to freely cede land for excavation of the reservoir. The target is to construct household water pans with a cumulative volume of 125 million cubic meters to irrigate 125,000 acres at an estimated cost of Kshs 16.25 billion for excavation as detailed in annex VI. During the period under review, a total of 25,091 household water pans with a volume of 28,091,666m³ that can irrigate 14,980 acres have been achieved.

iii. Rehabilitation and construction of community small dams and water pans.

Over the years, spanning from the colonial times, there has been numerous interventions of increasing access to water through harvesting and storage. It is estimated that there are

over 6000 water pans and small dams spread across the country both on public and private land. These reservoirs have been a sole source of water for diverse communities. However, over time, the reservoir has silted up or breached thus reducing their capacity to hold water. The objective of this project therefore is to rehabilitate the reservoirs and increase their capacity, if possible, to be utilized again. The primary advantage of this is that land is already available eliminating the complication of land acquisition. The target is to intervene in 3,945 pans with a combined volume of m³ to irrigate 394,500,000 acres at an estimated cost of Kshs 59.2 billion as detailed in annex VI.

iv. North Eastern

The Arid counties of Marsabit, Wajir, Mandera, Garissa, Samburu and Isiolo fall in the Ewaso Ng'iro North Catchment Area (ENNCA) classified as an arid land with an average mean annual rainfall is 510 mm. By hydrology, the catchment has numerous ephemeral streams that only storm water in direct response to precipitation with water flowing only during and shortly after large precipitation events. The only opportunity there is of reliably using these water resources for livestock watering and agricultural production is through provision of water harvesting and storage structures. Construction of small dams across the lagas accompanied by water pans and provision of efficient irrigation system preferably drip in greenhouses and solar powered pumps is envisaged to transform these counties to be food sufficient.

It is proposed that along the ephemeral streams, a cascade of water pans with a combined volume of 10,000,000 m³ is constructed to increase area under irrigation to 10,000 acres in each county as detailed in *annex VII*. The investment will increase the area under irrigation by 60,000 acres irrigated through 600 water pans with an accumulated volume of 60 million cubic meters. Upon development, the counties in the catchment will have the potential to provide water for 108,000 sheep and goats, produce 1.5 million bags of maize and horticultural crops valued approximately at Kshs. 15 billion annually and become food self-sufficient, build resilience against climate change and become economically empowered.

c) Groundwater for irrigation

This is a relatively new area for the sector and has shown potential in enhancing food security for communities with limited surface water resources. A good example is Turkana County that has immense groundwater resources provides a unique opportunity for cotton production at large scale under irrigation. The Lotikipi aquifer alone has renewable water (slightly saline) amounting to 3.224BCM/year and can irrigate approximately 170,000 ha of cotton particularly because it also does well in saline conditions. It is proposed groundwater mapping mainly for areas with limited surface water resources be carried out

followed by investing in boreholes combined with efficient irrigation technologies such as drip irrigation and centre pivots. As a pilot sector proposes to develop 23,000 acres in the arid counties using solar driven boreholes complete efficient irrigation systems at an estimated cost of Kshs 7 billion.

d) Galana Kulalu Food Security Project

The Project involves development of infrastructure for viable and economic utilization of the Galana and Kulalu Ranches through among others irrigated agriculture. The implementation plan of the project is phased comprising of 10,000-acre model farm as phase I, followed by 170,000acre pilot farm as phase II.

The implementation of the model farm is at 89% interms of infrastructure development that include installation of 21 center pivots covering 3300 acres, pipes for drip irrigation covering 1800 acres installed and construction of the 2 pumping stations and one sedimentation basin. Notably, all pipe networks to distribute water in the entire 10,000 acres farm have been installed.

To complete the 10,000 acres model farm, NIA disengaged with Green Arava, the Israeli Contractor who defaulted and abandoned site, and contracted Irico International to complete the remaining works (25 center pivots, 6 pumps and 36 km of pipeline). Out of these, one centre pivot has been installed, 7 km of pipeline laid and excavation of pump house commenced. Upon completion, the 10,000-acre farm will be availed to growers in the private sector for production as per agreed terms. In addition, hydrological studies indicated that the available water could irrigate an additional 10,000 acres without storage at an estimated Kshs 3 billion.

In summary, the proposed interventions as detailed in tables 12, 13, and 14 below will cover all regions through implementation of 5,715 projects. This is expected to increase the area under irrigation by 1,519,913 acres, provide water storage capacity of 1.5 billion cubic meters at a cost of Kshs 330 billion to generate annual revenue of Kshs 335 billion and create employment for over 5 million directly and indirectly.

Table 12: Summary for irrigation Projects

	No of Counties	No of projects	Area (acres)	Cost Kshs	Value of produce annually
Large scale irrigation projects	20	22	398,731	83,733,615,000	113,999,984,017
Community managed Irrigation projects	39	228	171,536	42,204,847,582	43,671,600,000

	No of Counties	No of projects	Area (acres)	Cost Kshs	Value of produce annually
Expansion of Public Irrigation Schemes	6	9	12,500	1,025,000,000	3,573,837,500
Groundwater for irrigation	23	23	23,000	8,050,000,000	6,575,861,000
		282	605,767	135,013,462,582	167,821,282,517

Table 13: Summary for Water Harvesting Projects

	No of Counties	No of projects	Area (acres)	Volume CM	Cost Kshs	Value of produce annually
Water harvesting for irrigation projects - large dams	5	7	408,400	1,021,000,000	111,680,000,000	27,161,165,000
Water harvesting for irrigation projects - Rehabilitation of existing small dams and pans	42	3,945	328,000	394,500,000	59,200,000,000	93,777,496,000
Water harvesting for irrigation projects - Water for Household	42	881	114,596	114,596,000	14,900,000,000	32,763,798,572
Water harvesting for irrigation projects - large pans on Ewaso Ng'iro North	6	600	60,000	60,000,000	9,600,000,000	15,000,000,000
Total		5,433	910,996	1,590,096,000	195,380,000,000	168,702,459,572

Table 14: Summary for irrigation and water harvesting projects

	No of projects	Area (acres)	Cost Kshs	Value of produce annually
Irrigation Projects	282	608,917	135,013,462,582	167,033,782,517
Water harvesting Projects	5,433	910,996	195,380,000,000	168,702,459,572
Total Combined.	5,715	1,519,913	330,393,462,582	335,736,242,089

2.9.2 Land Reclamation

Land degradation is the reduction in land quality due to natural or human activities. It is a global problem which leads to increasing aridity and desertification of marginal, semi-arid and dry sub-humid lands. The long-term effect of land degradation is the losses of both ecosystems function and land productivity from which the land cannot recover unaided. Such lands are restored with reclamation and rehabilitation.

Land Degradation Assessment Report (LADA- 2012) indicates that 25.3% of Kenya's land mass is moderately severe to severely degraded and affects over 12million people. Land degradation negatively impacts environmental water conservation, lead to high surface water runoff, silting of dams and is the main cause of food and water insecurity. Land degradation occurs in the whole country with varying levels of severity but whether natural or is the result of human activity, has aggravated resilience of ecosystems and the sustainability of livelihoods and is the major driver of the commonly occurring landslides and loss of lives and livelihoods. The primary driving forces of land degradation in Kenya are inadequate Policy environment; failure to recognize land waste as a serious national problem and weak and unsustainable interventions. It is aggravated by subdivision of land into uneconomic land parcels and weak interrelationships and thresholds between the technical, institutional and policy factors at different levels in the country. The Ministry in collaboration with partners undertook the 1st national Land Degradation Assessment (LADA) covering the years 1990 to 2012 and results indicate about 25.3% of Kenya's land mass is moderately severe to severely degraded and is increasing as shown in figure 20 and 21 below.

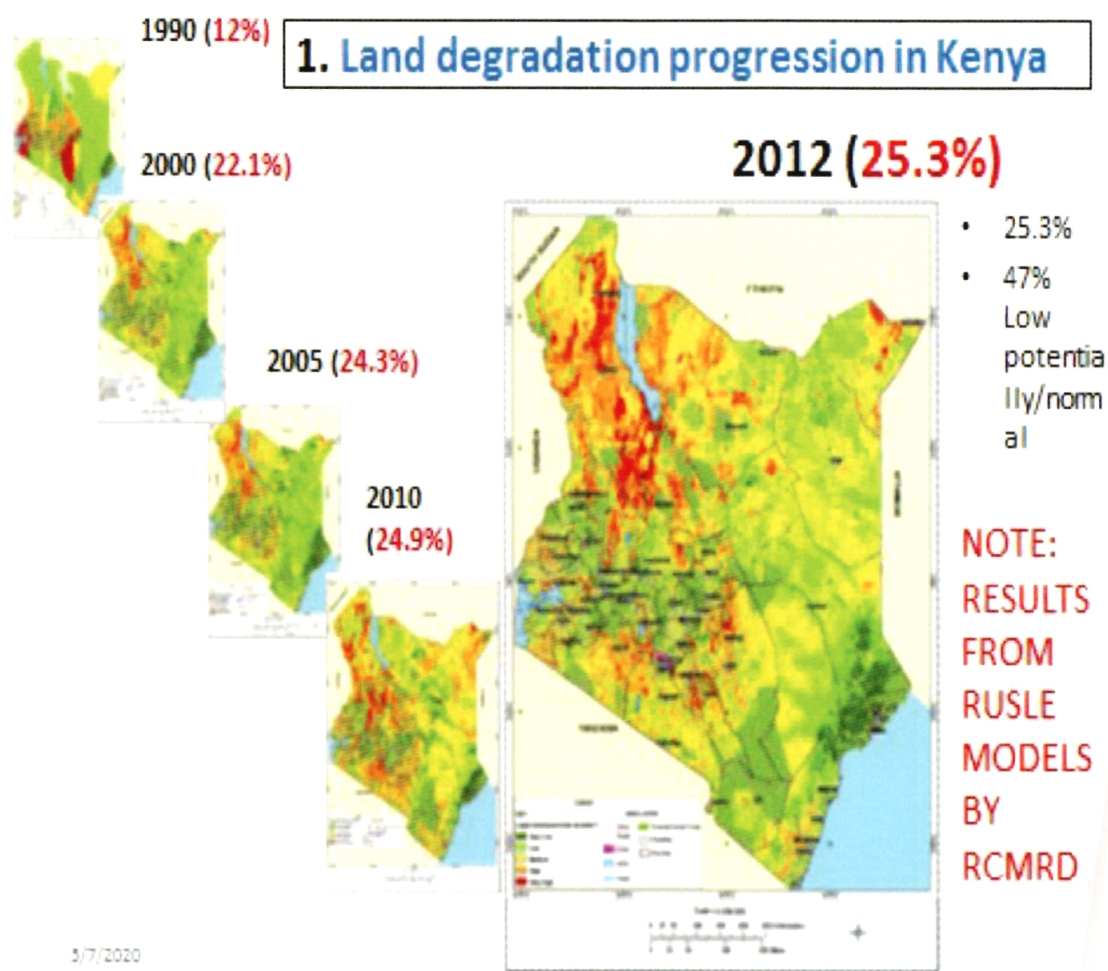


Figure 20: Land Degradation Assessment (LADA); Kenya -2012 (Source- RCMRD, UNEP and Ministry of Water, Sanitation and Irrigation)

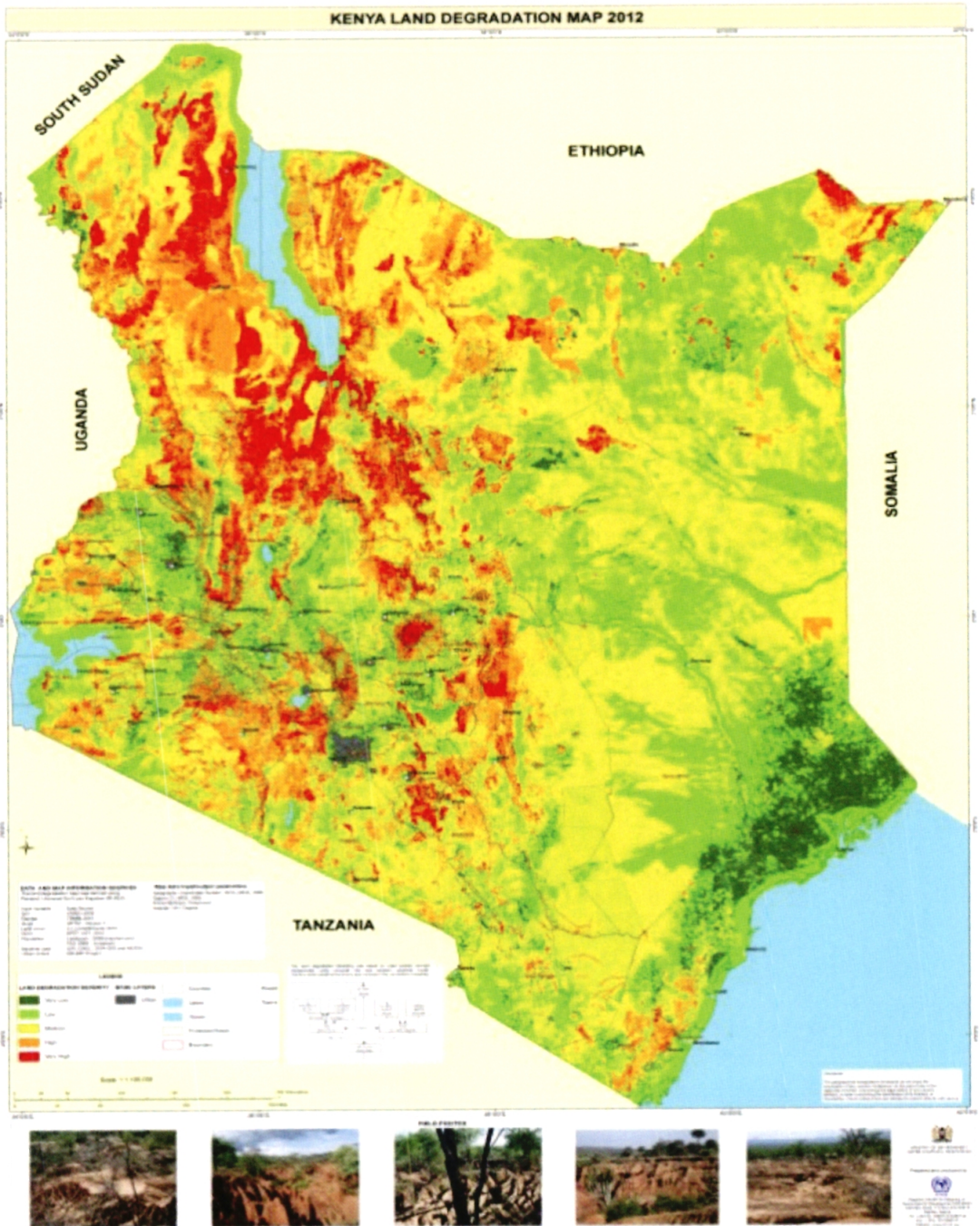


Figure 21: Land Degradation Assessment (LADA); Kenya -2012 (Source- RCMRD, UNEP and Ministry of Water and Irrigation)

The figures 22, 23, 24 and 25 below shows the impacts of land degradation and reclamation interventions in various Counties in the country.



Figure 22: Degraded and Reclaimed Land in Wajir County.



Figure 23: Nyaoroko Pan in Gilgil , Nakuru County where Land Waste is high but 60 acres of land have been reclaimed.



Figure 24: Rehabilitated Land which is now under Irrigation in Elgeyo-Marakwet County



Figure 25: Land in Turkana County under reclamation

2.8.2.1 Land Reclamation and Rehabilitation Program

In addressing increasing challenges of land degradation and waste, the Ministry has developed and implemented various tools including more detailed Land Degradation Assessments (LADA) that have become very useful tools for capacity building and achieving change among land owners, technical teams, professionals and policy makers. LADA for Lake Magadi watershed which is severely degraded in the country has been completed. Contracts were awarded for land degradation assessment for Upper Kerio Valley and Upper Ewaso Nyiro North watersheds. However, the project could not be executed fully due to budgetary constraints faced during the year. 13 outstanding watersheds shall be assessed at high resolution levels soon. During the year rehabilitation and reclamation of 200ha was done and more land owners engaged to reverse the trends and to achieve LDN on all land use activities.

2.8.2.2 National Water Harvesting and Groundwater Exploitation

To enhance environmental water storage, the Ministry has developed 159 water pans, sand dams and small dams in various parts of the country achieving over 12.5million m³ surface water storage. These interventions often serve as models where land owners are encouraged to replicate and with proper water management, land rehabilitation and reclamation is achieved with irrigation, re-vegetation, and land healing conservation.

3.0 CHALLENGES, LESSONS LEARNT AND EMERGING ISSUES

3.1 Lessons Learnt

Lessons learnt during implementation includes:

- i. Collaborative framework between the National and County governments is essential for sustainable water resource, sanitation., land Reclamation and irrigation management.
- ii. Formulation of appropriate grievance redress mechanisms for handling disputes affecting projects assist in fast-tracking project implementation.
- iii. It is essential to reduce water resources sharing conflicts through Trans country water resources framework.
- iv. Water and sewerage projects completed and transferred in the last five years have had minimal impact due to low household connections. Thus, it is essential to incorporate household connectivity during project planning stage.
- v. Financing of irrigation development through cost sharing model with project beneficiaries improves the rate of irrigation development, ownership and sustainability.
- vi. Capacity building is critical for increased Public Participation in planning, monitoring and evaluation of programs in the irrigation sector. Incorporating capacity building in all projects and programmes targeting all stakeholders from decision makers to subsidiary implementers results to sustainability and resilience.

Despite the progress with lessons learnt, there are still a number of challenges facing the ministry which will be used to inform policy direction going forward. These include;

3.2 Key Challenges

- i) Governance challenges in Water Services Providers especially due to delayed appointment of board members and appointment of those that are not qualified.
- ii) Investment in the water sector is not matching the population growth. This has the effect of stagnated or recessing growth in water and sanitation coverage in the near future.

- iii) The increase in water and sanitation coverage is tracked based on the number of people supplied with water from the completed water supplies and sanitation facilities. It is however evident that there are no funds allocated for maintenance of these water supplies and sanitation facilities leading to dilapidated infrastructure unable to serve the expected population.
- iv) Slow project implementation due to inadequate funds, delayed disbursements, and delayed approval of master lists for tax exemption by the National Treasury has negatively impacted on the implementation of some projects.
- v) Land acquisition/ compensation; wayleaves, forest moratorium issues for large infrastructure projects.
- vi) Pollution of Water resources: The low sewerage coverage poses a major threat to water quality and public health, largely due to inadequate effluent treatment.
- vii) Low Capacity of farmers in irrigation farming and overall governance/management of irrigation schemes.
- viii) Land reclamation mandate is not clearly stipulated as a national government or county government function, rendering effective implementation of land reclamation projects and programmes difficult.

3.3 Emerging Issues

- i. The Ministry's planned projects and programmes have been greatly impacted by COVID- 19 pandemic, through disruption of various activities, reallocation of funds; slow projects implementation.
- ii. Taxation of water and sewerage infrastructure services would make services unaffordable to majority of consumers thus it is essential to include a pro-poor tariff band (0-6m³) charged at a flat.
- iii. Mapping of degraded lands in the country is necessary for appropriate, efficient and effective county specific land reclamation programs aimed at reversing degradation and achieving land degradation Neutrality (LDN).
- iv. County- based mapping of irrigation schemes and national assessment of areas under irrigation is necessary for efficient and real time reporting.

4.0 CONCLUSION AND RECOMMENDATIONS

The Ministry of Water, Sanitation and Irrigation has enacted and is in the process of operationalizing Water Act 2016 and Irrigation Act 2019. The Ministry completed the development of various regulations which include; Water Services, Water Harvesting and Storage and Water Resources, and Irrigation Regulations. It has also developed Water Act (Amendments) Bill aimed at bridging gaps and addressing inconsistencies in Water Act, 2016. For these regulations and amendments to be finalized, the Ministry will depend on Parliamentary leadership to assist in fast-tracking these pieces of legislations.

There has been a steady increase in proportion of population with access to safe water, with an increase of 9.6% in five years from 55.9% to 65.5%. This, though still low is attributed to investment that the government has been making in the water sector. The various WWDAs achieved different results during this period. In order to achieve coverage of 80% by the year 2022, there is need for strategic investments in key projects especially on last mile water and sewerage connectivity. Allocation of resources should also be done such that the projects that are nearing completion are allocated more than the newly initiated ones.

Irrigation combined with water storage is key in meeting the country's food needs and raw materials for agro-processing consequently creating employment creation and spurring economic growth. The capital outlay for the large-scale irrigation projects and large multipurpose dams is enormous and will thus take more than ten years to complete. In the next ten years, the Ministry plans to develop at least a million acres under irrigation to create employment and support growth of agro-processing industries and agricultural trade services.

To address the inadequate financial resources, the Ministry will continue to rationalize its activities to match the expected exchequer releases. In addition, Continuous engagement of Parliament and National Treasury to enhance communication with project implementation agencies and grant exemption from remission of duty and taxes; resource mobilization for construction and rehabilitation of major Water, Sanitation and Irrigation projects and taxation of water and sewerage services to include a pro-poor band so as to make services affordable.

The Ministry undertook Asset and Liabilities verification exercise resulting in a comprehensive consolidated report from all the Agencies. The report recommended Phased transfer of assets since there are land ownership issues, some counties do not have capacity, and some national public water works are too large to be transferred at once due to their trans-county nature. As such it is recommended that the transition period be extend

from 3 to 6 years. The Ministry will also fast-track handing over instruments to enable smooth transfer of water and sewerage projects.

ANNEXES:

Annex I: Projects Completed in the Last Five Years in WWDAs

S/N	Project Name	Cost (KShs)	Population/ Treatment Capacity	Start	Completion
ATHI WWDA					
1.	Gatanga Community water project	264,000,000	Target Population: 70,000 Treatment Capacity: 6,000m ³ /day	Apr-17	Jul-17
2.	Komothai Water Augmentation Project	300,000,000	Target Population: 70,000 Treatment Capacity: additional 3,000m ³ /day	Feb-15	Jun-17
3.	Ithanga Water Supply Project	1,200,000,000	Target Population: 20,000 Treatment Capacity: 6,000 m ³ /day	Sep-17	Dec-19
4.	Muranga South Water Supply (Last Mile Connectivity)	26,853,325	Target Population: 30,000	Sep-19	Jan-21
5.	Independent Community Based Projects Within Nairobi Metropolitan Area (Emergency Covid-19 boreholes)	1,620,000,000	Target Population: 1,250,000	Jul-20	Jun-21
6.	Nairobi Water Distribution Project Lot I (Kiambu town - Roysambu - JKIA Transmission Line)	2,200,000,000	Target Population: 336,000	Jan-17	Jun-21
7.	Kigoro Water Treatment Plant Project	5,230,000,000	Treatment Capacity 140,000 m ³ /day	Mar-16	Nov-20
8.	Muranga Urban Water Supply (Last Mile Connectivity)	55,086,206	Target Population: 32,000	Sep-19	Dec-20
LAKE VICTORIA SOUTH WWDA					
9.	Isebania Water Supply Project	440,000,000	Target Population: 60,000	Jan-14	May-17

S/N	Project Name	Cost (KShs)	Population/ Treatment Capacity	Start	Completion
10.	Siaya - Bondo Water and Sanitation Project	2,200,000,000	Target Population:200,000	Nov-12	Jan-17
11.	Water Sector Development (Lake Victoria South) (Kericho, Kisii, Nyamira, Litein)	3,880,000,000	Target Poulation: 100,000 Treatment Capacity: 37,000 m3/day	Feb-14	Jun-21
RIFT VALLEY WWDA					
12.	Lotikip Well Field Development Project	500,000,000	Target Population: No estimate yet	Jul-15	Jun-18
13.	Iten Tambach Sabor Water Supply Project Phase II	1,000,000,000	Target Population: 184,000	Jun-17	Jun-18
14.	Iten Tambach Sabor Water Supply Project Phase I	1,580,000,000	Target Population: 64,000; Over 50 km gravity water system, Treatment Capacity: 5,500 m3/day and a water storage tank with 2,000 cubic meters storage capacity.	Oct-14	Feb-17
15.	18 Boreholes under drought mitigation	30,000,000	Target population, 100,000	Mar-16	Jul-17
16.	Kapindaram Water Supply Project	60,000,000	Target Population: 4,000	Jul-16	Jun-17
17.	Construction of Ellegirini Pipeline and Expansion of Kapsoya Treatment Works	625,000,000	Target Population: 24,000	May-16	Jan-18
18.	Pusol Water Project	40,000,000	Target Population: 6,000; Treatment Capacity in m3/day:500	May-16	Mar-17
19.	Kapenguria Water Supply Augmentation	60,000,000	Target Population: 25,000; Treatment Capacity: 2,500 m3/day	Jul-16	Jun-19
20.	Construction of Kases Dam Water Supply Project (Peace Dam)	249,754,411	Target Population: 50,000	Jul-20	Jun-21
21.	Construction of Narok Sewerage and last mile connectivity for Narok	1,714,225,175	Target Population: 25,000; Treatment Capacity: 3,000 m3/day	Apr-19	Jun-21

S/N	Project Name	Cost (KShs)	Population/ Treatment Capacity	Start	Completion
22.	Rehabilitation of Leshau – Karago-ini Water Supply Project	96,800,000	Target Population: 45,000	Feb-19	Sept-20
LAKE VICTORIA NORTH WWDA					
23.	Construction Water Supply Project in Chwele Area	300,000,000	Target Population: 92,000; Treatment Capacity: 2,000m ³ /day	Jun-16	Feb-18
24.	Drilling and equipping of 18No. Boreholes	30,000,000	Target population, 100,000	Mar-16	Jan-17
25.	Rehabilitation Sotik - Water Supply System	32,500,000	Target population 60,000	Nov-16	Aug-17
26.	Rehabilitation of Litein Water Supply System	29,700,000	Target Population: 60,000	Nov-16	Aug-17
27.	Kericho Sewerage Improvement Project	335,000,000	Target Population: 80,000	Dec-13	Dec-17
28.	Lake Victoria Water and Sanitation Initiative - Phase II (Kericho, Keroka and Isebania)	1,506,000,000	Target population 200,000	Aug-14	Dec-20
29.	Vihiga Cluster Project- Belgium funding	2,018,000,000	Target Population: 120,000; Treatment Capacity: 12,500m ³ /day	Nov-17	Dec-20
COAST WWDA					
30.	Construction of Water Supplies in Drought Areas, Lot 3: Construction of elevated steel tanks at existing boreholes	75,000,000	Target Population: 75,000	Jul-14	Jan-17
31.	Immediate Baricho Works Expansion & New Pipelines to Kilifi & Gongoni (Lot 3)	2,314,000,000	Target Population: 316,700	Sep-16	Nov-18
32.	Nyalani Water Supply Project	84,000,000	Target Population: 12,000	Jan-17	Apr-17
33.	Mombasa Network Rehabilitation - Lot 2	1,000,000,000	Target Population: 20,000	Mar-15	Aug-17
34.	Mkanda-Mwabandari rising main	32,597,212	Target Population: 3,000	Oct-16	Dec-17

S/ N	Project Name	Cost (KShs)	Population/ Treatment Capacity	Start	Completion
35.	Immediate Baricho Works Electromechanical Works (Lot 1)	911,000,000	Target Population: 220,000: Treatment Capacity: additional 22,000m ³ /day	Jul-16	May-18
36.	Extend Services to Informal Settlements - Lot 2	121,000,000	Target Population: 4,500	Feb-15	Feb-17
37.	Malindi Informal Settlement (Lot 2)	75,000,000	Target Population: 1,500	May-15	May-17
38.	Drilling and equipping of Three replacement boreholes at Baricho	415,032,958	Target Population: 50,000	May-19	Apr-21
39.	Program for the Improvement of Water Services in Mombasa County – Construction Works for West Mainland Phase I	404,375,960	Target Population: 80,000	Apr-18	Jan-21
NORTHERN WWDA					
40.	Expansion of Butiye, Manyatta and Heilu water Supply	90,000,000	Target Population: 23,000 people, 48,000 cattle and 120,000 goats	Mar-17	Mar-18
41.	Kursin Water Supply	90,000,000	Target Population: 4,000	Nov-17	May-18
42.	Wajir -Bor Water Piping & Supply	95,000,000	Target Population: 5,000	Nov-17	May-18
43.	Eldas Enole Water Supply	100,000,000	Target Population: 50,000	Sep-16	Feb-17
44.	Drilling and Equipping of 30 Boreholes	71,000,000	Target population: 150,000	Jan-16	Jun-17
45.	Libale Water Pan	60,000,000	Target Population:5,000	Jul-16	Jan-17
46.	Rumuruti Water Supply Project	45,000,000	Target Population: 40,000	Dec-15	Mar-17
47.	Moyale Water Supply	50,000,000	Target Population: 35,000	Dec-15	Mar-17
48.	Isiolo Water and Sanitation Project	89,000,000	Target Population: 60,000	Jul-15	Jan-17
49.	Forolle Mega Pan (Peace Dam)	229,652,630	Target Population: 10,000	Mar-20	Mar-21

S/N	Project Name	Cost (KShs)	Population/ Treatment Capacity	Start	Completion
50.	Wamba Water Supply Project	62,063,569	Target Population: 10,000	Nov-20	Jun-21
TANA WAWDA					
51.	Mukurwe-ini water Project	720,000,000	Target Population: 10,000	May-17	Dec-17
52.	Kabiru-ini Water Supply	65,000,000	Target Population: 3,500 Treatment Capacity: 1,500 m3/day	May-17	Dec-17
53.	Thangatha Dam	40,000,000	Target Population: 10,000	Apr-17	Jun-19
54.	Ura Dam 4	30,000,000	Target Population: 9,000	Apr-17	Jun-19
55.	Maua Water Project II and Sewerage/ Drainage Project	900,000,000	Target Population:100,000	Apr-17	Jun-19
56.	Othaya Sewerage Project (Last Mile Connectivity)	60,729,700	Target Population:10,000	Sept-19	Jun-21
TANATHI WAWDA					
57.	Wote Water Supply & Sanitation Project	500,000,000	Target Population: 12,000	Aug-16	Sep-18
58.	Wote Rehabilitation and Expansion of Water Supply Systems	15,000,000	Target Population: 2,000	Aug-16	Nov-18
59.	Yatta Canal Rehabilitation	2,200,000,000	Target Population: 70,000 and 1,500 Farmers	Aug-14	Feb-17
60.	Equipping of Kajiado Boreholes	72,400,000	Target Population: 100,000; 10 No. Boreholes with Capacity: 15,000 m3/day	Dec-16	Jun-17
61.	Migwani Water Supply Project	100,000,000	Target Population: 15,000	Jul-15	Mar-17
62.	Kakuya Water Supply (Kiambere-Mwingi Phase II)	58,334,892	Target Population: 75,000	Mar-20	Jun-21
63.	Masinga Cluster Phase II; Kaewa – Kangonde Water Supply Project	70,786,750	Target Population: 75,000	Oct-17	Jan-21
64.	Mavoko Drinking Water Supply and Sanitation Project	2,800,000,000	Target Population: 1,500,000	Feb-18	Jun-21

S/N	Project Name	Cost (KShs)	Population/ Treatment Capacity	Start	Completion
65.	Borehole Equipping and Rehabilitation	500,000,000	Target Population: 63,000	Nov-15	Nov-20
WATER SECTOR TRUST FUND					
66.	Water Sector Development (Support WSTF)	1,656,000,000	Target Population: 250,000	Dec-14	Jun-21
67.	Support to Equitable Access to Quality Water, Basic Sanitation and Enhanced Water Resources Management in Rural Kenya	2,325,000,000	Target Population 200,000	Oct-14	Jun-21
68.	The Saudi Programme for Drilling of Wells and Rural Development in Africa	600,000,000	Target Population 25,000	Jul-17	Jun-20

Irrigation Projects Completed in the Last Five Years

1.	Kinyako Irrigation Project	33	Area: 160 acres No. of farmers: 120	2018	2019
2.	Kaigunji Irrigation Project Phase I	177	26 km transmission line	2017	2019
3.	Kaigunji Irrigation Project Phase II Section I	100	Area: 600 acres No. of farmers: 500	2019/20	2020
4.	Kingirwa Irrigation project	144.6	Area: 100 acres No. of farmers: 600	2015/16	2019
5.	Wakulima Irrigation project	31.8	Area: 35 acres No. of farmers: 115	2015/16	2018
6.	Koibei Irrigation project	31.8	Area: 44 acres No. of farmers: 155	2015/16	2018
7.	Muongano Irrigation project	143	Area: 160 acres No. of farmers: 400	2015/16	2018
8.	Kamusinga Irrigation project	70.3	Area: 80 acres No. of farmers: 240	2015/16	2018
9.	Chakama Clusters	15.0	Area:100 acres No. of farmers: 200	May-2016	Jun-2017
10.	Hola expansion	39.8	Area: 3500 acres No. of farmers: 300	Jan-2014	Jul-2020
11.	Njukini Irrigation project	66.1	Area:350 acres No. of farmers: 350	May 2013	Feb-20

S/N	Project Name	Cost (KShs)	Population/ Treatment Capacity	Start	Completion
12.	Njoro Kubwa Canal	19.2	Area: 3000 acres No. of farmers: 3000	Apr-19	Jul-19
13.	Mansa irrigation project	29.9	Area:15 green houses No. of farmers: 100	Jul-2015	Jul-2020
14.	Malkadalka irrigation project	10.3	Area: 200 acres No. of farmers: 200	Feb-2021	May-2021
15.	Mwithaga Irrigation Project	46.9	Area: 125 acres No. of farmers: 125	Apr-15	Apr-16
16.	Mwithaga Irrigation Project	15.7	Area:100acres No. of farmers: 500	May-19	Dec-19
17.	Akaiga Irrigation Project	66.2	Area: 100 acres No. of farmers: 100	Mar-15	Sep-19
18.	Gachoka clusters 2 Irrigation Project	217.4	Area: 350 acres No. of farmers: 300	Jun-15	Jun-19
19.	Runga Irrigation scheme	76.2	Area: 500 acres No. of farmers: 500	Oct-15	Oct-17
20.	Lower Kithegi Irrigation Project	16.9	Area: 100 acres No. of farmers: 95	May-15	Jun-20
21.	Thua Model Farm Irrigation Project	81	Area:11 green houses and 12 acres No. of farmers: 100	Mar-15	Sep-19
22.	Kalundu Irrigation Project (Phase 1 & 2)	52.9	Area: 100 acres No. of farmers: 80	Jul-16	Sep-19
23.	Muringa Banana Irrigation (Phase I and 2)	748.7	Area: 3500 acres No. of farmers: 7000	Sep-11	Jan-16
24.	Kondo Irrigation Project (Phase 1 & 2)	40.5	Area:50 acres No. of farmers: 100	Feb-13	Sep-19
25.	Kwa Majee Irrigation Project (Phase 1 and 2)	62.1	Area:20 acres No. of farmers:40	Jan-15	Sep-17
26.	Kako/Kathonzweni Irrigation Project	45.7	Area: 300 acres No. of farmers: 300	Apr-15	Oct-17
27.	Marngarichi Water Pan	30.8	Area:10 acres No. of farmers:50	Jul-15	Jun-17
28.	Gatha dam Irrigation Development Project	109.5	Area:200 acres No. of farmers: 200	Nov-15	Mar-18
29.	Gathanje Irrigation Development Project	108.9	Area:300 acres No. of farmers: 300	Dec-15	Jan-18
30.	Kwa Njora Phase 1 and 2 Irrigation Projects	60.4	Area:10 acres No. of farmers: 50	Sep-15	Apr-17
31.	Mutumwa irrigation project	34.8	Area:10 acres No. of farmers: 50	Sep-15	Oct-16
32.	Thia Kiruka Irrigation Project	70.7	Area:500 acres No. of farmers: 300	Mar-15	Mar-17

S/N	Project Name	Cost (KShs)	Population/ Treatment Capacity	Start	Completion
33.	Riamukurwe Irrigation Project	75.5	Area:1000 acres No. of farmers: 800	Jan-14	Jan-20
34.	Kamuka Irrigation scheme	84.3	Area:150 acres No. of farmers: 100	Feb-14	Sep-20
35.	Lokipetot Irrigation Project	53.2	Area:300 acres No. of farmers: 150	May-15	Feb-18
36.	Turkana irrigation development project (Naipa Phase I)	15.4	Area: 910 acres No. of farmers: 1736	Mar-20	Mar-21
37.	Chesargatat Marich Irrigation Project	154.8	Area: 600 acres No. of farmers: 300	Aug-14	Dec-21
38.	Kipchukchuk Irrigation Development Project	82.2	Area:500 acres No. of farmers: 300	Sep-15	Sep-17
39.	Tunyo phase II	11.2	Area: 1000 acres No. of farmers: 750	Jul-19	Mar-20
40.	Chemase Irrigation development Project Phase 1	170.2	Area: 750 acres No. of farmers: 1000	Apr-15	Apr-17
41.	Chemase Irrigation development Project - Phase 2	18.5	Area: 100 acres No. of farmers: 100	Aug-19	Sep-20
42.	Eldume phase 1 and 2 Irrigation Project	83.8	Area: 1000 acres No. of farmers: 650	Jan-12	Feb-16
43.	Kamoskoi Phase 1 Irrigation Project	104.2	Area: 600 acres No. of farmers: 1000	Jan-13	Feb-16
44.	Mutiriri Irrigation Project (water pan and pipeline)	95.9	Area: 270 acres No. of farmers:300	Jun-15	Jul-17
45.	Mutaro Irrigation Project	64.8	Area: 500acres No. of farmers:500	May-19	Nov-21
46.	Soin Irrigation Project (Phase 2)	93.5	Area: 500 acres No. of farmers:300	Mar-15	Mar-16
47.	Chebara Irrigation Project (phase 1 and 2)	70.5	Area: 1200 acres No. of farmers:600	Jan-13	Jul-16
48.	Sare/Gwanga irrigation Project	16.8	Area:80 acres No. of farmers: 100	Sep-15	May-17
49.	Total	3,991.9			

Annex II: Water and Sanitation Projects Projected to Be Completed by 2022

S/N	County	Constituency	Project Name	Cost (KShs)	Population	Start	Completion	Additional Population Served		
								2017/18	2018/19	2019/20
ATHI W/WDA										
1	Kiambu	Ruiru and Juja	Ruiru Juja Water Supply Project	968,000,000	Target Population: 110,000 Treatment Capacity: 20,000 m ³ /day	01-Nov-10	01-Apr-16	40,000	20,000	20,000
2	Kiambu	Kikuyu and Kabete	Kikuyu Urban Water Supply Project	65,000,000	Target Population: 15,000 Treatment Capacity: 1,500 m ³ /day	01-Aug-14	01-Feb-16	2,000	-	-
3	Muranga	Gatanga	Gatanga Community water project	264,000,000	Target Population: 70,000 Treatment Capacity: 6,000m ³ /day	14-04-17	31-07-17	40,000	30,000	-
4	Nairobi	Westlands, Dagoreti North/South, Kibra, Langata, Starehe	Gigiri Kabete Water Supply	800,000,000	Target Population: 300,000	01-Nov-11	29-Jan-16	100,000	50,000	50,000
5	Kiambu	Kiambu	Kiambu Urban Water Supply Project	540,000,000	Target Population: 40,000 Treatment Capacity: 4,000 m ³ /day	01-Aug-14	30-Dec-16	5,000	-	-
6	Kiambu	Lari, Githunguri	Komothai Water Augmentation Project	300,000,000	Target Population: 70,000 Treatment Capacity: additional 3,000m ³ /day	01-Feb-15	30-Jun-17	40,000	30,000	-
7	Kiambu	Gatundu South	Theta Dam Treatment Works	291,000,000	Target Population: 60,000 Treatment	01-Mar-14	30-Sep-16	20,000	10,000	10,000

S/ N	County	Constituency	Project Name	Cost (KShs)	Population	Start	Completion	Additional Population Served		
								2017/18	2018/19	2019/20
			and Distribution Water Project		Capacity: 4,000 m3/day					
8	Nairobi	Kibra, Langata, Dagoreti North, Embakasi Central and Kasarani	Construction of Kangundo Road, Kibera, Upperhill and Kirichwa Ndogo Trunk Sewers	650,000,000	Target Population: 60,000	01-Aug-12	30-Aug-16	20,000	10,000	10,000
9	Muranga	Gatanga	Ithanga Water Supply Project	1,200,000,000	Target Population: 20,000	01-Sep-17	31-Dec-2019	-	10,000	10,000
10	Muranga	Maragwa, Kandara, Kigumo, Gatanga	Muranga South Water Supply (Last Mile Connectivity)	26,853,325	Target Population: 30,000	Sep-19	Jan-21	-	-	10,000
11	Nairobi, Kiambu, Kajiado, Muranga	Various	Independent Community Based Projects Within Nairobi Metropolitan Area (Emergency Covid-19 boreholes)	1,620,000,000	Target Population: 1,250,000	Jul-20	Jun-21	-	-	20,000
12	Muranga	Muranga	Muranga Urban Water Supply (Last Mile Connectivity)	55,086,206	Target Population: 32,000	Sep-19	Dec-20	-	10,000	15,000
				6,779,939,531				267,000	170,000	145,000
LAKE VICTORIA SOUTH WWDA										
1	Migori	Isebania	Isebania Water Supply Project	440,000,000	Target Population: 60,000	01-Jan-14	01-May-17	15,000	5,000	5,000
2	Sony Sugar	Migori and Uriri	2 boreholes	10,000,000	Target population, 28,000	10-Oct-16	28-Jun-17	15,000	13,000	-

S/ N	County	Constituency	Project Name	Cost (KShs)	Population	Start	Completion	Additional Population Served		
								2017/18	2018/19	2019/20
3	Nyamira	Keroka	Keroka Water Supply Project	1,890,000,000	Target Population: 56,000 Treatment Capacity: 3,000m ³ /day	01-Jan-14	30-Dec-16	16,000	15,000	-
4	Homa bay	Rangwe	Rangwe Water Supply Project phase I (Kosiga Dam)	45,000,000	Target Population: 15,000	01-Feb-15	31-Aug-16	2,000	-	-
5	Siaya	Bondo, Gem, Alego Usonga	Siaya - Bondo Water and Sanitation Project	2,200,000,000	Target Population: 200,000	01-Nov-12	31-Jan-17	50,000	50,000	20,000
6	Kericho, Kisii, Nyamira	Ainamoi/ Bogetutu Chache/ North Mugirango/ Bureti/ Sotik	Water Sector Development (Lake Victoria South) (Kericho, Kisii, Nyamira, Litein)	3,880,000,000	Target Population: 100,000 Treatment Capacity: 37,000 m ³ /day	Feb-14	Jun-21	-	-	25,000
				8,465,000,000				98,000	83,000	50,000
RIFT VALLEY WAWDA										
1	Turkana	Turkana West	Lotikip Well Field Development Project	500,000,000	Target Population: No estimate yet	01-Jul-15	01-Jun-18		20,000	
2	Baringo	Baringo North, South and Central	Baringo Rural Water Project	1,200,000,000	Target Population: 150,000; No. of Boreholes: 70 Boreholes	01-Jan-14	01-May-16	80,000	40,000	-
3	Elgeyo Marakwet	Keiyo North, Keiyo South	Iten Tambach Sabor Water Supply Project Phase II	1,000,000,000	Target Population: 184,000	01-06-17	30-06-18	0	100,000	50,000
4	Elgeyo Marakwet	Keiyo North, Keiyo South	Iten Tambach Sabor Water Supply Project Phase I	1,580,000,000	Target Population: 64,000; Over 50 km gravity water system, Treatment	01-Oct-14	28-Feb-17	50,000	14,000	

S/ N	County	Constituency	Project Name	Cost (KShs)	Population	Start	Comple tion	Additional Population Served		
								2017/18	2018/19	2019/20
					Capacity: 5,500 m3/day and a water storage tank with 2,000 cubic meters storage capacity.					
5	Elgeyo Marakwet	Marakwet West	Marakwet West/Kapcherop Phase II Water Supply	120,000,000	Target Population: 20,000 Treatment Capacity: 600m3/day	20-Aug-15	30-Dec-16	5,000	-	-
6	Uasin Gishu	Moiben, Soy, Eldoret North	18 Boreholes under drought mitigation	30,000,000	Target population, 100,000	15-Mar-16	30-Jul-17	80,000	20,000	
7	Narok	Narok North	Narok Water Supply Project	1,500,000,000	Target Population: 50,000; Treatment Capacity: 5,000 m3/day	01-Nov-13	30-Jun-16	5,000		
8	Trans Nzoia	Cherangani	Sengwer Community Water Supply Projects	36,000,000	Target Population: 3,000	01-Jun-15	30-Jun-16	500		
9	Baringo	Mogotio	Kapindaram Water Supply Project	60,000,000	Target Population: 4,000	01-Jul-16	30-Jun-17	4,000		
10	Uasin Gishu	Anaibkoi	Construction of Ellegirini Pipeline and Expansion of Kapsoya Treatment Works	625,000,000	Target Population: 24,000	30-May-16	31-Jan-18	10,000	14,000	
11	West Pokot	Pokot South	Pusol Water Project	40,000,000	Target Population: 6,000; Treatment Capacity in m3/day: 500	01-May-16	31-Mar-17	5,000	1,000	

S/ N	County	Constituency	Project Name	Cost (KShs)	Population	Start	Completion	Additional Population Served		
								2017/18	2018/19	2019/20
12	West Pokot	Kapenguria	Kapenguria Water Supply Augmentation	60,000,000	Target Population: 25,000; Treatment Capacity: 2,500 m ³ /day	Jul-16	Jun-19	-	10,000	15,000
13	West Pokot	Pokot North	Construction of Kases Dam Water Supply Project (Peace Dam)	249,754,411	Target Population: 50,000	Jul-20	Jun-21	-	-	10,000
14	Narok	Narok North	Construction of Narok Sewerage and last mile connectivity for Narok	1,714,225,175	Target Population: 25,000; Treatment Capacity: 3,000 m ³ /day	Apr-19	Jun-21	-	-	5,000
15	Nyandarua	Ndaragwa	Rehabilitation of Leshau – Karago-ini Water Supply Project	96,800,000	Target Population: 45,000	Feb-19	Sept-20	-	2,000	10,000
				8,811,779,586				239,500	201,000	90,000
LAKE VICTORIA NORTH WWDA										
1	Bungoma	Mount Elgon and Kabuchai	Construction Water Supply Project in Chwele Area	300,000,000	Target Population: 92,000; Treatment Capacity: 2,000m ³ /day	20-Jun-16	19-Feb-18	20,000	52,000	20,000
2	Bungoma	Mount Elgon and Sirisia	Chesikaki - Cheptais - Sirisia Water Supply Augmentation Project	130,000,000	Target Population: 15,000; Treatment Capacity: 4,000m ³ /day	10-Jul-15	30-Dec-16	2,000	-	-
3	Uasin Gishu	Moiben, Soy, Eldoret North	Drilling and Equipping of 18No. Boreholes	30,000,000	Target population, 100,000	01-Mar-16	20-Jan-17	40,000	20,000	20,000

S/ N	County	Constituency	Project Name	Cost (KShs)	Population	Start	Completion	Additional Population Served		
								2017/18	2018/19	2019/20
4	Bomet	Sotik	Rehabilitation Sotik - Water Supply System	32,500,000	Target population 60,000	02-Nov-16	31-Aug-17	40,000	20,000	
5	Kericho	Belgut and Burret	Rehabilitation of Litein Water Supply System	29,700,000	Target Population: 60,000	02-Nov-16	31-Aug-17	40,000	20,000	
6	Kericho	Ainamoi	Kericho Sewerage Improvement Project	335,000,000	Target Population: 80,000	01-Dec-13	31-Dec-17	50,000	30,000	
7	Kericho	Ainamoi/Bogetutu Chache/Borabu/Kuria West	Lake Victoria Water and Sanitation Initiative -Phase II (Kericho, Keroka and Isebania)	1,506,000,000	Target population 200,000	Aug-14	Dec-20	-	25,000	40,000
8	Vihiga	Emuhaya, Luanda, Sabatia, Hamisi	Vihiga Cluster Project-Belgium funding	2,018,000,000	Target Population: 120,000; Treatment Capacity: 12,500m3/day	Nov-17	Dec-20	-	20,000	50,000
				4,381,200,000				192,000	187,000	130,000
COAST WwDA										
1	Kwale	Msambweni, Kinango, Marafa, Tana Delta, Taveta, Mwatate	Construction of Water Supplies in Drought Areas, Lot 3: Construction of elevated steel tanks at existing boreholes	75,000,000	Target Population: 75,000	24-Jul-14	20-Jan-17	50,000	15,000	
2	Kwale	Kinango, Kaloleni, Mwatate	Construction of surface modular pressed steel water tanks for CWSB	0	Target Population: 200,000	06-Jul-05	20-Jan-17	75,000	75,000	50,000

S/ N	County	Constituency	Project Name	Cost (KShs)	Population	Start	Completion	Additional Population Served		
								2017/18	2018/19	2019/20
3	Kilifi	Malindi	Immediate Baricho Works Expansion & New Pipelines to Kilifi & Gongoni (Lot 3)	2,314,000,000	Target Population: 316,700	12-Sep-16	01-Nov-18	0	200,000	100,000
4	Taita Taveta	Kinango, Marafa, Wundanyi, Mwatate, Tana South	Construction of Water Supplies in Drought Areas, Lot 1: Equipping of Existing Boreholes for CWSB Region	58,000,000	Target Population: 70,000	24-07-14	20-01-16	10,000	10,000	
5	Taita Taveta	Taveta	Expansion of Taveta Lumi Supply	84,000,000	Target Population: 60,000	01-01-16	31-08-16	40,000	20,000	
6	Tana River	Kwale, Kilifi, Lamu, Tana River and Taita Taveta	Installation of plastic tanks, gutters and fittings in CWSB areas	50,000,000	Target Population: 225,000	01-07-15	31-03-17	150,000	20,000	
7	Kwale	Kinango	Nyalani Water Supply Project	84,000,000	Target Population: 12,000	01-Jan-17	27-04-17	7,000	5,000	
8	Kwale	Msambweni, Marafa, Taveta, Mwatate	Construction of Water Supplies in Drought Areas, Lot 2: Development of water sources & equipping with submersible pump sets, solar panels & Gensets	47,000,000	Target population, 80,000	24-Aug-16	30-06-17	60,000	20,000	
9	Mombasa	Kisauni, Bamburi, Nyali,	Mombasa Network Rehabilitation - Lot 2	1,000,000,000	Target Population: 20,000	01-Mar-15	30-08-17	20,000		

S/ N	County	Constituency	Project Name	Cost (KShs)	Population	Start	Comple tion	Additional Population Served		
								2017/18	2018/19	2019/20
		Changamwe and Mvita								
10	Kwale	Lungalunga/ Msambweni	Mkanda- Mwabandari rising main	32,597,212	Target Population: 3,000	25- Oct-16	30-12-17	3,000		
11	Kilifi	Malindi	Immediate Baricho Works Electromechanical Works (Lot 1)	911,000,000	Target Population: 220,000: Treatment Capacity: additional 22,000m3/day	01-Jul- 16	31-05-18	120,000	100,000	
12	Mombasa	Nyali	Extend Services to Informal Settlements - Lot 2	121,000,000	Target Population: 4,500	01- Feb-15	28-Feb- 17	500		
13	Kwale	Msambweni	Mkanda Dam Rehabilitation Project	200,000,000	Target Population: 30,000	01- Oct-15	31-Aug- 16	2,000		
14	Taita Taveta	Taveta	Expansion of Taveta Lumi Supply	84,000,000	Target Population: 60,000	01-Jan- 16	31-Aug- 16	5,000		
15	Kilifi	Malindi	Malindi Informal Settlement (Lot 2)	75,000,000	Target Population: 1,500	01- May- 15	31-May- 17	1,500		
16	Kilifi	Malindi	Drilling and equipping of Three replacement boreholes at Baricho	415,032,958	Target Population: 50,000	May- 19	Apr-21	-	-	50,000
17	Mombasa	Changamwe	Program for the Improvement of Water Services in Mombasa County – Construction Works	404,375,960	Target Population: 80,000	Apr-18	Jan-21	-	-	40,000

S/ N	County	Constituency	Project Name	Cost (KShs)	Population	Start	Completion	Additional Population Served		
								2017/18	2018/19	2019/20
			for West Mainland Phase I							
				5,955,006,130				544,000	175,000	90,000
NORTHERN WAWDA										
1	Garissa	Ijara	Masalani Water & Sanitation Project	84,000,000	Target Population: 10,000	01-12-15	31-12-16	0		
2	Turkana	Turkana North and Turkana South	Drilling and equipping of 30 Boreholes	71,000,000	Target population: 150,000	01-06-16	30-06-17	100,000	50,000	
3	Marsabit	Moyale	Expansion of Butiye, Manyatta and Heilu water Supply	90,000,000	Target Population: 23,000 people, 48,000 cattle and 120,000 goats	01-03-17	01-03-18	13,000	10,000	
4	Wajir	Wajir East	Kursin Water Supply	90,000,000	Target Population: 4,000	01-11-17	31-05-18	0	4,000	
5	Wajir	Wajir South	Wajir -Bor Water Piping & Supply	95,000,000	Target Population: 5,000	01-11-17	31-05-18	0	5,000	
6	Wajir	Eldas	Eldas Enole Water Supply	100,000,000	Target Population: 50,000	01-Sep-16	28-Feb-17	20,000	10,000	
7	Wajir	Wajir South	Habaswein Water Supply (Wajir)	52,000,000	Target Population: 25,000	01-Feb-15	30-Nov-16	0		
8	Turkana	Turkana North and Turkana South	Drilling and equipping of 30 Boreholes	71,000,000	Target population: 150,000	01-Jan-16	30-Jun-17	100,000	50,000	
9	Garissa	Fafi	Libale Water Pan	60,000,000	Target Population:5,000	01-Jul-16	31-Jan-17	0		
10	Laikipia	Laikipia West	Rumuruti Water Supply Project	45,000,000	Target Population: 40,000	01-Dec-15	31-Mar-17	30,000		
11	Marsabit	Moyale	Moyale Water Supply	50,000,000	Target Population: 35,000	01-Dec-15	31-Mar-17	25,000		

S/ N	County	Constituency	Project Name	Cost (KShs)	Population	Start	Comple tion	Additional Population Served		
								2017/18	2018/19	2019/20
12	Isiolo	Isiolo North	Isiolo Water and Sanitation Project	89,000,000	Target Population: 60,000	01-Jul-15	31-Oct-16	5,000		
13	Marsabit	North Horr	Forolle Mega Pan (Peace Dam)	229,652,630	Target Population: 10,000	Mar-20	Mar-21	-	-	10,000
14	Samburu	Samburu East	Wamba Water Supply Project	62,063,569	Target Population: 10,000	Nov-20	Jun-21	-	-	5,000
				1,188,716,199				293,000	129,000	15,000

TANA WAWDA

1	Nyeri	Mukurweini	Mukurwe-ini water Project	720,000,000	Target Population: 1,000	20-05-17	31-12-17	1,000		
2	Nyeri	Mathira	Kabiru-ini Water Supply	65,000,000	Target Population: 3,500 Treatment Capacity: 1,500 m3/day	01-05-17	31-12-17	3,500		
3	Meru	Tigania East	Thangatha Dam	40,000,000	Target Population: 10,000	03-Apr-17	30-Jun-19		10,000	
4	Meru	Igembe Central	Ura Dam 4	30,000,000	Target Population: 9,000	03-Apr-17	30-Jun-19		9,000	
5	Meru	Igembe South	Maua Water Project II and Sewerage/ Drainage Project	900,000,000	Target Population: 100,000	03-Apr-17	30-Jun-19	-	50,000	50,000
6	Nyeri	Othaya	Othaya Sewerage Project (Last Mile Connectivity)	60,729,700	Target Population: 10,000	Sept-19	Jun-21	-	-	5,000
				1,815,729,700				4,500	69,000	55,000

TANATHI WAWDA

1	Makueni	Makueni	Wote Water Supply & Sanitation Project	500,000,000	Target Population: 12,000	01-08-16	30-09-18		10,000	2,000
2	Makueni	Makueni	Wote Rehabilitation and Expansion of	15,000,000	Target Population: 2,000	01-Aug-16	30-11-18		2,000	0

S/ N	County	Constituency	Project Name	Cost (KShs)	Population	Start	Comple tion	Additional Population Served		
								2017/18	2018/19	2019/20
			Water Supply Systems							
3	Kitui	Masinga, Kitui Central, Kitui West and Kitui Rural	Masinga - Kitui Water Supply Project	2,200,000,000	Target Population: 180,000 Treatment Capacity: 18,000 m ³ /day	23-Jun-12	23-Jun-16	60,000	20,000	10,000
4	Machakos	Yatta	Yatta Canal Rehabilitation	2,200,000,000	Target Population: 70,000 and 1,500 Farmers	01-Aug-14	28-Feb-17	30,000	25,000	15,000
5	National Housing Corporation	Nairobi, machakos and Kisumu	3 Boreholes	65,000,000	Target population, 15,000	02-Aug-16	30-Jul-17	15,000	0	0
6	Kajiado	Kajiado south, Kajiado central, Kajiado north, Kajiado East,	Equipping of Kajiado Boreholes	72,400,000	Target Population: 100,000; 10 No. Boreholes with Capacity: 15,000 m ³ /day	01-Dec-16	30-Jun-17	50,000	50,000	0
7	Kitui	Mwingi central	Migwani Water Supply Project	100,000,000	Target Population: 15,000	01-Jul-15	31-Mar-17	15,000	0	0
8	Kitui	Mwingi North	Kakuya Water Supply (Kiambere-Mwingi Phase II)	58,334,892	Target Population: 75,000	Mar-20	Jun-21	-	-	25,000
9	Machakos	Yatta	Masinga Cluster Phase II; Kaewa – Kangonde Water Supply Project	70,786,750	Target Population: 75,000	Oct-17	Jan-21	-	-	25,000
10	Machakos	Mavoko and Kathiani	Mavoko Drinking Water Supply and Sanitation Project	2,800,000,000	Target Population: 1,500,000	Feb-18	Jun-21	-	-	100,000

S/ N	County	Constituency	Project Name	Cost (KShs)	Population	Start	Completion	Additional Population Served		
								2017/18	2018/19	2019/20
11	Kajiado, Kitui, Makueni , Machakos	All	Borehole Equipping and Rehabilitation	500,000,000	Target Population: 63,000	Nov-15	Nov-20	-	15,000	20,000
				8,581,521,642				170,000	122,000	197,000
WATER SECTOR TRUST FUND										
1	Tharaka Nithi Nandi Kisumu Uasin Gishu West Pokot Mombasa Taita Taveta Kilifi Kwale Kakamega Busia	Maara Homa Bay Town Kapenguria Changamwe Mwatate Kilifi North Msambweni Nandi Central Kisumu Central Eldoret North Mumias West Budalangi	Up-scaling of Basic Sanitation for the Urban Poor (UBSUP)	1,013	Target Population: 600,000	Jul-11	Dec-21	146,000	208,000	67,000
2	Kitui Muranga Kirinyaga	Kitui Central Maragua Mwea Homa Bay	Water Sector Development (Support WSTF)	1,656	Target Population: 250,000	Dec-14	Jun-21	86,000	56,000	48,000

S/ N	County	Constituency	Project Name	Cost (KShs)	Population	Start	Comple tion	Additional Population Served		
								2017/18	2018/19	2019/20
	Home Bay Nyeri Lamu Vihiga Meru Laikipia Garissa Nakuru Nyandarua Bomet	Town Naivasha Ndaragwa Lamu West Bomet Central Mukurweini Imenti South Buuri Nyeri Central Vihiga Laikipia West Ijara								
3	Nakuru Murang'a Kisumu Nyeri Embu	Nyeri Town Embu west Kandara Kisumu East Naivasha Mathira	Kenya Urban Water And Sanitation OutPut Based Aid Project (OBA)	1,385	Target Population 120,000	Dec-14	Jun-22		47,000	34,000
4	Laikipia Tharaka Nithi Narok Kwale Nandi Migori	Laikipia East Tharaka Chuka Igambangombe Narok South Suna East Nyatike Suna East Laikipia Esat Mosop Chesumei Tindiret	Support to Equitable Access to Quality Water, Basic Sanitation and Enhanced Water Resources Management in Rural Kenya	2,325	Target Population 200,000	Oct-14	Jun-21		67,000	46,000

S/ N	County	Constituency	Project Name	Cost (KShs)	Population	Start	Comple tion	Additional Population Served		
								2017/18	2018/19	2019/20
		Matuga Kilgoris Narok East Kinango Matuga Chuka Igambangombe Laikipia East Lungalunga Maara								
5	Garissa Tana River Wajir Turkana Mander a Isiolo Lamu Marsabit	Lamu West Lamu East Bura Tana Isiolo North Isiolo South Ijara Fafi Balambala Garissa Township Galole Garsen Wajir North Wajir South Wajir West Wajir East Turkana East Turkana Central Mandera West	Green growth and employment creation-Access to and management of of water resources in the Arid and Semi- Arid Lands	2,222	Target Population 200,000	Jul-16	Jun-22		35,000	67,000

S/ N	County	Constituency	Project Name	Cost (KShs)	Population	Start	Comple tion	Additional Population Served		
								2017/18	2018/19	2019/20
		Mandera North Laisamis Saku								
6	Meru Makueni Kirinyaga Machakos	Kibwezi East Machakos Town Buuri Ndia	Water Supply and Sanitation for the Urban Poor -KfW	800	Target Population 150,000	June 16	Dec-22			24,000
7	Baringo Kajiado Kilifi Taita Taveta Mandera Machakos West Pokot Samburu Kitui	Kitui East Kitui West Ganze Kajiado East Mwatate Mandera East Pokot South Samburu West Samburu East Baringo South	Ending drought Emergencies Support to drought Risk Management	2,653	Target Population 360,000	Jul-16	Jun-22			
8	Wajir Mandera Garissa	To be determined	The Saudi Programme for Drilling of Wells and Rural Development in Africa	600	Target Population 25,000	Jul.-17	Jun-20			
				12,654			Totals	232,000	413,000	286,000
						Grand Totals		2,040,000	1,549,000	1,058,000

Annex III: Irrigation Projects expected to be Completed by 2022

S/N	County	Constituency	Project Name	Cost (KShs Mill)	Area and beneficiaries	Start Date	Expected Completion Date
1	Nyeri	Tetu	Kaigunji Phase ii (B) Irrigation project	548.7	Area: 1900 acres No. of farmers: 1000	2020/21	2021/2022
2	TharakaNithi	Chuka Igamba Ng'ombe	Thuchi Ridge	164	Area: 160 acres No. of farmers: 418	2015/16	2021/22
3	Kirinyaga	Kirinyaga Central	Kinyako Irrigation Project	33	Area: 60 acres No. of farmers: 100	2019	2022
4	Tharaka Nithi	Maara	Kanini irrigation project	34.4	Area: 60 acres No. of farmers: 100	2020/21	2021/22
5	Muranga	Kiharu	Muranga Cluster Lot 1	132	Area: 130 acres No. of farmers: 150	2020/21	2021/22
6	Muranga	Kangema, Gatanga and Kandara	Muranga Cluster Lot 3	218.7	Area: 200 acres No. of farmers: 300	2020/21	2021/22
7	Embu	Gaturi	New Kithimu irrigation project	285	Area: 600 acres No. of farmers: 1230	Oct-2020	2021/22
8	Embu	Embu West	Itabua Muthatari irrigation project	218	Area: 765 acres		2021/22

S/N	County	Constituency	Project Name	Cost (KShs Mill)	Area and beneficiaries	Start Date	Expected Completion Date
					No. of farmers: 1530	Oct-2020	
9	Embu	Mbeere South	Kiamuringa irrigation project	216	Area: 600 acres No. of farmers: 1200	Oct-2020	2021/22
10	Embu	Mbeere North	Kanyuambora irrigation project	220	Area: 625 acres No. of farmers: 1250	Oct-2020	2021/22
11	Embu	Runyenjes	Iriari irrigation project	95	Area: 330 acres No. of farmers: 1230	Oct-2020	2021/22
12	Meru		Meru Clusters irrigation project	258.3	Area: 800 acres No. of farmers: 1000	2020/21	2021/22
13	Tharaka Nithi		Tharaka Nithi Clusters 2 irrigation project	353.8	Area: 1200 acres No. of farmers:	2020/21	2021/22
14	Muranga	Maragua Sub-County	Ngindairrigation project	217.4	Area: 675 acres No. of farmers: 1350	Jun-2020	2021/22
15	Muranga	Mathioya	Mukurwe Wa Nyagathangairrigation project	263.3	Area: 585 acres No. of farmers: 1170	May-2020	2021/22

S/N	County	Constituency	Project Name	Cost (KShs Mill)	Area and beneficiaries	Start Date	Expected Completion Date
16	Muranga	Muranga-East	Mirira irrigation project	544.4	Area: 675 acres No. of farmers: 2300	Aug-2020	2021/22
17	Muranga	Mathioya	Gikinduirrigation project	131.9	Area: 250 acres No. of farmers: 300	Sep-2020	2021/22
18	Muranga	Kahuro	Kiambokairrigation project		Area: 100 acres No. of farmers: 30	Sep-2020	2021/22
19	Muranga	Kahuro	Gakakiirrigation project		Area: 163 acres No. of farmers: 120	Sep-2020	2021/22
20	Muranga	Kahuro	Kahithe Gitiriirrigation project		Area: 288 acres No. of farmers: 100	Sep-2020	2021/22
21	Muranga	Kandara	Boboti Kiamande irrigation project	113.9	Area: 550 acres No. of farmers: 20	Sep-2020	2021/22
22	Muranga	Kigumo	Thangaini irrigation project		Area: 100 acres No. of farmers: 20	Sep-2020	2021/22
23	Muranga	Kandara	Ndakaini Wanduhiirrigation project		Area: 100 acres No. of farmers: 120	Sep-2020	2021/22

S/N	County	Constituency	Project Name	Cost (KShs Mill)	Area and beneficiaries	Start Date	Expected Completion Date
24	Muranga	Kigumo	Kieni Gathugu Irrigation Project	15.9	Area: 150 acres No. of farmers: 200	Sep-2020	2021/22
25	Laikipia	Laikipia East	Nyamuguna irrigation project	182.5	Area: 375 acres No. of farmer: 500	May-2019	2021/22
26	Nyeri	Mathira	Kaguyu Kienjaini irrigation project	52.7	Area: 200 acres No. of farmers: 800	Jan-2020	2021/22
27	Nyeri	Othaya	Changachicha irrigation project	151.4	Area: 400 acres No. of farmers: 400	Feb-2021	2021/22
28	Nyandarua	OI Kalou	Mumbi Dam	33.1	Area: 225 acres No. of farmers: 67	Sep-2020	2021/22
29	Nyandarua	OI Kalou	Gwa Kiongo water pan	56.7	Area: 600 acres No. of farmers: 100	Sep-2020	2021/22
30	Nyandarua	Kinangop	Upper Gitwe	21.1	Area: 225 acres No. of farmers: 285	Sep-2020	2021/22
31	Turkana	Loima	Naipa Lot 2	70	Area: 120 acres	Jan-2020	2021/22

S/N	County	Constituency	Project Name	Cost (KShs Mill)	Area and beneficiaries	Start Date	Expected Completion Date
					No. of farmers: 500		
32	Turkana	Turkana West	Lotikipi (Nanam)	64.3	Area: 20 acres No. of farmers: 80	Mar-2020	2021/22
33	Makueni	Kibwezi East	Yikitaa Irrigation Project	219.9	Area: 300 acres No. of farmers: 300	Aug-2017	2021/22
	Total			4915.4			

Annex III: Details of Dams

S/N	Name of Dam	County	Capacity (million m ³)	Beneficiaries (persons)	Approx. Cost (KSh million)	Contracting Authority	Project Status/Challenges
Design, Build and Finance Dams							
Under Construction Phase							
1.	Itare Dam	Nakuru	28	800,000	29,000	RVWSB	Construction Works at 27%. Project Contractor faced financial challenges with head office in Italy. The contractor temporarily stopped work since October 2018 and work is expected to resume next month. Addendum to ring-fence the operation of the project is being formulated.
<i>Sub- Total</i>			<i>28</i>		<i>29,000</i>		
Under Design Phase							
2.	Bonyunyu Dam	Nyamira	40	400,000	5,838	LVSWSB	Works to start once Resettlement of Project Affected Persons and Loan negotiation are finalized.
3.	Ruiru II Dam/Water Supply	Kiambu	36	400,000	21,000	AWSB	Geotechnical investigations being done for Detailed Design.
4.	Maragua IV Dam and Water Supply	Muranga	225	1,500,000	35,600	TWWDA	Draft commercial contract has been prepared and submitted to the AG's office and the National Treasury; Cabinet Memo has been prepared to seek approval from the Cabinet
<i>Sub- Total</i>			<i>301</i>	<i>2,300,000</i>	<i>62,438</i>		
Under Procurement Stage							
5.	Kamumu Dam	Embu	31	100,000	6,000	TWSB	RFP Finalized awaiting treasury clearance of financing proposal subject to availability of land, due diligence and Environmental Impact assessment.
6.	Rupingazi Dam	Embu	28	120,000	5,500	TWSB	RFP Finalized awaiting treasury clearance of financing proposal subject to availability of land, due diligence and Environmental Impact assessment.

S/N	Name of Dam	County	Capacity (million m ³)	Beneficiaries (persons)	Approx. Cost (KSh million)	Contracting Authority	Project Status/Challenges
Design, Build and Finance Dams							
7.	Thambana Dam	Embu	12	100,000	5,000	TWSB	RFP Finalized awaiting treasury clearance of financing proposal subject to availability of land, due diligence and Environmental Impact assessment.
8.	Kithino Dam	Meru	103	205,000	10,200	TWSB	RFP Finalized awaiting treasury clearance of financing proposal subject to availability of land, due diligence and Environmental Impact assessment.
9.	Maara Dam	Tharaka-Nithi	27	50,000	4,136	TWSB	RFP Finalized awaiting treasury clearance of financing proposal subject to availability of land, due diligence and Environmental Impact assessment.
10.	Thingithu Dam	Meru	3	210,000	600	TWSB	RFP Finalized awaiting treasury clearance of financing proposal subject to availability of land, due diligence and Environmental Impact assessment.
11.	Kahurura Dam	Laikipia	2	217,000	3,000	NWSB	Proposal to prioritize design of the dam, water supply and sewerage infrastructure to be financed by AfDB to guide in sourcing of funds for the works under either PPP or EPCF
12.	Pesi Dam	Nyandarua	16	80,000	3,000	NWWSA	Project at Feasibility phase. Lack of funds to carry out detailed design.
13.	Kinja Dam	Nyandarua	1.6	158,000	2,000	NWWSA	Project at Feasibility phase. Lack of funds to carry out detailed design.
14.	Wiyumiririe Dam	Laikipia	1.5	50,000	3,000	NWWSA	Project at Feasibility. Lack of funds to carry out detailed design.
15.	Karemeno Dam	Nyeri	12.3	1,375	8,000	AWSB	Preliminary Design
16.	Londiani	Kericho	1	115,000	4,685	NWWSA	At detailed design. NWWSA requires a total of Kshs. 60.8 Million to pay the consultant to complete project studies/documentation.
17.	Maragua IV B	Muranga		230,000	749	AWSB	Project ongoing at 50%
18.	Bute Dam	Wajir	21	77,000	7,000	NWSB	RFP Finalized awaiting treasury clearance of financing proposal subject to availability of land, due diligence and Environmental Impact assessment

S/N	Name of Dam	County	Capacity (million m ³)	Beneficiaries (persons)	Approx. Cost (KSh million)	Contracting Authority	Project Status/Challenges
Design, Build and Finance Dams							
19.	Bosto Dam	Bomet	70	800,000	19,900	NWHSA	Commercial and Financing Agreement Signed. Contractor to mobilize once access to site is granted. Negotiation with KFS on variation of the moratorium.
20.	Gatei dam	Kiambu	16		15	AWSB	Evaluation of Expression of Interest finalized. RFP to be issued
21.	Keben/Lessos Dam	Nandi	5.4	3,750	4,200	LVNWSB	Commercial contract signed seeking clearance from The National Treasury subject to availability of land, due diligence and Environmental Impact assessment
22.	Isiolo Dam/Crocodile Jaw	Laikipia	215	950,000	10,000	NWHSA	Project final designs have been completed but Environmental Impact Assessment has not been completed as some of the communities on the downstream of the dam have not accepted the project.
23.	Ndarugo I dam	Kiambu	11	1,000,000	15,000	AWSB	RFP Finalized awaiting treasury clearance of financing proposal.
<i>Sub- Total</i>			<i>576.8</i>		<i>101,785</i>		
Completed							
24.	Chemususu Dam	Baringo	35	300.00 0	4,800	RVWSB	Completed in 2011
25.	Theta	Kiambu	0.4	50,000	741	AWSB	Completed in 2015
26.	Kiserian Dam	Kajiado	1.8	253.00 0	1,000	NWHSA	Completed 2013
27.	Maruba dam	Machakos	0.6	200.00 0	500	NWHSA	Completed 2010
28.	Thangatha Dam	Meru	0.25	165,000	100	TWSB	Completed in 2020
29.	Ura Dam	Meru	0.1	50,000	100	TWSB	Completed in 2020
30.	Kianjuri Dam	Meru	0.25	90,000	90	TWSB	Completed in 2020
31.	Wamba Dam	Samburu	0.15	3,100	106	NWSB	Completed in 2021
<i>Sub- Total</i>			<i>38.55</i>		<i>101,785</i>		
Under Construction							

S/N	Name of Dam	County	Capacity (million m ³)	Beneficiaries (persons)	Approx. Cost (KSh million)	Contracting Authority	Project Status/Challenges
Design, Build and Finance Dams							
32.	Thwake Dam	Makueni	681	1,300,000	42,000	MoWS	Construction works started in March, 2018 and the project is at 52%.
33.	Siyoi/Muruny	West-Pokot	9.9	200,000	9,000	NWHSA	Physical project progress at 65%
34.	Karimenu II Dam	Kiambu	19	580,000	23,000	AWSB	Construction works at 35%. Works Ongoing with diversion tunnel complete. Grouting works ongoing
35.	Mwache Dam	Kwale	118	2,000,000	15,000	MoWS	Contract Awarded. Resettlement of Project Affected Persons ongoing.
36.	Badasa	Marsabit	5	100,000	846	NWSHA	Consultant procured to review the pending works. Lack of funds to pay the consultant
37.	Umaa Dam	Kitui	0.9	75,000	879	NWHSA	Consultant procured to review the pending works. Lack of funds to pay the consultant.
38.	Yamo Dam	Samburu	6	1,500	1,200	NWSB	Physical Project progress at 43.8%.
<i>Sub- Total</i>			<i>721.8</i>	<i>2,256,500</i>	<i>76,925</i>		
Under Planning and Design							
39.	Malewa Dam	Nyandarua		2,500	20,000	MoWS	Feasibility to be completed by April, 2019
40.	Irati Dam	Muranga		5,000		AWSB	Pre-Feasibility completed.
41.	Dam 42A	Busia	170		15,000	LVNWSB	Detailed design
42.	Dam 40A	Kakamega	100		4,000	LVNWSB	Preliminary Design
43.	Dam 33B	Bungoma	100		5,000	LVNWSB	Preliminary Design
44.	Malakisi Dam	Bungoma	36.3	23,500	8,000	LVNWSB	Feasibility Study
45.	Tisi Dam	Bungoma	21		6,000	LVNWSB	Feasibility Study
46.	Soin/Koru Dam	Kericho/ Kisumu	86.6	1,710,000	19,200	NWHSA	Detailed Design complete. Land acquisition has not been done. A court case is ongoing. Direction given by the Court is that more consultations between NWHSA and the stakeholders be done in order to resolve the contentious matters surrounding the project facing rejection by some stakeholders
47.	Two Rivers Dam	Uasin Gishu	12.8	400,000	4,000	LVNWSB	Pre-Feasibility completed.
48.	Beregei Dam	Baringo	20		2,300	RVWSB	Feasibility Study

S/N	Name of Dam	County	Capacity (million m ³)	Beneficiaries (persons)	Approx. Cost (KSh million)	Contracting Authority	Project Status/Challenges
Design, Build and Finance Dams							
49.	Nyangores Dam	Bomet		1,000		RVWSB	Feasibility Study
50.	Bisanadi Dam	Isiolo	0.04	2,150		NWSB	Interim Study
51.	Kathita II Dam	Meru	0.25	15,000	0.75	TWSB	Design on going
52.	Kathita Mega	Meru	7			TWSB	Preliminary Design
53.	Rare Dam	Kilifi	80	500,000	29,000	NWHSA	Detailed Design completed.
<i>Sub- Total</i>			<i>666.9</i>		<i>119,501</i>		
Under Procurement							
54.	Mwache Dam	Kwale	118	2,000,000	15,000	MoWS	Contract Awarded. Resettlement of Project Affected Persons ongoing.
55.	Kiandongoro/Chania Dam	Nyeri	24	20,000	12,000	TWSB	Feasibility
<i>Sub- Total</i>			<i>142</i>		<i>27,000</i>		

ANNEX IV: Projects under the Big ‘Four’ Agenda

Key ongoing water and sewerage projects to support Manufacturing pillar

S/No	Project Name	Service Area	Cost (KShs. M)	Allocation FY 2020/21 (KShs. M)	Description	Status
1.	Naivasha Industrial Park Water Supply	Naivasha	1,200	-	Drilling and equipping boreholes to supply 9,000m ³ /day of water to the Park and development of a sewerage system to treat effluent from the Industrial Park and adjacent developments. The long term water supply will be supplied by Aberdare Bulk Water Project.	Drilled and equipped 9 Boreholes in Naivasha. Project currently at 80.5%. The project has been fully funded by GoK
2.	Dongo Kundu Water Supply	Mombasa SEZ	500	-	3No. Boreholes were drilled with a yield of 2,500m ³ /day. The project involves extension of pipeline to supply 1,000m ³ /day of water as a short term measure to the Dongo Kundu SEZ in Mombasa. The long term water supply will be supplied using Mwache Dam	Pipeline extension from the line from Tiwi Boreholes to the SEZ as a short term plan. Phase I is complete and Phase II is ongoing
3.	Water Supply to Kenanie Leather Industrial Park	Athi River	300	150	To ensure the Kenanie Leather Industrial Park facilities are connected to reliable water supply to enable its development and running	Proposed to get water from Mavoko Water Supply system
4.	Supply water to Constituency Industrial Development Centres -ESP	44 Counties	44	44	Connect water supply to 88 Constituency Industrial Development facilities distributed across the country	Proposed to be connected to the existing water supplies managed by the Water Service Providers
5.	Immediate Water Supply Konza Technopolis Complex	Konza City	70	70	7No. boreholes have been drilled and equipped to supply 1,000m ³ /day. Extension of Pipeline from Nol Turesh Water Supply serve the Konza City facilities will provide an additional 2,000m ³ /day as a short term water supply to enable development and running of the city. Medium term (10,000m ³ /day) and Long term water supply of 30,000m ³ /day will be from Thwake Dam.	Currently being serviced by 7No. strategic boreholes with a yield of 1,000m ³ /day. Extension of pipeline has been planned for FY 2021/22
6.	Naivasha Industrial Park	Naivasha	2,000	0	Proposed Sewerage Project is expected to serve the Industrial Park	At Conception Stage, project site being identified.

S/No	Project Name	Service Area	Cost (KShs. M)	Allocation FY 2020/21 (KShs. M)	Description	Status
	Sewerage Project				that is under development and the adjacent developments.	Project is GoK funded. Funding is yet to be allocated.
	Total		4,114	264		

Key projects to support Food Security and Nutrition

S/No	Project Name	Service Area	Cost (KShs. M)	Allocation FY 2020/21 (KShs. M)	Description	Status
1.	Development of Blue Economy Initiatives - Connection of potable water to fish landing sites at the Coast	Mombasa	165	85	Connection of fish landing site facilities at Kichwa Cha Kati, Gazi, Vanga, Ngomeni, Kibuyuni with reliable water supply	Proposed to get water by pipeline extension from the Baricho Works Pipeline. Funding removed during supplementary
2.	Connection of potable water to two fish markets at the Coast at Malindi and Likoni	Malindi and Likoni	30	30	Connection of two fish market facilities at Malindi and Likoni with reliable water supply	Proposed to get water by pipeline extension from the Malindi and Likoni water supplies. Funding removed during supplementary
3.	Supply of water to livestock holding grounds	13 Counties	300	150	Drilling and equipping of boreholes to supply 15 livestock holding grounds facilities with reliable water supply	Proposed to drill and equip boreholes, and construct water tanks for each of the sites. Funding removed during supplementary
4.	Small Holder Irrigation Programme	Embu, Kirinyaga and Tharaka Nithi	630	220	The project aims to construct 6 schemes namely: - Gatene (Embu); Miuka and Kandeki (Kirinyaga); Mutino, Magati and Karuma Marimanti (Tharaka Nithi); On completion 1,500 acres would be put under irrigation.	Detail designs ongoing in 3 lots; draft field work reports completed. Tender for Prequalification of works contracts advertised.
5.	Bura Irrigation Scheme	Tana River	9,532	1,789	The Project aims at installation of gravity water abstraction system to lower the cost of production and increase the area under irrigation in Bura to	46% progress Started in 2013 to be completed in 2022

S/N o	Project Name	Service Area	Cost (KShs. M)	Allocation FY 2020/21 (KShs. M)	Description	Status
					15,000 acres from the current 6,000 acres.	
6.	Community Based Irrigation Projects	Country wide	12,682	832	To construct/rehabilitate community-based smallholder irrigation projects which will put 30,000 acres under irrigation and benefit 32,000 farmers. The project will involve construction of intake structures, main canals and infield structures in the various schemes that are yet to be completed.	Contracts were awarded for Kaigunji Irrigation Project Phase II section II, Muranga cluster and Kanini irrigation projects and construction ongoing. Approximately 550 acres were completed out of the targeted 2,000 acres
7.	Galana Kulalu Food Security Project	Kilifi and Tana River Counties	8,681	10	The aim of the project is to develop 10,000 acres model farm project consisting of centre pivot and drip irrigation system as a pilot. Expansion of the project to 400,000 acres ultimately under PPP to explore the potential of irrigation in the area will be undertaken in future phases	89% complete; New contractor, Irico International engaged to complete the remaining works (25 center pivots, 36km pipeline and 6 pumps). NIB has taken over production
8.	National Expanded Irrigation Programme	Country wide	114,000	4,110	Provision of irrigation infrastructure for abstraction, conveyance, distribution and application of irrigation water for 572 identified irrigation projects across the country	40% completion status
9.	Mwea Irrigation Development Project (Thiba Dam and Irrigation Area)	Kirinyaga County	19,967	2,151	The project aims to increase water storage by 15.4 million M3 by construction of Thiba dam to facilitate double cropping in Mwea Scheme from 19,500 acres to 50,000 acres and expansion of the scheme by 10,000 acres. 20,000 people are expected to benefit	Project is 62% complete
10.	Rwabura Irrigation Development Project	Kiambu County	880	690	The project aims as providing irrigation infrastructure for 1500 acres that will support	10% Complete.

S/N o	Project Name	Service Area	Cost (KShs. M)	Allocation FY 2020/21 (KShs. M)	Description	Status
					production of horticultural crops and fruits valued at Kshs 390 million by 2022.	
11.	Turkana Irrigation Development Project	Turkana County	9,197	335	The project aims at construction of intake, conveyance canals for 5000 acres in Naipa, expansion of Katilu clusters by 4000 acres, groundwater for irrigation targeting 3000 acres. These and others are expected to increase the area under irrigation in Turkana from the current 22,000 acres to 53,000 acres within five years.	The project is 62% complete
12.	Lower Kuja Irrigation Scheme	Migori County	4,694	250	Construction of intake, canal network and water control structures for 19,290 acres to benefit 3,000 farmers directly.	100 acres completed and under production. Ongoing contract for 2000 acres at 60%.
13.	Lower Sabor Irrigation Project	Uasin Gishu County	400	20	Supply, laying of pipelines. Supply, and installation of drip kits and in-field sprinkler irrigation systems for 2000 acres to benefit 4,500 people directly and indirectly	Construction of on-farm infrastructure for 2000 acres ongoing at 96%.
14.	Household Irrigation Water Harvesting Project	Country wide	7,680	1,678	The programme involves increasing water storage capacity by 4.4 billion cubic metres through enhancing reliable and adequate water harvesting and storage to meet domestic, irrigation and industrial water needs as well as environmental storage through the construction of medium size and multipurpose dams.	To date 25,091 water pans have been constructed across 47 counties. This translates to 28,091,666 m3 of storage to irrigate about 14,980 acres.
15.	Land Reclamation (Land Degradation Assessment Program)	394	394	20	The project aims at using integrated GIS/Remote sensing supported Land Degradation Assessment (LADA) Program at watershed level to develop	Contract awarded for land degradation assessment of Upper Kerio and Upper Ewaso Nyiro

S/No	Project Name	Service Area	Cost (KShs. M)	Allocation FY 2020/21 (KShs. M)	Description	Status
					recommendations to halt and reverse degradation and provide solutions for reclamation.	watersheds, which are highly degraded
16.	National Water Harvesting and Groundwater Exploitation	11,000	11,000	0	The project involves construction of water pans and small dams ranging from 10,000m ³ – 50,000m ³ by 2021 to harvest and store about 18 million m ³ of water from the surface run-off. This will enable about 180,000 Hectares to be reclaimed to be put under production.	Projects initiated in 2014. To date, 941 water pans/small dams constructed harvesting over 14.3 million m ³ of water; Implementation of 5 water pans and 13 boreholes ongoing
17.	Micro Irrigation Programme for Schools	Country wide	2,030	100	The project involves constructing micro irrigation facilities in 2000 schools. This will enable about 2,000 acres in schools to be put under production. Drill boreholes to benefit 2000 schools with water across the country annually.	Projects initiated in 2016. 78 boreholes have since been drilled & equipped and 120 pilot greenhouses.
Total			202,262	12,470		

Water Projects Supporting Affordable Housing

S/No	Project Name	Service Area	Cost (KShs. M)	Allocation FY 2020/21 (KShs. M)	Description	Status
1.	Water & Sewer Reticulation for Park Road, Starehe & Shauri Moyo Housing Projects	Nairobi	3,307	300	Development of 40km reticulation water pipelines; Development of 15km sewers and sewer outfall; Development of water storage tanks capacity 12,500m ³	Proposed to get water from Nairobi City Water Supply system
2.	Water & Sewer Reticulation - Combined Ruai (Utawala, Mihango, Ruai and Githunguri)	Nairobi	6,400	300	Activated Sludge Conventional Sewage Treatment Plant, capacity 70,000m ³ /day including wastewater reuse technology; Development of 12km water pipeline; Development of 8km sewers and sewer outfall;	Proposed to get water from Nairobi City Water Supply system

S/No	Project Name	Service Area	Cost (KShs. M)	Allocation FY 2020/21 (KShs. M)	Description	Status
					Development of water storage tanks, capacity 5,000m ³	
3.	Mavoko Drinking water supply Project	Mavoko	2,800	94	Construction of intake and treatment works of 30,000m ³ /day; Distribution pipeline of over 150km and water tanks; Rehabilitation and augmentation of Mavoko, Athi River and Mlolongo towns sewerage system	Ongoing at 98%. Expected to be completed in July 2021
4.	Mavoko Water & Sewerage Interventions - Extension of Pipeline	Mavoko	585	125	Development of 15km water pipeline; Drilling & Equipping of 5no. Boreholes to cater for construction works; Development of 15km sewers and sewer outfall; Development of 2,000m ³ water storage tank and 250m ³ steel elevated tank; Development of sewerage pre-treatment facility (DTF); Development of 1.5km sewer for NHC housing	Independent water supply from boreholes
5.	Water & Sewer Reticulation - Kibera B Housing Project	Nairobi	450	125	Pipeline extension to Kibera B Housing Projects facilities	Proposed to get water from Nairobi City Water Supply system
6.	Water & Sewer Reticulation - Mariguini Housing Project	Nairobi	370	125	Pipeline extension to Mariguini Housing Projects facilities	Proposed to get water from Nairobi City Water Supply system
7.	Water & Sewer Reticulation - East Africa Portland Housing Project	Athi River	1,400	125	Development of 25km water pipeline; Development of 30km sewers and sewer outfall; Development of 5,000m ³ water storage tank and 350m ³ of steel elevated tank; Development of sewerage pre-treatment facility (DTF) Prioritization of Mavoko Dam Water Supply Project under Belgian Funding	Proposed to get water from Mavoko Water Supply system

S/No	Project Name	Service Area	Cost (KShs. M)	Allocation FY 2020/21 (KShs. M)	Description	Status
	Total		15,312	1,194		

Projects Supporting Universal Health Coverage

S/No	Project Name	Service Area	Cost (KShs. M)	Allocation FY 2020/21 (KShs. M)	Description re	Status
1.	Connect 56 level 4 health facilities to a safe and reliable Water supply	Countrywide	359	359	Pipeline extension to the health facility or drilling and equipping of boreholes, construction of water tank and pipeline extension	One facility connected, 17 facilities in the process of connection
2.	Connect 435 level 3 health facilities to a safe and reliable Water supply	Countrywide	3,812	300	Pipeline extension to the health facility or drilling and equipping of boreholes, construction of water tank and pipeline extension	7 facilities in the process of connection
3.	Connect 2576 level 2 health facilities to a safe and reliable Water supply	Countrywide	21,787	100	Pipeline extension to the health facility or drilling and equipping of boreholes, construction of water tank and pipeline extension	Two facilities connected, two facilities in the process of connection
	Total		25,958	759		

Key Projects Supporting the Big Four Agenda Projects

S/No	Project Name	Service Area	Cost (KShs. M)	Allocation FY 2020/21 (KShs. M)	Description	Status
1.	Aberdare Bulk Water Project	Nyandarua and Naivasha	25,000	50	Proposed Multi-Purpose Dam and 20,000m ³ /day Water Supply and pipelines to serve Naivasha Industrial Park, Ol Kalou in Nyandarua County, Naivasha and Gilgil Towns in Nakuru County. Project expected to serve a population of 200,000, adequate up to 2035	Feasibility Study Done. Malewa Dam Project needs to be packaged to include Kinja and Pesi Dam
2.	Thwake Multipurpose Water Development	Makueni and Kitui	42,365	6,640	Comprises of construction of Thwake dam with a storage capacity of 688 million cubic meters of water, development of 40,000 hectares of irrigation, development 20 megawatts of hydropower and	The Project implementation is ongoing at 52%.

S/No	Project Name	Service Area	Cost (KShs. M)	Allocation FY 2020/21 (KShs. M)	Description	Status
	Programme Phase 1				development of water supply system to provide clean water to 1.3 million people	
3.	Mwache Dam and Water Supply Project	Mombasa	25,000	700	Proposed Multi-Purpose Dam and Water Supply to produce 186,000 m ³ / day and pipelines to serve Mombasa Industrial Park (Dongo Kundu), Mombasa, parts of Kilifi and Kwale counties. Project expected to serve a population of 1,500,000 up to 2030 people	Contract signed and currently the Ministry is fast-tracking implementation of RAP
4.	Mzima II Pipeline	Mombasa	35,000	0	Construction of 220km of 1.2m diameter pipeline from Mzima Springs to Mombasa to serve Mombasa Industrial Park (Dongo Kundu), Taita Taveta, Kwale, Kilifi and Mombasa Counties to serve a population of 1,050,000 people adequate up to 2030.	Loan application done to China Exim bank, Cabinet Memo prepared and submitted to NT & AG.
5.	Northern Collector Tunnel	Nairobi	15,000	1,300	Construction of a 11.7km long tunnel with 3.2m diameter from Maragua, Gikigie and Irati Rivers to Thika Dam Reservoir to and 40km bulk pipeline serve Nairobi City with 140,000m ³ /day. Project expected to serve a population of 1,200,000 people, adequate up to 2030	Project implementation is ongoing at 85%. Excavation and lining of the tunnel has been completed.
6.	Ruiru II dam	Nairobi	22,000	1,032	Proposed Multi-Purpose Dam and Water Supply to produce an additional 50,000m ³ /day to serve Karuri, Kiambu and Githunguri. Project will serve a population of 300,000 people	All conditions precedent for implementation of the project have been achieved. The Ministry has sought waiver from HoPS for approval. Cabinet Memo has been prepared
7.	Karimenu II dam	Nairobi	24,000	1,700	Proposed Multi-Purpose Dam and Water Supply to produce an additional 47,000m ³ /day to serve Ruiru, Juja and Thika. Project will serve a population of 300,000 people	Project implementation is ongoing at 35% Diversion Tunnel complete, Dam embankment started

S/No	Project Name	Service Area	Cost (KShs. M)	Allocation FY 2020/21 (KShs. M)	Description	Status
8.	Ndarugu I Dam and Water Supply	Machakos and Nairobi	35,600	0	The project entails construction of a 35m high concrete dam to impound 225 Million Cubic Metres of water with a treatment works with a capacity of 173.000m ³ /d and a transmission network of approximately 100km. The primary objective of the project is to meet the medium and long term water demand for Eastern parts of Nairobi, Juja, Ruiru, Ruai, Syokimau and Kitengela with a population of 1.5 Million	Draft commercial contract has been prepared and submitted to the AG's office and the National Treasury; Cabinet Memo has been prepared to seek approval from the Cabinet
9.	Maragua IV Dam and Water Supply	Maragwa	37,400	0	The project entails construction of a 70m high Dam capable of storing 60 million cubic metres of water, Water treatment plant of capacity 140,000m ³ /d to supply Nairobi, Thika and Muranga. Construction of over 140km of transmission and distribution pipelines. Terminal storage tanks in Nairobi and Thika. The project will serve 1.2 million people in Nairobi, Muranga and Thika	EPCF&F advertised and is being evaluated by the implementation Agency.
10.	Kenya Towns Sustainable Water Supply and Sanitation Programme	In 28 Towns across the Country	39,959	9,841	Development of Water, Sewerage and Sanitation Projects for 28 Medium sized towns across the country. Details of this project are provided in Annex II.	Ongoing at 25%. Experiencing master list approval challenges
Total in Ksh. Millions			301,324	21,263		

Annex V: Proposed Large Scale and Strategic Irrigation Projects

Project Name	Project Features	Irrigation Area acres	Project cost kshs	Contribution to Big four (Results/Project Benefits)	Action Required	Financing options
Lower Nzoia Phase II	<ul style="list-style-type: none"> Location - Budalangi Siaya and Busia Counties Water source – Lower Nzoia Intake works and intake headrace construction ongoing under Lower Nzoia Phase I project A major irrigation scheme with a total area of 9,490 acres. Canal irrigation system with option for lining and closed conduits in some sections <p>Feasibility study and detailed designs completed. RAP carried out – land compensation not yet.</p>	9,490	1,992,900,000.00	<ul style="list-style-type: none"> Increase food production <ul style="list-style-type: none"> o 118,625 bags of maize annually o 11,388 MT of paddy rice o Various horticulture and high value crops worth Kshs 2billion Create direct and indirect employment for 47450 Add GDP value of Kshs 3.6 billion annually from value of produce. Improve agricultural productivity through irrigation water management Promote growth of agro-based industries by providing a reliable and steady supply of raw materials. Improved the income levels of the local population by at least 40% thereby improving their socio-economic well being 	• Construction	• World Bank/KfW had shown interest
Lower Kuja Irrigation development Project, Lot 2 to 6	<p>Location - Nyatike District</p> <p>Kisii, Migori Counties</p> <p>Water source - Kuja River</p> <p>Major irrigation scheme at a 19,290</p>	19,290	4,050,900,000.00	<p>Increase food production</p> <p>241,100 bags of maize annually</p> <p>23,151 MT of paddy rice</p> <p>Various horticulture and high value crops worth Kshs 4billion</p>	Construction works	Gok financed construction of the intake weir and conveyance canals

Project Name	Project Features	Irrigation Area acres	Project cost kshs	Contribution to Big four (Results/Project Benefits)	Action Required	Financing options
	<p>acres net command area.</p> <p>Intake weir and conveyance canals have been constructed.</p> <p>Total length of Branch canal offtaking from the main canal is 26 km.</p> <p>Feasibility study and detailed designs completed and land acquisition for primary infrastructure partially completed</p>			<p>Create direct and indirect employment for 96,000</p> <p>Add GDP value of Kshs 7.4 billion annually from value of produce.</p> <p>Improve agricultural productivity through irrigation water management</p> <p>Promote growth of agro-based industries by providing a reliable and steady supply of raw materials.</p> <p>Improved the income levels of the local population by at least 40% thereby improving their socio-economic well being</p>		<p>under lot 1</p> <p>JICA had shown interest and Rice Production intensification programme</p>

Project Name	Project Features	Irrigation Area acres	Project cost kshs	Contribution to Big four (Results/Project Benefits)	Action Required	Financing options
Perkerra Irrigation scheme	<p>Location - Marigat Baringo County</p> <p>Water Source - Perkerra river</p> <p>800 ha of gazetted land as National Scheme</p> <p>Scheme targeted for expansion to 5,050 acres</p> <p>Components</p> <p>Modernizing the irrigation system through lining of canals.</p> <p>Improve water management</p> <p>modern irrigation system of drip or sprinkler combined with solar power.</p> <p>10 No. night storage dams to supply the</p> <p>15 No. units with water</p> <p>Flood protection dykes and access roads</p> <p>Feasibility study and detailed designs completed</p>	5,050	1,060,500,000.00	<p>Increase food production 126,250 bags of maize annually</p> <p>Various horticulture and high value crops worth Kshs 1billion</p> <p>Create direct and indirect employment for 25,000</p> <p>Add GDP value of Kshs 2 billion annually from value of produce.</p> <p>Improve agricultural productivity through irrigation water management</p> <p>Promote growth of agro-based industries by providing a reliable and steady supply of raw materials.</p> <p>Improved the income levels of the local population by at least 40% thereby improving their socio- economic well being</p>	Construction of modern irrigation infrastructure	Be financed through GoK expenditure Project suitable for climate funding
Lower Muranga irrigation development project	<ul style="list-style-type: none"> • Location - Murang'a County • Water Source – R. Maragua, R. Thika, R.Sagana • A major irrigation scheme at a 19890 acres by 	19,890	4,176,900,000.00	<ul style="list-style-type: none"> • Increase food production <ul style="list-style-type: none"> ○ 497,000 bags of maize annually ○ Various horticulture and high value crops worth Kshs 4.2 billion 	<ul style="list-style-type: none"> • Construction of Irrigation infrastructure • Value chain development and support 	<ul style="list-style-type: none"> • The Spanish government had shown interest in financing

Project Name	Project Features	Irrigation Area acres	Project cost kshs	Contribution to Big four (Results/Project Benefits)	Action Required	Financing options
	<p>gravity flow net command area.</p> <ul style="list-style-type: none"> • Conveyance pipeline system, Sub-mains • Distribution network (feeder lines), 89.0 Km • Infield system for sprinkler and drip hectares communal land) <p>Feasibility study and detailed designs completed</p>			<ul style="list-style-type: none"> • Create direct and indirect employment for 99,000 • Add GDP value of Kshs 5.3 billion annually from value of produce. • Improve agricultural productivity through irrigation water management • Promote growth of agro-based industries by providing a reliable and steady supply of raw materials. • Improved the income levels of the local population by at least 40% thereby improving their socio-economic well being 		g the project
Hola Irrigation Development Project	<ul style="list-style-type: none"> • Location - Hola Tana river County • Water Source - Tana river • 13,000 acres gazetted land however only 5000 acres has been developed. • Objective is to provide a gravity water abstraction system and increase area under irrigation to 13,000 acres. 	13,000	2,730,000,000.00	<ul style="list-style-type: none"> • Increase food production <ul style="list-style-type: none"> ○ 325,000 bags of maize annually ○ 13,000MT of cotton • Create direct and indirect employment for 65,000 • Add GDP value of Kshs 5.4billion annually from value of produce. • Improve agricultural productivity through irrigation water management • Promote growth of agro-based industries 	<ul style="list-style-type: none"> • Construction of irrigation infrastructure 	<ul style="list-style-type: none"> • BADEA had shown interest in funding the project

Project Name	Project Features	Irrigation Area acres	Project cost kshs	Contribution to Big four (Results/Project Benefits)	Action Required	Financing options
	<p>Components</p> <ul style="list-style-type: none"> • 1 Headworks at Aratolo Intake on Tana River; • 3 No. Sedimentation Basins; • 1 Main canal from the Aratolo headworks; • 2 Branch canals from the Aratolo Main canal; • 6 Sub-branch canals and 6 No.Sub-Main Pipelines • Tertiary Pipelines/Canals • Access Roads • Infield system including:- commercial farmers through center pivot and furrow system for local farmers <p>Feasibility study and detailed designs completed and land is government land thus minimal land acquisition requirements.</p>			<p>by providing a reliable and steady supply of raw materials.</p> <ul style="list-style-type: none"> • Improved the income levels of the local population by at least 40% thereby improving their socio-economic well being 		
Usueni – Wikithuki irrigation	<ul style="list-style-type: none"> • Location - Tana river • Kitui County 	14,280	2,998,800,000.00	<ul style="list-style-type: none"> • Increase food production <ul style="list-style-type: none"> ○ 357,000 bags of maize annually 	<ul style="list-style-type: none"> • Construction of Irrigation 	<ul style="list-style-type: none"> • The Indian Exim bank

Project Name	Project Features	Irrigation Area acres	Project cost kshs	Contribution to Big four (Results/Project Benefits)	Action Required	Financing options
development project	<ul style="list-style-type: none"> A major irrigation scheme at a 14280 acres by gravity flow net command area. Head works (at Makwenje across Tana river) Conveyance system (18.87km both twin 1 and 2); Mainline (22.53 km twin 1 and 18.95km twin 2); Sub-mains(23 lines ;40.52 km network) Distribution network (feeder lines) Infield system (2000 hectares; 2507 individual connections and 795 hectares communal land) <p>Feasibility study and detailed designs completed</p>			<ul style="list-style-type: none"> 7100 MT of cotton Various horticulture and high value crops worth Kshs 1.5 billion Create direct and indirect employment for 71,000 Add GDP value of Kshs 5.9 billion annually from value of produce. Improve agricultural productivity through irrigation water management Promote growth of agro-based industries by providing a reliable and steady supply of raw materials. Improved the income levels of the local population by at least 40% thereby improving their socio-economic well being 	infrastructure	had shown interest to finance the project
Ahero West Kano Irrigation Project	<ul style="list-style-type: none"> Location - Nyando River and L. Victoria Kisumu County Objective is to provide a gravity water 	12,825	2,693,250,000.00	<ul style="list-style-type: none"> Increase food production <ul style="list-style-type: none"> 30,780 MT of paddy rice Various horticulture and high value 	Construction works for irrigation infrastructure	JICA had shown interest and Rice Product

Project Name	Project Features	Irrigation Area acres	Project cost kshs	Contribution to Big four (Results/Project Benefits)	Action Required	Financing options
	<p>abstraction system and increase area under irrigation to 5,130ha.</p> <ul style="list-style-type: none"> • Components include Intake structure (side weir) for gravity system • Conveyance and distribution network <p>Feasibility study and detailed designs completed</p>			<p>crops worth Kshs 2.7 billion</p> <ul style="list-style-type: none"> • Create direct and indirect employment for 64,000 • Add GDP value of Kshs 7.12 billion annually from value of produce. • Improve agricultural productivity through irrigation water management • Promote growth of agro-based industries by providing a reliable and steady supply of raw materials. • Improved the income levels of the local population by at least 40% thereby improving their socio-economic well being 		ion intensification programme
Nyabomite irrigation development project	<ul style="list-style-type: none"> • Location - Charachani • Nyamira County • Water Source – R. Charachani, R. Eaka • A major irrigation scheme at a 2000ha by gravity flow net command area. • Head works:- 2 No. Chacharani and 1 no. 	5,000	1,050,000,000.00	<ul style="list-style-type: none"> • Increase food production <ul style="list-style-type: none"> ○ 192,750 bags of maize annually ○ Various horticulture and high value crops worth Kshs 1.6 billion • Create direct and indirect employment for 38,000 • Add GDP value of Kshs 4.28 billion annually from value of produce. • Improve agricultural productivity through 	<ul style="list-style-type: none"> • Construction of Irrigation infrastructure • Value chain development and support 	<ul style="list-style-type: none"> • The Spanish government had shown interest in financing the project

Project Name	Project Features	Irrigation Area acres	Project cost kshs	Contribution to Big four (Results/Project Benefits)	Action Required	Financing options
	<p>bombo-Bokimori</p> <ul style="list-style-type: none"> • Conveyance pipeline system 23.05Km • Sub-mains 22.1 Km • Distribution network (feeder lines), 89.0 Km • Infield system for sprinkler and drip hectares communal land) <p>Feasibility study and detailed designs completed.</p>			<p>irrigation water management</p> <ul style="list-style-type: none"> • Promote growth of agro-based industries by providing a reliable and steady supply of raw materials. • Improved the income levels of the local population by at least 40% thereby improving their socio-economic well being 		
Lumi Irrigation development project	<ul style="list-style-type: none"> • Location - Lumi River • Taveta County • A major irrigation scheme at a 14,100 acres by gravity flow net command area. • Head works (weir, retaining walls, intake, protection works); • Canals (main, branch, sub-branch and tertiary); • Drains (mains and tertiary); • Canal and drain structures (drops, culverts, 	14,100	2,961,000,000.00	<ul style="list-style-type: none"> • Increase food production <ul style="list-style-type: none"> ○ 173,300 bags of maize annually ○ 16,929 MT of paddy rice annually ○ Various horticulture and high value crops worth Kshs 3billion • Create direct and indirect employment for 70500 • Add GDP value of Kshs 5.4 billion annually from value of produce. • Improve agricultural productivity through irrigation water management • Promote growth of agro-based industries 	<ul style="list-style-type: none"> • Construction of Irrigation infrastructure • Value chain development and support 	<ul style="list-style-type: none"> • GoK funding • Suitable for funding under climate resilience

Project Name	Project Features	Irrigation Area acres	Project cost kshs	Contribution to Big four (Results/Project Benefits)	Action Required	Financing options
	turnouts, division boxes, cross drainage structures, flumes, etc); <ul style="list-style-type: none"> • Access and farm roads; Feasibility study and detailed designs completed			by providing a reliable and steady supply of raw materials. <ul style="list-style-type: none"> • Improved the income levels of the local population by at least 40% thereby improving their socio-economic well being 		
Soy Irrigation Development Project	<ul style="list-style-type: none"> • Location - Soy • Water Source - Little Nzoia River on Ziwa dam 2 • Kakamega and Uasin gishu Counties • A major irrigation scheme at a 3750 acres by gravity flow net command area. • Head works (Intake chamber) • Conveyance pipeline using Upv and GI • 2 No storage dams with capacity of 2,432M m³ • Infield system for sprinkler system 	3,750	787,500,000.00	<ul style="list-style-type: none"> • Increase food production <ul style="list-style-type: none"> ○ 93,750 bags of maize annually ○ Various horticulture and high value crops worth Kshs 787 million • Create direct and indirect employment for 18,750 • Add GDP value of Kshs 1 billion annually from value of produce. • Improve agricultural productivity through irrigation water management • Promote growth of agro-based industries by providing a reliable and steady supply of raw materials. • Improved the income levels of the local population by at least 40% thereby improving their socio-economic well being 	<ul style="list-style-type: none"> • Construction of Irrigation infrastructure • Value chain development and support 	<ul style="list-style-type: none"> • The Spanish government had shown interest in financing the project

Project Name	Project Features	Irrigation Area acres	Project cost kshs	Contribution to Big four (Results/Project Benefits)	Action Required	Financing options
	Feasibility study and detailed designs completed					
Upper Nzoia Irrigation Development Project	<ul style="list-style-type: none"> Location - Kuywa, Lunyu, Tongaren and Webuye Bungoma County Water source – R. Nzoia, R. Kuywa, R. Kibisi A major irrigation scheme at 21250 acres by gravity flow net command area. 4 Head works (Intake chamber) Conveyance pipeline using Upv and Gl Infield system for sprinkler system <p>Feasibility study and detailed designs completed, land acquisition not done</p>	21,250	4,462,500,000.00	<ul style="list-style-type: none"> Increase food production <ul style="list-style-type: none"> 531,250 bags of maize annually Various horticulture and high value crops worth Kshs 4.46 billion annually Create direct and indirect employment for 106250 Add GDP value of Kshs 5.7 billion annually from value of produce. Improve agricultural productivity through irrigation water management Promote growth of agro-based industries by providing a reliable and steady supply of raw materials. Improved the income levels of the local population by at least 40% thereby improving their socio-economic well being 	<ul style="list-style-type: none"> Review of design Construction of Irrigation infrastructure Value chain development and support 	<ul style="list-style-type: none"> Funding proposal from Turkish exim bank presented to National Treasury
Thwake irrigation Area I and II	<ul style="list-style-type: none"> Makueni and Kitui Counties Water Source – Thwake dam-Athi river 	100,187.5	21,039,375,000.00	<ul style="list-style-type: none"> Increase food production <ul style="list-style-type: none"> 3,100,000 bags of maize annually 	<ul style="list-style-type: none"> Dam is under construction. Detailed designs 	<ul style="list-style-type: none"> AfDB has show interest in funding

Project Name	Project Features	Irrigation Area acres	Project cost kshs	Contribution to Big four (Results/Project Benefits)	Action Required	Financing options
	<ul style="list-style-type: none"> Total area 40075 ha (Area I – 3172ha and Area II 36,900ha) Draw down tower – in the dam and conveyance system for area I, intake on R. Athi and conveyance canals for area II. Infield sprinkler irrigation system <p>Feasibility study as part of Thwake dam carried out. Detailed design not carried out. Thwake dam is under construction.</p>			<ul style="list-style-type: none"> 32,000MT of cotton – targeting 20,000 acres Various horticulture and high value crops worth Kshs 25 billion annually. Create direct and indirect employment for 300,000 Add GDP value of Kshs 32.13 billion annually from value of produce. Improve agricultural productivity through irrigation water management Promote growth of agro-based industries by providing a reliable and steady supply of raw materials. Improved the income levels of the local population by at least 40% thereby improving their socio-economic well being 	<ul style="list-style-type: none"> Construction of Irrigation infrastructure Value chain development and support 	irrigation as a fit for purpose use for Thwake dam.
Kavunyalo	<ul style="list-style-type: none"> Malindi Sub-county, Kilifi County Water source, Sabaki river 2,170 ha Intake weir, canals and distribution system 	5,425	1,139,250,000.00	<ul style="list-style-type: none"> Increase food production <ul style="list-style-type: none"> 162,750 bags of maize annually Various horticulture and high value crops worth Kshs 1.36 billion Create direct and indirect employment for 27,000 	<ul style="list-style-type: none"> Review of design Construction of Irrigation infrastructure Value chain development and support 	<ul style="list-style-type: none"> Funding required for implementation.

Project Name	Project Features	Irrigation Area acres	Project cost kshs	Contribution to Big four (Results/Project Benefits)	Action Required	Financing options
	Feasibility study and detailed design carried out.			<ul style="list-style-type: none"> • Add GDP value of Kshs 1.74 billion annually from value of produce. • Improve agricultural productivity through irrigation water management • Promote growth of agro-based industries by providing a reliable and steady supply of raw materials. • Improved the income levels of the local population by at least 40% thereby improving their socio-economic well being 		
Greater Bura	<ul style="list-style-type: none"> • Location - Tana River Basin • Kitui, Garissa and Tana River Counties • Water source – Tana River • Construction of HGF Dam • Saka-Garissa Conveyor • Nanigi Barrage • Masalani Conveyor <p>Feasibility study and detailed designs completed. RAP and Compensation not yet done</p>	50,000 acres	10,500,000,000.00	<ul style="list-style-type: none"> • Increase food production • Pasture for livestock • Create direct and indirect employment • The project will allow for the possibility of multiple-cropping, and will therefore lead to an increase in annual output; • Improve agricultural productivity through irrigation water management • The facility will also contribute to the generation of electricity and thus enhance governments' effort towards rural 	<ul style="list-style-type: none"> • Construction of HGF Dam • Construction of Irrigation infrastructure • Value chain development and support 	<ul style="list-style-type: none"> • Funding required for implementation.

Project Name	Project Features	Irrigation Area acres	Project cost kshs	Contribution to Big four (Results/Project Benefits)	Action Required	Financing options
				<p>electrification and economic development;</p> <ul style="list-style-type: none"> Enhanced cross-cultural relations by attracting people from other cultures. 		
Turkwel and Kerio	<ul style="list-style-type: none"> Location - Turkana Turkana County Water source – Turkwel and Kerio Rivers Pre-feasibility study for the middle and lower Turkwel and Kerio River Basins Detailed Feasibility indicating feasibility Study option or options with a net irrigable area of up to 30,000ha preferably in one location/basin Detailed design of Intake, supply, Distribution and on-firm infrastructure <p>Feasibility study and detailed designs completed. Lowaat Dam designs completed</p>	60,000 acres	12,600,000,000.00	<ul style="list-style-type: none"> The project will improve yields through reduced crop loss due to erratic, unreliable or insufficient rainwater supply; 1.2 Million Bags of Maize The project will allow for the possibility of multiple-cropping, and will therefore lead to an increase in annual output; It will allow a greater area of land to be used for crops in areas where rain fed production is impossible and is therefore likely to boost output and income levels; The facility will also contribute to the generation of electricity and thus enhance governments' effort towards rural electrification and economic development; 	<ul style="list-style-type: none"> Construction of Lowaat Dam to regulate flow on Kerio River Construction of Irrigation infrastructure 	<ul style="list-style-type: none"> Funding required for implementation.

Project Name	Project Features	Irrigation Area acres	Project cost kshs	Contribution to Big four (Results/Project Benefits)	Action Required	Financing options
Rahole	<ul style="list-style-type: none"> • Location - Mbalambala • Garissa County • Water source – R. Tana • Construction of 2km farm access roads within farm • Construction of 4.5 km secondary canal network within the farm • Construction of farm infield structures i.e division structures(6 major and 25 small) • Completion of 4.5 km drains and 2km dyke • Completion of solar fence 	7500 acres	235,537,830	<ul style="list-style-type: none"> • Increase food production • Pasture for livestock • Create direct and indirect employment • The project will allow for the possibility of multiple-cropping, and will therefore lead to an increase in annual output; • Improve agricultural productivity through irrigation water management • The facility will also contribute to the generation of electricity and thus enhance governments' effort towards rural electrification and economic development; • Enhanced cross-cultural relations by attracting people from other cultures. 	Completion of water conveyance and distribution works	<ul style="list-style-type: none"> • Funding required for implementation.
Kayatta	<ul style="list-style-type: none"> • Location: Matungulu and Mwala • Machakos County • Benefit over 12,500 farmers each irrigating a proposed area of 0.4 Ha • Munyu Dam – Embankment Dam 35m 	10.000 acres	2,100,000,000.00	<ul style="list-style-type: none"> • It is estimated that net production will increase from 55 million to 1.7 Billion without and with project respectively • Sustainably supply water for irrigation thorough development of irrigation 	<ul style="list-style-type: none"> • Design Dam • Review of design • Construction of Irrigation infrastructure 	<ul style="list-style-type: none"> • Funding required for implementation.

Project Name	Project Features	Irrigation Area acres	Project cost kshs	Contribution to Big four (Results/Project Benefits)	Action Required	Financing options
	<p>High and 700m long Dam Crest</p> <ul style="list-style-type: none"> • Head Works • Sedimentation Basin • Break Pressure Tank • Conveyance Pipeline • Main Pipeline • Distribution Pipeline • Infield system <p>Feasibility study and detailed designs completed. RAP and Compensation not yet done</p>			<p>infrastructure for 5,000 ha.</p> <ul style="list-style-type: none"> • Improve food self-sufficiency and security in the project area through promotion of irrigated agriculture. • Create gainful employment opportunities • Improve income per capita hence wealth creation. 	<ul style="list-style-type: none"> • Value chain development and support 	
Suba	<ul style="list-style-type: none"> • Homabay County • Water Sources: Lake Victoria • Project comprises of five projects/clusters namely:- <ol style="list-style-type: none"> 1. Rang'wena; 2. Nyagidha; 3. Olambwe; 4. Sindo and 5. Konyango <ul style="list-style-type: none"> • Head Works 	5,250 acres	1,102,500,000.00	<ul style="list-style-type: none"> • 315,000 Bags of Rice annually • Create direct and indirect employment for 200,000 • Add GDP value of Kshs 1.8 billion annually from value of produce. • Improve agricultural productivity through irrigation water management • Promote growth of agro-based industries by providing a reliable and steady supply of raw materials. 	<ul style="list-style-type: none"> • Review of design • Construction of Irrigation infrastructure • Value chain development and support 	<ul style="list-style-type: none"> • Funding required for implementation.

Project Name	Project Features	Irrigation Area acres	Project cost kshs	Contribution to Big four (Results/Project Benefits)	Action Required	Financing options
	<ul style="list-style-type: none"> • Sedimentation Basin • Break Pressure Tank • Conveyance Pipeline • Main Pipeline • Distribution Pipeline • Infield system • Drainage works <p>Feasibility study and detailed designs completed. RAP and Compensation not yet done</p>			<ul style="list-style-type: none"> • Improved the income levels of the local population by at least 45% thereby improving their socio- economic well being 		
Kisumu	<ul style="list-style-type: none"> • Kisumu County • Seme • Chiga • Awach Kano • Ombeyi • Construction of intakes • Canals • Drainage works <p>Feasibility study and detailed designs completed. RAP and Compensation not yet done</p>	9,375 acres	1,968,750,000.00	<ul style="list-style-type: none"> • 221,250 Bags of Rice • Create direct and indirect employment for 106250 • Add GDP value of Kshs 2.7 billion annually from value of produce. • Improve agricultural productivity through irrigation water management • Promote growth of agro-based industries by providing a reliable and steady supply of raw materials. • Improved the income levels of the local population by at least 40% thereby improving their 	<ul style="list-style-type: none"> • Review of design • Construction of Irrigation infrastructure • Value chain development and support 	<ul style="list-style-type: none"> • Funding required for implementation.

Project Name	Project Features	Irrigation Area acres	Project cost kshs	Contribution to Big four (Results/Project Benefits)	Action Required	Financing options
				socio- economic well being		
Bondo	<ul style="list-style-type: none"> • Bondo • Siaya County • Water source: River Yala and Lake Victoria • Head works (weir and intake) • Sedimentation basin; • Pump intake; • Delivery pools; • Irrigation Canals (Main, branch, sub-branch, tertiary and field); • Pipeline; • Drainage Canals (mains, collector and field)); • Related canal and drain structures; • Roads (inspection and farm roads); • Flood protection dyke; <p>Feasibility study and detailed designs completed. RAP and</p>	8,000 acres	1,680,000,000.00	<ul style="list-style-type: none"> • 480,000 Bags of Rice annually • Create direct and indirect employment for 200,000 • Add GDP value of Kshs 1.8 billion annually from value of produce. • Improve agricultural productivity through irrigation water management • Promote growth of agro-based industries by providing a reliable and steady supply of raw materials. • Improved the income levels of the local population by at least 45% thereby improving their socio- economic well being 	<ul style="list-style-type: none"> • Review of design • Construction of Irrigation infrastructure • Value chain development and support 	<ul style="list-style-type: none"> • Funding required for implementation.

Project Name	Project Features	Irrigation Area acres	Project cost kshs	Contribution to Big four (Results/Project Benefits)	Action Required	Financing options
	Compensation not yet done					
Burangi	<ul style="list-style-type: none"> Magarini sub-county, Magarini location, Marikebuni and Pokea Mwana Sub-locations Kilifi County Water source - Sabaki River] Sedimentation Basin Break Pressure Tank Conveyance Pipeline Main Pipeline Distribution Pipeline Infield system 	1,169 acres	245,490,000.00	<ul style="list-style-type: none"> Ensure food security at the local and national level with approx. 46,760 bags of Maize Creation of employment and income generation of the locals approx. 3,000 people Sustainable supply of raw materials for agro-based industries Foreign exchange generation through export of surplus food and cash crops. 	<ul style="list-style-type: none"> Review of design Construction of Irrigation infrastructure Value chain development and support 	<ul style="list-style-type: none"> Funding required for implementation.
Mwangea	<ul style="list-style-type: none"> Ganze Subcounty Kilifi County 	3,900 acres	819,000,000.00	<ul style="list-style-type: none"> Project will go a long way in improving the social, economic and cultural lives of the people in the project area in many ways including: <ul style="list-style-type: none"> Increased farm output approximately 156,000 bags of maize Increased family income Improved access to social amenities 	<ul style="list-style-type: none"> Review of design Construction of Irrigation infrastructure Value chain development and support 	<ul style="list-style-type: none"> Funding required for implementation.

Project Name	Project Features	Irrigation Area acres	Project cost kshs	Contribution to Big four (Results/Project Benefits)	Action Required	Financing options
				e.g. hospitals and schools • Improved infrastructure		
398,731	83,733,615,000.00	Summary of contribution to Big 4 annually				
		Rice paddy in MT	368,748 MT			
		Maize 90kg Bags	8,502,760			
		Rice 75Kg Bags	1,068,350			
		Value of horticultural crops	Kshs 75 B			
		Jobs created	1,993,655			
		Contribution to GDP	Kshs 114 B			

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