Republic of Kenya

Ministry of Water, Sanitation and Irrigation

National Irrigation Policy 2017

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Foreword

The Constitution of Kenya 2010 confers to each citizen the right to be free from hunger and to have adequate food of acceptable quality. It further provides for two levels of government, which are distinct and interdependent. Irrigation as an enabler for agriculture remains a concurrent function.

The opportunities for economic growth through irrigation are immense in Kenya. The country has an irrigation potential of 1,341,900 hectares (3,354,750 acres) based on surface, underground water resources and water harvesting and storage. Irrigation accounts for 1.7 percent of total land area under agriculture, and contributes 3.0 per cent to the GDP thereby providing 18 percent of the value of all agricultural produce.

The irrigation sector has operated without a Policy, compounding the challenges it faces. The challenges include, low rate of irrigation infrastructure development, inadequate funding and investment by public and private sector for development, poorly developed marketing channels and lack of diversification of irrigated enterprises and related commodity value chains. Further, the legal and regulatory frameworks did not reflect the emerging operational and socio-economic realities.

In the circumstances, there was need to develop a comprehensive national irrigation policy with detailed provisions and mechanisms to address all aspects of the irrigation sector and to align it to the Constitution of Kenya 2010 in order for the two levels of government to work together harmoniously for the full exploitation of the irrigation potential in the country.

In the year 2017 this Irrigation Policy was formulated and approved by Cabinet. In earnest its implementation began and has to date resulted in the Irrigation Act 2019, the Irrigation Regulations (2021) and the National Irrigation Services Strategy (2021-2025).

The Vision and Guiding Principles of this Policy are aligned to Kenya Vision 2030, National Water Policy, the National Agriculture Policy and the Sessional paper No. 3 of 2009 on National Land Policy.

The Policy aims at ensuring food security, wealth and employment creation, and poverty reduction through accelerated development and improvement of the performance of the irrigation sector. The key aspiration of this Policy is to accelerate irrigation development at a rate of 40,000 ha per year with the requisite investments in support infrastructure such as water resource development for irrigation. To achieve this, the Policy proposes to mobilize resources for investments from various stakeholders including the private sector and increase Government financial allocation to irrigation.

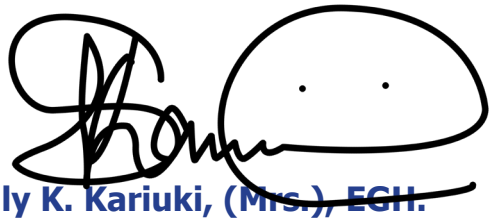
The legal and institutional framework proposed in the Policy establishes key and necessary institutions to enhance the performance of the sector. Among the key irrigation sector institutions are the National Irrigation Authority (NIA) which is responsible for implementation of national/ public irrigation schemes, strategic irrigation schemes, trans-boundary and trans-county schemes. At the county level, the County Irrigation Development Units (CIDU) shall be responsible for irrigation development and management. In addition, it provides for the establishment and strengthening of farmer organizations and particularly Irrigation Water Users' Associations (IWUAs) to enable them play their rightful role in irrigation development and management.

The Policy recognizes the existence of knowledge and skills gaps amongst sector stakeholders and proposes capacity building through promotion of modern irrigation technologies; research and innovation; technical training of irrigation personnel and training of beneficiary communities to ensure sustainable management of irrigation.

This Policy was developed through wide and intensive consultations amongst stakeholders. The corresponding instruments, including the Irrigation Act, 2019; Irrigation (General) Regulations, 2021 and the National Irrigation Services Strategy anchor strategic interventions and provide an

enabling environment to support and fast track Policy implementation for the growth and sustainability of the sector.

The adoption and implementation of this Policy will therefore facilitate better sector coordination thus enabling accelerated irrigation development. This will substantially contribute to meeting the country's goals of food and nutrition security, wealth and employment creation, and poverty reduction. I therefore urge the County governments and all other sector actors to play their respective roles in the implementation and monitoring of this policy to achieve sustainable irrigation development in the country and uplift the living standards of Kenyans. It is the only sure way to assure Kenyans of food security, wealth creation and employment opportunities.



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

Preface

Food and nutrition security is a key issue for Kenya as emphasized in various key government policy documents including Vision 2030. Thus food security and nutrition are important imperatives even as we pursue other equally important objectives of reducing poverty and employment creation. To attain increased and sustained food production, the country will need to reduce reliance on rain-fed agriculture and increase irrigation-based systems that allow production throughout the year, thus better responding to market demand fluctuations.

Irrigation can increase agricultural production by up to 400 percent, and create jobs at a rate of up to 15 persons per hectare directly and indirectly. A robust irrigation sector will therefore guarantee raw materials for agro-industries, create employment opportunities especially for youth and women, improve security and stem the tide of rural urban migration in search of employment opportunities.

The impact of the irrigated horticultural and floricultural production in parts of country demonstrates the potential of irrigation. In the face of adverse impacts of climate change, expanding irrigation through development of sustainable irrigation production systems will contribute to the stabilization and subsequent growth of agricultural production.

The implementation of the National Irrigation Policy will require active stakeholder participation including the private sector and will be further strengthened by institutional and legal frameworks, as well as sectoral strategies which will provide an enabling environment for orderly and rapid development of the irrigation sector. The Policy will further seek to stimulate and guide irrigation and drainage development through increased capacity of water harvesting and storage for irrigation,

targeted technical support, intensified investment, improved research and technology, extension services and capacity building for both staff and farmer organizations to ensure development and sustainability of the sector.

The National Irrigation Policy proposes institutional arrangements at National and County government levels such as the National Irrigation Authority (NIA) and County Irrigation Development Units (CIDUs). This will enable the National and County governments to work together harmoniously as per the Constitution of Kenya 2010, taking cognizance of the obligations of each level of government with regard to irrigation development and management. It further proposes establishment of a regulatory unit within the State Department responsible for irrigation.

The recognition and strengthening farmer organizations and particularly Irrigation Water Users' Associations (IWUAs) is at the heart of proposed institutional arrangements that ensure sustainability of community based irrigation development.

To ensure sustainability in irrigation development, the Policy proposes agency contracting for management of schemes, putting into consideration return to investment through sustainable fee and tariff structures. The Policy also proposes legislative and administrative mechanisms to coordinate irrigation research, innovation, training and capacity building for irrigation development and management.

The Policy takes into account relevant and emerging issues that affect or are affected by the sector at county, national, regional and international levels. In this regard the Policy makes reference to various relevant Acts of

Parliament including Agriculture, Food and Fisheries Authority (AFFA) Act 2013, Crops Act 2013, Kenya Agriculture Livestock Research Organization (KALRO) Act 2013, Water Act 2016, and Environmental Management and Coordination Act (EMCA) 1999.

We commit to continue working with all stakeholders to ensure that the vision as espoused in this Policy is realized for the transformation and growth of the irrigation sector, enhanced and sustainable food security, employment creation and the social and economic prosperity of the country.

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

Acknowledgement

On behalf of the Ministry of Water, Sanitation and Irrigation, I would like to convey the Ministry's profound gratitude to all who participated in the development of the National Irrigation Policy. I sincerely thank Parliament for offering timely and worthwhile guidance during the process of developing this Policy document.

I acknowledge with gratitude the leadership and support of the then Cabinet Secretary in the Ministry of Water and Irrigation, and the Principal Secretaries in the Ministry at the time of development and finalization of this Policy.

I appreciate the support and contribution of the Council of Governors and specifically the committee on agriculture and land. I recognize the support and invaluable contribution of the county governments through the County Executive Committee Members in charge of irrigation and the unwavering support from the intergovernmental thematic working group on policy, legislation and standards.

I thank all the members of staff in the Ministry of Water, Sanitation and Irrigation and the sector state corporations for their contribution towards the development of this Policy.

I sincerely thank the German International Development Cooperation Agency (GIZ) through the Food Security and Drought Resilience Programme (FSDRP) and the European Union (EU) for funding the policy development process. I also recognize with gratitude the support provided by all other development partners and all actors in the irrigation sector who took time to provide feedback and valuable inputs to the policy formulation process.

I recognize and appreciate all the national government ministries, departments and institutions for clearly identifying their stake in this Policy and giving valuable inputs which greatly enriched the Policy. I appreciate the various universities, private sector, farmer organizations,

civil society organizations, the media, other institutions and individuals for their valuable feedback through memoranda submission, participation during the regional consultative forums, the national validation workshop, and through other means.

Finally, I acknowledge and appreciate the tireless efforts and commitments demonstrated by the inter-ministerial technical taskforce which worked tirelessly to complete this Policy.

Mr Joseph W. Irungu, CBS
Principal Secretary
Ministry of Water, Sanitation and Irrigation

Executive Summary

The agricultural sector directly contributes over 25% of Kenya's Gross Domestic Product (GDP) and a further 27% through manufacturing, distribution and service sectors, and accounts for 65% of the total export earnings. The sector employs over 80% of the country's rural work force and provides more than 18% of formal employment. The Kenya Vision 2030 recognizes the significance of agriculture towards its goals that aim at achieving an average Gross Domestic Product growth rate of 10% per annum up to the year 2030.

In spite of the critical role of the agricultural sector in the economy, it is increasingly vulnerable due to overreliance on rain-fed production given that 84% of the country is arid and semi-arid lands (ASAL), hence the need for irrigation to ensure sustainable agricultural production. However, irrigation sector also faces some challenges, key among them lack of specific policy and legal framework; under-exploited irrigation potential due to low levels of investment including inadequate budgetary allocation; inadequate private sector participation and investment; inadequate infrastructure development and water storage for irrigation; weak governance of irrigation water users' associations and other farmer associations; inadequate and un-coordinated information sharing in irrigation and research, inadequate provision of irrigation support services; inadequate access to credit and financial services; and weak input and output market linkage.

Irrigation accounts for 1.7 percent of total land area under agriculture, contributes 3.0 percent to the GDP and provides 18 percent of the value of all agricultural produce demonstrating the potential of irrigation in increasing agricultural production and productivity. With irrigation, agricultural production can be increased by up to 400 percent, and jobs created at the rate of up to 15 persons per hectare directly and indirectly. A robust irrigation sector will guarantee raw materials for agro-industries, create employment opportunities especially for youth and women,

improve security and stem the tide of rural urban migration in search of employment opportunities

In the past, irrigation development strategies and approaches were articulated in a number of government Policy papers including: the Sessional Paper No.4 of 1981 on National Food Policy; Sessional Paper No. 1 on Economic Management for Renewed Growth; Sessional Paper No.2 of 1994 on National Food Policy; the Economic Recovery Strategy for Wealth and Employment creation (2003 - 2007); the Strategy for Revitalizing Agriculture (2004-2014); the Agriculture Sector Development Strategy (ASDS 2010-2020) and the Kenya Vision 2030. All these policies and strategies have not comprehensively explored ways and means on how the irrigation potential could be better harnessed since they aimed at providing employment and settlement of the landless basically through development of national irrigation schemes, as well as broadly dealing with aspects of irrigation.

The National Irrigation Policy has been developed with wide stakeholder participation and consultations and once implemented will ensure establishment of mechanisms for sustainable irrigation development through exploitation of the irrigation potential.

The Policy aims at ensuring food security, wealth and employment creation, and poverty reduction through accelerated development and improvement of the performance of the irrigation sector. More specifically the Policy proposes to exploit the irrigation potential by increasing the area under irrigation by 40,000 ha per year; to increase available water for irrigation through innovative technologies including water harvesting, flood control, use of wastewater, and sustainable exploitation of groundwater; to mobilize resources for investments from various stakeholders and increase Government financial allocation to irrigation to at least 2% of the annual national budget.

Other key objectives are: to undertake irrigation research and development; to build capacity of technical personnel and irrigators; to promote participation of stakeholders in irrigation development and

management; to adopt an integrated approach to sustainable commercial irrigation farming; and to formulate an appropriate legal, institutional and regulatory framework for the sector.

The implementation of the Policy shall be under a proposed institutional framework consisting of institutions at both the National and County Government levels. In order to work harmoniously they shall be facilitated by a coordination mechanism guided by provisions as prescribed in the Constitution of Kenya on inter-governmental relations.

The Policy also proposes the establishment of both administrative and legal mechanisms for water harvesting, flood control and water storage infrastructure. It further proposes establishment of a regulatory unit within the State Department responsible for irrigation. The policy puts emphasis on the role of developing suitable guidelines for private sector involvement and engagement in irrigation development on the State Department responsible for irrigation. In order to ensure sustainability in irrigation development, the Policy proposes agency contracting for management of schemes, putting into consideration return to investment through sustainable fee and tariff structures.

The Policy proposes legislative and administrative mechanism to coordinate irrigation research, innovation, training and capacity building for irrigation development and management. The Policy further recognizes the key role played by the county governments in the irrigation sector and proposes the establishment of County Irrigation Development Units (CIDU) to be responsible for irrigation development and management at the county level. The Policy provides for the establishment and strengthening of farmer organizations and particularly irrigation water users' associations (IWUAs) to enable them play their rightful role in irrigation development and management.

In order to realize the institutional reforms and the targeted growth proposed in the Policy, the annual budgetary allocation to the irrigation sector will need to be increased from 1% to 2% per year of the annual national budget.

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Abbreviations and Acronyms

ADC	Agricultural Development Corporation
ASALs	Arid and Semi-Arid Lands
ASDS	Agricultural Sector Development Strategy for 2010-2020
CAADP	Comprehensive Africa Agricultural Development Programme
Cap	Chapter
DID	Director of Irrigation and Drainage
EMCA	Environmental Management and Coordination Act
ERS	Economic Recovery Strategy for Wealth and Employment Creation
GIS	Geographic Information Systems
GDP	Gross Domestic Product
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
Ha	Hectares
ICT	Information Communication Technology
SDI	State Department of Irrigation
IDMIS	Irrigation and Drainage Management Information System
IDRI	Irrigation and Drainage Research Institute
IFAD	International Fund for Agricultural Development
IMT	Irrigation Management Transfer
IWRM	Integrated Water Resources Management
IWUAs	Irrigation Water Users Associations
JICA	Japan International Corporation Agency
KALRI	Kenya Agricultural Research Institute
KALRO	Kenya Agricultural and Livestock Research Organization
KEBS	Kenya Bureau of Standards
KEFRI	Kenya Forestry Research Institute

KEMRI	Kenya Medical Research Institute
KEPHIS	Kenya Plant Health Inspectorate
KEWI	Kenya Water Institute
KfW	Bank aus verantwortung
KIRDI	Kenya Industrial Research and Development Institute
M & E	Monitoring and Evaluation
MoALF	Ministry of Agriculture, Livestock and Fisheries
MTP	Medium Term Plan
MWI	Ministry of Water and Irrigation
NEMA	National Environmental Management Authority
NGO	Non-Governmental Organization
NIB	National Irrigation Board
NIA	National Irrigation Authority
NYS	National Youth Service
O & M	Operations and Maintenance
OP	Office of the President
PPP	Public Private Partnership
RDA	Regional Development Authority
SME	Small and Medium Scale Enterprise
SRA	Strategy for the Revitalization of Agriculture
WRA	Water Resources Authority
WSTF	Water Sector Trust Fund
WASREB	Water Services Regulatory Board
WRUA	Water Resources User Association
WSB	Water Services Board
WUA	Water User Association
WAB	Water Appeals Board
CoK	Constitution of Kenya
EU	European Union
OPEC	Organization of Oil Exporting Countries
AfDB	Africa Development Bank
WB	The World Bank

Chapter 1: Towards A National Irrigation Policy

1.1 Rationale

1. The Constitution of Kenya (CoK) 2010 marks a critical stage in the country's development process. It provides for Kenyans the right to be free from hunger and to have adequate food of acceptable quality (Article 43(c). It further provides for two levels of government namely the national and county governments. The two levels of government have specific, residual and concurrent functions and powers as provided for under Article 186 and the Fourth Schedule – Part 1: National government and Part 2: County governments.

2. The Constitution describes the two levels of government as distinct and interdependent and it requires the two levels of government to cooperate with, support and consult and liaise with each other for the purpose of exchanging information, coordinating policies and administration and enhancing policy.

3. The Fourth Schedule of the Constitution has assigned specified functions on Agriculture to the National Government and the county governments respectively and it stipulates that the two levels of government shall conduct their mutual relations on the basis of consultation and cooperation (Article 6, Article 189 (1) (b) (c). The provisions related to irrigation at the National Government include: the use of international waters and water resources; national public works; protection of the environment and natural resources (water protection, securing sufficient residual water, hydraulic engineering and the safety of dams; and agricultural policy and capacity building, as well as technical assistance to the counties and public investment.

4. At the county government level the functions assigned by the Fourth schedule include: Agriculture; implementation of specific national

government policies on natural and environmental conservation on soil and water. The functions assigned to county governments through the Kenya Gazette Supplement No. 116 of 9th August 2013 include: Agriculture (crop husbandry); implementation of programmes in the agricultural sector to address food security in the county; development of programmes to intervene on soil and water management and conservation of the natural resource base for agriculture; land development services such as construction of water pans for horticultural production for food security and others.

5. Cooperation requires that there be intergovernmental dialogue or consultation to inform both the vertical and horizontal relationships between national and county levels of government and among the county governments respectively. The Constitution requires the national government and county governments to embrace a system of consultation, negotiation and consensus building to promote social and economic development (Article 174 (f)) while upholding the principles of good governance, integrity, transparency, accountability and sustainable development. The relationship between the two levels of government is further guided by the Intergovernmental Relations Act no. 2 of 2012 which provides for the establishment of a framework for consultation and co-operation. It also establishes mechanisms for the resolution of intergovernmental disputes in line with the Constitution of Kenya 2010 Articles 6(2) and 189 (i); (3) and (4).

6. The National Irrigation Policy takes cognizance of the obligations of each level of national and county government with regard to irrigation development and management. The Constitution recognizes Kenya as a member of the international community and Article 2 (5) (6) upholds the principles of international law and recognizes all the treaties, conventions, protocols and agreements ratified by Kenya as part of the laws of Kenya.

7. The Policy recognizes and upholds the participation of all the relevant stakeholders including farmers and the communities in the

implementation of the policy as a national value and principle of good governance.

8. The Policy recognizes that there are clear functions and roles of the National Government and county governments in the implementation of the Policy and the need for intergovernmental and inter-sectoral structures at both national and county government levels to address irrigation matters. The formulation and implementation of the Policy therefore involves the two levels of government in line with the spirit of the Constitution of Kenya 2010.

9. The sharing of roles and functions between the National Government and county governments will require review of some of the existing policies and laws. There will also be development of new policies and legislation for various agencies within Government as the current dispensation either adds or takes away roles that were earlier performed by the central Government. It will also require the development of new institutional frameworks for the sector. As part of the exploitation of the irrigation potential and improve agricultural productivity and production, there will be need for expansion of areas under irrigation as well as improvement in the performance of the sector.

10. The implementation of the National Irrigation Policy will require active stakeholder participation and will be complemented by institutional and legal frameworks, and sectoral strategies which will provide an enabling environment for orderly and rapid development of the irrigation sector. The Policy will further seek to stimulate and guide irrigation and drainage development through targeted technical support, intensified investment, improved research and technology, extension services and capacity building for both staff and farmer organizations to ensure development and sustainability of the sector.

11. The Vision and Guiding Principles of this Policy are aligned to the Kenya Vision 2030 and other relevant policies and strategies in the sector including Agricultural Sector Development Strategy (ASDS),

Water Policy (under review), National Agriculture Policy (under development) and National Land Policy 2009. This Policy further make reference to various and relevant Acts of Parliament including Agriculture, Food and Fisheries Authority (AFFA) Act 2013, Crops Act 2013, Kenya Agriculture Livestock Research Organization (KALRO) Act 2013, Water Act 2016, Environmental Management and Coordination (EMCA) Act 1999 as amended 2015. The Policy takes account of relevant and emerging issues that affect or are affected by the sector at county, national, regional and international levels.

12. Kenya has an area of approximately 582,646 square kilometres comprising 97.8 % land and 2.2% water surface. Out of this only 20% of the land falls within medium to high rainfall areas where 75% of the population live and the rest is arid or semi-arid characterized by water deficits for agricultural production.

13. The high rainfall zones receive more than 1,000 mm per annum and occupies less than 20% of the productive agricultural land and carries approximately 50% of the country's population. Most of the food and cash crops as well as livestock products are produced in these zones under semi-intensive and intensive systems. The medium rainfall zones receive between 750-1000 mm of rainfall annually and occupy between 30%-35% of the 20% of the productive agricultural land area. These zones are home to about 30% of the population. Farmers in these zones keep cattle and small stock, and grow drought-tolerant crops. The ASALs receive200-750 mm of rainfall annually and occupy about 84% of the total land area. ASALs which are predominantly used as rangelands and game parks carry 80% of the country's livestock and 65% of the wildlife.

14. The Constitution of Kenya 2010 has provision for the natural resource base including water used for irrigation. The Fourth Schedule, Part 1 Clause 2 on the management of international waters and water resources is key to the development of irrigation and other water uses. Clause 22 deals with the protection of the environment and natural

resources necessary for establishment of durable and sustainable development. Subsection (c) states as follows: *'water protection, securing sufficient residual water, hydraulic engineering and safety of dams'.* There are provisions on land use and water resources in Chapter Five of the Constitution.

15. Article 71 of the Constitution of Kenya 2010 requires that legislation on agreements relating to exploitation of natural resources be done before the due date. Under Article 260 of the Constitution, natural resources mean the physical non - human factors and components whether renewable or non-renewable including surface and ground water among others.

1.1.1 Agriculture

16. Agriculture is the mainstay of Kenya's economy, directly contributing 26 per cent of the Gross Domestic Product (GDP), and another 25 per cent indirectly. The sector accounts for 65 per cent of the export earnings and provides more than 18 percent of formal employment and 70 per cent of informal jobs in the rural areas. Towards the achievement of national aspirations as captured in the Kenya Vision 2030 economic pillar, agriculture is one of the key sectors to contribute to national poverty reduction, wealth and employment creation. The agricultural sector has been negatively affected as the cropping and livestock production systems follow the annual rainfall patterns which are highly variable and unreliable. Therefore, there is need for the country to shift focus from rain-fed to irrigated agriculture. Irrigation will enhance production of crop, livestock and fisheries which will in turn significantly contribute to meeting the demands of national food security as well as products for emerging export markets and agro-industries.

1.1.2 Kenya's Irrigation Potential and Development

17. Kenya has not fully developed her irrigation potential estimated at 1.342 million ha. The irrigation potential is based on surface and underground water including water harvesting and storage. By the end of 2015, approximately 180,503 ha of irrigation had been developed. This is about 13.5% of the potential leaving more than 80% of Kenya's irrigation potential untapped.

Table 1: Distribution of Irrigation Potential in Water Basins

Irrigation Potential and Development Per Basin			
Water Basin Catchment Areas	**Est. Irrigation potential (Hectares)**	**Developed as at 2015 (Hectares)**	**Percentage developed**
Lake Victoria	327,219	23,939	7%
Rift Valley	84,200	18,822	22%
Athi River	295,956	51,443	17%
Tana River	566,995	74,160	13%
Ewaso Nyiro North	151,730	12,141	8%
Total	**1,341,900**	**180,503**	**13%**

(Adopted from: IDD, WMP, MoEWNR)

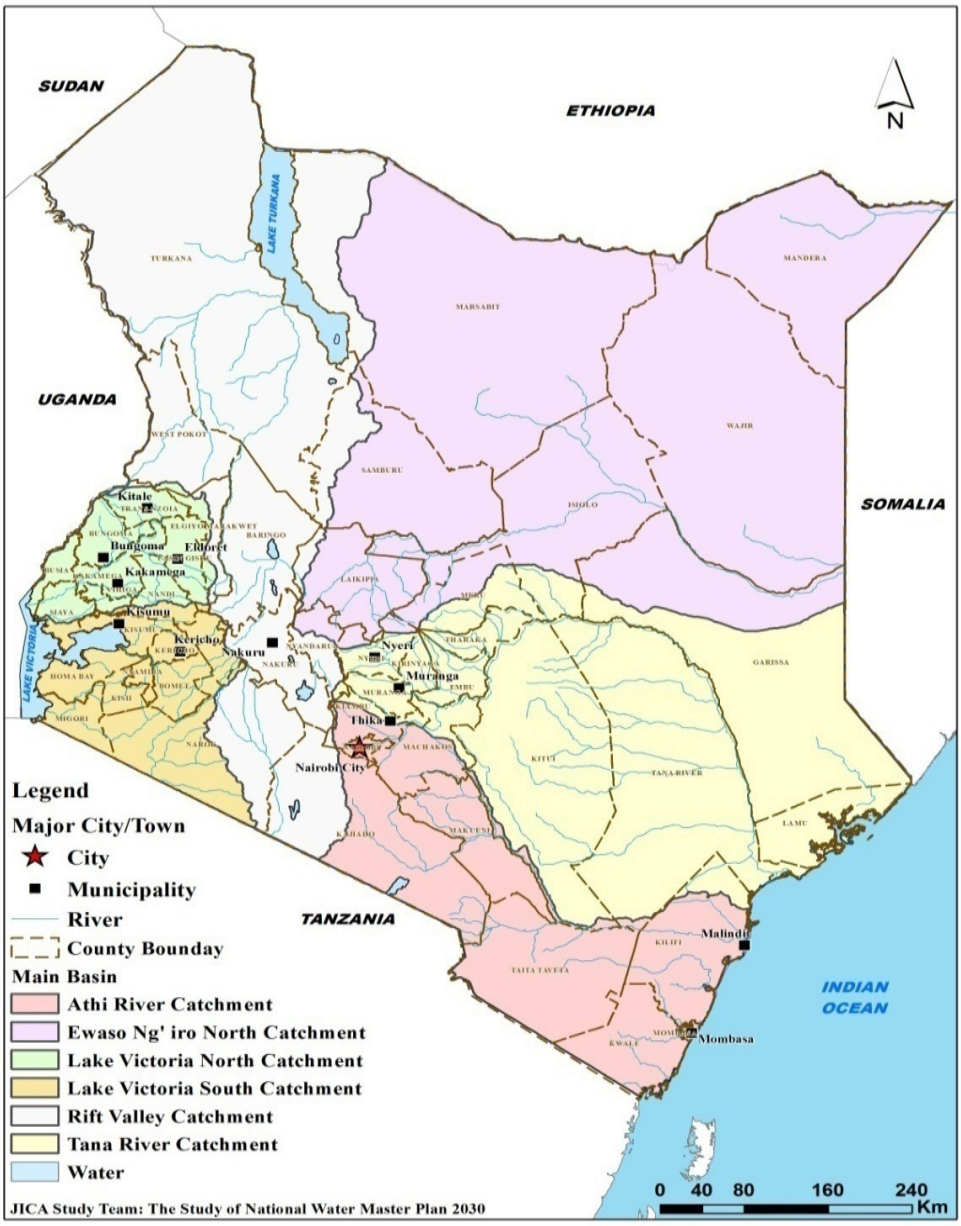

Figure 1: Geographical Map of the Water Catchment Basins

1.1.3 Past Irrigation Development Related Policies

18. Past irrigation development strategies and approaches are articulated in Sessional Paper No.4 of 1981 on National Food Policy, Sessional Paper No. 1 on Economic Management for Renewed Growth, Sessional Paper No.2 of 1994 on National Food Policy, the Economic Recovery Strategy (2003 - 2007), Strategy for Revitalizing Agriculture (2004-2014), the Agriculture Sector Development Strategy (ASDS 2010-2020) and Kenya Vision 2030. In the existing schemes, the National Irrigation Board (NIB) played a central role in providing water conveyance, land preparation, inputs supply, produce marketing and processing. Since the liberalization of financial markets and removal of marketing restrictions, farmers' participation in identification, development, operation and maintenance of the schemes through Irrigation water users' associations (IWUAs) has increased. The irrigation development strategies of this Policy draw experiences from the successes and failures of the past while institutionalizing more participatory, stakeholder-led and business-oriented approaches.

1.1.4 Organizational Categories of Irrigation Schemes in Kenya

19. Kenya's irrigation sector is categorized into two broad categories based on whether they are public or privately owned. These categories can further be classified into national and institutional (for the public schemes) and either individual/firm or community-based (for privately owned schemes).

20. Public owned irrigation schemes are developed in government-owned land and are developed and managed by public institutions. The country has a number of public irrigation schemes with a total area of 24,240ha. These schemes have acreages ranging from 400 ha to over 12,000 ha and account for 18% of the irrigated land area in Kenya. These schemes are managed by the NIA, Regional

Development Authorities (RDAs), National Youth Service (NYS), the Prisons, universities and colleges. In some national schemes, the government jointly manages the schemes with farmers' organizations such as IWUAs through irrigation management transfer programmes. The RDAs invest in estate-type irrigation schemes with nucleus and out grower farmers' arrangement. Public schemes employ about 900,000 people directly and indirectly. Examples of national schemes include Mwea, Ahero, West Kano, Bunyala, Bura, Hola, Pekerra and Galana Kulalu while institutional schemes include those owned by the ADC, NYS, and the Prisons Department.

21. In 2013, the National Government initiated Galana-Kulalu food security irrigation, which is one of the National Government flagship project. The project will be implemented in phases to achieve the target depending on resource availability. Currently a 4,000 ha (10,000 acre) model farm is under implementation with 1,600 ha (4,000 acres) developed by July 2016.

22. The community based smallholder irrigation schemes belong to individuals/groups of farmers sharing a common irrigation system operating as Irrigation water users' associations (IWUAs), cooperatives or self-help groups. There are about 3,600 smallholder irrigation schemes covering 57,760 ha with over 2 million people working in them. They account for the bulk of horticultural produce consumed in Kenya, appreciable amounts of export crops, grain staples and tubers. These schemes have been developed with the participation of farmers, supported by the Government, development partners and NGOs. Some of the schemes include South West Kano, Mitunguu, Ena, Kioru Giaki, Chala, Lower Kuja, Oluch Kimira among others.

23. Private commercial farms cover about 53,000 hectares accounting for 40% of irrigated land. Most of them utilize high technology and produce high-value crops for the local and export market, especially

flowers and vegetables. The farms employ a workforce of about 82,500 people. Examples of private owned schemes include those owned by Del Monte, Kakuzi, Finlay and Equator Flowers, Dominion, among others.

1.1.5 Challenges in Irrigation Development

24. There are many constraints and challenges facing the irrigation sector, which include: (i) lack of specific policy and legal framework; (ii) under-exploited irrigation potential due to low levels of public participation and investments including inadequate budgetary allocation; (iii) inadequate private sector participation and investments; (iv) inadequate infrastructure development for irrigation, drainage and water storage;(v) poorly developed channels for participation by irrigators and weak governance of water users'/farmer associations; (vi) inadequate and un-coordinated information sharing in irrigation research, science and technology; (vii) inadequate irrigation support services; (viii) insecure land tenure and unsustainable land use; ix) inappropriate utilization of waste water and storm water; (x) inefficient use of water resources in existing schemes; (xi) inadequate access to credit and financial services; (xii) inadequate input supplies and output markets; (xiii) limited incentives for investment in irrigation materials, technology, equipment and machinery; and (xi) negative impacts of climate change.

1.1.6 Increased demand for water for production

25. The demand for water for economic use has been increasing while water resources have been declining. This has resulted in most of the schemes experiencing water shortages during the drought thus leading to declining production and undermining further expansion especially in the ASALs. Therefore, there is need to develop sustainable strategies for agricultural water management systems.

1.1.7 The Need for a National Irrigation Policy

26. Kenya has not had a policy on irrigation development and management. As the sector continues to grow and amidst the multiple stakeholders and interests, there is a clear need and demand for a national policy to guide irrigation development. It is in this context that this Policy will seek to facilitate and guide irrigation development by addressing the challenges and constraints in the sector through:
    a. Formulation of appropriate institutional and legal framework
    b. Establishment of mechanisms for resource mobilization, investments and financing of the sector
    c. Harmonization of roles and functions in the development, operation and management of irrigation in the country
    d. Capacity building, research, innovation, science and technology
    e. Mainstreaming the use of existing and emerging water sources and technologies such as recycled, storm water, geo-thermal water, desalinated, and waste water
    f. Mechanisms for improved coordination, monitoring and evaluation

1.2 Vision

27. The Overall Vision of this Policy is:

    To transform the irrigation sector through accelerated development, modernization and commercialization of sustainable irrigation systems and water storage for attainment of food security, employment creation and socio-economic growth.

1.3 Mission

28. The Mission Statement of this Policy is: "To guide and facilitate the development and management of irrigation in Kenya".

1.4 Policy Objectives

29. The specific policy objectives are to:

a. Promote sustainable exploitation of irrigation potential by increasing the area under irrigation by 40,000ha per year in line with Kenya Vision 2030

b. Increase available water for irrigation through innovative technologies including water harvesting and flood control, use of wastewater, and sustainable exploitation of groundwater

c. Mobilize resources for investments from various stakeholders and increase Government financial allocation to irrigation to at least 2% of the annual national budget

d. Undertake irrigation research and development

e. Build capacity of technical personnel and irrigators

f. Promote participation of stakeholders in irrigation development and management

g. Adopt an integrated approach to sustainable commercial irrigation farming including crop, livestock and aquaculture production

h. Formulate an appropriate legal, institutional and regulatory framework for the irrigation sector

i. Guide the implementation process of the policies and strategies for irrigation development and management in the country

1.5 Guiding Principles and Concepts for the Policy

30. In order to meet the objectives of the Policy, the irrigation sector shall be guided by the following principles:

a. Intergovernmental co-ordination and consultation

b. Demand-driven and sustainable irrigation development and management

c. Social inclusiveness and participation in irrigation development and management
d. Environmental sustainability in irrigation development and management
e. Mainstreaming integrated water management and efficient water use in irrigation development
f. Equity, transparency and good governance
g. Professionalism in irrigation development and management
h. Fairness and justice in conflict resolution
i. Promotion of sustainable and modern technologies including renewable energy

Chapter 2: Broad Irrigation Development Strategies

2.1 Introduction

31. Irrigation development presents an opportunity to increase productivity to meet the rising demand for food and other agro-products. It requires formulation and operationalization of national strategies to guide and fast- track irrigation development, improve sector financing, build a well-equipped human resource and technical capacity to plan and manage the growth and operations, while institutionalizing a well-functioning monitoring and evaluation system. The sector development also intends to establish an institutional arrangement for efficient management and coordination of the sector in order to facilitate increased irrigation infrastructural development, enhanced participation of stakeholders and embrace a business approach to irrigated agriculture.

32. The National Government and the county governments with other irrigation stakeholders will apply the following broad irrigation development strategies.

2.1.1 Increase Land Under Irrigation

33. The National Government, county governments and other stakeholders will build irrigation infrastructure to increase the area under irrigation by developing new schemes, as well as rehabilitation and performance improvement of existing ones. This will ensure accelerated sustainable exploitation of the irrigation potential by expanding area under irrigation from the current irrigated 161,900ha to 1,341,900 ha by 2030.

34. Domesticate and implement appropriate protocols and agreements to enable exploitation of trans-boundary water resources in irrigation development.

35. Promote the development and expansion of water harvesting and storage, control, delivery and storage infrastructure for irrigation, as part of multi-purpose water use.

2.1.2 Increase Production of Irrigated Agriculture

36. Incorporate holistic agricultural water management (AWM), which includes irrigation water harvesting and storage, in-field water management, protection of water catchment and riparian areas, soil fertility management, pest and disease control and other appropriate agronomic practices.

37. Rehabilitate and upgrade existing under-utilized irrigation systems.

38. Improve efficiency, accessibility and affordability of the required farm inputs, irrigation equipments and support services.

39. Diversify the crop enterprises and integrate livestock and fisheries in irrigated agriculture.

2.1.3 Improve Quality of Irrigated Agricultural Produce

40. Improve quality of produce through effective utilization of approved and appropriate technologies in water use, field and agronomic management practices, product handling and care.

41. Enforce quality control regulations and standards for agricultural produce, input supplies, sanitary and phyto-sanitary controls and environmental protection.

42. Enhance farmer education and awareness, and improve communication and information flow.

2.1.4 Improve Marketing and Marketing Linkages

43. Ensure proper maintenance of existing markets and establishing modern marketing infrastructure and institutions.

44. Streamline the whole value chain and improve the quality of goods in internal and external markets.

45. Provide market information and access for agricultural produce and regulatory functions to protect farmers from undue exploitation.

2.1.5 Increase Incomes of Farmers Along the Value Chain

46. Expand and improve facilities for post-harvest handling, processing, packaging, transport and wholesale market points for irrigated farm produce.

47. Impart entrepreneurial skills to promote rural-based agro-industry with adequate capacity.

48. Enhance investments in irrigated agriculture through appropriate financing, credit, insurance and savings mechanisms.

2.1.6 Mitigating Effects of Climate Change

49. Harness agricultural water resources and storage infrastructure to reduce flood and drought disasters, and environmental damage arising from climatic variations.

50. Enhance crop, aquaculture and livestock farming systems' resilience through appropriate agricultural water management using water efficient technologies and production methods.

51. Promote increased use of renewable energy

2.1.7 Enhancing sustainability in irrigated agriculture

52. Encourage policies geared towards lowering the costs of irrigation equipment and inputs.

53. Encourage provision of marketing through appropriate mechanisms such as farming contracts with exporters.

54. Encourage targeted smart incentives and subsidies to women, youth and persons with disabilities.

55. Enhance and encourage availability of adequate water storage for irrigation.

56. Encourage participation in protection of water catchments and riparian areas.

57. Review Government policies on financing and credit availability to support irrigation development.

58. Develop an irrigation framework for the formation and management of stakeholder groups, including IWUAs at scheme level to ensure water use and equitable distribution, undertake operation and maintenance, and resolve water related conflicts.

59. Develop diagnostic tools and mechanisms for performance assessment to enable effective monitoring and evaluation.

60. Promote initiatives aimed at reducing the cost of energy needs through the use of green energy options.

2.1.8 Enhance Public-Private Partnerships

61. Public-Private Partnerships (PPPs) will be promoted through innovative incentives for entrepreneurs and other private sector players to invest and participate in irrigation development and management.

2.1.9 Improve Service Delivery to the Irrigation Sector

62. The National Government and county governments and other stakeholders will develop principles, standards, guidelines and procedures and monitoring and evaluation systems for development and management of irrigation.

63. Strengthen stakeholder participation and irrigation water resource management (IWRM) principles shall be adopted in all irrigation projects, programmes and initiatives.

64. Encourage and support small and medium enterprises (SMEs) to establish and develop alongside irrigation value chains to facilitate supply of inputs and equipment, value addition, transport and output markets.

65. Develop irrigation support infrastructure and related services to enhance efficiency and commercialization of the sector.

2.1.10 Farmer Participation in Irrigation Development and Management

66. Involve farmers in irrigation development policy formulation, and ensure that they are involved in all stages of the irrigation development and management processes.

67. Promote formation of farmer organizations or cooperatives to support production, marketing and overall production management of irrigation schemes.

2.1.11 Gender Equity and Involvement of Youth in Irrigation Development and Management

68. Address gender-related challenges and the involvement of the youth in irrigated agriculture in order to achieve equity and greater participation in the irrigation sector.

69. Include and incorporate gender roles and the involvement of the youth in irrigation development in irrigation planning, development and management.

70. Enhance targeted capacity building based on gender and establish mechanisms to involve the youth in irrigated agriculture.

2.1.12 Improved Resource Mobilization for Irrigation Development

71. Develop mechanisms for enhanced resource mobilization for the irrigation sector.

72. Promote and target public investment in the irrigation sector through the development of major irrigation infrastructure, agricultural water harvesting, storage facilities, waste water recycling, and storm water storage facilities.

73. Establish a funding mechanism dedicated for the growth and development of irrigation sector.

74. Develop appropriate mechanisms for financing the operation and maintenance of irrigation systems.

2.1.13 Utilization of Research, Science and Technology in Irrigated Agriculture

75. Ensure the irrigation sector growth is driven by modern research, science and technology in order to attain high productivity and meet quality standards.

76. Encourage farmers to adopt modern farming and irrigation technologies to increase productivity and efficiency.

77. Promote cooperation and collaboration in irrigation research, science and technology, and information sharing with all stakeholders including regional and international partners.

2.1.14 Enhance Capacity Building

78. Improve and enhance capacity building for irrigation stakeholders at all levels of the irrigation sector.

79. Promote and strengthen networking linkages for capacity building amongst institutions engaged in irrigation development.

2.1.15 Enhance Compliance with Environmental, Statutory and Legal Requirements

80. Ensure the mainstreaming of environmental, health and other related policies and legal requirements in irrigation development.

81. Enhance and promote capacity building among irrigators on health, environment, management and other related legal requirements.

Chapter 3: Development, Operations and Management

3.1 Rationale

82. Irrigation development will enhance food security, employment creation, incomes generation and provision of raw materials for industrial growth as envisioned in Kenya Vision 2030 and in line with the constitutional right to be free from hunger and to have adequate food of acceptable quality under Article 43(2).

83. Kenya's Vision 2030 has listed increasing the amount of irrigated land among the eight challenges for the water sector. The Agricultural Sector Development Strategy for 2010-2020 (ASDS) has also recognized improvement of water management and irrigation development as a strategic requirement for building a dynamic agricultural sector.

84. Supportive infrastructure including handling and processing facilities, telecommunication, transport and social amenities, access roads, energy and market infrastructure are essential to enable development of sustainable irrigated agriculture.

85. Sustainable irrigation development is dependent on institutional effectiveness for development and management including effective operations and maintenance. Appropriate legal, regulatory and institutional arrangements are necessary for successful and sustainable development.

3.2 Situational Analysis

3.2.1 Water for Irrigation

86. Kenya has limited natural endowment of renewable fresh water, estimated at 21 billion m^3 out of which 10 billion m^3 is shared in trans-boundary basins. The per capita annual fresh water availability is projected to fall to 235 m^3 against the internationally accepted threshold of 1000 m3 by 2025 with human population increase. Water availability is mainly concentrated in the country's five water towers and Lake Victoria regions but deforestation of catchment areas, human settlements and recurrent droughts have adversely affected hydrological sustainability. There also exist disparities in water resources within different water basins with ASALs having the worst shortages.

87. The bulk of Kenya's renewable water resources are derived from an average annual rainfall volume of 354 billion m^3, translating to an annual runoff of 20 billion m^3, of which only 4.7 billion m^3 is used annually. The bulk of this runoff potential (15 billion cubic meters) remains un-utilized, while about 40% of renewable fresh water has potential for development. The remaining 60% may be required for maintenance of the ecosystems besides being a reserve for future development. The country's safe yield of surface water has been assessed to be 7.4 billion m^3 per annum while that of groundwater is about one billion m^3 per annum.

88. The main sources of water for irrigation in Kenya include rivers, streams, lakes and ground water. Surface water sources account for 86% and groundwater 14%, however this latter figure is likely to rise as a result of the recently identified water aquifers in Northern Kenya especially Turkana. The country has 26 medium to large dams and about 4,100 small dams and water pans with a total water storage capacity of 184 million $m^{3,}$ equivalent to 5.3 m^3 per capita per year. This is among the lowest water storage rates in the world

and is equivalent to only 3 months' use. Thus, if the country does not receive rains for only three months, it experiences famine, lacks water for irrigation and faces power rationing.

89. A number of irrigation schemes have been experiencing declining water availability as a result of climate change, erratic rains, destruction of water catchments areas, deforestation and inadequate water harvesting and storage.

90. Water storage in large dams is mainly used for hydro-power generation and urban water supplies. Generally, irrigation has not been considered in the development of the existing large water reservoirs, partly due to inadequate integration of multipurpose use of water storage infrastructure, low levels of financing and prioritization of water storage for irrigation.

91. Of the available ground water resources, the total safe abstraction rate is about 193 million m^3 out of which only about 1% of available total is used for irrigation, mostly by private firms. The ASALs which are in most need of irrigation are poorly served by streams, rivers and lakes. Further, rainwater harvesting, even in the driest parts of the country remains an untapped water source which could be used for irrigation. Therefore, the scarcity of irrigation water in Kenya has more to do with failure to develop and harness available resources than absolute lack of water.

3.2.2 Irrigation Infrastructure Development

92. The total area developed for irrigated agriculture is estimated at 180,503 ha in 2015 against a potential of 1,341,900 ha. This accounts for over 13.5% of the total irrigation potential.

93. The governance and management structures of public schemes are often weak resulting in poorly maintained and inefficient irrigation systems. This has led to underutilization of existing production potential. The public schemes depend on exchequer subsidies for operations and maintenance (O&M) as there are inadequate sustainable self-financing mechanisms.

94. Privately-owned schemes generally employ modern and efficient irrigation technologies and have diversified enterprises with high levels of value addition integration with specific market-focus. The development of this category of schemes is often constrained by land tenure rights which include incomplete adjudication, registration and leasing complications. In addition, access to water rights due to high fees chargeable has constrained investment in irrigation development.

95. The community based smallholder schemes experience challenges of poor farmer mobilization and participation; weak IWUAs; poor governance; inadequate resources for system development and maintenance; lack of or weak legal and regulatory framework; limited support from Government and other service providers; and insecurity of land tenure especially in the ASALs.

96. The pump-fed public and smallholder schemes are more likely to be unsustainable due to low profit margins because of the high cost of electricity and diesel/petrol.

3.2.3 Expansion of Irrigation and Infrastructure Development

97. Irrigation development includes opening up new irrigation schemes, expansion and rehabilitation of existing irrigation schemes. It also entails improving the productivity of irrigated enterprises, diversification and value addition, all of which require infrastructure development. At current investment rates, the country has been achieving a growth rate of less than 5%, equivalent to about 5,000 ha per year of additional irrigated area. This is as a result of low financing levels in the sector. This growth rate is eight times less than the projected growth of 40,000 ha per year, needed to meet the targets set in Vision 2030. The development of irrigation is

costly and the Government will continue playing a key role in the development of large schemes and provision of major infrastructure. The private sector including individual farmers and non-government entities have always complemented government efforts in irrigation development. Irrigation infrastructure for smallholder farmers becomes unnecessarily costly due to complex irrigation system networks resulting from the need to provide water to small portions of scattered individual farms.

3.2.4 Agricultural Water Harvesting and Storage

98. Irrigation schemes have suffered from recurrent water shortages due to inadequate investments in water harvesting and storage. Though there are opportunities to expand irrigated areas, the opportunities are constrained by inadequate water and high cost of infrastructure. Co-ordination of water harvesting and storage within and across ministries and other institutions remains a critical gap.

99. As cities and urban areas grow, they concentrate large volumes of storm water which drain to various water ways unused. Furthermore, cities and other urban centers compete with agriculture for water. These same cities and urban areas concentrate large volumes of storm water during the rains which drains to various water ways unused. Furthermore, they produce large quantities of waste water which also goes to waste as it is not re cycled for re-use.

3.2.5 Land Tenure

100. Land tenure and land use have major implications for irrigation development. Major challenges constraining the irrigation sector development are insecurity of tenure, land use conflicts and uneconomical land fragmentation. In some areas there are individually owned large parcels of land with potential for irrigation but which are unused. In addition, lack of mechanisms to secure way leave to water sources, storage and conveyance systems have constrained development.

3.2.6 Operations and Maintenance

101. Operations, management and maintenance of irrigation infrastructure and systems require expertise and finances. This role has been undertaken by the Government through the National Irrigation Board (NIB) especially in the public schemes. However, since the late 1990s, the Irrigation Management Transfer (IMT) has been implemented in public schemes to facilitate the gradual transfer of O&M responsibilities. In the smallholder irrigation schemes, O&M has been the responsibility of the farmers through their respective IWUAs.

3.2.7 Agricultural Enterprises in Irrigated Agriculture

102. The ASDS envisions strategic agricultural development to be *"Innovative, commercially-oriented and modern agriculture sector".* ASDS has identified among others, the improvement of water management and irrigation development for crops, livestock, fisheries and urban and peri-urban agriculture.

3.2.8 Value Addition, Marketing and Commercialization

103. Kenya is uniquely placed to take advantage of expanding the domestic, regional and international markets. Due to diverse agro-ecological zones in the country, a wide range of temperate, tropical, and sub-tropical products can be produced. But 40% of agricultural production in Kenya is lost through poor post-harvest handling and storage. Value addition reduces these losses and has the potential of providing producers with income generating opportunities.

3.2.9 Climate Change

104. Due to greenhouse gas effects and other environmental phenomena, there has been a rise in temperatures and erratic rainfall regime, increased frequency and severity of drought and floods causing scarcity of water resources for irrigation and damage to infrastructure respectively.

3.2.10 Environmental Issues

105. Irrigation development has environmental implications on the soil, flora, fauna and human ecosystems which can have long-term impacts. Safeguard mechanisms must therefore be instituted in new and existing schemes.

106. A major challenge for Kenya is the continued dwindling of the forest cover which currently stands at 2% of total land. This has been due to unplanned excision of forest land for settlements and excessive harvesting of trees without replanting. This has resulted in loss of catchment protection, increased soil erosion, flooding, and generally, hydrological imbalances. Whereas irrigation usually targets areas devoid of forest cover, the impact of the sector has been, and should be generally positive towards increasing agro-forestry and especially fruit trees. This is especially crucial for the sustainability of hydrological balance in water catchment areas, from which irrigation water is obtained.

3.2.11 Public Health and Sanitation

107. The issues of disease and pest control in agriculture, including irrigation, are covered by several laws namely; Animal Diseases Act Chapter 364 of Laws of Kenya, Rabies Act Cap 365, Cattle Cleansing Act Cap 358 and Meat Control Act Cap 356 and Fertilizer and Animal Foodstuff's Act, Cap 345, Fisheries Act Cap 378 among others. All these laws have implications on irrigation, particularly the Public Health Act, Cap 242 and the Malaria Prevention Act, Cap 246, since irrigated agriculture has a tendency to increase water-borne diseases

such as malaria, bilharzia and typhoid. The control of pollution of water bodies and the prevention of water-related hazards are among the key functions of the Ministry of Environment and Natural Resources. About 24 million hectares of Kenya's land is dominated by saline and sodic soils of which 40% of the area are in ASALs, requiring special attention if irrigation is developed.

3.2.12 Standards and Quality Control

108. Currently, the irrigation sector does not have harmonized and domesticated design standards, codes of practice and quality parameters leading to use of materials, goods, equipment, machinery of varied characteristics not subjected to any quality compliance controls. Quality control and standards are governed by several organizations. The Kenya Bureau of Standards (KEBS) is the national standards body. Other key institutions that address quality control standards with a major bearing on irrigation include Kenya Plant Health Inspectorate Service (KEPHIS), the Pesticides Control Products Board (PCPB), National Environmental Management Authority (NEMA), Water Resources Authority (WRA) and the Pharmacy and Poisons Board (PPB). As some of the irrigated produce is exported, the observance of quality control has implications for the export markets which have become stringent on issues of traceability, safety, sanitary and phyto-sanitary standards and maximum residue limits (MRL). Compliance on produce quality, technological, social and environmental standards demands that requisite quality controls are observed.

3.3 Specific Policy Objectives

109. The Policy objective is to have sustainable irrigation development and management through exploitation of the potential irrigable areas, rehabilitation of existing ones, improved productivity of irrigated lands, enterprise diversification and attainment of high quality standards in production and outputs.

3.3.1 Policy Statements

3.3.1.1 Water for Irrigation Development

110. The National Government and county governments, working with stakeholders, will mobilize and provide resources and support for the improvement, rehabilitation and development of sustainable water harvesting and storage facilities.

111. The National Government and county governments will provide incentives for irrigation schemes that have invested in irrigation water storage infrastructure.

112. The National Government and county governments in collaboration with stakeholders will promote development of multipurpose water storage facilities and also facilitate intra - and inter-basin irrigation water transfers to deficit areas.

113. The county governments in collaboration with the National Government and other stakeholders will increase investments in storm water harvesting and storage in cities and urban areas and in recycling of waste water for urban and peri-urban irrigated agriculture in accordance with the existing legal and regulatory framework.

114. Irrigation development will be informed by stakeholder participation and multiple-use water systems and will adopt integrated water resources management (IWRM) to reduce water conflicts and concurrently comply with the relevant laws and regulatory frameworks.

115. The National Government and county governments will promote efficient water management methods and technology.

116. Irrigation Water Users' Associations and farmer groups will be empowered to enforce regulations that promote AWM and efficient utilization of water for irrigation.

3.3.1.2 Irrigation Infrastructure Development

117. The National Government and county governments, working with stakeholders, will mobilize and provide resources and support development and rehabilitation of sustainable irrigation infrastructure.

118. An agricultural water management (AWM) strategy and master plan will be developed for sustainable growth of the irrigation sector.

119. The National Government and county governments will continue to support public investments in the development of irrigation. Both levels of government shall come up with mechanisms to attract private sector investments in irrigation. This will include incentives for private sector investments under agreed terms in irrigation infrastructure development, water harvesting, flood control and storage facilities.

120. The National Government and county governments will provide subsidies and tax incentives on irrigation equipment and machinery among others. In addition, in order to develop long-term resilience against drought and famines, the government will give special attention to the development of water harvesting and storage for irrigation especially in ASALs. Further, both National Government and county governments will support pro-poor approaches including mainstreaming gender and vulnerable groups through targeted smart incentives, subsidies and effective credit support for irrigation development.

121. The National Government and county governments will develop mechanisms for stakeholder contribution and ownership for investment in irrigation development and management.

122. The National Government will classify the scope and scale of irrigation development in line with the criteria outlined in Table 2 below.

Table 2: Scheme Implementation Delineation

Scale	Scheme Category by size	Institutions responsible for implementation
Large	Public, transboundary and smallholder schemes (both trans- and within county schemes) of over 3,000 acres	NIA and other state agencies in consultation with county governments
Medium	Public, transboundary and smallholder schemes (both trans- and within county schemes) from 100 – 3,000 acres;	NIA and other state agencies in consultation with county governments
Small	Public and smallholder up to 100 acres	County government (CIDU) and other state agencies in consultation with National Government
	Transboundary and inter-county smallholder schemes	NIA and other state agencies in consultation with county governments

123. The National Government in collaboration with county governments and stakeholders will put in place a national inventory and resource assessment for the irrigation sector and develop databases for planning.

124. Irrigation development will adopt IWRM and concurrently comply with the environmental management plans for maximum benefits.

125. The National Government and county governments will promote the use of sustainable renewable energy including solar and wind in irrigation schemes.

3.3.1.3 Operations and maintenance

126. For the public irrigation schemes there shall be gradual irrigation management transfer to IWUAs and/or contract entities in consultation with county governments to be implemented within agreed timeframes and other terms and conditions.

127. The National Government will support county governments in the development and rehabilitation of smallholder irrigation schemes with sustainable incentives and enabling environment, particularly the initial investment in irrigation infrastructure and institutionalization of IWUAs and building their capacity.

128. Private and commercial firms will be encouraged to offer operation and management (O&M) services and upgrading of the systems on agreed terms and modalities with NIA and IWUAs.

129. The National Government will formulate the irrigation standards, codes of practice and quality assurance for the irrigation sector.

130. The participation of farmers will be promoted at all stages of irrigation development including O&M. A legal framework for scheme management agents and IWUA operations will be developed and modalities for the leasing, management or full transfer of the assets to IWUAs.

131. IWUAs will institute by-laws, register with the relevant authorities and shall observe the principles of good governance, accountability and transparency in managing the irrigation schemes.

132. The National Government and county governments, in collaboration with development partners and key stakeholders, will encourage and promote gender equity and support gender mainstreaming in irrigation development, operations and management.

3.3.1.4 Land Tenure

133. The National Government in consultation with county governments will review land tenure and use systems to provide adequate security and access to land to encourage investment in land improvement, development and productivity, minimize conflicts and encourage lease arrangements for private and corporate investment for irrigation development.

134. The National Government in collaboration with county governments will ensure that irrigation concerns are entrenched within the National Land Use Policy and National Spatial Plans in line with the mandate of the National Land Commission.

135. The National Government in consultation with county governments will enact appropriate legal instruments to access land and emerging water sources including way-leaves for various cadres of irrigation development under different land tenure systems. This process should be undertaken in a manner that minimizes the adverse effects of land acquisition, including changes in lifestyles in ASALs for irrigation development and livelihood improvement of communities.

3.3.1.5 Agricultural Enterprises

136. Irrigation will be used to increase the production, productivity and diversification of agricultural enterprises including crop, livestock and fisheries production in order to up-scale food security initiatives.

137. The National Government and county governments will support the development of the irrigation sector by negotiating for better and more competitive markets abroad, and assist smallholder farmers attain the requisite standards and facilities to access export markets.

138. Irrigation development will be driven by the strategic sector vision: ***"to be innovative, commercially-oriented and modern sector"***, and will be responsive and adaptive to new technologies and innovations.

139. The National Government and county governments will promote and support urban and peri-urban irrigated agriculture in conformity with existing laws and regulatory frameworks.

3.3.1.6 Climate Change

140. The National Government and county governments, in collaboration with various stakeholders, will ensure integration of climate change adaptation and mitigation measures including environmental protection, soil and water conservation, agro-forestry, renewable energy, water harvesting and storage.

141. The National Government and county governments will promote the use of integrated pest management to address the issue of emerging pests and diseases as important coping and adaptation strategies against climate change and its impacts.

142. The National Government and county governments will encourage efforts by development agencies and private sector organizations to support Government initiatives for climate change adaptation and mitigation.

3.3.1.7 Environment and Health

143. The National Government and county governments will promote the use of treated waste and recycled water for irrigation development in the context of urban and peri urban agriculture in line with existing laws and regulatory frameworks.

144. Development of irrigation shall comply with environmental protection requirements to ensure ecosystem integrity, agro biodiversity and environmental conservation.

145. Irrigation developments will include measures to reduce the incidence of water-borne and water-related diseases in order to protect and enhance public health.

146. Irrigation programmes shall observe prevention and control of water pollution and promote safe use of agrochemicals and other harmful substances. Emphasis will be given to use of organic fertilizers.

147. The National Government and county governments will promote and encourage adherence to the set guidelines and standards in all irrigation developments and management.

148. The National Government in collaboration with county governments shall promote conservation of catchment areas and water sources.

149. The National Government shall develop, harmonize and domesticate relevant designs standards, code of practice and quality parameters in consultation with relevant stakeholders.

3.3.1.8 Value addition and Marketing

150. The National Government and county governments will support the improvement of linkages for irrigated agriculture from production to value addition and to markets by ensuring quality control and enabling farmers to access information on markets and technologies.

151. The National Government and county governments will provide smart incentives to encourage private sector investments in infrastructure and equipment for agro-processing and value adding of irrigated produce, the supply of inputs, services, technology and the development of trading centers by developing services such as roads, power and water supply and security.

152. The National Government and county governments will support the commercialization of irrigated agriculture through introduction of light industries in rural areas, in collaboration with various stakeholders. Regulatory structures will be developed to protect farmers from exploitation and to improve the business orientation of irrigated agriculture.

153. The National Government and county governments will encourage private and commercial actors to invest in irrigation. Large-scale commercial farms will be encouraged to take up a leading role in value addition, processing and marketing of produce to take advantage of their economies of scale in promoting agricultural industrialization.

Chapter 4: Capacity Building

4.1 Rationale

154. The Constitution (Article 190 (1)) provides that Parliament shall by legislation ensure that county governments have adequate support to enable them perform their functions. This may include technical support in terms of human resource needs to be provided according to the differential needs of the counties, such as agricultural and irrigation staff. Efforts will be made to maintain a pool of qualified technical staff at the national and county government levels to provide technical, advisory, research and training services.

155. There is no targeted training and research for the irrigation sector development and management. The core funding for human resource capacity development is also limited and has been left to universities and other institutions whose mandates and areas of focus are at times different. This has led to the sector suffering from limited adoption of research, innovation, science and technology resulting in low productivity and poor performance.

156. There has been a tendency to view capacity-building from the narrow perspective of training that merely concerns impartation of knowledge. This alone is inadequate for effective and sustainable irrigation and drainage development; hence the need to pay attention to building of skills and attitude change for sustainable development of the sector. Long-term investment in capacity building of the sector actors and the development of relevant institutions will translate to effective and efficient implementation of the sector mandate to achieve the planned objectives. There is therefore need to establish a research, innovation and training institute for human resource development targeting all cadres of stakeholders in irrigation development.

157. Capacity building for the stakeholders within the sector is urgently needed to cater for existing knowledge and skills gap. The use of research, science and technology should be promoted through institutional arrangements that are dedicated to irrigation.

4.2 Situation Analysis

4.2.1 Promoting Science and Technology in Irrigation

158. The Kenya Vision 2030 recognizes the role of science, technology and innovation in a modern economy. It acknowledges that new knowledge plays a central role in wealth creation, social welfare and international competitiveness. Although universities, public institutions, NGOs and private sector have developed technologies on irrigation, the adoption of the technologies by farmers has been limited due to lack of proper linkages. The large scale commercial irrigated farms utilize modern technologies and highly scientific methods of production. However, public and smallholder irrigation suffers weak linkages with science and technology, extension and education. Although Kenya has a well-developed agricultural research infrastructure, there are inadequate research extension packages and linkages.

4.2.2 Research and Innovation

159. Research and innovation in irrigation are essential if the country is to achieve its long-term development objectives. However, the sector is inadequately served by research, lacks dedicated institutions with specific mandate for research in irrigation. The existing national research institutes such as Kenya Agricultural Livestock Research Organization (KALRO), Kenya Forestry Research Institute (KEFRI), Kenya Medical Research Institute (KEMRI) and Kenya Industrial Research Development Institute (KIRDI) are parastatal organizations established under the Science and Technology (Amendment) Act of 1979 or specific legislations and have their specific mandates

which do not cover irrigation research effectively. In practice only limited research on irrigation is being undertaken by KALRO, Kenya Water Institute (KEWI) and the NIA. The national universities and international research centres also conduct research in irrigation, but their focus is guided mostly by their own institutional agendas. Thus, there is no institution in Kenya with adequate capacity and dedicated mandate to conduct research in irrigation. There is also no functional consultative mechanism between National Government and county government levels for coordinating the identification of the research agenda and priorities.

4.2.3 Technical Training

160. Kenya lacks a dedicated technical training institution for irrigation. Training is indirectly offered through units within the curricula of other degree programmes of various universities. Formerly, the Ministry of Agriculture used to offer in-house practical training and certificate level training at Eldoret College which is now a University. Farmer training institutions belong to respective counties after the devolution of the extension function and rarely focus on irrigation. There is thus a shortage of training institutions for building the capacity of the irrigation sector and where institutional memory can be built.

4.2.4 Capacity Building for Farmers

161. Currently, farmer training is provided through extension services by the agriculture staff at the counties, non-state entities and in some cases by private sector in out-grower schemes. The National Government through the Department of Irrigation and the NIA offer training to irrigators on water management as part of their mandate. Even with all these initiatives, it has not been possible to build effective capacity amongst farmers in irrigation farming.

4.2.5 Information and Knowledge Management Systems

162. Information and knowledge management is a key asset in the modern world for planning. The creation of a proactive knowledge centre requires hardware, software, personnel and the resources to gather the knowledge, process and disseminate it to intended users. Geographic information systems (GIS) and remote sensing facilities are necessary tools for capturing and compilation of information related to earth resources including irrigation. Efforts have been made in the past to develop GIS databases for irrigation. However, the process was never completed. Thus, information on irrigators and all the relevant information pertaining to irrigation is not consolidated and updated in a central inventory.

4.3 Specific Policy Objectives

163. This Policy aims at developing capacity for research, knowledge and skills improvement and information management using modern and sustainable technologies to improve the productivity and performance of the irrigation sector.

4.3.1 Policy Statements

4.3.1.1 Science and Technology

164. The National Government and county governments will support investments and promotion of science and technology in irrigated agriculture to positively respond to national and international demands for improved quantity and quality of products from irrigation.

165. Capacity of farmers will be improved to promote adoption of modern, scientific and innovative practices and appropriate technologies.

166. The National Government and county governments will provide incentives to encourage various stakeholders to invest in science and technology and establish stronger linkages with farmers, for the entire value chain of irrigated agriculture.

167. The National Government will pursue business models that embrace innovation and modern technology transfer including adoption of ICT in their operations.

4.3.1.2 Research and Innovation

168. The National Government in collaboration with county governments will promote coordinated and regulated research and technology development for irrigation, to gain from new and emerging knowledge.

169. The National Government and county governments will promote the participation of various stakeholders in research and innovation in order to take advantage of opportunities in access to knowledge and linkages to drive the irrigation sector growth.

170. The National Government and county governments will undertake measures geared towards strengthening research, training and innovation in irrigation.

171. The National Government and county governments will support research in the utilization of waste and recycled water from settlement centers (urban) for development of the irrigation sector.

172. The National Government and county governments will support research on affordable and sustainable methods for desalination of saline water for use in irrigation.

4.3.1.3 Supporting Institutions for Research and Capacity Building

173. The National Government will use administrative and legislative mechanisms to ensure an efficient research and training in the irrigation sector.

174. The National Government and county governments will support relevant priority research areas to improve sustainability for the irrigation sector.

4.3.1.4 Technical Training

175. The National Government in collaboration with county governments will conduct capacity building for county technical personnel and other stakeholders in the irrigation sector.

176. The National Government in consultation with county governments will support capacity building programmes and in this regard will establish, source and or manage scholarships.

177. The National Government and county governments and other stakeholders will support practical training on irrigation development through introduction of targeted training programmes for students, farmers and leaders of farmer groups. Others are IWUAs, cooperatives as well as extension staff.

4.3.1.5 Knowledge Management

178. The National Government in collaboration with county governments will support information and knowledge management for irrigation, through the establishment of a knowledge centre for the sector. The Irrigation and Drainage Management Information System (IDMIS) will be developed and hosted within the Ministry responsible for irrigation.

179. The National Government in collaboration with county governments will facilitate a national-level resource assessment for the sector, using modern tools and methods, and develop databases for planning and design. An inventory will be developed of all areas identified with irrigation potential and those under irrigation.

180. The National Government and county governments will develop mechanisms and modalities for an effective innovative system to strengthen stakeholder networking as part of knowledge and information sharing.

4.3.1.6 Farmers and staff Capacity Strengthening

181. The National Government and county governments and their partners will support development, management and implementation of appropriate training programs for technical personnel, farmers and IWUAs. The programmes will include aspects of irrigation scheme development, governance, management, and financing, among others.

182. Support to farmers will include irrigation water management and training on the use of water in agricultural production and agribusiness along the whole value chain.

Chapter 5: Resource Mobilization and Financing

5.1 Rationale

Resource mobilization and financing remain a major challenge in the development of the irrigation sector. While the liberalization of the financial sector, removal of price controls and marketing restrictions opened doors for farmers to obtain credit and access niche markets, it also resulted in unpredictable costs of inputs, machinery, and labour, thus reducing profitability to farmers. The role envisaged by the Constitution for the National Government as a facilitator of development, encourages shared responsibility between the National Government, county governments and amongst the key sector investment players. Since irrigation is a strategic sector, it is important that the National Government shoulder funding of the bulk of irrigation development while the county governments will be responsible for the development of irrigation as described in Table 3. This raises the need for the National Government and county governments to formulate and implement strategies that encourage increased investment by development partners, private sector and communities.

5.2 Situation Analysis

5.2.1 Public Sector Financing

183. Public sector investment in irrigation development in Kenya is low. Of the total current funding to irrigation, Government contribution is about 70%. For example, the budgetary provision to the irrigation sector in 2016/2017 is Ksh.20.1 billion, which is below the sector requirements estimated at KSh.40 billion annually to meet the targets of Kenya Vision 2030. Funding to support the sector is therefore inadequate and dispersed across several organizations, making

it difficult to coordinate planning, development, operations and management. The inadequate funding has resulted in slow growth of the sector.

5.2.2 Financial and Credit Services

184. Although the country has a relatively well developed banking system, financing and access to credit for irrigation development remains a challenge. The risks associated with the farming business, complicated land laws and water rights makes financing of the irrigation sector a risky business. Banks charge high interest rates and the rural areas have few financial institutions making administration of loans difficult and expensive, especially for smallholders. Some micro credit and savings institutions, including cooperative societies, support financing of the sector but the terms and conditions for most of them have unfavorable restrictions, such as group financing. There is need therefore to support the financial sector to adopt innovative ways to provide new and better services to the irrigation sector.

5.2.3 Development Assistance, Grants and Loans

185. Development partners are key sources of investment and financing for irrigation. However, their assistance is difficult to predict and sustain. This raises the need to structure project planning and implementation to enhance local ownership, participation and up-scaling even as finance is sought from external sources.

5.2.4 Private Sector Financing

186. The private sector has potential to finance irrigation development, operations and maintenance. The sector has successfully financed development of irrigated export horticulture. However, poor physical infrastructure, inadequate water, bureaucracy and socio-economic issues are challenges that need to be addressed to enable effective resource mobilisation by the private sector.

5.2.5 Farmer Financing

187. In the past, farmers have relied mainly on government financing for major irrigation infrastructure development. They have however been contributing in kind (unskilled labour and local materials) and in O&M. There is potential for farmers to also contribute financially towards irrigation infrastructure development from their accrued benefits.

5.2.6 Emerging Opportunities for Financing

188. Kenya is signatory to regional and international agreements, which facilitate trade and development. She is also a signatory to international conventions, protocols and other instruments that call on the member states to take measures to increase budgetary and financial allocations for increasing food production and eliminating poverty. This includes the 2013 Malabo Declaration that calls on countries to increase their budgetary allocations to agriculture to 10% and irrigation to at least 5% of their national budgets.

5.3 Specific Policy Objectives

189. There is need for increased Government budgetary allocation, financing and investments by private sector, development partners, farmers and other stakeholders to facilitate sustainable development of the sector.

5.3.1 Policy Statements

5.3.1.1 Public Funding

190. The National Government shall increase funding for irrigation sector from 1% to 2% per year of the annual national budget.

191. The National Government and county governments will continue to play a leading role in funding irrigation development, and will seek to galvanize support of development partners and other stakeholders in this regard.

192. The National Government and county governments will channel external assistance funds from development partners and other stakeholders to identified priorities in irrigation development.

193. Private financing (investments, loans, grants, donations) for the irrigation sector and collaboration and partnerships will be guided by agreements between the various parties concerned.

194. The National Government will encourage the development partners and other stakeholders to channel their funding for the irrigation sector through the Fund.

195. The National Government in consultation with county governments and other stakeholders will develop mechanisms for the disbursement of monies from the Fund including a provision for specific programmes under bilateral and multilateral agreements with development partners and private sector.

196. Financing for irrigation through development assistance by stakeholders will be encouraged and frameworks for implementation developed.

5.3.1.2 Beneficiary participation in financing of Irrigation

197. Mechanisms for beneficiary financing of irrigation infrastructure development and O&M will be developed. Legal frameworks will be developed to enhance the contribution of beneficiaries to irrigation financing (cost sharing and cost recovery mechanisms) and to ensure that infrastructure and requisite irrigation support facilities are in place. Irrigation schemes shall develop annual work plans and budgets based on actual needs, water acquisition, fees and other charges for O&M.

198. Farmer organizations and water user groups engaged in resource mobilization for irrigation will be legally required to register with the relevant Government institutions and legal instruments developed and applied to enforce accountability and transparency.

199. Farmers will be empowered to be part of the tendering and contracting processes. This will build transparency, accountability and harmony among the various actors in the schemes.

5.3.1.3 Emerging Sources of Financing

200. Stakeholders will be encouraged to take advantage of new and emerging opportunities for resource mobilization at global, regional, national and local levels.

201. Legal and regulatory frameworks will be developed and revised regularly to accommodate the adoption and adaptation of emerging financing issues and opportunities.

5.3.1.4 Smart Incentives for Irrigation Development

202. The National Government and county governments will provide and support targeted "smart" incentives such as insurance, creating a supportive investment climate and providing smart subsidies for special groups such as pastoralists, persons with disabilities, youth and women, and for accelerated sustainable irrigation development.

Chapter 6: Legal and Institutional Framework

6.1 Rationale

203. This Policy aligns the irrigation sector to the Constitution of Kenya 2010 as well as the Kenya Vision 2030, Sustainable Development Goals and the international laws, treaties, agreements and other instruments ratified in Kenya.

204. The Constitution provides for the review of existing legislation to introduce any "alterations, adaptations, qualifications and exceptions" to bring such laws into conformity with the Constitution.

205. In Kenya, irrigation has for nearly 50 years been governed by the Irrigation Act (cap 347) which is now largely archaic and is narrowly focused on the establishment and operations of the NIB and the management of national irrigation schemes. It does not address many issues, including those related to privately owned, developed or managed irrigation schemes, smallholder farmers and the private sector, research and training, the respective roles of the National Government and county governments.

206. There is need to review laws with a bearing on irrigation in line with the Constitution and emerging issues in the general rules of international laws and the provisions of any treaty or other instrument ratified by Kenya.

207. The National Government in consultation with county governments and all the relevant stakeholders shall review all the legislation currently in force and develop new legislation to adequately address and create an enabling environment for irrigation development and management in the country.

6.2 Situation Analysis

6.2.1 Role of National Government in Irrigation

208. The Constitution of Kenya 2010 does not directly or explicitly refer to irrigation as such. Therefore, the irrigation function is residual in nature and its vesting at the national level is under Article 186(3) of the Constitution.

209. The overall mandate for irrigation development in the country is currently vested in the Ministry of Water and Irrigation (MWI), Department of Irrigation (DI). The MWI/DI is generally responsible for the overall coordination of the irrigation function. Moreover, the Ministry of Agriculture, Livestock and Fisheries (MoALF) through the relevant department has been responsible for smallholder irrigation development in the country. There are ongoing reforms to align the irrigation and related functions to conform to the Constitution. The reforms should address the role of the two levels of Government in irrigation development and management. The key roles of the National Government include policy formulation, regulation and legislative reform proposals, standards and guidelines, capacity building including training, research and innovation, monitoring and evaluation, sector coordination, and development and management of national irrigation schemes.

210. Other Government Ministries that currently have direct or indirect relationship and impact on irrigation include Ministries responsible for Environment and Natural Resources, Energy, the National Treasury; Transport and Infrastructure, Devolution and Planning; Lands, Housing and Urban Development; Industrialization and Enterprise Development, Health among others. There is overlap of functions, inadequate coordination and different approaches in irrigation development and management. Whereas the mandate of irrigation development is vested within MWI other Ministries and agencies undertake irrigation development and management without a structured engagement.

211. There are many statutory Boards, parastatals and semi-autonomous agencies involved in irrigation development and management. They include Regional Development Authorities (RDAs) and institutions responsible for infrastructure development, environmental conservation and management, public health, research and training institutions including universities. This has led to poor or weak coordination and duplication of functions.

212. The NIB as established under the Irrigation Act Cap 347 of 1966 is mandated to develop and manage public irrigation schemes. The schemes are Mwea, Hola, Perkerra, Bura, West Kano, Ahero and Bunyala. Over time the NIB activities have expanded to include development of smallholder irrigation schemes. There is therefore need to review the existing law to provide for an all-inclusive and comprehensive statute to guide the development of all types and scale of irrigation schemes.

6.2.2 Role of County Government in Irrigation

213. The role of county governments emanates from the Constitution of Kenya 2010, the 4th Schedule Part 2 which includes crop and animal husbandry, natural resources and environment (soil and water conservation). Nevertheless, the Constitution does not explicitly provide for the irrigation function in its elaboration of county functions and roles.

214. While at the national level, the irrigation function has been clearly placed under the MWI, in different counties it has been placed in varying ministries or is missing entirely as a department. However, the counties are free to identify the key ministries and institutions at the county level to take the lead in irrigation development.

6.2.3 Institutions Financing Irrigation Sector

215. Currently, the sector is mainly financed by the government, development partners, and other stakeholders. The funding level is inadequate and thinly spread to meet the increasing demand for development. The budgeting, implementation and monitoring are uncoordinated resulting in poor sector growth. This therefore calls for institutional reforms to harmonize and improve financial mobilization and fund management in the sector.

6.2.4 Institutions for Regulation of Irrigation

216. The institutions that regulate the irrigation sector include the MWI/DI, Water Resources Authority (WRA) and the National Environmental Management Authority (NEMA). Whereas these institutions have their specific roles, there are inadequate coordination mechanisms to support irrigation development in the country. Therefore, there is need for development of a mechanism to regulate and attain better coordination of irrigation as it continues to expand.

217. Whereas the allocation of water is the responsibility of WRMA; irrigation as a major water user often faces challenges during drought. There are inadequate incentives to promote compliance with water allocation requirements including storage of flood water and related payments of user fees.

218. Currently the existing mechanisms and structures to identify the number of irrigation schemes within the country is inadequate. As a result, a comprehensive database on the status of the irrigation sector is not available.

6.2.5 Research in Irrigation Development

219. Research and innovation in the irrigation sector are essential for the country to achieve its long-term development targets. However, due to lack of a dedicated institution with specific mandate for

irrigation research, the sector has been in the past inadequately served. Research in irrigation development has in the past been mainly undertaken by the now defunct Kenya Agriculture Research Institute (KARI), now renamed KALRO. The national universities and international research centers also conduct research in irrigation, but their focus is guided mostly by their own institutional agenda. This provides justification and opportunity for the establishment of a dedicated irrigation and drainage research institution to provide focused research for the sector.

6.2.6 Farmers' Organizations

220. Farmers sharing a common irrigation system often establish formal and informal organizations such as Irrigation Water Users Associations (IWUAs), cooperatives or self-help groups. These organizations usually operate at scheme level and play different roles such as development of irrigation infrastructure and operation and maintenance, irrigation water management, marketing of produce, acquisition of inputs and credit.

221. The major challenge with these farmer organizations is their low capacity to undertake their respective mandates. Furthermore, the legal status of most of these organizations is problematic as many are not legal entities. Their roles and activities therefore need streamlining for the realization of their full potential in irrigation development and management.

6.2.7 Regional, International Organizations and Development Partners

222. Irrigation development draws support from international and regional agencies. However, the collaboration and coordination mechanisms with the development partners to facilitate rapid growth of the sector are inadequate.

6.2.8 Public-Private Partnership in Irrigation Development

223. The economic liberalization and market-driven policies in Kenya have provided for increased levels of private sector investment in irrigation. However, the enabling environment for enhanced public-private partnership for effective participation has not been mainstreamed. One such initiative to introduce this aspect is the upcoming Galana-Kulalu food security project.

6.2.9 Legal Framework for Irrigation Sector

224. The current Irrigation Act Cap 347 established the NIB with a mandate to identify, design, develop, administer and manage public irrigation schemes. This Act does not take into account community-based smallholder and private irrigation schemes. Moreover, there are other public irrigation schemes managed by RDAs and other state agencies which are not covered under the Act. Lack of a comprehensive legal framework has created challenges in the administration and regulation of the irrigation sector, hence the need for review of the Act.

6.3 Specific Policy Objectives

225. The policy objectives are:

a. To establish an appropriate institutional, legal, regulatory and implementation framework for the irrigation sector for effective promotion, coordination, management, regulation and development

b. To create an enabling environment for the participation of the stakeholders in the irrigation sector growth

6.3.1 Policy Statements

226. To achieve the policy objectives:

a. There will be a State Department responsible for irrigation under the Ministry responsible for irrigation to advice on policy, coordination, regulation, capacity development and research, resource mobilization, develop master plans, establish information data bases, and ensure participatory monitoring and evaluation

b. The National Irrigation Authority (NIA) shall be established to serve the need of the irrigation sector. This institution will facilitate an integrated and multi-sectoral approach to sustainable irrigation development and management

c. At the county level, an irrigation unit or entity referred to as County Irrigation Development Unit is proposed to be responsible for county irrigation development functions

d. Legislation covering the new structure, functions and duties of various institutions will be enacted

e. Mechanisms to promote public-private partnerships approach towards irrigation sector growth will be enhanced

f. Sector-wide approach to planning (SWAP) and development will be enhanced

g. The MWI will maintain a databank as a tool to enhance planning and efficiency in resource utilization in collaboration with county governments

h. Farmer organizations and irrigation water user groups engaged in resource mobilization for irrigation will be legally required to register with the relevant Government institutions and legal instruments developed and applied to enforce accountability and transparency

6.3.1.1 Mandate of the Ministry Responsible for Irrigation

227. The Ministry responsible for irrigation through the Directorate for Irrigation shall undertake the following responsibilities:

a. Formulate and review national irrigation policy and strategy in collaboration with county governments and other relevant stakeholders

b. Provide oversight and coordination of irrigation sector entities and agencies

c. Collaborate and liaise with other agencies involved in irrigation development at local, regional and international levels

d. Formulate sector regulations, standards and guidelines in collaboration with county governments and other relevant stakeholders

e. Establish a regulatory unit within the Directorate responsible for irrigation for efficient development of the sector

f. Promote capacity building, coordinate technology and research development

g. Formulate national projects and programmes in collaboration with county governments and other stakeholders

h. Undertake resource mobilization and financing of the sector

i. In consultation with county governments, develop a national irrigation master plan, investment plan and respective Strategic plans

j. Establish a national irrigation and drainage management information system (IDMIS)

k. Undertake monitoring and evaluation of irrigation sector performance

l. Undertake the regulatory function for the irrigation sector including conflict resolution mechanisms to deal with irrigation disputes

m. Support in building the capacity of IWUAs in consultation and collaboration with the counties

6.3.1.2 Mandate of the County Irrigation Development Unit

228. County government may establish a County Irrigation Development Unit (CIDU). The unit shall be responsible for the following functions:

a. Ensuring uniformity and national standards in the irrigation sector through its legislative and administrative action to implement and act in accordance with the national policy guidelines issued by the Cabinet Secretary and or approved by Parliament

b. Formulate and implement county irrigation strategy in collaboration with relevant stakeholders, in line with national policies and strategies

c. Develop and maintain an irrigation database and integrate systematic monitoring and evaluation

d. Identify community-based smallholder irrigation schemes for implementation in line with national guidelines

e. Mainstream irrigation related statutory obligations such as those that relate to the environment, water and health

f. Provide capacity building for farmers and support establishment of viable farmer organizations, and in particular irrigation water users associations to develop and manage irrigation schemes including actively participating in conflicts resolution within irrigation schemes

g. Set up measures to implement adaptation and mitigation to climate change, and enhance sustainable environmental management

6.3.1.3 Mandate of the National Irrigation Authority

229. At the national level, an institution known as the National Irrigation Authority **(NIA)** with a mandate to facilitate irrigation development in the whole country will be established. The key responsibilities of **NIA** will be to:

a. Spearhead implementation of the Policy, guidelines and standards in consultation with county governments

b. Plan, design, construct and manage large strategic food security irrigation projects in consultation with county governments

c. Plan, design and construct irrigation projects that cut across water basins and international boundaries

d. Mainstream irrigation related statutory obligations such as environmental, water and health

e. Support capacity building of farmers and establishment of relevant farmer organizations for irrigation development in collaboration with county governments

f. Implement the national irrigation master plan and investment plans

g. Provide technical advisory and other support services in irrigation

h. Advise and oversee the operation and management of strategic irrigation projects

i. Maintain an information system on irrigation development and management in consultation with county governments

j. Integrate irrigation in water harvesting, flood control and storage projects in collaboration with other government institutions

6.3.1.4 Irrigation Research Innovation and Training

230. The Cabinet secretary of the Ministry responsible for irrigation through administrative and legislative measures will ensure the following functions are efficiently carried out and coordinated:

a. Hydraulic research on irrigation and drainage development

b. Hydrological research for application in irrigation development

c. Undertake research on soil, water and crop relationships

d. Carry out modeling and simulation studies, innovations and technology adaptations and dissemination of the research results and innovations

e. Seek research and innovations advances in irrigated agriculture for improved productivity and quality standards

f. Promote international cooperation in irrigation research and information

g. Promote linkages between research, extension and farmers for effective adoption of technological packages

h. Monitor and evaluate irrigation projects with regard to the effectiveness of the technologies and impacts they have on beneficiaries

i. Development of other research manuals, publications and materials for dissemination

j. Promote initiatives to encourage various stakeholders to invest in science and technology and related businesses

k. Promote coordinated and regulated research and technology development for irrigation sector to gain from emerging knowledge

l. Identify research priority areas in collaboration with the county governments and other stakeholders

231. The Cabinet Secretary will ensure that the following training and capacity building functions are carried out:

a. Identify key training priority areas for the sector in collaboration with the county governments and other relevant stakeholders

b. Develop curricula in collaboration with the county government and other relevant stakeholders

c. Undertake scheduled training in collaboration with relevant stakeholders

d. Undertake revision of the training modules in collaboration with relevant stakeholders

e. Set linkages with relevant professional bodies such as Institute of Engineers of Kenya (IEK), Engineers Registration Board (ERB), universities and other training institutions for improved staff development

f. Create a data bank in collaboration with other stakeholders to facilitate planning of appropriate institutional programs

g. Establish mechanisms for information sharing amongst stakeholders

h. Keep pace in technology changes and ensure continuous staff development through regular review of training needs and training

6.3.1.5 Mandate of the Irrigation Water Users' Association and Related Farmer Organizations

232. Irrigation Water Users' Association (IWUAs) and other farmer organizations will be established for community-based public and smallholder schemes for effective participatory development and management. They will be required to register with the relevant government institutions and legal instruments developed and applied

to enforce accountability and transparency. They will have links to the CIDU, NIA, and other stakeholders. Their responsibilities and roles will include the following:

a. Undertake resource mobilization from members for the installation, maintenance and sustainable management of irrigation or drainage facility
b. Provide management of O&M of the irrigation facility for maximum benefits to members
c. Facilitate access and ensure effective management of resources for sustainability of the irrigation schemes
d. Provide equitable access to irrigation water and drainage to the members
e. Facilitate access to inputs, financial services, value addition and marketing
f. Develop and promote group cohesion
g. Participate in the tendering and contracting processes at scheme level to build transparency, accountability and harmony among the various actors in the schemes
h. Develop and enforce scheme by laws and strategies to ensure participatory and representative decision making and management
i. Establish mechanisms for conflict resolution
j. Develop annual work plans and budgets based on actual needs water acquisition, fees and other charges for O&M
k. Capability building for members

6.4 Structure and Linkages of the Irrigation Sector

233. Effective coordination and management of the irrigation sector requires maximum cooperation, participation and linkages among different stakeholders. This Policy will therefore be implemented

taking into account all the related sector actors such as the MWI/DI, and Ministries responsible for Agriculture, Livestock and Fisheries, Environment, Industry, Energy, Devolution and Planning, and Lands, and the private sector and non-state entities at both the county and national levels. This policy will be guided by national multi-sectoral and multi-agency through a framework for consultation and co-operation in the sector as guided by the Intergovernmental Relations Act 2012 and other relevant Government legal and institutional instruments.

234. The National Government in consultation with county governments and other stakeholders will establish mechanisms for stakeholder coordination in the sector.

6.5 Private Contractors

235. A legal frame work will be established for involvement of private contractors not only during the initial infrastructure development but also during the operations and maintenance of irrigation schemes.

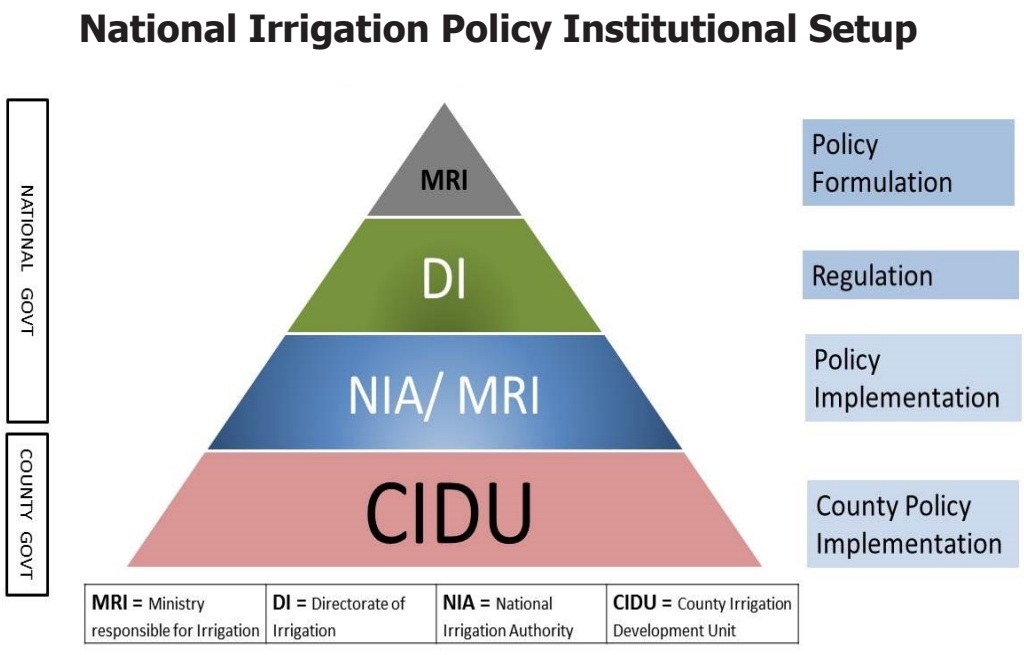

Figure 2: Institutional Set-up for the National Irrigation Policy

Chapter 7: Monitoring and Evaluation of Policy Implementation

239. In order to track the implementation of this Policy, it will be essential to record and measure progress, changes as well as the overall performance of the irrigation sector. Monitoring and evaluation (M&E) will provide reliable and timely data to inform the decision makers, stakeholders and the public on progress, results and shortcomings of the policy implementation. A highly consultative and participatory monitoring and evaluation process will be adopted to facilitate periodic reviews of the Policy and its contribution to the national economy. An M&E task force comprising of the National Government, the county governments and other stakeholders will be established within the MWI/DI to ensure M&E provides reliable and timely data for planning purposes.

240. Monitoring and evaluation units will be established at various levels and linked through relevant channels to the MWI/DI at the national level for overall information management and sharing in the sector.

241. The National Government in collaboration with county governments and other stakeholders will be responsible for M&E on policy implementation at various levels.

242. The National Government and county governments, in collaboration with other stakeholders will build capacity for M&E units to effectively carry out the M&E activities as part of policy implementation, including development of irrigation and drainage management information system (IDMIS).

Chapter 8: Implementation Framework for the Policy

243. The National Irrigation Policy 2017 sets a basis and principles to guide sustainable irrigation sector growth. Subsequently major development strategies and institutional reforms have been prioritized for implementation. An estimated cost equivalent to 2% of the annual budgetary allocation shall be required to undertake irrigation sector reforms for the next 5 years.

244. The detailed implementation framework to be developed shall feed into the wider establishment of new institutions, review and re-organize the existing institutions and other mechanisms to operationalize this policy, repeal the current Irrigation Act Cap 347, and create a new comprehensive legislation for the Irrigation Act. Further, the framework will provide for institutional strengthening and capacity building for effective delivery of irrigation services, including mechanisms for financing the implementation of the Policy. Therefore, this policy and other related instruments will anchor strategic interventions in an irrigation strategy and investment plan for the sector.

245. The implementation framework will incorporate an integrated approach, joint planning and participation of stakeholders. The focus will be addressed through coordinated programmes and projects. These include: institutional reforms, operations and maintenance, research and technology development, information gathering and management, monitoring and evaluation, capacity building and training, and infrastructural development. This Policy underscores the government's commitment to increase the public-private partnerships (PPP) to strengthen sustainability of the sector.

246. The National Government in collaboration with county governments undertakes to consolidate and strengthen the renewed working relations with development partners. Improved sectoral coordination at the national and county level will be achieved through formal periodic consultations and fora.

247. The National Government in consultation with county governments and other stakeholders shall develop a five-year national irrigation services strategy and investment plan to implement the irrigation policy. County governments may develop their own specific irrigation strategies and implementation plans in line with the national strategy and guidelines.

Table 3: Description of Institutional Linkages in the Irrigation Sector

No	Institution	Roles	Key Linkages
1	Intergovernmental Coordinating Committee (ICC)	1. Coordinates inter-sectoral structures at both national and county government levels that address irrigation matter.	Presidency & Council of Governors, Inter-Governmental Relations Technical Committee, Natural resources sector technical committees
2	Ministry responsible for irrigation	1. Oversee the formulation of irrigation laws and policies, provide sector regulation, coordination and guidance, and monitoring and evaluation; 2. Appoint officers and carry out other mandates as may be specified in the Irrigation Act; 3. Report to Parliament annually, and from time to time as may be necessary, on the state of, and needs for, irrigation development and management in the country. 4. Consult and seek the cooperation of other ministries and agencies of the national Government, county governments, as well as non-government entities, so as to encourage broad support for irrigation development and management. 5. Establish and oversee a sector-wide cross ministerial body to coordinate with all organizations related to the irrigation sector regarding development and management of schemes and provision of support services to irrigation water users' associations.	Headed by the Cabinet Secretary MWI linked to: • Other Sector ministries e.g. Ministry of Agriculture, Livestock and Fisheries, Environment & Natural Resources, Energy, Industry, The National Treasury • County Ministry responsible for Irrigation • Sector Development Partners • Private Sector & Civil society

No	Institution	Roles	Key Linkages
3	State Department of Irrigation (SDI)	1. Formulate and review national irrigation policy and strategy in collaboration with relevant stakeholders; 2. Oversight and coordination to irrigation sector entities and agencies; 3. Collaborate and liaise with other agencies involved in irrigation development at local, regional and international levels; 4. Formulation of sector regulations, standards and guidelines; 5. Capacity building, coordinate technology and research development; 6. Formulation of national projects and programmes in collaboration with county governments and other stakeholders. 7. Resource mobilization and financing of the sector; 8. In consultation with county governments, develop a national irrigation master plan, investment plan and respective Strategic plans; 9. Establish a national Irrigation and Drainage Management Information System (IDMIS); 10. Monitoring and evaluation of irrigation sector performance. 11. Undertake regulatory function for the sector including conflict resolution mechanisms to deal with irrigation disputes. 12. Build the capacity of Irrigation Water Users Associations to deal with scheme level disputes amicably	Headed by the Principal Secretary MWI/SDI linked to: • County Ministry responsible for Agriculture & CIDU • All national and county institutions responsible for water and irrigation • Development partners and other financial institutions • Private Sector and Civil Society irrigation stakeholders • Water sector regulatory and judicial institutions • Water Sector technology research and development, and standards institutions

No	Institution	Roles	Key Linkages
5	National Irrigation Authority (NIA)	1. Spearhead implementation of the irrigation policy, guidelines and standards in consultation with county governments; 2. Plan, design, construct and manage large strategic food security irrigation projects in consultation with county governments; 3. Plan, design and construct irrigation projects that cut across water basins and international boundaries 4. Mainstream irrigation related statutory obligations such as environmental, water and health; 5. Capacity build farmers and support establishment of relevant farmer organizations for irrigation development in collaboration with the county governments; 6. Provide technical advisory and other support services in irrigation; 7. Advising and overseeing the operation and management of strategic irrigation projects; 8. In consultation with county governments, maintain an information system on irrigation development and management; 9. Integrate irrigation in water harvesting and storage projects in collaboration with relevant other government institutions	Headed by a Board and a Chair appointed by the President. • Managed by a CEO appointed by the Board • Other water sector institutions • Closely linked to the County Irrigation Development Unit (CIDU) • Public Schemes • IWUAs, other farmers

No	Institution	Roles	Key Linkages
6	County Irrigation Development Unit (CIDU)	1. Implement irrigation policy at the county level as per its mandate; 2. Formulate and implement county irrigation strategy in collaboration with relevant stakeholders, in line with national policies and strategies; 3. Develop and maintain an irrigation database and integrate systematic monitoring and evaluation of the sector development at the county; 4. Provide technical (surveys, designs, supervision of construction), financial and other support services for the development of the irrigation sector; 5. Identify community-based smallholder schemes for implementation in line with national guidelines. 6. Mainstream irrigation related statutory obligations such as environmental, water and health; 7. Rehabilitation of existing irrigation schemes within the counties; 8. Capacity build farmers and support establishment of viable farmer organizations to develop and manage irrigation schemes including actively participating in conflicts resolution within irrigation schemes; 9. Set up measures to implement adaptation and mitigation to climate change, and enhance sustainable environmental management; 10. Implementation of the regulatory function in line with national standards	Headed by a Director appointed by the Governor • Linked to all National Level and County level institutions addressing irrigation especially SDI & NIA • Closely linked to IWUAs, commercial farmers and other county irrigation stakeholders

No	Institution	Roles	Key Linkages
7	Irrigation Water Users' Associations (IWUAs) / Farmer Organizations (FOs) and Contractors	1. Register irrigation water users in their area with CIDU and NIA for the purpose of capacity building and other forms of support 2. Promote controlled and legal use of irrigation water in their area 3. Promote good governance in management practices including gender equity in sustainable use of irrigation water. 4. Promote water conservation practices to ensure sufficient water reserves that meet the demands of the environment, the wildlife, the livestock and all the communities who rely on the water resource In collaboration with WRA and WRUAs in their area; 5. Agency contracting for improved O&M services to enhance sustainability of irrigation projects; 6. Work towards reducing conflict in use of the water resource and participate in solving those that arise; 7. Promote catchment conservation and other measures to improve water quantities and quality; and 8. Promotion of agri-business along the whole value chain.	Registered under the Societies Act • Association management • Linked to CIDU, NIA, KALRO • Other water sector players e.g. WRUAs, WRA, NEMA

Table 4: Definition of Key Terms

Term	Definition/Brief description
Agricultural Water Management (AWM)	The holistic management of water for agriculture (crops, trees, fisheries and livestock) in the continuum from rain fed systems to irrigated agriculture. It includes irrigation and drainage, soil and water conservation, rainwater harvesting, agronomy, in-field water management, integrated watershed management and all relevant aspects of the management of water and land.
Aquaculture	The farming of aquatic organisms including fish, mollusks, crustaceans and aquatic plants with some sort of intervention in the rearing process.
Drainage	The process of managing excess surface water and controlling water logging from shallow water tables.
Ecosystem services	The benefits people obtain from well-maintained ecosystems. Examples include clean water from rivers, fresh air, availability of timber from forests, flood and disease control, ground water recharge, nutrient cycling.
Environment	A combination of the various physical, geographic, biological, cultural and political elements that affect the life of an individual or organism.
Equity	The fairness, the standard by which each person and group is able to maximize the development of their latent capacities. Justice is the vehicle through which equity is applied, its practical expression.
Evapotranspiration (ET)	The sum of water lost from an area through the combined effects of evaporation from the ground surface and transpiration from the vegetation.
Food security	When all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life.
Freshwater resources	Water that is available in rivers and aquifers, and having good quality to be used for human purposes (e.g. drinking, washing, irrigation, industry).
Gravity-fed Irrigation	The type of irrigation in which water is available or made available at a higher level so as to enable supply to the land by gravity flow.

Term	Definition/Brief description
Groundwater	Water that exists beneath the earth's surface in underground streams and aquifers.
Integrated Agriculture-Aquaculture (IAA)	Mixed farming systems that incorporate fish production and agricultural use of water. Fish production has been successfully integrated into irrigated crops, especially rice and hydroponic horticultural systems.
Integrated Water Resource Management (IWRM)	A process which promotes the co-ordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems.
Irrigation	Any process, other than by natural precipitation, which supplies water to crops or any other ***"human actions taken to improve availability of water for agricultural production of crops, pasture, livestock, aquaculture, and desired forest trees".***
Irrigation efficiency	The ratio of irrigation water consumed by the irrigated plants to the water delivered from the supply source.
Irrigation Management Transfer (IMT)	The gradual handing-over of the rights and responsibilities to operate, maintain and manage irrigation systems from development agencies to the farmers.
Land degradation	The reduction in the capability of the land to provide goods and services, and/or benefits from a particular land use under a specific form of land management.
Land tenure	How property rights in land are allocated within societies. Land tenure systems determine who can use what resources for how long, and under what conditions.
Marginal-quality water	This term includes urban wastewater, agricultural drainage water, and saline/sodic surface water and groundwater
Overhead irrigation	A method of irrigation water application in which the water is ejected into the air to fall as spray on to the crops or on the ground surface.
Policy	A concise, formal statement of principles which indicates how a sector 's objectives and rational outcomes will be achieved. A Policy provides the 'roadmap' for sector development. In the present case "Policy" means the National Irrigation Policy 2017.

Term	Definition/Brief description
Policy making	Policy making is an inherently political activity, with sequential steps from problem formulation, to evaluation of alternatives, to implementation.
Policy-maker	A person with power to influence or determine policies and practices at an international, national, regional, or local level.
Irrigation Stakeholder	Any organization, group or individual that is involved in the promotion and development of irrigation and drainage. They range from development partners, national and county government agencies, NGOs and farmers.
Poverty	The inability to satisfy basic needs, such as food, shelter, water and sanitation, usually described as people living on the equivalent of less than $1 a day.
Rain fed agriculture	In rain fed agriculture, natural rainfall, which falls directly on a given field, is the predominant source of water for growing crops, trees or pasture on that field. It also includes crops grown with flood flows harvested from excess rainfall runoff.
Recycled water	Water that has already been diverted and used at least once. Recycling takes place, for example, by reusing drainage water or urban waste water.
Runoff farming	Also known as runoff harvesting/ water spreading/ spate irrigation, is the collection of rainwater from a surface and its storage in the soil profile.
Salinity	Soils having high concentration of soluble salts. Salinity may be caused by the presence of salts in the soil or from irrigation water.
Salinization	The increased accumulation of excessive salts in land and water at sufficient levels to impact on human and natural assets (plants, animals, aquatic ecosystems, water supplies or agriculture).
Scale of Irrigation Schemes	Small scale schemes: schemes with area of 0 - 40 ha (>0≤100 acres); Medium scale: >40 ≤ 1,200 ha (>100≤3,000 acres) and Large scale >1,200 ha (>3,000 acres).
Supplementary irrigation	Providing additional water to stabilize or increase yields where rainfall is insufficient for crop growth.

Term	Definition/Brief description
Surface irrigation	Surface irrigation systems are those which supply irrigation water to the ground surface for crop use. The main surface irrigation methods include: basin, border, furrow, corrugation, wild flooding and spate.
Virtual water	An economic concept defined as the water used to grow exported food. It is normally expressed in litres of water per kilogram of produce.
Water application efficiency	The ratio of the water applied that can be accounted for as increase in soil moisture in the soil as occupied by the principal rooting system of the crop against total amount of water applied at the field level.
Water conveyance efficiency	The ratio of water delivered in the fields at the outlet head to that diverted into the canal or pipe system from the source.
Water harvesting	Activities where water from rainfall and/or surface runoff is collected, diverted, stored and utilized.
Waste water	The water which is of no further immediate value to the purpose for which it was used or in the pursuit of which it was produced because of its quality, quantity or time of occurrence.
Waste water treatment	Process to render waste water fit to meet applicable environmental standards or other quality norms for recycling or reuse and irrigation.
Water control	The physical control of water by measures such as conservation practices on the land, channel improvements, and installation of structures for reducing water velocity and trapping sediments.
Water logging	State of land in which the water table is located at or near the surface resulting in poorly drained soils, adversely affecting crops production. Drainage can be used to solve the problem.
Water pricing	A charge levied on the beneficiaries for supplying irrigation water. It may be based on O&M expenses, depreciation charges or other criteria which may cover the working expenses and interest on investment.

Term	Definition/Brief description
Water productivity (WP)	An efficiency term quantified as the ratio of product output (goods and services) over water input. It can be expressed in term of yields (physical WP), income (economic WP) or environmental services (environmental WP).
Water resources management	The decision-making, manipulative, and non-manipulative processes by which water is protected, allocated, and/or developed.
Water rights	A legal system for allocating water from a water source to water users.
Water scarcity	A water supply that limits food production, human health and economic development (thresholds about 1000 m^3/year/person or more than 40% use relative to supply, an area is in situation of severe scarcity).
Water user association (WUA)	An association of water users combining both governance and management functions.
Irrigation Water Users' Association (IWUA)	A group of farmers within a given geographical location who have come together for the common interest of utilizing a common water resource for the purpose of irrigation and/or drainage. They pool resources to install, operate, maintain and manage an irrigation facility for sustainable production of irrigated enterprises for enhancement of their livelihoods.
Water withdrawal	The gross amount of water extracted from any source, either permanently or temporarily, for a given use. It can be either diverted towards distribution networks or directly used.
Participatory Irrigation Development	A process through which irrigation stakeholders influence and share development initiative, decision making and resources that affect them.
Demand-driven development	Development that has its origin from the benefiting group based in the identified needs.
Wetland	Areas of marsh, fen, peat land or water, natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine waters, the depth of which at low tide may not exceed six meters.