REPUBLIC OF KENYA

MINISTRY OF WATER, SANITATION AND I

STATE DEPARTMENT FOR IRRIGATION

"OVERVIEW OF IRRIGATION IN KENYA"

A presentation at the E.A Food-Energy-Water Conference held in Mbeya, Tanzania

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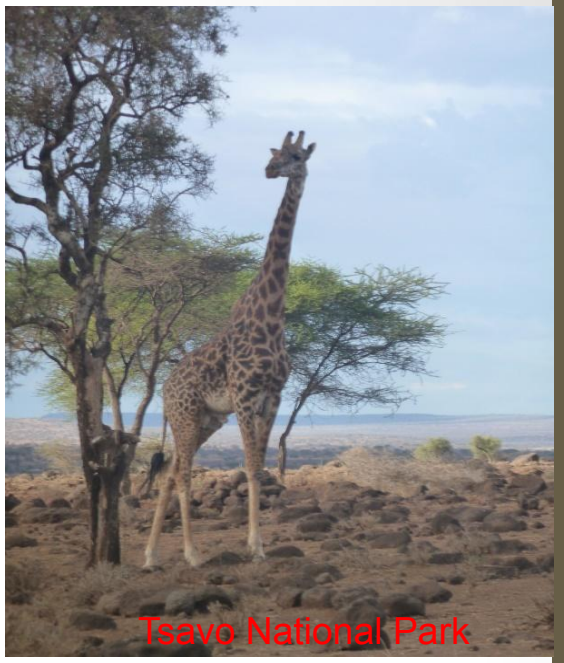
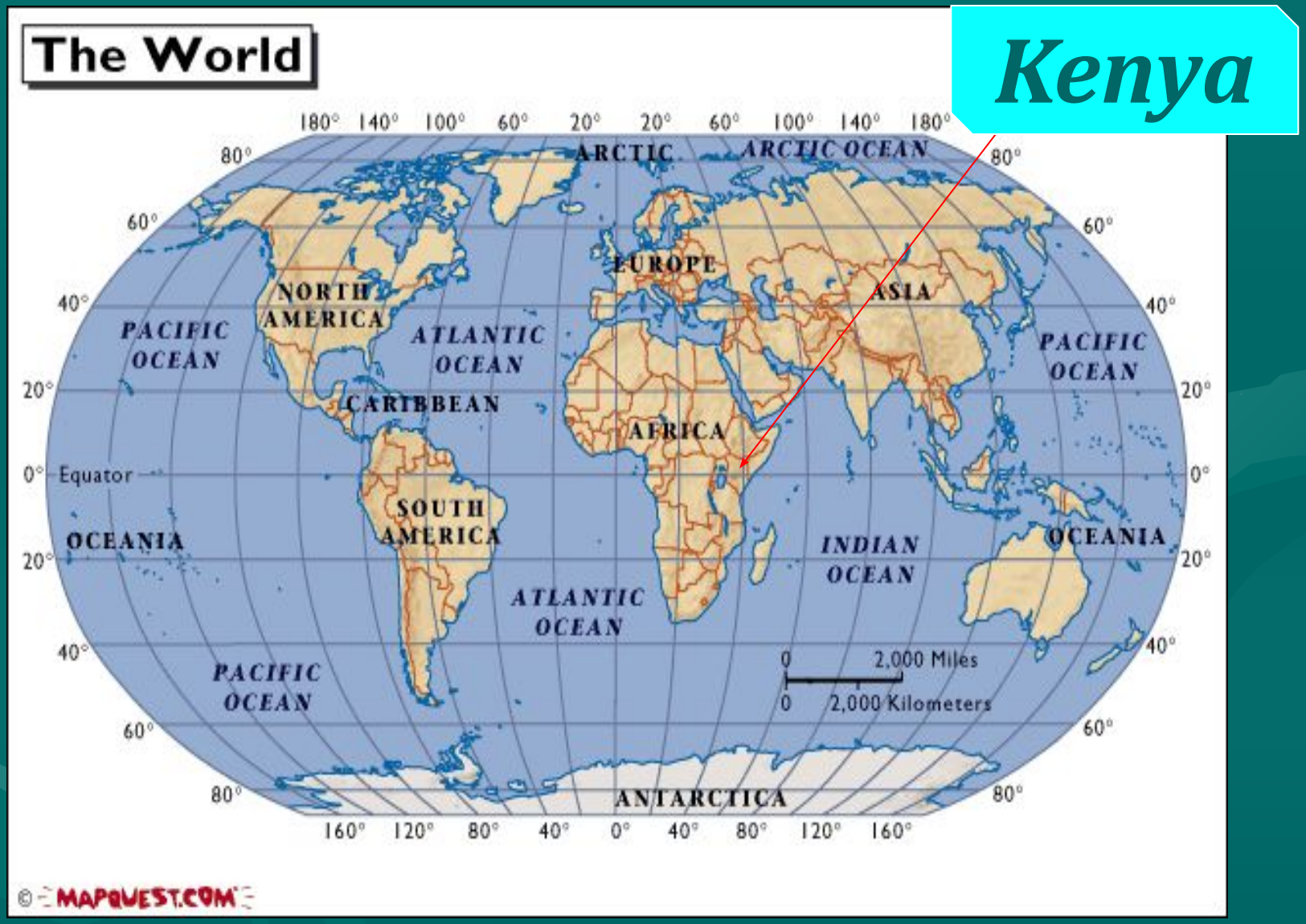
Outline

- Background
- Irrigation development in Kenya
- Opportunities in irrigation development
- National Irrigation Sector Investment Plan
- Sustainable Food-Energy-Water Nexus- What next?


Tsavo National Park


Samburu Game Reserve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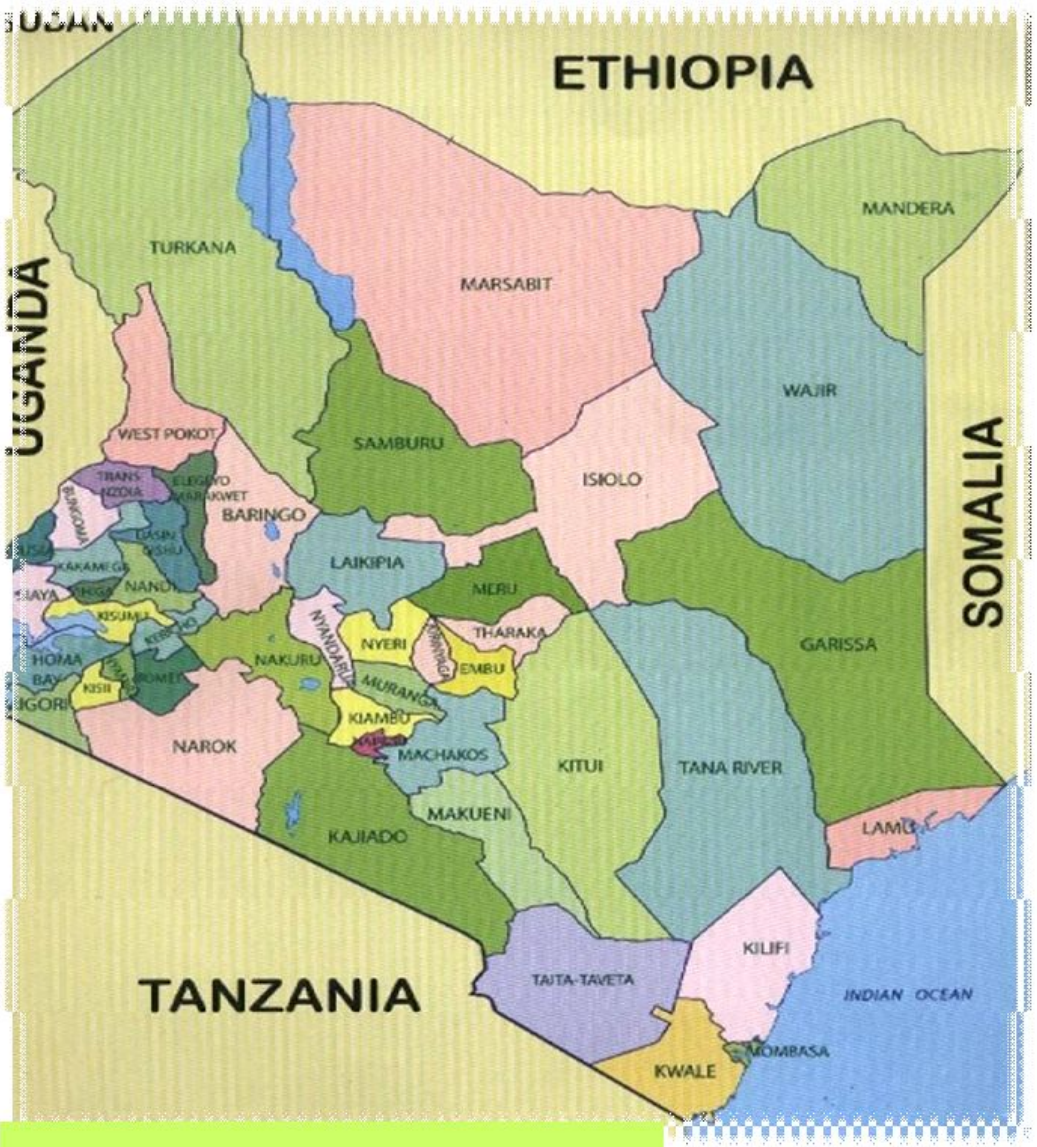
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TAITA-TAVETA
INDIAN OCEAN
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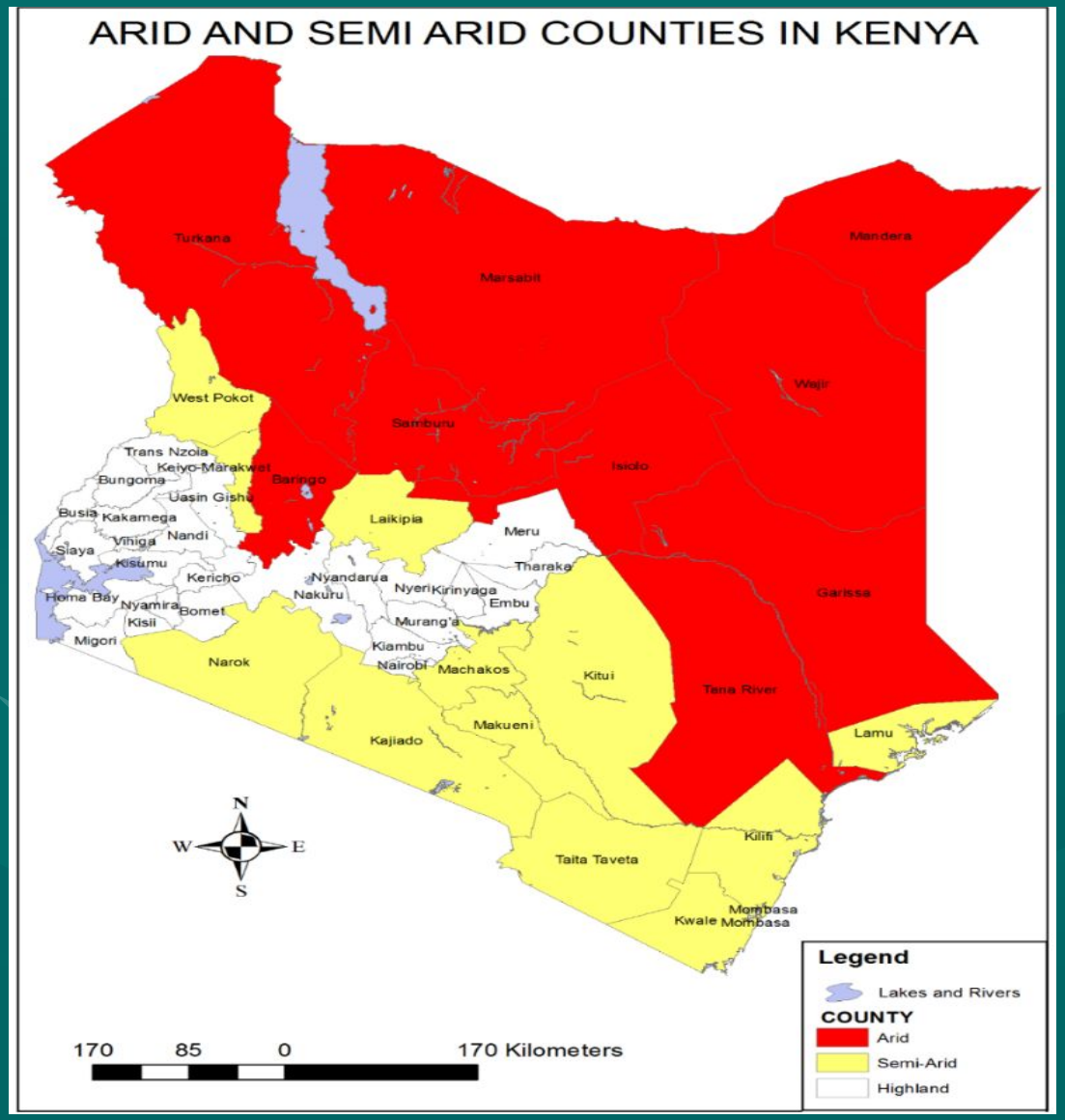
KWALE

1a. Back ground information- Country Statistics

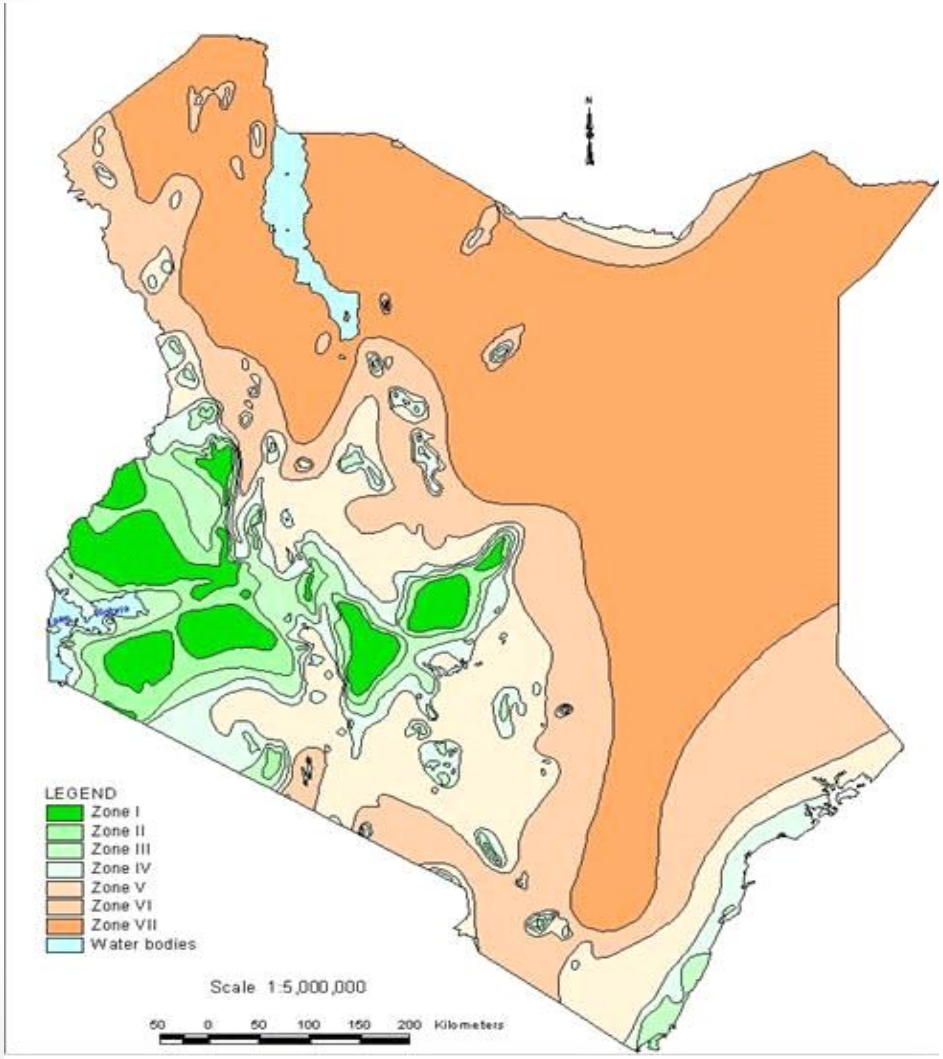
- Total land area: 582,646km^2 [58,264,600Ha)
- Total agricultural land: 274,430 km^2 (47.1%)
- Non-Agricultural land*:* 308,216 km^2 (52.9%)
- Potential irrigation area: 7,652 km^2 [1.3% of total country's surface or 3% of the total agricultural land]
- Developed irrigation area: 2,848 km^2 [712,000 acres (284,800 Ha)]; 37.2% of the potential
- Total population: 47,564,296 persons (2019)
- Projected: 51,464,936 persons (1.99%)
- Agriculture's contribution to the GDP: 21%
- 70-80% total employment is from agriculture
- 50.6% of population lack adequate food (40-65 mill USD spent on famine relief annually)

1b. Back ground (cont…..)



- ASAL areas: 80 – 89%
- Severely affected by perpetual drought events
- Communities vulnerable to effects of climate change

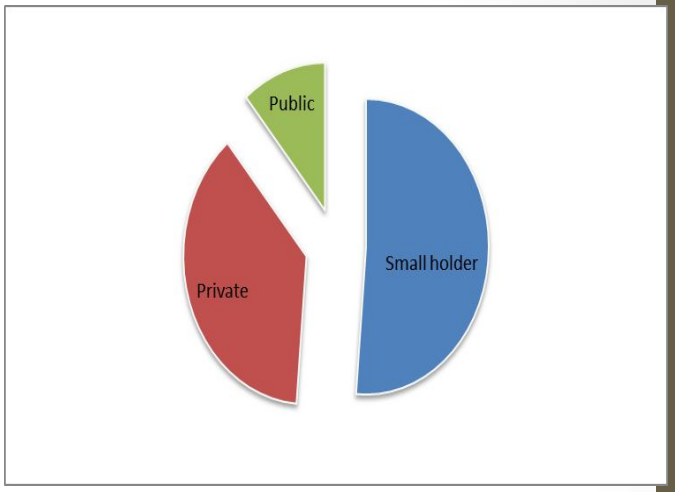
1c. Agro-Ecological Zones



Agro - Climatic Zone	Classification	Moisture Index (%)	Annual Rainfall (mm)	Land Area (%)
I	Humid	>80	1100-2700	12
II	Sub-humid	65 - 80	1000-1600	
III	Semi-humid	50 - 65	800-1400	
IV	Semi-humid to semi-arid	40 - 50	600-1100	5
V	Semi-arid	25 - 40	450-900	15
VI	Arid	15 - 25	300-550	22
VII	Very arid	<15	150-350	46

2a. IRRIGATION DEVELOPMENT IN KENYA- AN OVERVIEW

- Kenya's Irrigation potential **1.913 million acres** (765,200 ha) without water storage
- **3 million acres** (1.2 million ha) with storage- *Water Master Plan 2030*
- In 2017, area under irrigation was 484,000 acres and has progressively increased to the current **712,000 acres** (284,800 Ha) by June, 2025



Smallholder Communal Irrigation Schemes (64%)

These are farmer owned and famer managed, individual or community based

Private Irrigation (27%)

These are privately owned commercial irrigation schemes

National public schemes (9%)

These are managed by the National Irrigation Authority

2b. Sector Challenges and Constraints

i. **Poor** temporal and spatial distribution of water resources and competing water uses exacerbated by merging climate change risks and vulnerabilities

ii. **Limited funding** for capital investments and farm operations

iii. **Fragmented and uncoordinated** investments in the sector

iv. **Uncoordinated** efforts by the key sector players

v. **Weak** governance systems and institutional framework

vi. Poor or inadequate irrigation infrastructure and supporting infrastructure including roads and electricity

vii. Lack of structured marketing of agricultural produce translating to **low returns for farmers**

viii. **Inadequate** farmer knowledge and skills, extension services and lack of highly skilled irrigation personnel

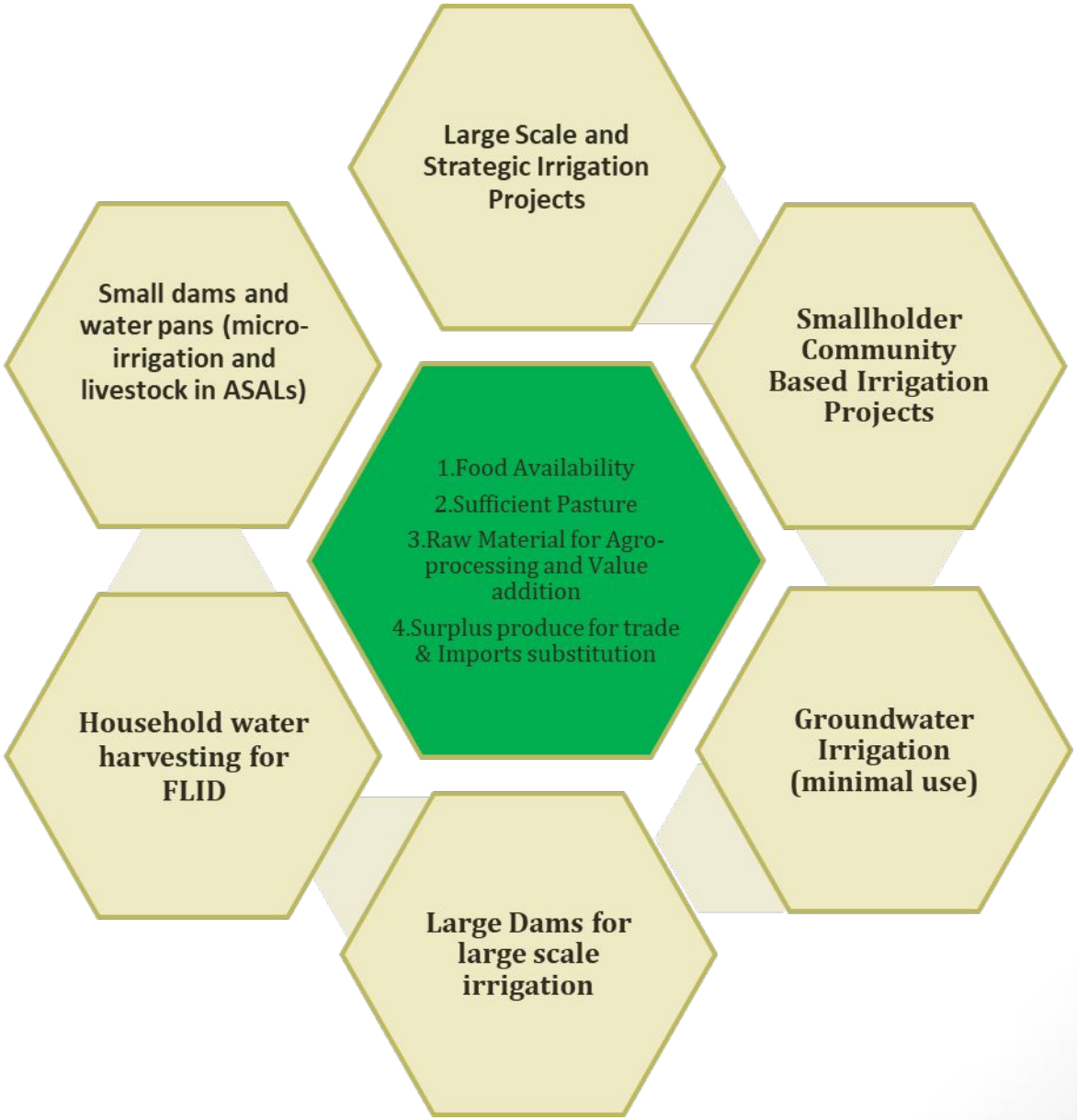
ix. Limited access to irrigation equipment and after-sale services, exacerbated by **limited awareness** and access to irrigation technologies

x. **Limited access** to improved agricultural inputs including seeds, fertilizers, and pesticides

xi. Limited access to weather information by irrigation farmers

2c. Irrigation Strategies

Identified Irrigation Development Opportunities



2d. OPPORTUNITIES FOR IRRIGATION DEVELOPMENT

Water Harvesting for Irrigation – Large Dams

- Construct 15 medium & large dams to increase national water storage capacity from 4,136MCM to 13,177MCM for multi-purpose use by 2027
- Planned along side large scale irrigation projects
- Additional area under irrigation: 786,750 acres
- Excellent climate resilience tools
- To be implemented through innovative financing including PPP

Thiba dam

2e. Irrigation practices

- **1. Surface/flood irrigation**
  - Mainly in paddy rice schemes (Mwea, Ahero, Bura, Bunyala, etc)
  - Operational efficiency 45-55%
  - Utilization: 80%
  - Cost: Kshs 250,000 - 350,000 per acre (USD 2,300)
- **2. Sprinkler irrigation/center pivots**
  - Mainly in vegetable production
  - Operational efficiency 60-75%
  - Utilization: 15%
  - Cost: Kshs 400,000 - 650,000 per acre (USD 4000)
- **3. Drip irrigation**
  - Mainly in horticultural, flowers, high value crops and in green houses
  - Operational efficiency 80-90%
  - Utilization: 3%
  - Cost: Kshs 700,000 - 900,000 per acre (USD 6100)
- **4. Others-** hose pipe, bucket, hydroponics, precision irrigation

2f. Irrigation Sector legal and institutional framework

National Irrigation Policy, 2017

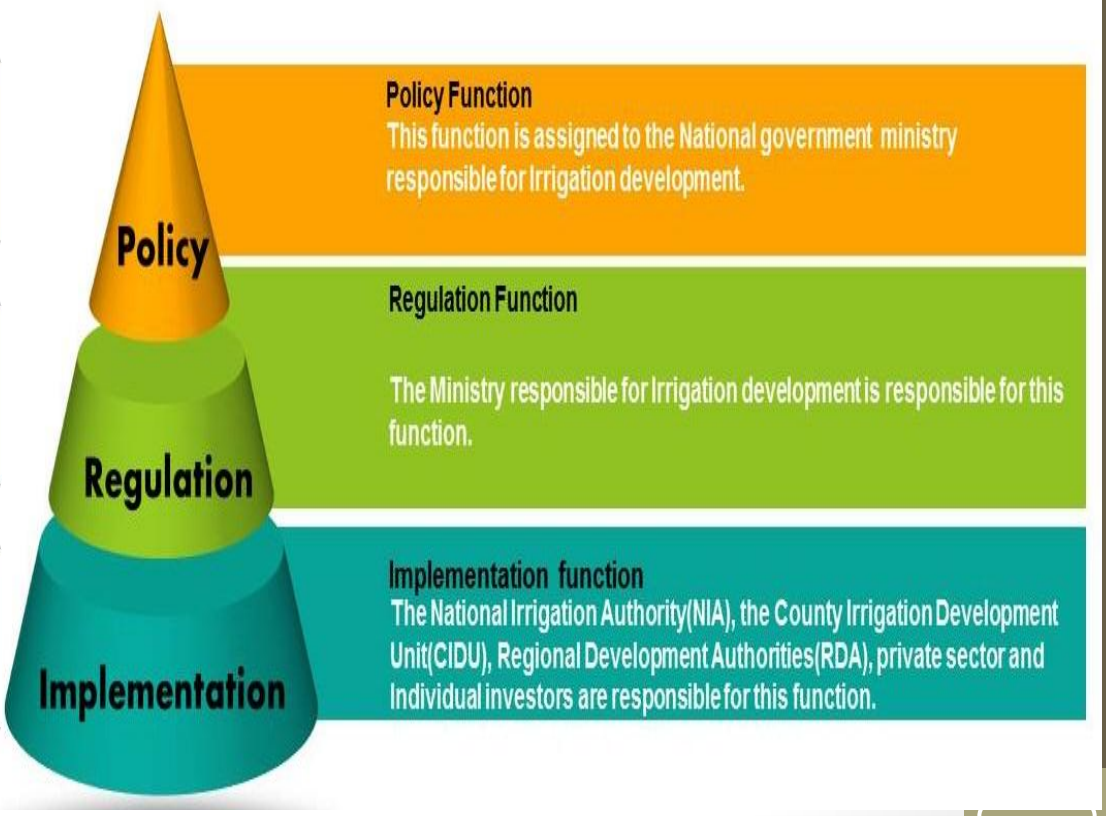
The policy aims at ensuring food security, wealth and employment creation, and poverty reduction through accelerated development and improvement of the performance of the irrigation sub-sector.

Irrigation Act No. 14 of 2019

The object of the act is to provide for the development, management and regulation of irrigation, to support sustainable food security and socio-economic development in Kenya.

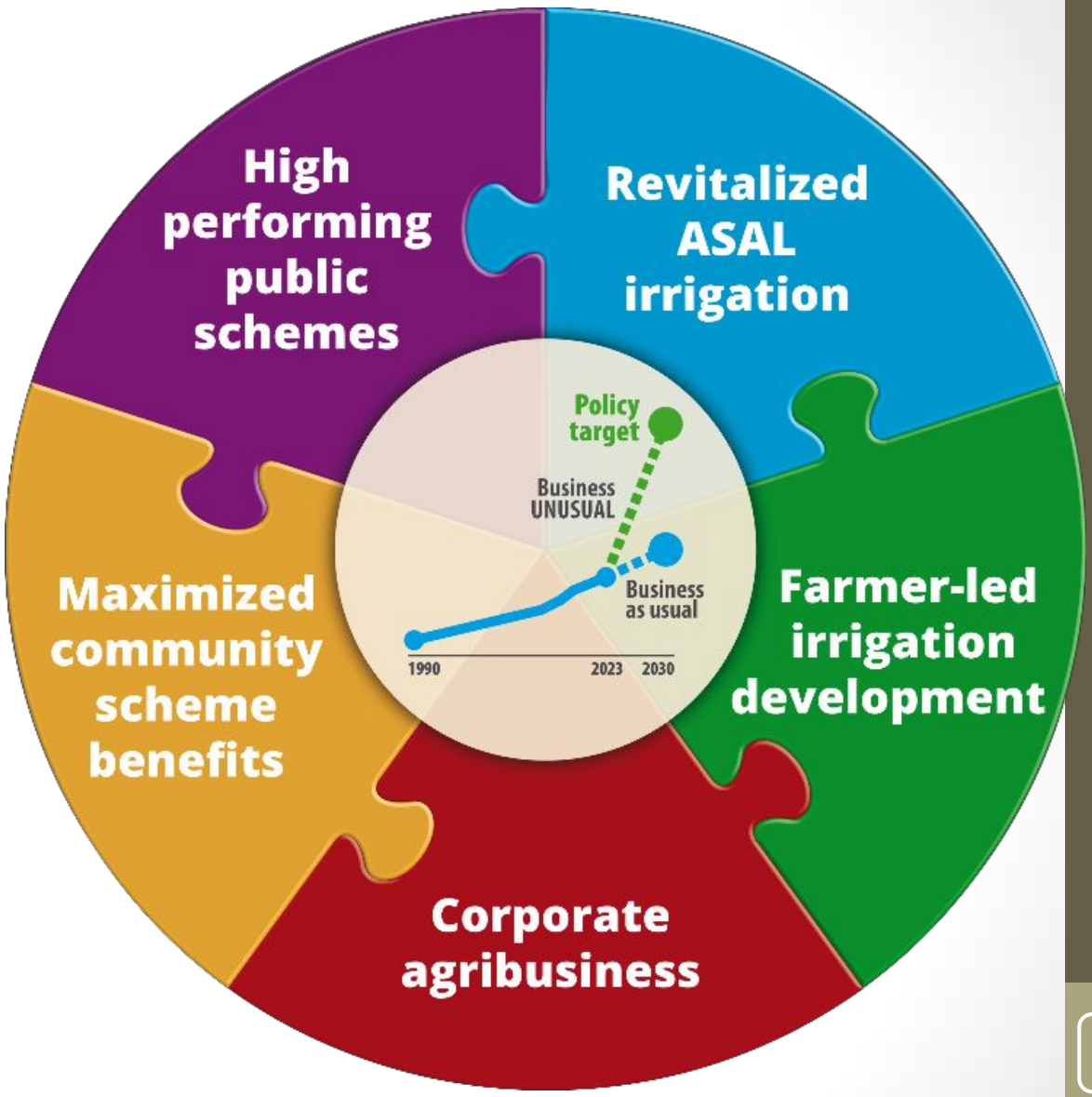
Irrigation (General) Regulations, 2021

Purpose: Sustainable development, management, financing, provision of support services and effective regulation of the entire irrigation sector in Kenya; - operationalize regulatory functions in the Irrigation Act.



3A. NATIONAL IRRIGATION SECTOR INVESTMENT PROGRAMME (NISIP)

NISIP investment pathways



3B. NISIP

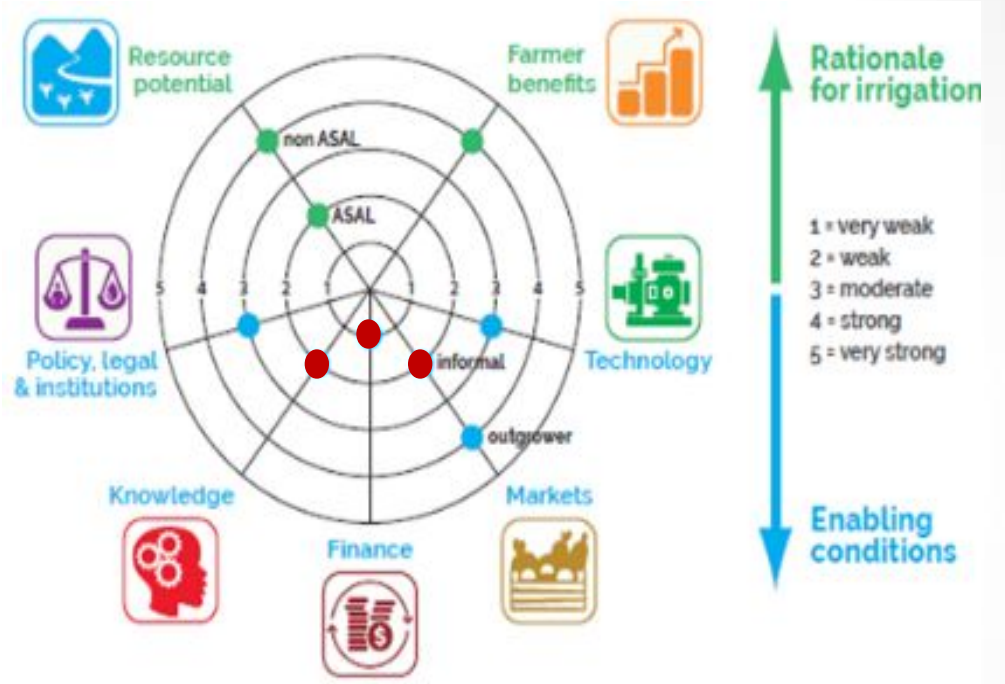
NISIP investment pathways

Irrigation Investment Areas / Pathways	Characteristic features
1 EXPANDED FARMER-LED IRRIGATION DEVELOPMENT Facilitate rapid micro-irrigation expansion at a large scale	**GOAL: Facilitate irrigation uptake by individuals and small groups of farmers on 0.5 ha to 2 ha, with a market-oriented farming agenda.** • Government drives awareness and incentivizes technology uptake. • Farmers decide, own, operate and manage the systems themselves • Suppliers and financing institutions provide the essential services. • Capital costs are funded mostly or entirely by farmers.
2 HIGH PERFORMING PUBLIC SCHEMES' Optimize service delivery on public schemes	**GOAL: Improve governance, management, and technology to achieve operational and financial sustainability through high-performance irrigation service delivery.** • Performance is reflected by adequate, reliable, equitable, and affordable water, in a sustainable ecological balance. • Early warning data and crisis preparedness • Formalized and optimized irrigation-water services to farmers on Government schemes (National and County owned and managed). • Irrigation service fees cover operations and maintenance costs.
3 ENABLED CORPORATE AGRIBUSINESS Scale-up corporate and commercial investments in irrigated Agriculture	**GOAL: Promote commercially oriented irrigation projects undertaken independently by the Private Parties, or jointly with Government and Communities.** • Secure access to land and infrastructure for private investment. • Streamlined channels and multi-line ministry coordination of initiatives. • Transparent and predictable environment for business transaction. • Co-funding by multiple stakeholders. • Mechanized farming and technology transfer.
4 REVITALIZED IRRIGATION IN ASALs Ensure food and fodder production in vulnerable pastoralist communities	**GOAL: Provide adequate, reliable, and safe-quality water to support irrigation development in ASAL regions.** • Small and medium blue-water storage investments for new irrigation schemes. • Flood-spate irrigation for fodder production. • In-situ water harvesting and infiltration methods for grazing enhancement. • Access to underground water and managed aquifer recharge and enhanced natural aquifer recharge.
5 MAXIMIZED COMMUNITY SCHEME BENEFITS Enhance community-based irrigation for maximum benefits	**GOAL: Strengthen community irrigation scheme management and production through an integrated organizational and agricultural enterprise development effort.** • End to end approach responsive to priority organizational and agricultural enterprise support needs. • County Government and CIDUs lead the interventions. • Co-financing of infrastructure improvements by farmers. • Operations and maintenance costs covered by farmers. • Early warning data and crisis preparedness, flood-risk mapping

3C. NISIP

EXPANDED FARMER-LED IRRIGATION DEVELOPMENT (PATHWAY 1)

CONSTRAINTS



Opportunities and enabling conditions for farmer-led irrigation development in Kenya

4a. The Food-Energy-Water Nexus

- Due to rising population, there is increasing demand for food and energy, which leads to increase in water needed in their production
- Food production (irrigation) is highly water-intensive (70% water withdrawals)
- Water sources for irrigation: rivers, lakes, ground water
- Abstracted through gravity flow, sometimes requiring pumps/energy to lift water for use in irrigation (grid power, fossil fuels, solar power or manually operated) – solarization, gravity flow!
- The food system requires energy inputs for on-farm production (farm tillage), storage, processing into food products, distribution/transportation to consumers, and food preparation

4b. Sustainable Food-Energy-Water nexus?

- Collaboration initiatives in:
  - Enhancing capacity building of irrigators in irrigation management, water use efficiency and scheme governance
  - Increasing investments in water resources development, especially water harvesting & storage for irrigation
  - Integrated water resource management/catchment conservation
  - Bridging the affordability gap for small farmers through innovative financing models - *cost sharing/blended financing, RBF, insurance, credit guarantee schemes and cost recovery in irrigation infrastructure development e.g SIPMK*

4b. Sustainable Food-Energy-Water nexus?.....ctd

- Providing grants or loans to farmers who adopt sustainable irrigation practices, or establishing pricing mechanisms that reflect the true cost of water use
- Providing financial and other incentives to encourage sustainable water use and management practices - *tax rebates or subsidies to companies that invest in water-efficient irrigation technologies*
- De-risking private sector to attract investments in water storage and irrigation infrastructure development; through PPPs (Design, Finance, Build, Operate, Maintain and Transfer Model)
- Deploying climate smart agriculture technologies *(micro-irrigation, precision irrigation, lining of canals)*

Irrigation Infrastructure Development- Pictorials

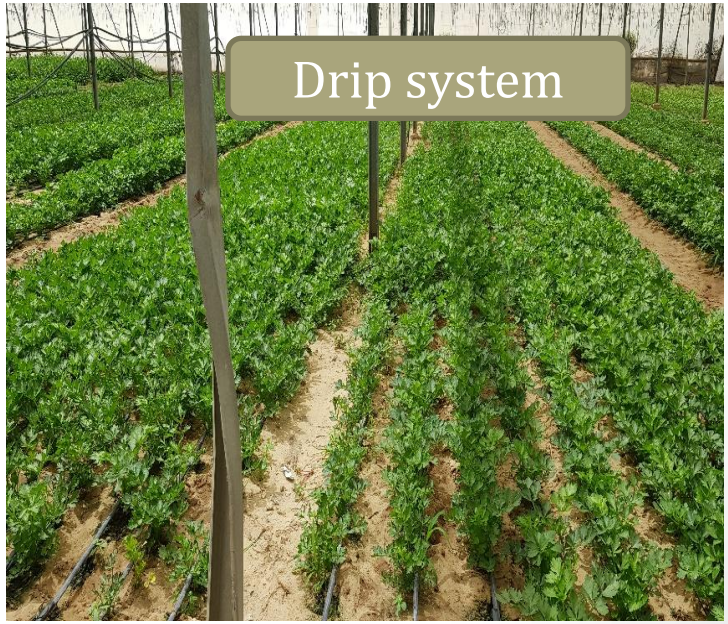
Irrigation scheme intake

Conveyance line [open]

Conveyance line [closed]

Sluice Gates

Irrigation Technologies



Irrigation technologies

THE END