

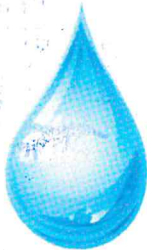


MINISTRY OF WATER, SANITATION AND IRRIGATION

2021 ANNUAL STATUS REPORT

ON

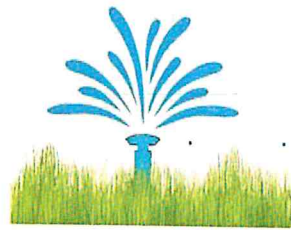
WATER, SANITATION AND IRRIGATION



Water is Life
Water is Life



Sanitation is Dignity
Sanitation is Dignity



Irrigation is Livelihood

JUNE 2021

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.

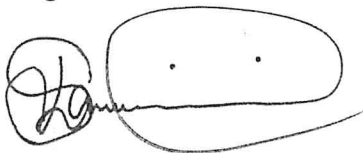
The Ministry's mandate entails the development and management of Water Resources, drainage and land reclamation, Sanitation and Irrigation. In discharging the mandate, the Ministry is guided by key policy documents which include the Constitution of Kenya, the Jubilee Manifesto, the Third Medium Term 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.

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 large, rounded, horizontal stroke that tapers to the right.

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

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

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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
NWHS	National Water Harvesting and Storage Authority

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.

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.

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.

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

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.

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

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.

2.6 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

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

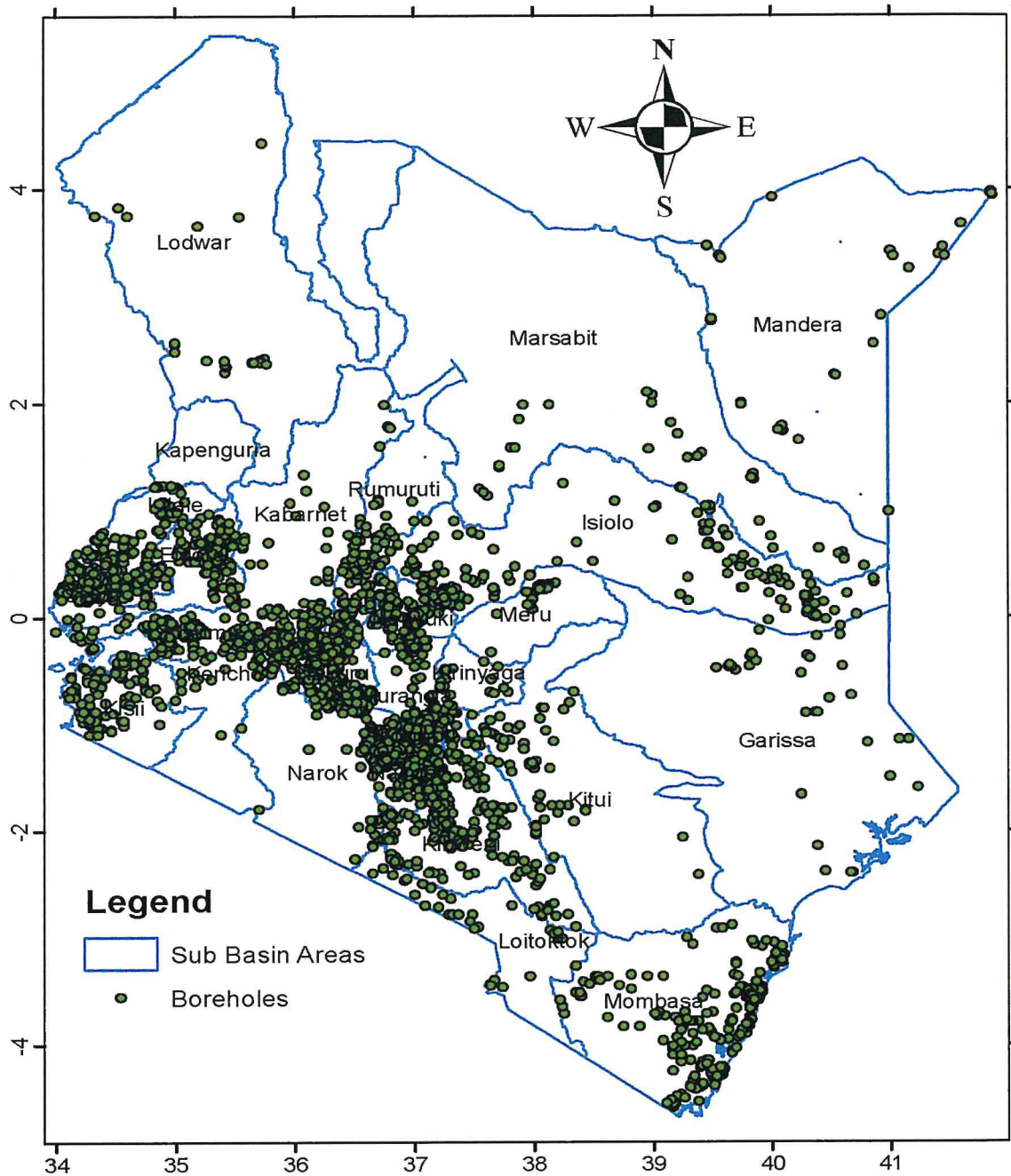


Figure 3: Map of boreholes spatial distribution and sub basin delineations across the country

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

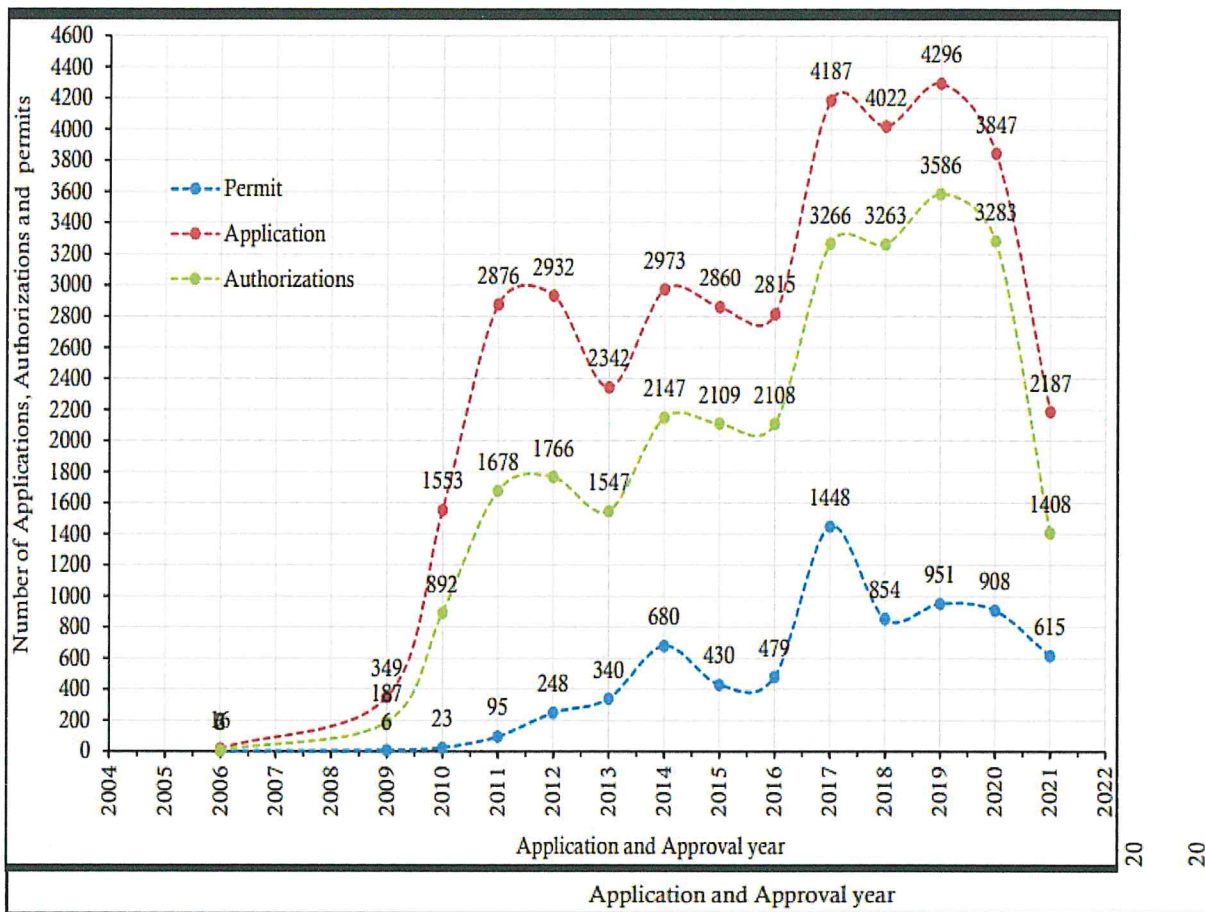


Figure 5: Groundwater applications and approvals from the year 2004 – 2021

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



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

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.

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

Catchment Area \ Station Type	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.

- 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.

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, Garrissa 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.

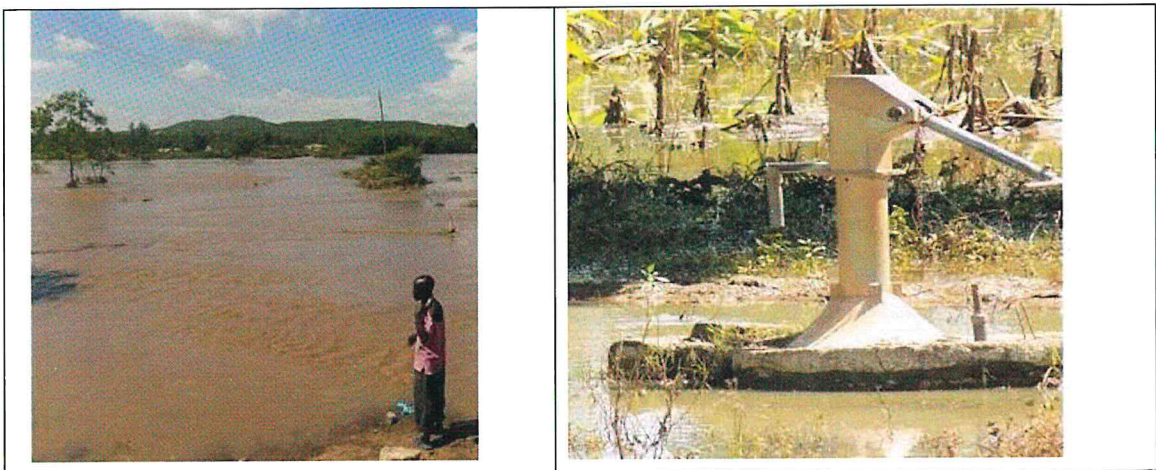


Figure 13: Flooded River Nzoia at Ruambwa and Flood covered community water point-source of water contamination.

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 Loitoktok - Taveta experience low flows during dry periods due to over abstraction and lack of rainfall to refill the water channel. Hence the

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.

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

(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 (WWDA's)** - 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

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 839.8Million Cubic Meters. Four 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

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.

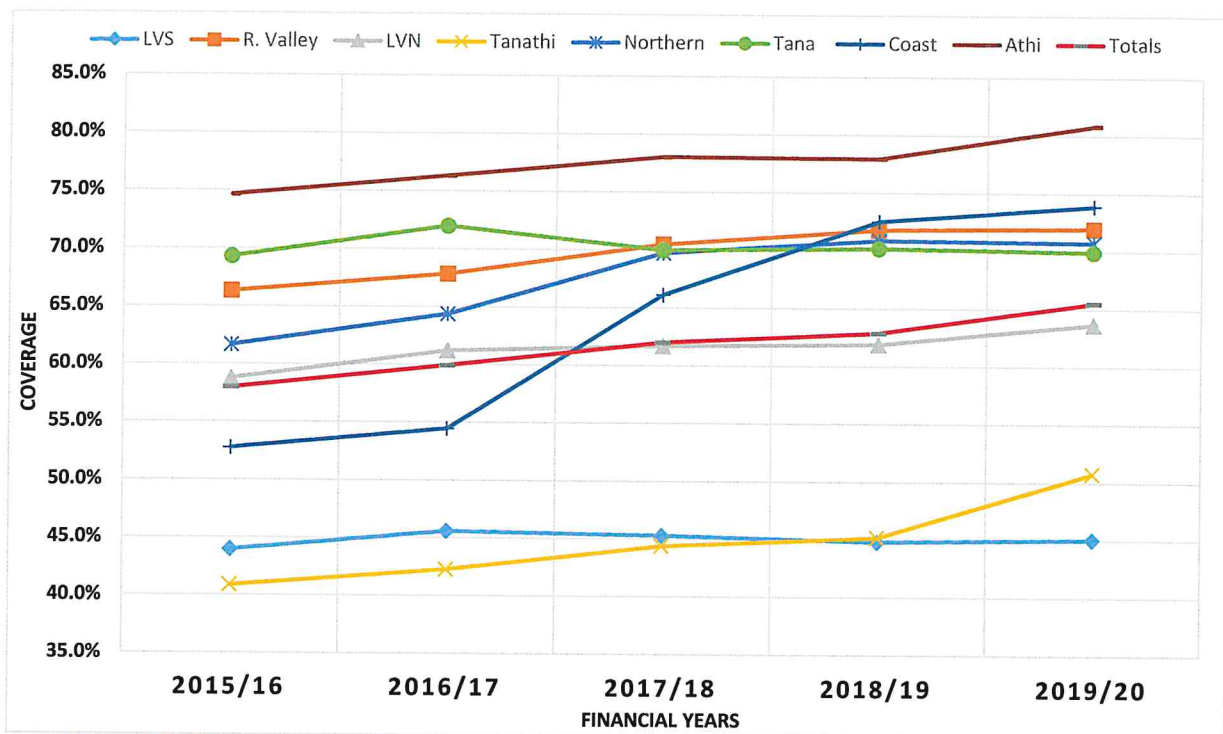


Figure 15: Comparison of water coverage by various WWDAs for the last 5 years

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

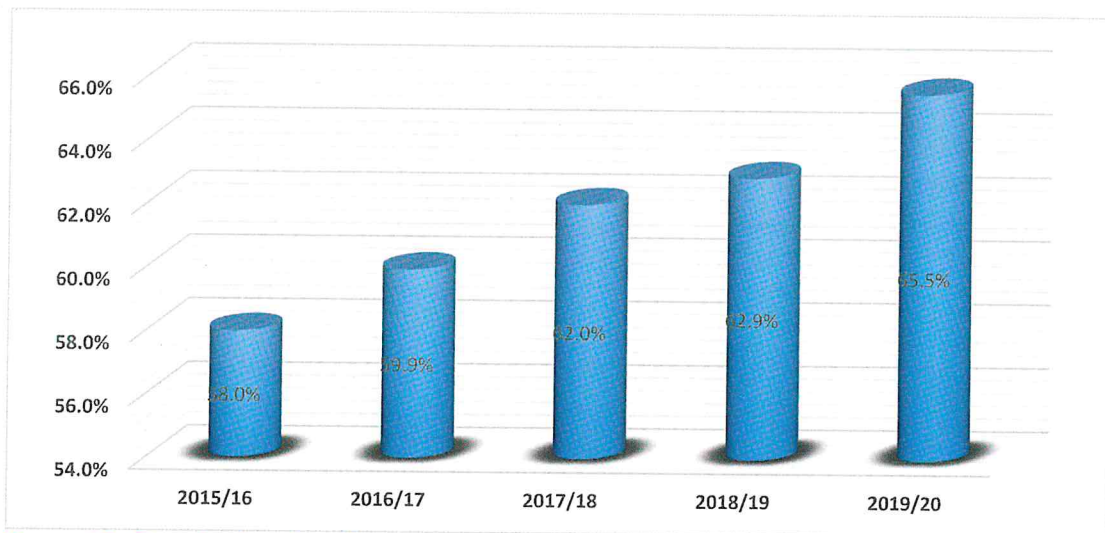


Figure 16: Trend of national water coverage for the last 5 years

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%

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.

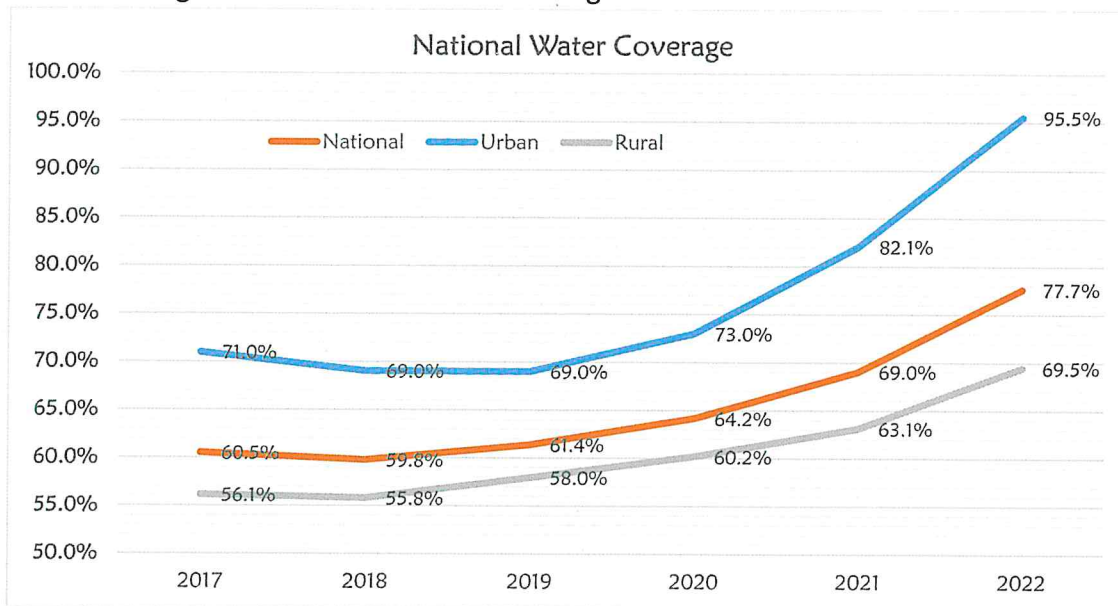


Figure 17: Projected Water coverage to be achieved on or before year 2022

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

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%

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.

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 Kiviyai, 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.

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

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

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.

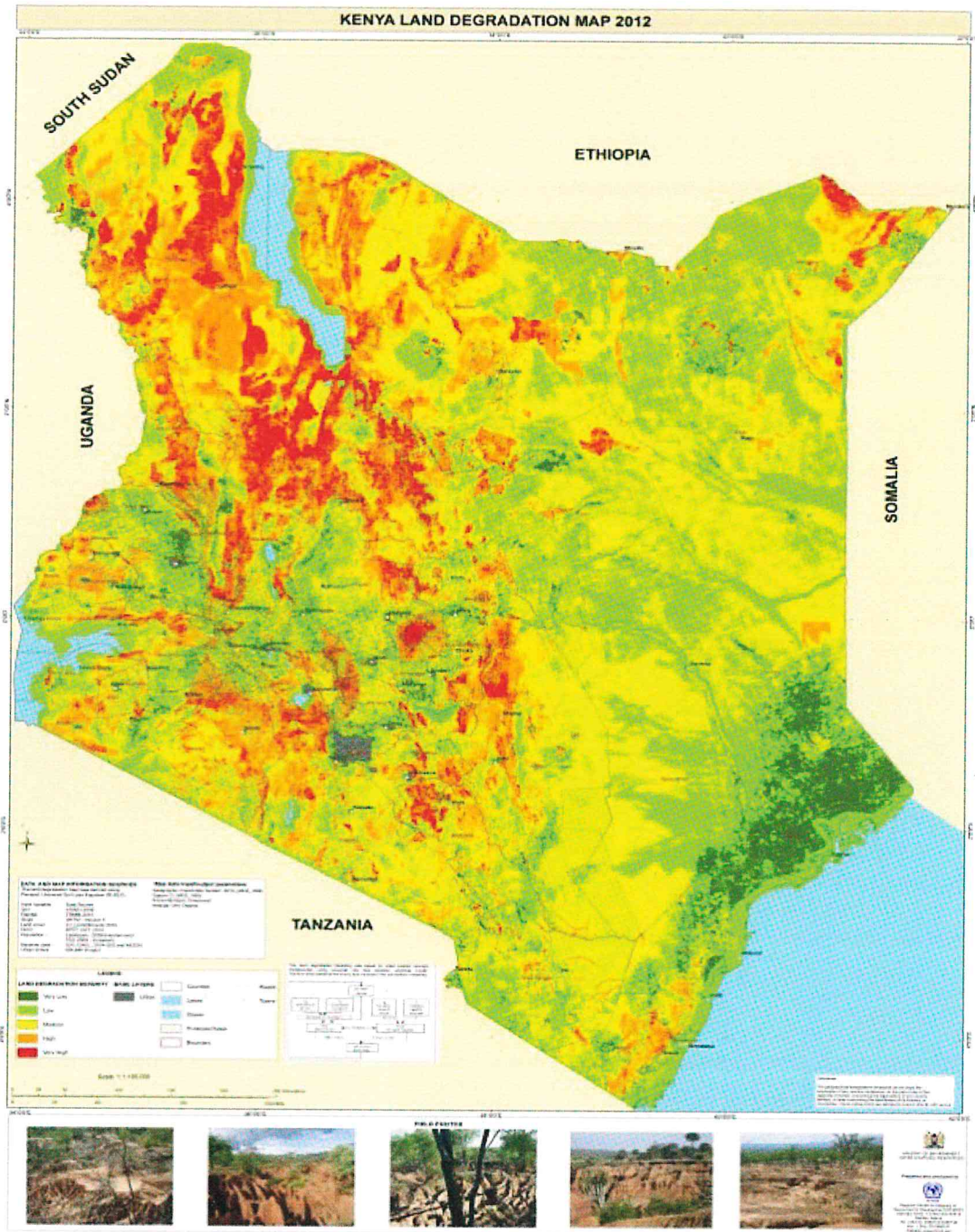


Figure 21: Land Degradation Assessment (LADA); Kenya -2012 (Source- RCMRD, UNEP and Ministry of Water and Irrigation)

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



Figure 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.

- 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.

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

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
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
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
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 1)	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			

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, Kajjido, 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 WAWDA										
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
					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
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/Bogetu tu 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
								192,000	187,000	130,000
COAST WWDA										
1	Kwale	M sambweni, 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 CWWSB	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
		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 22,000m ³ /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
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	Mukurweini 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 m ³ /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	Completion	Additional Population Served		
								2017/18	2018/19	2019/20
11	Kajiado, Kitui, Makeni, 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	Completion	Additional Population Served	
								2017/18	2018/19
		Matuga Kilgoris Narok East Kinango Matuga Chuka Igambangombe Laikipia East Lungalunga Maara							
5	Garissa Tana River Wajir Turkana Mandera 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 water resources in the Arid and Semi-Arid Lands	2,222	Target Population 200,000	Jul-16	Jun-22	35,000	67,000

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
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 Wanduhirrigation 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
					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			

S/N	Name of Dam	County	Capacity (million m ³)	Beneficiaries (persons)	Approx. Cost (KSh million)	Contracting Authority	Project Status/Challenges
7.	Thambana Dam	Embu	12	100,000	5,000	TWSB	RFP Finalized awaiting treasury clearance of financing and Environmental Impact assessment.
8.	Kithino Dam	Meru	103	205,000	10,200	TWSB	RFP Finalized awaiting treasury clearance of financing and Environmental Impact assessment.
9.	Maara Dam	Tharaka-Nithi	27	50,000	4,136	TWSB	RFP Finalized awaiting treasury clearance of financing and Environmental Impact assessment.
10.	Thingithu Dam	Meru	3	210,000	600	TWSB	RFP Finalized awaiting treasury clearance of financing and Environmental Impact assessment.
11.	Kahurura Dam	Laikipia	2	217,000	3,000	NWWSB	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.	Whyimiriri 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	AWWSB	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	AWWSB	Project ongoing at 50%	
18.	Bute Dam	Wajir	21	77,000	7,000	NWWSB	RFP Finalized awaiting treasury clearance of financing 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							
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	NWWSHA	Consultant procured to review the pending works. Lack of funds to pay the consultant
37.	Urmaa 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	NWWSB	Physical Project progress at 43.8%.
Sub- Total			721.8	2,256,500	76,925		
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	LVNWWSB	Detailed design
42.	Dam 40A	Kakamega	100		4,000	LVNWWSB	Preliminary Design
43.	Dam 33B	Bungoma	100		5,000	LVNWWSB	Preliminary Design
44.	Malakisi Dam	Bungoma	36.3	23,500	8,000	LVNWWSB	Feasibility Study
45.	Tisi Dam	Bungoma	21		6,000	LVNWWSB	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	LVNWWSB	Pre-Feasibility completed.
48.	Beregeti Dam	Baringo	20		2,300	RVWWSB	Feasibility Study

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/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/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
	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, OI 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
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		

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
	gravity flow net command area. <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) Feasibility study and detailed designs completed			<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
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>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
	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 GI 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
	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
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
	<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
	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.