The Institution of Engineers of Kenya

ENGINEERS BOARD OF KENYA

2023

INFRASTRUCTURE REPORT CARD

PREPARED BY

DEUU VENTURES
ENGINEERING CONSULTANTS

FORWARDS

PRESIDENT OF THE INSTITUTION OF ENGINEERS OF KENYA

ENG. ERICK OHAGA

As we undertook the crucial task of preparation of the 2023 Infrastructure Report Card for Kenya, we acknowledged the pivotal role our institution plays in shaping the future of our nation's infrastructure. Year by year, our collective efforts to engineer sustainable, resilient, and inclusive systems have become increasingly essential.

The goal of the 2023 Infrastructure Report Card is to assess and communicate the state and performance of our country's vital infrastructure sectors in both National and County governments. Through this report, we aimed to spotlight both the strengths and areas needing improvement, offering valuable insights and recommendations for policymakers, Decision makers, sectoral stakeholders, and the public at large.

We have observed notable progress across various sectors since our first 2021 report card. Yet, as we examine the present state of our infrastructure, several challenges persist, demanding immediate attention. As engineers, it is our duty to articulate these concerns effectively and propose viable solutions aligned with our long-term sustainable development goals.

This year's report card entails a comprehensive evaluation of critical infrastructure sectors, including Transportation, Energy, Water and Sanitation,Telecommunications, Housing, Education, Health, Agriculture, and Production/Manufacturing.

Moreover, we emphasize considering the broader impact of infrastructure on society, encompassing environmental sustainability, social equity, and economic resilience. As engineers, we advocate for infrastructure that not only meets immediate needs but also ensures a prosperous and sustainable future for generations.

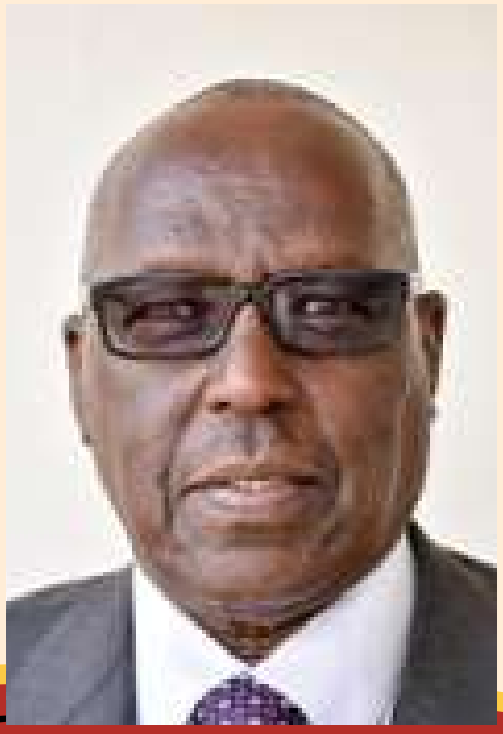
Recognizing the multifaceted nature of our challenges, collaboration among various stakeholders is crucial. We urge all Engineers to engage with policymakers, industry leaders, and fellow professionals to facilitate meaningful discussions on infrastructure development. Together, we can leverage our collective expertise to influence policy decisions, allocate resources effectively, and drive positive change.

Lastly, we would like to express our heartfelt gratitude to the Engineers Board of Kenya for their steadfast support throughout the development of this report. We also extend our appreciation to all IEK members for their unwavering dedication in advancing engineering excellence in Kenya. Your profound commitment, extensive knowledge, and unwavering passion play a pivotal role in shaping the infrastructure landscape and driving the nation's growth forward.

Let us unite as a community of engineers, driven by a shared vision of a resilient, inclusive, and sustainable Kenya. Together, we can build an infrastructure system that truly reflects the aspirations and needs of our great nation.

BOARD CHAIR - EBK

ENG. E. K. MWONGERA



Engineering is key to economic development in the society. In cognizance of this, the Engineer's Board of Kenya, a statutory body established under Section 3(1) of the Engineers Act, No.43 of 2011, undertook to support the production of this second Infrastructure Scorecard both financially and technically so that as a nation we can compare ourselves with the global best practice. This, we have done because as EBK, we recognize the pivotal role that the engineers play in infrastructure development. We appreciate the contribution of research in improving engineering efficiency and value this study as a key decision modelling tool that will give a comprehensive insight into the capacity analysis of the vital sectors of the economy that steer the intertwined development framework. As engineers, it is our primary objective to apply science and mathematics in providing solutions to the everyday challenges faced by our societies, and at the same time offer soft skills in protecting the society against harm occasioned by malfunctioning engineering systems. Therefore, I appeal to the decision-makers to adopt the recommendations highlighted herein and initiate prompt action, so that our people are not exposed to risks thereto.

Otherwise, I hereby applaud the IEK's President and the Policy Research and Advocacy Committee for this good piece of work which I believe will certainly challenge our national consciousness and probably cause us to put more effort into improving our future performance scores. As EBK, we pledge to continue our partnership and we shall strive to work also with other decision-makers in developing our infrastructure.

ENG. MARGARET OGAI

CEO - EBK

It gives me great pleasure to realize how pivotal engineers are in our national development for they are the champions of progress in every society. As a testament to this, as a board, we always feel proud to note that our members are spread in every sector of the economy. In that sense, we were inspired to partner with IEK to help produce this report just so that, we can also see for ourselves the great work our members have done. This infrastructure scorecard report is critical in our work as the regulator of engineering practice as it shows us where we need to put extra effort in terms of the distribution of engineers. This year's report is unique, for it has included an assessment of the Counties' infrastructure performance. This means it will act as a tool to mobilize the political class in allocating resources where they are most needed. I, therefore, take this opportunity to urge our leaders across the nation to use reports to improve our infrastructure, where they are poor, and to put in a resilience mechanism for the good ones.

CHAIRMAN OF POLICY, RESEARCH, AND ADVOCACY COMMITTEE OF IEK

I am truly indebted to IEK Council for bestowing on me the responsibility to steer the production of this report. A lot of work has gone into it and I sincerely thank our consultant, Deuu Ventures Ltd for the spirited effort. This report is our national forward-thinking tool to help us reminisce on the milestones we have made as a nation in the infrastructure development landscape. Even though, we still have huge gaps in infrastructure development, we have to appreciate our past efforts, and this report will evidence this. I have to give it to our engineers spread all over Kenya who have helped us make the recorded strides. For this reason, I congratulate every engineer on achieving the milestones. However, we must work tirelessly to bridge the gaps so that we improve the wellbeing of every Kenya wherever they are on our land. Engineers are duty-bound for this call. This report will help in strategizing the way to better our infrastructure going forward.

ENG. JUSTUS A. OTWANI

CHAIRPERSON, INFRASTRUCTURE REPORT CARD TASKFORCE

ENG. JENIFFER KORIR

As the Chairperson of the Infrastructure Report Card Taskforce, I am delighted to present the findings of the 2023 Infrastructure Report Card for Kenya. This thorough assessment aims to offer a comprehensive view of our nation's current infrastructure status, addressing successes, challenges, and forthcoming opportunities.

Our taskforce, comprising esteemed experts from diverse engineering backgrounds, diligently evaluated crucial infrastructure sectors, considering various performance indicators such as condition, capacity, resilience, and sustainability. Through this report, we aim to enlighten decision-makers, policymakers, and the public about critical issues affecting our infrastructure systems.

The 2023 Infrastructure Report Card showcases both accomplishments and areas necessitating immediate attention. We commend progress in specific sectors, where innovative projects and policies have significantly boosted infrastructure performance. These successes highlight the effectiveness of collaborative efforts, public-private partnerships, and forward-thinking strategies in infrastructure development.

Nevertheless, we must also recognize challenges in other sectors. The report card underscores issues like aging infrastructure, insufficient maintenance, funding gaps, and the imperative for enhanced resilience amid evolving climate patterns. Addressing these challenges demands a comprehensive and coordinated effort from all stakeholders involved.

Moreover, the report card stresses the significance of considering the social and environmental aspects of infrastructure development. We must ensure that infrastructure projects prioritize inclusivity, sustainability, and long-term benefits. This involves emphasizing equitable access, reducing environmental impact, and integrating advanced technologies to enhance resilience and efficiency.

We acknowledge that successful infrastructure systems depend on effective governance, substantial investment, and strategic planning. Hence, we urge policymakers and decision-makers to leverage the insights provided in this report card for informed policy-making, resource allocation, and project prioritization. By utilizing this information, we can collectively steer towards a more sustainable and resilient infrastructure landscape.

The 2023 Infrastructure Report Card reflects the collaborative efforts of numerous experts, professionals, and stakeholders who generously contributed their time, knowledge, and expertise. We extend our deepest gratitude to all participants in the evaluation process for their invaluable insights. Your dedication to enhancing our nation's infrastructure is truly commendable.

We invite all stakeholders to engage in meaningful dialogues, forge collaborative partnerships, and devise innovative solutions to tackle the challenges identified in this report card. Together, we can cultivate an environment conducive to sustainable infrastructure development, improving quality of life and propelling economic growth for the benefit of all Kenyans.

Thank you for your attention, and we anticipate the positive impact that the 2023 Infrastructure Report Card will have on shaping the future of Kenya's infrastructure.

EXECUTIVE SUMMARY

SECTOR	SCORE	DETAIL
Energy Oil an Gas	B (Good)	Infrastructure in good condition and meets current and projected demand.
Production/ Manufacturing	E (Fail)	Infrastructure performing dismally and needs immediate attention.
Water Supply	C (Fair)	Infrastructure acceptable, although upgrading necessary to avoid deficiencies
Sanitation	D (Poor)	Infrastructure in poor state and is likely to pose risk if not acted upon.
Building	C (Fair)	Infrastructure acceptable, although upgrading necessary to avoid deficiencies
Roads	C (Fair)	Infrastructure acceptable, although upgrading necessary to avoid deficiencies
Railways	D (Poor)	Infrastructure in poor state and is likely to pose risk if not acted upon.
Airways	D (Poor)	Infrastructure in poor state and is likely to pose risk if not acted upon.
Maritime Transportation and Commercial Ports	B (Good)	Infrastructure in good condition and meets current and projected demand.
Agriculture	C (Fair)	Infrastructure acceptable, although upgrading necessary to avoid deficiencies
Telecommunications	B (Good)	Infrastructure in good condition and meets current and projected demand.
Health	C (Fair)	Infrastructure acceptable, although upgrading necessary to avoid deficiencies
Education	D (Poor)	Infrastructure in poor state and is likely to pose risk if not acted upon.

County	AVERAGE PERFPRMANCE	DETAIL
Mombasa	C (Fair)	Infrastructure acceptable, although upgrading necessary to avoid deficiencies.
Kwale	D (Poor)	Infrastructure in poor state and is likely to pose risk if not acted upon.
Kilifi	D (Poor)	Infrastructure in poor state and is likely to pose risk if not acted upon.
Tana River	D (Poor)	Infrastructure in poor state and is likely to pose risk if not acted upon.
Lamu	D (Poor)	Infrastructure in poor state and is likely to pose risk if not acted upon.
Taita Taveta	C (Fair)	Infrastructure acceptable, although upgrading necessary to avoid deficiencies.
Garissa	E (Fail)	Infrastructure performing dismally and needs immediate attention.
Wajir	E (Fail)	Infrastructure performing dismally and needs immediate attention.
Mandera	E (Fail)	Infrastructure performing dismally and needs immediate attention.
Marsabit	D (Poor)	Infrastructure in poor state and is likely to pose risk if not acted upon.
Isiolo	D (Poor)	Infrastructure in poor state and is likely to pose risk if not acted upon.
Meru	C (Fair)	Infrastructure acceptable, although upgrading necessary to avoid deficiencies.
Thakara – Nithi	D (Poor)	Infrastructure in poor state and is likely to pose risk if not acted upon.
Embu	C (Fair)	Infrastructure acceptable, although upgrading necessary to avoid deficiencies.
Kitui	D (Poor)	Infrastructure in poor state and is likely to pose risk if not acted upon.
Machakos	C (Fair)	Infrastructure acceptable, although upgrading necessary to avoid deficiencies.
Makueni	C (Fair)	Infrastructure acceptable, although upgrading necessary to avoid deficiencies.
Nyandarua	C (Fair)	Infrastructure acceptable, although upgrading necessary to avoid deficiencies.
Nyeri	C (Fair)	Infrastructure acceptable, although upgrading necessary to avoid deficiencies.
Kirinyaga	C (Fair)	Infrastructure acceptable, although upgrading necessary to avoid deficiencies.
Murang'a	C (Fair)	Infrastructure acceptable, although upgrading necessary to avoid deficiencies.
Kiambu	B (Good)	Infrastructure in good condition and meets current and projected demand.
Turkana	D (Poor)	Infrastructure in poor state and is likely to pose risk if not acted upon.
West Pokot	E (Fail)	Infrastructure performing dismally and needs immediate attention.
Samburu	D (Poor)	Infrastructure in poor state and is likely to pose risk if not acted upon.
Trans Nzoia	D (Poor)	Infrastructure in poor state and is likely to pose risk if not acted upon.
Uasin Gishu	C (Fair)	Infrastructure acceptable, although upgrading necessary to avoid deficiencies.
Elgeyo Marakwet	D (Poor)	Infrastructure in poor state and is likely to pose risk if not acted upon.
Nandi	D (Poor)	Infrastructure in poor state and is likely to pose risk if not acted upon.
Baringo	D (Poor)	Infrastructure in poor state and is likely to pose risk if not acted upon.
Laikipia	C (Fair)	Infrastructure acceptable, although upgrading necessary to avoid deficiencies.
Nakuru	C (Fair)	Infrastructure acceptable, although upgrading necessary to avoid deficiencies.
Narok	D (Poor)	Infrastructure in poor state and is likely to pose risk if not acted upon.
Kajiado	C (Fair)	Infrastructure acceptable, although upgrading necessary to avoid deficiencies.
Kericho	C (Fair)	Infrastructure acceptable, although upgrading necessary to avoid deficiencies.
Bomet	D (Poor)	Infrastructure in poor state and is likely to pose risk if not acted upon.
Kakamega	C (Fair)	Infrastructure acceptable, although upgrading necessary to avoid deficiencies.
Vihiga	D (Poor)	Infrastructure in poor state and is likely to pose risk if not acted upon.
Bungoma	D (Poor)	Infrastructure in poor state and is likely to pose risk if not acted upon.
Busia	D (Poor)	Infrastructure in poor state and is likely to pose risk if not acted upon.
Siaya	D (Poor)	Infrastructure in poor state and is likely to pose risk if not acted upon.
Kisumu	C (Fair)	Infrastructure acceptable, although upgrading necessary to avoid deficiencies.
Homa Bay	D (Poor)	Infrastructure in poor state and is likely to pose risk if not acted upon.
Migori	D (Poor)	Infrastructure in poor state and is likely to pose risk if not acted upon.
Kisii	C (Fair)	Infrastructure acceptable, although upgrading necessary to avoid deficiencies.
Nyamira	D (Poor)	Infrastructure in poor state and is likely to pose risk if not acted upon.
Nairobi	B (Good)	Infrastructure in good condition and meets current and projected demand.

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SECTION A: INTRODUCTION

PROJECT OVERVIEW

Infrastructure is the set of assets that society develops, owns and utilizes in order to improve the standard of living and the quality of life. It enables economic development and keeps society healthy and should therefore be maintained in optimum working conditions. Infrastructure includes the basic facilities, services and installations needed for the functioning of a community or society. It comprises public and private structures such as roads, airports, railways, bridges, water supply, sewers, electrical grids, and telecommunications (O'Sullivan et al, 2003).

Infrastructural enhancement in our societies promotes investments, productivity, value addition, knowledge transfer, technological advancements, quality of life, and the general social welfare of the community. During the 2022 Infa4Dev Conference organized by the World Bank and International Growth Centre, it was showcased that infrastructure is an essential input in the production of goods and services where it can reduce the cost of delivered goods, facilitate physical mobility of people and products, remove productivity constraints, and increase competitiveness.

The United Nations Millennium Development Goals commits member states, Kenya included, to eight goals whose achievements are centred around infrastructure. In Kenya, infrastructure is considered key in achieving the Vision 2030 Goals. While the World Bank (2022) reports an investment deficit of up to US$1.8 billion for our country, considerable national budgetary allocations and private sector investments have been channelled to infrastructure. This study seeks to research on the capacity and gaps of the infrastructure development in various sectors.

SUMMARY OF INFRASTRUCTURE COMPONENTS

TRANSPORTATION

Rail	Roads	Airports	Water Transportation
• Heavy haul • General freight • Passenger lines	• International Trunk Roads (Class A) • National Trunk Roads (Class B) • Primary Roads (Class C) • Secondary Road (Class D) • Minor Road (Class E) • Forest Roads (Class F) • Roads serving Schools, Hospitals and Government Institutions (Class G) • Roads leading to Coffee growing areas (Class K) • Roads accessing settlement schemes (Class L) • National Park Roads (Class P) • Roads Accessing Rural areas (Class R) • Roads Accessing Sugar growing areas (Class S) • Roads accessing tea growing places (Class T) • Unclassified Rural Roads including those leading to areas with mineral deposits (Class U) • Roads Accessing Wheat growing areas (Class W)	• International airports • Domestic airports • Military airports • Private airports • Airfields	• Maritime transportation • Inland Container Depots • Inland Water Transport

WATER AND SANITATION

Water supply	Solid waste Management	Sanitation and wastewater	Sector Coordination and Regulation
• Bulk infrastructure • Major urban areas All other areas	• Major urban areas • All other areas	• Major urban areas • All other areas	• Water Research • Infrastructure Development for Rural Water Supply, Urban Water Supply, and Vulnerable and Marginalized Groups • Infrastructure Management • Resource Harvesting and Storage Water Service Provision

ENERGY

Electricity	Oil and Gas	Other Energy Resources
• Generation and transmission • Local distribution in rural, urban, and industrial zones	• Exploration • Bulk storage and transportation of refined fuel • Manufacturing of petroleum products • Wholesale and retail trade of refined petroleum products	• Nuclear Power • Biomass resources • Wood fuel and charcoal • Biofuels • Biogas systems • Municipal waste • Solar energy • Wind energy

PRODUCTION / MANUFACTURING

Manufacturing Industry	Processing Industry	Assembly Industry	Informal Manufacturing Sector	Cottage Industry
• Light manufacturing industries • Heavy manufacturing industries • Manufacture of machinery and machine tools Industrial zones • Manufacture of engineering products • Supply chain • De-carbonization and net-zero policies	• Agro-processing • Minerals exploration and processing • Wood products	• Motor vehicle assembly • Assembly of automotive components and electronics	• Woodworkers / carpentry • Wood crafts • Metal works • Soapstone crafts • Leather production	• Stone-works and pottery • Unrefined sugar production • Building materials

BUILDING SECTOR

Residential	Non -Residential
• Multi-dwelling units • Single dwelling units	• Office establishments • Warehouses • Commercial establishments • Hospitals and clinics • Institutions of learning • Prisons and law enforcement • Other government facilities

AGRICULTURE SECTOR

Crop Farming	Livestock Farming	Aquaculture	Horticulture	Supply Chain and Value Addition
• Food crops farming • Cash crops farming • Contract farming	• Dairy farming • Beef farming • Pork farming • Chicken farming • Sheep and goat farming	• Fish farming • Molluscs • Crustaceans • Seaweeds	• Ornamental horticulture • cultivation of fruits, vegetables, nuts, seeds, herbs, sprouts, mushrooms, algae, flowers, seaweeds	• Off-takers to end-markets • Post-harvest services and storage • Processors • Agro-dealers • Equipment suppliers • Domestic and export end-markets • Intermediate off-takers • Research

TELECOMMUNICATIONS SECTOR

Fibre Infrastructure	Wireless Network Coverage
• Broadband • Submarine cables	• Communications towers • Satellite communications

HEALTH SECTOR			
Health Facilities	**Medical devices, equipment, and hospital supplies**	**Medical insurance and services**	**Pharmaceuticals & Related Segments**
• Dispensaries • Health centres • District hospitals • Provincial hospitals • Teaching and referral hospitals • Private maternity and nursing homes • Private clinics • Voluntary Counselling and Testing (VCT) facilities	• Local production • Imports • Exports	• National insurance • Private insurers	• Raw materials • Manufacturing • Supply chain

EDUCATION SECTOR	
Basic Education	**Tertiary Education**
• The ECDE Sub-sector • The Primary Sub-sector • The Secondary Sub-sector	• TVET • University Sub-sector • Adult and Continuing Education

This research, championed by the Institution of Engineers of Kenya (IEK) in partnership with the Engineers Board of Kenya (EBK), has its objective centred around capacity assessment of the country's infrastructural investment milestones and aims to deliver a scorecard on the nine subsectors of the economy highlighted above. The contract runs up to February 2024 upon submission of an approved Infrastructure Score Card Report, with the scope of assessments covering infrastructural capacity and gaps assessments, emissions controls, accessibility, quality controls, and technological advancements.

PROJECT DETAILS

CONTRACT PARTICULARS	
Project Name:	Consultancy Services to Develop the Institution of Engineers of Kenya 2023 Infrastructure Report Card
Contract Number:	IEK/IRC/2023
Employer:	The President, Institution of Engineers of Kenya, Through Policy Research and Advocacy Committee (PRAC)
Financier:	Engineers Board of Kenya (EBK)
Consultant:	**DEUU VENTURES LTD**

ENGINEERING PROFESSION

Kenya's professional fraternity is regulated by the Engineers Board of Kenya, which is a statutory body established under Section 3(1) of the Engineers Act, No.43 of 2011. The Board has the overall mandate of registration and licensing of engineers and engineering consulting firms, developing, and regulating of engineering practice in Kenya. As of 31st December 2023, there are 559 consulting engineers, and 2,891 professional engineers who are mandated to offer professional engineering services in the country. This falls short of the recommended UNESCO ratio of professional engineers to a middle-income country's population is 1:5,000 persons. The table below shows the number of registered engineers per discipline for both consulting and professional categories

DISCIPLINE	NUMBER OF ENGINEERS (PROFESSIONAL & CONSULTING)
AERONAUTICAL	3
AEROSPACE	3
AGRICULTURAL	157
BIOMECHANICAL and PROCESSING	1
BIOSYSTEMS	4
CHEMICAL and PROCESS	27
CIVIL	1765
CIVIL and ARCHITECTURAL	1
CIVIL and STRUCTURAL	235
ELECTRICAL	319
ELECTRICAL and COMMUNICATION	70
ELECTRICAL and ELECTRONICS	283
ELECTRICAL and TELECOMMUNICATIONS	9
ENERGY	1
ENVIRONMENTAL and BIOSYSTEMS	2
INDUSTRIAL	1
INDUSTRIAL and TEXTILE	2
INSTRUMENTATION and CONTROL	3
MANUFACTURING	2
MANUFACTURING ENGINEERING and TECHNOLOGY	7
MECHANICAL	444
MECHANICAL and INDUSTRIAL	3
MECHANICAL and PRODUCTION	32
MECHATRONIC	11
METALLURGY	1
PRODUCTION	48
TELECOMMUNICATION and INFORMATION	1
TELECOMMUNICATIONS	1
WATER	3
WATER and ENVIRONMENTAL	11
TOTAL PROFESSIONAL & CONSULTING ENGINEERS	3450
AGRICULTURAL	1
CIVIL	10
ELECTRICAL	4
MECHANICAL	2
TOTAL ACCREDITED CHECKERS	17

EBK DATA as of 31st December 2023

SCOPE OF IEK IRC 2023

Energy, Oil and Gas Sectors

- Condition and capacity of power generating equipment
- Condition and capacity of power transmission equipment
- Condition and capacity of power distributing equipment
- Household power accessibility
- Cost of power
- Emmissions control
- Oil and gas storage capacity
- Oil and gas facilities location infrastructure
- Oil and gas product access by county market share trends

Production / Manufacturing Sector

- Key stakeholders.
- Types of the industries, ownership, and management.
- Diversity
- Key cost drivers (Energy, labour)
- Global reach (exports, etc)
- Worker benefits (Medical, Housing, Mortgage, etc)
- Raw materials sources
- Production capacities versus installed capacity.
- Innovation
- De-carbonization and net-zero policies
- Energy / water recovery
- Taxation regime

Building Sector

- Enabling environment; objective
- ease of obtaining permit
- Availability of building materials and technology.
- Cost of materials.
- Transportation of materials.
- urban population.
- Housing access.
- Number of housing units;
- Commercial Centers / Markets.
- Number of commercial buildings / markets
- Informal settlements.
- Industrial areas
- Water Supply and Sewer systems.
- Solid Waste Management.
- Access Roads.
- Access to Electricity
- Affordable Housing provision /
- Awareness of Green Building Concept

Water and Sanitation Sector

- Adequacy of bulk water supply
- Commodity access
- Reliability
- Sanitation system service level
- Sanitation systems capacity
- Adequacy of solid wastes management systems
- Hazardous wastes handling
- Recycling

Transportation Sector

- Adequacy and condition of road networks
- Road coverage (density / county)
- Road accessibility
- Road safety
- Airports distribution
- Airports capacity
- Condition of runways
- Support infrastructure
- Aerodomes
- Safety and incidents
- Commercial ports capacity
- Condition and capacity of berthing equipment
- Freight handling
- Ports support infrastructure
- Dry dock facilities
- Harbours support infrastructure
- Freight storage
- Categories of ship
- Economic contribution
- Pipeline transportation
- Assessment of fishing ports
- Rail transportation assessment (commercial and passenger)

Agriculture Sector

- Irrigation agriculture
- Agricultural roads
- Agricultural equipment
- Agricultural building
- Energy production from agriculture
- Institutional infrastructure
- Agricultural wastes management

Telecommunications

- Mobile coverage
- Base transceiver stations
- Radio networks controllers
- Subscribers
- Transmission network per operator
- Type of infrastructure transmission
- Enterprise internet coverage
- Mobile phone network availability
- Connectivity technology

Health Sector

- Adequacy of facilities
- Conditions and maintenance
- Staffing
- Facilities

Education Sector

- Number and distribution of schools
- Adequately serviced
- Support infrastructure
- Boarding and residential facilities

BENCHMARKING THE IEK'S IRC AGAINST THE INTERNATIONAL DOCUMENTS

IEK'S IRC (2021)	SAICE IRC (2022)	ASCE IRC (2021)	JSCE IRC (2021)
• Water services (access to clean water in urban and rural centers, dams) • Sanitation(access to clean water in urban and rural centers) • Transportation (paved and unpaved roads, accessibility index) • Railway sector (heavy haul, freight lines, passenger line) • Aviation (airports and aerodomes) • Education (number of institutions, access to infrastructure, textbooks, and staffing) • Energy (electricity generation, transmission, and distribution, oil and gas) • Health (bed density, health facilities, personnel) • Prisons	• Water (bulk water resources, supply in major urban areas, and other areas • Sanitation (urban Areas, and other areas) • Solid Waste Management (collection in major urban areas and other areas, waste disposal in major urban areas and other areas) • Roads (national roads, paved provincial roads, paved roads in urban areas and other municipalities, unpaved roads) • Airports • Ports (commercial and fishing ports) • Oil and gas pipelines • Rail (heavy haul freight, branch, passenger lines) • Electricity (generating, transmission, and distribution infrastructure) • Healthcare (hospitals & clinics) • Education (primary, secondary, and tertiary institutions)	• Aviation (condition and capacity, O&M and innovation, safety and resilience) • Bridges (condition and capacity, funding, O&M, innovation, safety) • Dams (condition and capacity, future need, funding, hazard potential, resilience and innovation) • Drinking Water (capacity and condition, funding, O&M, future need, safety) • Energy (condition, capacity, O&M, oil and gas, resilience and innovation, public safety) • Hazardous Wastes (capacity and condition, resource conservation and recovery, public safety, funding and future need, innovation) • Inland Water ways (condition and capacity, funding and future need, O&M, innovation) • Levees (condition and capacity, O&M, funding and future need, safety and resilience, innovation) • Ports (capacity and condition, funding and future need, O&M, public safety and resilience, innovation) • Public Parks (capacity and condition, funding and future need, O&M, public safety and resilience, innovation) • Rail (freight, passenger, funding, future need, O&M, safety) • Roads (roadway condition, congestion and reliability, funding and future need, innovation, O&M) • Schools (capacity and condition, O&M, funding and future need, safety) • Solid waste management (capacity, recycled, safety, funding and future need, innovation) • Stormwater (capacity, condition, O&M, funding, safety, resilience, innovation) • Transit (capacity and condition, funding and future need, resilience, innovation) • Wastewater • Spotlight and broadband	• Roads (bridges, tunnels, road pavements) • Railway (bridges, tunnels, tracks) • Ports (mooring facilities, protective facilities for harbours) • Ports (mooring facilities, protective facilities for harbours) • Rivers (levees, river structures, dams) • Waterworks (pipe facilities) • Sewerage works (pipe facilities) •

From analysis, it is clear that the USA version, 2021, touched on diverse sectors of the economy, while the South African version, 2022, analysed comprehensively the various infrastructure under study. On the other hand, the IEK's IRC 2023 scope is as below:

A detailed sectoral scope of work for various sub-sectors of the economy will include.

SECTION B: METHODOLOGY

PROJECT OBJECTIVES AND METHODOLOGY

MAIN OBJECTIVE

To conduct infrastructure research across various sectors of the economy, and compare them across all counties so as to provide evidence for effective policy formulation, influencing key decision makers in the built and natural environments, and raising awareness of the importance of economic and social infrastructure, as well as the role of engineering and built environment professionals.

SPECIFIC OBJECTIVES

The specific objectives of the assignment include:

1. To undertake data collection and analysis of infrastructure data.
2. To oversee data collection in-country from all sectors.
3. To develop an analytical report and policy briefs that highlight key findings.

SITUATIONAL ANALYSIS

Infrastructure report cards (IRCs) are abbreviated reports and commentary on the general condition of a nation's economic and social public infrastructure. Usually produced by the national institution of engineering, they vary in frequency, scope and detail depending on available resources and their objectives. A number of developed countries conduct periodic infrastructure grading, including the USA, UK, Canada, Japan, New Zealand, and Australia. In the developing world, South Africa has produced fairly detailed reports in 2006, 2011 and thereafter. Nigeria produced its first IRC in 2015. In 2012 Zambia issued a framework for its reports and its first IRC in 2017. Kenya has not been left behind and has been producing its IRC report since

Locally, an engineering organization like the IEK, as an independent learned society and fair arbiter of the country's evaluation, has the professional and institutional mandate to establish Kenya's infrastructural profile. With an access to robust research and large body of knowledgeable experts, the IEK seeks now to develop of an infrastructure report card (IRC) that seeks to increase awareness of the importance of economic and social infrastructure and the associated role of engineering and built environment professionals. The IRC should also provide assistance to decision-makers and their support teams in the built and natural environments.

METHODOLOGY OF STUDY

SUMMARY OF METHODOLOGY

For this study, the Consultant broke down the works to be performed into discrete tasks and activities, in-line with the scope of services as outlined in the Terms of Reference. The consultant deployed a mix of methodology ranging from desktop evaluation, participatory stakeholder engagement for co-design process and technical investigations / onsite validation, with the output processed in terms of all prerequisite documentations; reports, graphical presentations, and outputs.

DATA COLLECTION METHODOLOGY

SAMPLING AND DATA COLLECTION

Sampling of the departments responsible for infrastructure development and regulation in the respective ministries in charge of Energy, Production/Manufacturing, Building, Water and Sanitation, Transport, Agriculture, ICT, Health, and Education and sourcing of relevant infrastructure information.

Data Collection Methods included on-site inspections, surveys, interviews, and existing records and databases. Collection tools included structured electronic questionnaires. Extracting information from previously collected data, archives, or databases was also deployed in gathering information from various sectors. Notes from focused group discussion engagements during report presentation will also be used to add value to the scorecard.

Data Analysis Plan Involved Research Questions and Hypotheses, Data Cleaning and Pre-processing; Descriptive Statistics, Exploratory Data Analysis, Inferential Statistics, Segmentation and Stratification, Comparative Analysis, Spatial Analysis, Qualitative Data Analysis, Validation and Sensitivity Analysis, and Documentation and Reporting.

Data Validation surveys will be carried out through discipline-based coordination for the confirmatory studies to evaluate the infrastructure performance. This will be done for the entire investment menu.

CAPACITY NEEDS ASSESSMENTS

An intricate assessment of various gaps was conducted. This included infrastructure gaps targeting various sectors both nationally and regionally through interviews, and questionnaires; technical capacity gaps; and socio-economic gaps.

Activities here included identifying and categorizing the infrastructure, evaluating the current capacity of each infrastructure component, projecting future demands on the infrastructure based, defining and establishing performance metrics that reflect the effectiveness and efficiency of the infrastructure, identifying potential risks and vulnerabilities associated with the infrastructure's current and projected capacity, considering regulatory requirements or standards related to infrastructure, estimating the financial investments needed to address capacity shortfalls and meet future demands, incorporating considerations for the lifecycle of the infrastructure, including maintenance, upgrades, and replacement, and engagements with relevant stakeholders, including government agencies, private sector entities, and the public, to gather input and ensure that capacity needs align with the broader goals and expectations of the stakeholders.

COUNTIES INFRASTRUCTURE ASSESSMENTS AND COMPARISONS

Comparing counties or regions within an infrastructure report card framework is a valuable exercise that allows for the identification of disparities, best practices, and areas for improvement. This was achieved by defining standardized metrics and key performance indicators (KPIs) to assess infrastructure across different counties or regions, considering of a multi-dimensional assessment that covers various infrastructure sectors, ensuring uniformity in data collection and reporting across counties or regions, setting benchmarks and targets based on national or international standards, utilization of geospatial analysis to map infrastructure data and identify spatial patterns or disparities, inclusion of public input and perception surveys, considering the economic and social context of each county or region when assessing infrastructure, evaluating the infrastructure development through the principle of equity and inclusion, identifying capacity gaps, assessing the environmental impact of infrastructure development, and recommendation of collaboration and peer review mechanisms between counties or regions to enable mutual learning and constructive feedback.

GRADING INDICES

Sectoral conditions, results and information on the situational analysis was collected from published data and surveys, and data validation carried out by the experts from the Institution of Engineers of Kenya, specifically, PRAC. After evaluating the data considering the regions and infrastructure owners, the grades were evaluated as the national average.

GRADING SCALE

A: Sound (90-100%)	B: Good (80-89%)	C: Requires Attention (70-79%)	D: At Risk (41-69%)	E: Unfit for Purpose (40% and below)
Infrastructure is performing optimally in every aspect.	Infrastructure is in good condition and satisfies current projected demands .	Infrastructure condition is acceptable although stressed at peak periods. It will need investment in the current Medium Term to avoid serious deficiencies.	Infrastructure is not coping with normal demand and is in poor state. It is likely that the public will be subjected to severe inconvenience and even danger without prompt action.	Infrastructure has failed or is on the verge of failure, exposing the public to social, health and safety hazards. Immediate action is required.

SECTION C: KENYA'S INFRASTRUCTURE SCORE CARD 2023

KENYA GDP

In the year 2022, there was marked economic growth in Kenya with the real Gross Domestic Product (GDP) expanding by 4.8%. This was however a reduction from the 2021 performance of 7.6%. The nominal GDP increased from KSh. 12,027.7 billion in 2021 to KSh. 13,368.3 billion in 2022. This acceleration is attributed to the stabilization of most economic sectors after posting high growths in 2021 driven by recovery from the effects of the Covid-19 pandemic. The economy was characterized by high inflationary pressure that closed at 7.9% in June 2023. Despite the inflationary pressure on the economy, the GDP per capita at current prices increased from KSh. 237,861 in 2021 to KSh. 260,024 in 2022.

THE PUBLIC ASSET

RESPONSIBILITY FOR INFRASTRUCTURE

The 2021 IEK's IRC noted the Kenya's impressive private sector investment, and at the same time highlighted the need for improved infrastructure development. While the 2021 report attributed the need for improved infrastructure resource allocation to the country's economic development, it is important to also note that the governance devolution has brought about a resounding need for improved and equitable resource allocation to the counties so as to ensure that accruing pressure on the limited grassroot resources are adequately handled.

Considering the 2021 baseline, the KNBS reported a local power production of 1,014.22 million KWh in December 2021, and 995.14 million KWh in March 2023, reflecting a decrease. For building and construction sector in Nairobi City, which is the economic hub of Kenya, the value of approved buildings by November 2023 was KES. 195.1 billion, registering a mammoth rise from KES. 19.3 billion recorded in the post COVID 19, December 2021. In the production / manufacturing sector, referencing the KNBS Leading Economic Indicators Report, March 2023, sample sectors included cement production recorded at 9.5 million MT in the FY 2022, while a figure of 3.8 million MT was recorded in the FY 2023, reflecting a decrease; local sugar production increased from 700,000 MT in the FY 2021/2022 to 790,000 MT in the FY 2022/2023.

For water and sanitation sector, WASREB's IMPACT 15 Report 2023, reported that water coverage in regulated areas in the Reporting Year 2021/2022 improved from 60% to 62% while sewerage coverage remained at 16%. In the transport sector, according to the Quarterly Gross Domestic Product Report, Third Quarter of 2023, transportation and storage sector activities were slower in the third quarter of 2023 compared to the corresponding quarter of 2022. The sector is estimated to have recorded 2.8 per cent growth in the period under review compared to 5.1 per cent growth in a similar quarter of 2022. The same KNBS report, highlighted the agriculture, forestry, and fishing sector to have registered a growth of 6.7 per cent in the third quarter of 2023 compared to a 1.3 per cent contraction in the corresponding quarter of 2022.

In Telecommunications, KNBS reported the sector growth by 7.3 per cent in the third quarter of 2023, compared to an 11.8 per cent growth in the corresponding quarter of 2022, with the indicators supported by voice traffic, internet use and mobile money. For health sector whose main objective is to attain equitable, affordable, accessible and quality health care for all, the Ministry's MTEF for 2024/25-2026/27 reported a budgetary allocation for the sector at KES.120.8 billion in 2020/21 FY, KES.129.8 billion in 2021/22 FY, and KES. 116.4 billion in 2022/23 FY.

Education in the Country is undergoing massive sector reforms following the replacement of the 8-4-4 curriculum with the Competence Based Curriculum (CBC). The Treasury reported that the approved total budget for education for FY 2020/21 - 2022/23 MTEF period increased from KES. 489,357M, to KES. 567,883.3M. During that same period, overall enrollments grew by 12.17%.

INVESTMENT

ENERGY, OIL AND GAS SECTOR

The country continues to invest progressively, in line with the Vision 2030 economic transformation blueprint. To begin with the energy sector, the Kenya Energy Transition & Investment Plan (ETIP) projects a rise from around 20 Mt CO2e in 2021 to around 130 Mt in 2050 in the Business As Usual (BAU) scenario, while the target points towards the Net Zero Energy Pathways. This steers the public and private sector investment in the energy sector.

According to the Ministry of Energy and Petroleum titled, Climate Investment Funds Renewable Energy Integration Program Investment Plan for Kenya, September 2023, Kenya's geothermal resource potential is estimated to be between 8,000 to 12,000 MW spread over 14 sites within the Rift Valley region, while only 940 MW generation capacity is utilized out of this. The same report estimates hydropower potential at 3000 – 6000 MW, with only 840 MW exploited already. The report highlights that Kenya's insolation rates averages 5-7 peak sunshine hours and an average daily insolation of 4-6 kWh/m2 whose 10-14% can be converted into electricity. Utilized solar power generation stands at 90 MW, with additional estimated 9 GWh generated at household level for domestic and light industrial appliances. The same report averages the country's potential wind farms with excellent wind speeds of 6m/s and above at 90,000 km2 at a total technical potential of 4,600 MW, with only 436 MW installed. Another potential source of energy, according to the Climate Investment Funds Renewable Energy Integration Program Investment Plan for Kenya, September 2023, is bioenergy, where there's an existing cogeneration capacity of 130 MW in sugar factories and the grid-connected 2 MW Biojoule capacity. With the projected increment in agricultural productivity, as well as the Municipal Solid Wastes, the bioenergy potential also shows huge promise.

According to EPRA report of 2022, the quantity of petroleum products imported into the country for local use through the OTS increased from 4,994,577 m3 in the financial year 2020/2021 to 5,539,884 m3 in the financial year 2021/2022. However, a total of 4,451,472.64 m3 was imported through OTS during the 2022/2023 period, reflecting a decrease.

Key public allocations for the energy sector in the FY 2023/24 Budget include:

Ksh 33.8 billion	National Grid System;
Ksh 11.4 billion	Geothermal Generation;
Ksh 12.1 billion	Rural Electrification;
Ksh 1.4 billion	Development of Nuclear Energy and Exploration and Mining of Coal
Ksh 3.2 billion	Alternative Energy Technologies

PRODUCTION/MANUFACTURING SECTOR

PRODUCTION / MANUFACTURING SECTOR

According to the KNBS Quarterly Gross Domestic Product Report for the Third Quarter, 2023, Credit advanced to enterprises in the manufacturing sector amounted to KES. 620.9 billion as at September 2023 compared to KES. 508.8 billion as at September 2022.

In the KAM's Manufacturing Priority Agenda (MPA), 2023, 4 thematic focus areas were highlighted as the key drivers to achieving the manufacturing agenda 20BY30. Key areas of focus included improving global competitiveness, promoting export led industrialization, promoting SME development, and industrializing agriculture.

- Kenya ranked position 115 out of 152 in the UNIDO's Competitive Industrial Performance (CIP) Index Report, 2020, lower than other competitor African countries but higher than its East African counterparts. The same report of 2023 ranked Kenya at number 108, showing promise for improvement.
- According to UNIDO, Kenya's export market share in the world was 0.03% in 2018 and accounted for 0% of high-technology manufactured goods. To promote this, KAM reports that the Government need to enhance domestic access, enhance EAC market access, diversify and increase international market access.
- SMEs are businesses whose annual turnover of between KES. 0-250 million, and locally, they account for about 24% of the country's GDP. The Government of Kenya, through the Executive Order No. 1 of 2023, created the State Department for Micro, Small and Medium Enterprises, charged with the responsibility of supporting the growth and development of MSMEs.

Key public allocations for the production / manufacturing sector, according to the FY 2023/24 Budget include:

Ksh 4.7 billion	Establishment of County Integrated Agro-Industrial Parks
Ksh 3.0 billion	Construction of EPZ Flagship Projects
Ksh 1.5 billion	Kenya industry and Entrepreneurship Project
Ksh 500 million	Development of SEZ Textile Park Naivasha
Ksh 250 million	Construction of an Effluent Treatment Plant - Kenanie

BUILDINGS SECTOR

This study centers around investments in housing development. Policy interventions in the building sector include the National Housing Development Fund (NHDF) established under section 7 of the Housing Act, 1953, and managed by the National Housing Corporation (NHC), where according to the PSC Report on Financial and Economic Analysis of the Affordable Housing Bill, 2023, as of September of the same year, a total of 433,189 Kenyans had registered on the platform with a total contribution of a total of KES. 451.6 million.

The second policy intervention was the creation of the Kenya Mortgage Refinancing Company (KMRC) in 2018 which began lending in 2020. By 2022, KMRC refinanced over 2,500 mortgage loans valued at KES. 6.8 billion at an average mortgage interest rate of 9.5% and an average maturity tenor of 9.9 years.

The third policy intervention was the creation of the Kenya Slum Upgrading, Low-Cost Housing and Infrastructure Trust Fund (KENSUF) in 2006 through Legal Notice No. 168 under the Government Financial Management Act No. 5 of 2004. The Fund has implemented various mega projects including the construction of 12,608 housing units at a cost of Ksh. 4.4 billion in Mukuru Slums, 462 houses at a cost of 1.1 billion in Mavoko SNP Athi River, and 822 houses at a cost of Ksh. 2.9 billion in Kibera Soweto East Zone A.

The fourth policy was the Civil Servants Housing Mortgage Fund established in 2004 with a mandate to provide loan facilities to civil servants for the purpose of either purchasing or constructing a residential house

Key public sector allocations for the housing sector, according to the FY 2023/24 Budget include:

Ksh 5.1 billion	Construction of Markets;
Ksh 5.0 billion	Kenya Affordable Housing Project (Kenya Mortgage Refinance Company);
Ksh 3.2 billion	Construction of Affordable Housing Units;
Ksh 5.6 billion	Kenya Informal Settlement Improvement Project – Phase II;
Ksh 1.0 billion	Construction of Housing Units for National Police and Kenya Prisons;
Ksh 7.2 billion	Kenyan Urban Programme (KenUP);
Ksh 3.3 billion	Construction of Social Housing Units

WATER AND SANITATION SECTOR

WATER AND SANITATION SECTOR

According to the KNBS Economic Survey Report of 2023, development funding for water supply reduced from KES. 46.5 billion in 2021/22 to KES 45.3 billion in 2022/23. Funding for Rural Water Supply and National Irrigation Authority is expected to jointly decline by 6.1 per cent in 2022/23.

Key public sector allocations for the water and sanitation sector, according to the FY 2023/24 Budget include:

Ksh 81.0 billion	Expand Access to Clean and Adequate Water for Domestic and Agricultural Use

TRANSPORTATION SECTOR

The FY 2023/24 budget brief points out that the Government will continue to invest in road infrastructure by completing all roads under construction and prioritizing upgrading and maintaining of rural access roads as well as improving road infrastructure in urban informal settlement and critical national and regional trunk roads that have the highest immediate economic impact. A budget of KES. 244.9 billion has been allocated in the FY 2023/24.

Key public sector allocations for the transportation sector, according to the FY 2023/24 Budget include:

Ksh 113.9 billion	Construction of Roads and Bridges;
Ksh 50.9 billion	Maintenance of Roads; and
Ksh 80.1 billion	Rehabilitation of Roads

For the rail and ports construction, the Government aims to intensify national connectivity through rail and port infrastructure to foster an enabling environment for economic recovery and inclusive growth. Connectivity to rail and ports aims to continue to open many areas to economic activities and spur growth in other sectors of the economy.

To continue improving rail transport and construction of ports, the following allocations have been proposed in the FY 2023/24:

Ksh 37.4 billion	Standard Gauge Railway
Ksh 2.6 billion	Dongo Kundu Special Economic Zone.
Ksh 727 million	Construction and expansion of airports and airstrips
Ksh 579 million	Rehabilitation of Locomotives
Ksh.500 million	Smart Driving License
Ksh 489 million	Development of Nairobi Railway City
Ksh 300 million	Acquisition of ferries for Lake Victoria

TRANSPORTATION SECTOR

AGRICULTURE SECTOR

The KNBS Economic survey of 2023 notes that there was a slowdown in the performance of agriculture, forestry and fishing activities in 2022 compared to 2021, with the poor performance attributed to crop and livestock production severely affected by the widespread drought experienced in 2022. The report notes that production of cash crops and export of horticultural produce varied during the review period, where the volume of coffee produced increased by 50.4 per cent to stand at 51.9 thousand metric tonnes in 2021/22. Similarly, the volume of cane deliveries increased by 11.5 per cent from 7.7 million metric tonnes in 2021 to 8.7 million metric tonnes in 2022, volume of tea produced declined from 537.8 thousand metric tonnes in 2021 to 535.0 thousand metric tonnes in 2022, volume of fruit exports increased by 11.2 per cent to stand at 130.5 thousand tonnes in 2022, volume of exported vegetables and cut flowers declined by 19.6 and 5.4 per cent, respectively, in 2022, while the volume of marketed milk declined by 5.9 per cent in 2022 to stand at 754.4 million litres in 2022 compared to 801.9 million litres in 2021.

The treasury reported that in FY 2023/24 budget, KES 49.9 billion was allocated to the agricultural sector as below:

Ksh 4.5 billion	Fertilizer Subsidy Programme;
Ksh 1.4 billion	Small Scale Irrigation and Value Addition Project;
Ksh 2.1 billion	Kenya Cereal Enhancement Programme;
Ksh 2.7 billion	National Agricultural and Rural Inclusivity Project;
Ksh 8.6 billion	National Agricultural Value Chain Development Project (NAVCDP);
Ksh 2.8 billion	Emergency Locusts Response;
Ksh 1.5 billion	Climate Smart Agricultural Productivity Project;
Ksh 1.3 billion	Enhance Resilience for Food Production and Nutrition security Programme;
Ksh 8.1 billion	Blue Economy Priority Projects;
Ksh 7.5 billion	Improve Livestock Production;
Ksh 350 million	Development of the Leather Industry Park;
Ksh 1.2 billion	Processing and Registration of Title Deeds
Ksh 893 million	Digitization and construction of Land Registries;

TELECOMMUNICATIONS SECTOR

According to the Ministry of Information, Communications and the Digital Economy Strategic Plan, 2023 – 2027, the implementation of the 2018-2022 strategic plan saw the sector achieving key milestones as highlighted below:

- finalized 6 policies and 7 Bills;
- Internet subscriptions increased from 41.1 million in June 2018 to 49.36 million in June 2023, while broadband subscriptions grew from 20.5 million in June 2018 to 33.32 million in June 2023;
- installed 8,900 Km of National Optic Fibre Network Backhaul Initiative (NOFBI);
- connected 443 Government buildings, 91 hospitals, 23 police stations and 8864 public secondary schools
- the proportion of the population covered by digital terrestrial television grew from 78% to 97.17% by 2023 against a target of 100% coverage;
- modernized 31 KNA Stations;
- provided 16,000 Digital Terrestrial Television (DTTV) and Broadcasting set-top boxes to 800 villages;
- disseminated 16,000 TV features and 76,000 News items.

Challenges faced included inadequate funding; low literacy levels and slow adoption of technologies; cyber threats and attacks and COVID-19 pandemic.

According to the report, the 2023 - 2027 strategic plan has identified seven Key Result Areas (KRAs) for implementation, to include policy, legal and institutional frameworks; digital superhighway, broadcasting and telecommunications infrastructure; digital government services and products; universal access to information; Business Process Outsourcing (BPO), IT Enabled Services (ITES) and local content development; governance, finance and human capital development; and cyber security, data management and Emerging technologies Further, specific strategic objectives and corresponding strategies have been developed for each KRA.

Public expenditure budget for the FY 2023/24 allocated KES. 15.1 billion for the sector, in the below schedule:

Ksh 4.8 billion	Horizontal Infrastructure phase 1 – EPCF for Konza
Ksh 1.2 billion	Konza Data Centre and Smart City Facilities;
Ksh 5.7 billion	Construction of KAIST at Konza Technopolis
Ksh 600 million	Government Shared Services
Ksh 475 million	Construction of Konza Complex Phase 1 B.
Ksh 1.3 billion	National Optic Fibre Backbone Phase II Expansion Cable
Ksh 583 million	Last Mile County Connectivity Network.

HEALTH SECTOR

HEALTH SECTOR

According to the Health Sector Report on the Medium-Term Expenditure Framework (MTEF) for the Period 2024/25 - 2026/27, December 2023, budgetary allocation for the Sector increased from Kshs.120.8 billion in 2020/21 FY to Kshs.129.8 billion in 2021/22 FY but then dipped to Kshs. 116.4 billion in 2022/23 FY. The actual expenditure for the period was Kshs.105.5 billion, Kshs.109.4 billion and Kshs.98.7 billion for 2020/21, 2021/22 and 2022/2023 financial years respectively.

According to the report, key milestones achieved by the budgetary allocation include:

- Reduction of Prevalence of HIV from 4.3% in 2020 to 3.7 in 2022;
- Developing new TB drugs, optimization of the existing ones, and developing, piloting and adopting a new malaria vaccine
- established a diagnostic and reporting centre at KNH
- operationalized an Oxygen plant with a capacity to produce 1,500 litres of oxygen per minute at Mwai Kibaki Hospital
- development and equipping the Chandaria Cancer and Chronic Diseases Centre (CCCDC) at Moi Teaching and Referral Hospital (MTRH)
- established an Integrated Molecular Imaging Center (IMIC) and IMIC Hospitality Centre at KUTRRH
- ramped efforts to for Covid-19 vaccination with 31.9% of adult population being fully vaccinated
- Establishment and equipping of the East Africa Kidney Institute (EAKI)
- construction of a National Commodity storage centre at KEMSA

Public expenditure budget for the FY 2023/24 allocated KES. 141.2 billion for the sector, with key allocations outlined as below:

Ksh 18.4 billion	Universal Health Coverage;
Ksh 5.9 billion	Managed Equipment Services
Ksh 4.1 billion	Free Maternity Health Care
Ksh 1.7 billion	Medical Cover for the Elderly and Severely Disabled in our Society
Ksh 21.6 billion	Kenyatta National Hospital
Ksh 12.8 billion	Moi Referral and Teaching Hospital
Ksh 8.8 billion	Kenya Medical Training College
Ksh 4.6 billion	Vaccines and Immunizations
Ksh 2.4 billion	Kenya National Hospital Burns and Paediatrics Centre
Ksh 2.5 billion	Construction and Strengthening of Cancer Centers
Ksh 24.8 billion	Global Fund (HIV, Malaria, TB)

EDUCATION SECTOR

EDUCATION SECTOR

The sector comprises basic education, technical vocational education and training, higher education and research, and teachers service commission. According to the 2023 Education Sector Report on Medium Term Expenditure Framework 2024/25 – 2026/27, during the FY 2020/21 - 2022/23 MTEF period, the approved total budget for education increased from Ksh. 489,357M, to Ksh. 567,883.3M. The Recurrent budget increased from Ksh 469,529M to Ksh 533,866.7M, while the Development Budget increased from Ksh 34,016.6M to Ksh 19,828M. In the same period, the total expenditure increased from Ksh. 471,008M to Ksh. 544,530.5M representing a 15.61% growth. Out of this, while the recurrent expenditure increased by Ksh 67,011.5 from Ksh 455,690M to reach Ksh 522,701.5M, development expenditure increased by only Ksh. 6,511 from Ksh 15,318M to Ksh 21,829M.

According to the report, notable milestones achieved by the sector included:

- Enrolment in Public Primary Schools grew from 8,592,810 in FY 2020/21 to 8,849,268 in FY 2021/22 before declining to 8,123,952 in FY 2022/23, due to transition of grade 6 learners to junior school in grade 7;
- Enrolment of learners with special needs increased from 132,466 in FY 2020/21 to 146,313 in FY 2022/23;
- All learners in public primary schools were supported by the government through capitation under the free primary education programme;
- Enrolment in Public Secondary Schools increased from 3,289,885 to 3,690,376, representing a 12.17% growth;
- Overall enrolment in Public TVET institutions depicted a positive trend having increased from 250,733 to 380,638 (51.81% change). At the same time, the number of trainees enrolled in TVET SNE institutions increased from 3,301 to 4,487;
- Enrolment in public and private universities increased by 11.72% from 571,510 in FY 2020/21 to 638,479 in FY 2022/23;
- increased its skilled workforce in public schools by recruiting 5,000 teachers in FY 2020/21 and FY 2021/22 and 13,000 teachers in FY 2022/23;

Public expenditure budget for the FY 2023/24 allocated KES. 628.6 billion for the sector, with key allocations outlined as below:

Ksh 77.8 billion	Free primary and Day Secondary Education (Including NHIF)
Ksh 25.5 billion	Junior Secondary School Capitation
Ksh 4.9 billion	School Feeding Programme
Ksh 4.8 billion	Recruitment of 20,000 Intern Teachers
Ksh 5.0 billion	Examinations Fee Waiver
Ksh 316.7 billion	Teachers Service Commission
Ksh 1.3 billion	Competency Based Curriculum (CBC) Training of Teachers
Ksh 6.0 billion	Primary and Secondary Infrastructure including classrooms for Junior Secondary Schools
Ksh 400 million	Digital Literacy Programme and ICT Integration in Secondary Schools
Ksh 30.3 billion	Higher Education Loans Board (HELB)
Ksh 97.5 billion	University Education
Ksh 749 million	Research, Science, Technology and Innovation

SECTION D: SECTORAL STUDY

SECTORAL SCORES

ELECTRICAL ENERGY, OIL AND GAS

B

Capacity of generating equipment, according to EPRA Biannual Report 2022/2023, is 3321.3 MW. Against the projected demand in the 10 yr. horizon, adopting the hybrid model energy projection of 3671 MW in 2033 (Least Cost Medium Term Power Development Plan, 2023- 2027) - Excellent

Capacity of transmission equipment at April 2023 (5928 MVA) against the projected demand in the 5 yr. horizon (2737 MVA). However, the underdevelopment of network redundancy paths / alternative routes has led to circumstances of power outages. Score – Fair

Capacity of distribution equipment at April 2023 (4669 MVA) against the projected demand in the 5 yr. horizon (2567 MW). However, the overloading in the distribution network due to longer distribution lines (from the substation) in the Western region has caused occasional shut off of the regional transmission lines, resulting to cascading effect in the national grid. Score – Fair

Emission control, resulting from power produced from renewable sources (87.42%) – Good

Household power accessibility (76.54% in 2021 according to the World Bank Collection of Development Indicators) – Good

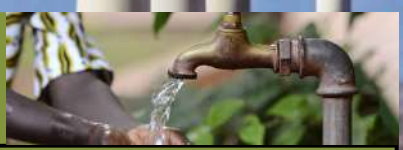
Power tariff compared to regional peers (Ethiopia, Egypt, Morocco, South Africa, Tanzania) – Poor

The Customer Average Interruption Duration Index – Fair.

Midstream, and downstream Oil and gas storage, market access – Excellent

Projection: The growing adoption of solar energy for domestic and captive use which could potentially reduce the regulator's electricity tariff revenues; greater adoption of electrical cars which would require new legislative provisions and infrastructural developments

WATER SUPPLY



C

According to WASREB Performance Report on Kenya's Water Service Sector, 2021/2022, water coverage in regulated areas was recorded at 62%. The same report estimated the access to clean and safe drinking water at 95%. This, when compared to the UNSDG's 2030 target of achieving universal and equitable access to safe and affordable drinking water for all - Fair

According to WASREB Performance Report on Kenya's Water Service Sector, 2021/2022, the average daily service hours improved marginally from 16 to 17, with all size categories recording an improvement, which was above the acceptable sector benchmark of 12 - Fair

SANITATION

D

According to the 2019 Census data, an estimated 7.4% of Kenyans practice open defecation, meaning that relative to 0% open defecation target, the score is - Good

According to WASREB Performance Report on Kenya's Water Service Sector, 2021/2022, Sewered Sanitation Coverage by WSP Category, was 16% against the recommended 80% - Fail

According to the UN 2021 Progress on Wastewater Treatment, Total household wastewater generated for Kenya was estimated at 831.778 million m3. Study by WHO on 2021 and UN-HABITAT Sustainable Development 6 Goal Monitoring estimates the total volume of household waste water safely treated at 77.996 million m3. Comparing this to the UNSDG's 2030 target of halving the proportion of untreated wastewater - Fail

According to the Environmental Management and Co-ordination (Waste Management) Regulations, 2023, Kenya generates an estimated 22,000 tons of waste per day (per capita production of 0.5 kg/head/day), translating to over 8 million tonnes annually. Ministry of Environment and Forestry's National Sustainable Waste Management Policy, 2021, estimates that only about 40% of the population in many parts of major cities receive waste management services. Comparing the per capita optimum target of 0.1 kg/capita/day in the UNSDG 2019 target, - Fail

The Ministry of Environment and Forestry's National Sustainable Waste Management Policy, 2021, notes that Kenya is an active participant in (i) The Basel Convention, 2000, addressing the need to control trans-boundary movement of hazardous wastes and their disposal, (ii) The Bamako Convention, that prohibits the import of any hazardous (including radioactive) waste into Africa, and (iii) The Stockholm convention, 2004,on persistent organic pollutants, (iv) The forth United Nations General Assembly (UNEA4 of 2019) resolution UNEP/EA/4/L.8on environmentally sound management of waste - Good

HEALTH

C

According to Kenya Health Facility Census Report, September 2023, mean availability of specialized services was 30%, pharmacy services at 62%, basic laboratory services at 83%, comprehensive laboratory services at 64%, reflecting an average score of - Fair

On the availability of core workforce, the national average of 20 core health workforce access per 10,000 people is below the recommended 23, score – Good

On the availability of core workforce, the national average of 20 core health workforce access per 10,000 people is below the recommended 23, score – Good

BUILDING SECTOR

C

The free online approval of building plans and construction permits by NCA eliminates approval bottlenecks in a great way. Score – **Good.**

According to the Centre for Affordable Housing Africa (CAHF), 2023, the average price of the cheapest newly constructed house in Kenya was US$. 7,111, cheapest among all the African nations under study. This can be translated to portray lower Construction Input Price Indices (CIPI). Score – **Good.**

According to the UN-HABITAT's Report titled, A Better Quality of Life for All in an Urbanizing World, 2023, 31.2% of the Kenyan population live in urban areas. The UN's SDR, 2023, estimates that 50.8% of the urban population live in informal settlements compared to UNSDG's target of 0%, Score - **Poor.**

The UN's SDR, 2023, also estimates that 60.2% of the urban population have access to clean water, against the UNSDG's target of 100%, Score - **Poor**.

EDUCATION

D

Learner-to-Teacher Ratios at Pre-Primary Level of Education in 2020 was 1:52, 1:41 at primary, and 1:29 at secondary level, against the recommended 1:40, Score – **Good**

Learner classroom ratio of 1:53 at pre-primary, 1:37 at primary level, 1:40 at secondary level, against the recommended 1:45, Score – **Fair**

Pupil to toilet ratio of 1:37 at pre-primary1:30 at primary level, 1:20 at secondary level, against the recommended 1:24.75, Score – **Poor**

Functional internet at 14.9 at pre-primary, Score – **Poor**

RAILWAY TRANSPORTATION

D

The SGR was designed to handle 20 million tonnes annually. This compared to the 6.29 million tonnes transported in the FY 2023, Score – **Fail.**

From reports, cargo transported via MGR increased from 787,000 tonnes in 2022 to 1,955,000 tonnes in 2023. This is projected to increase, with the procurement of new wagons.

The annual passenger transportation through the SGR was 2,727,727 in FY 2023.

Decarbonization strategy aimed at Electrifying SGR from Mombasa to Nairobi, shifting 30% of freight from Mombasa to Nairobi from road to rail, improving heavy-duty and light-duty truck efficiency. Score – **Poor.**

MARITIME TRANSPORTATION AND COMMERCIAL PORTS

B

From Kenya Ports Authority Report, Port of Mombasa has an annual capacity of handling capacity of 2.65 million Twenty-foot Equivalent Units (TEUs), Kisumu Port has an annual capacity of 15,000 TEUs. Other small ports along the Kenyan coasts supplements the port of Mombasa in handling fish, oil and gas, chemicals, while the Lamu Port with a capacity of 10,000 TEUs is envisioned to serve Northern Kenya. The Kenya's port capacity can handle the 2021 combined cargo throughput for Kenya and East Africa's landlocked nations of 2.4 million TEU (Trademark East Africa (TMA), 2021). However, the port capacity in its current state would throttle with the projected 5-year horizon demand of 2.7 million TEU. Score – **Excellent**

The condition of berthing equipment, reflected in the cargo handling capacity and waiting time. According to TMA's Northern Corridor Quarterly Performance Dashboard, January to March 2023, the Mombasa Port's current waiting time is 15 hrs, while the targeted time is 12 hr. Score – **Excellent**

According to the TMA Report, 2022, The Mombasa Port and Northern Corridor Community Charter stipulates average cargo dwell time at the port to be 48 hours by 2024. The TMA's Northern Corridor Quarterly Performance Dashboard, 2023, reported the average dwell time at 86 hours. Score – **Fail**.

Decarbonization strategy targeting to create shore power infrastructure at berths, and purchasing fuel-efficient engines. Score – **Fair**.

AIR TRANSPORTATION

D

Information obtained from KCAA showed that Kenya has a total of 470 aerodromes, privately and publicly owned. According to International Air Transport Association (IATA), Sustainability & Economics Q1, 2023, Kenya in terms of Air Connectivity Index (ACI) ranked position 76 out of 100 countries. Score - **Fail**

Information obtained from KCAA also showed that 84% of the KAA owned aerodromes runways are in good condition. Score – **Good**.

In terms of cargo handling, IATA ranked Kenya's facilitation of air cargo through its customs and borders' regulations ranks 69th out of 124 countries in terms of the Air Trade Facilitation Index (ATFI), while Kenya's passenger facilitation (3.1/10) scores slightly above the African average (3/10). Score – **Poor.**

Decarbonization strategy targeting to introduce certification policies based on the sustainable aviation charter. Score – **Fair**.

AGRICULTURE

C

551,000 acres put under irrigation, against the 1.913 million acres as per the National Water Master Plan 2030 (without enhanced storage) - **Fail.**

Agriculture roads dependent on RAI at 62.5% - **Poor**

According to International Food Policy Research Institute (IFPRI) publication titled Food Systems Transformation in Kenya, December 2023, the mechanization level of agriculture in Kenya was estimated at 0.14 hp/ha in 2019, relatively consistent with that in other major sub-Saharan African countries – **Fail**.

According to the 2023 Kenya's Economic Report, agriculture sector contribution to the Country's GDP in the FY 2022 /2023 was 21%, performance - **Excellent**

ROAD TRANSPORTATION

C

According to the UNSDG 2023 Report, a rural population of 64.4% of the rural population had access to all-season roads, against the recommended RAI of 100%. Score - **Fair**

According to the KRB's Road Inventory and Conditions Survey (RICS) in 2023, total length of roads in Kenya was estimated at 161,451 km. Paved roads were 18,603 km (2023) km while non paved were 157,596 km, reflecting a score of 3.4 km/10,000 inhabitants. Compared to the World Bank's average for developing countries of 4.7 km/10,000 inhabitants - **Fair**

National Road Safety Action Plan 2023-2027, the ministry of roads aims to reduce road fatalities to a minimum 50% reduction in deaths and serious injuries in designated high-risk demonstration corridors and urban areas, measured from a 2022 baseline. in 2023, there were reported 3609 fatalities from road accidents, reflecting a mortality rate of 65 killed/1 million inhabitants, which compared to the 2022 baseline of 4690 (87 killed/1 million inhabitants) reported fatalities. Performance - **Poor**

The absence of proper policy framework for addressing poor fuel quality, aging vehicle fleet, and mandatory roadworthy emission tests have contributed to increased transport emissions, especially in urban centres. However, climate change sensitization campaigns have seen the improvement of green transport initiatives among the sector players. Score - **Poor**

PRODUCTION / MANUFACTURING

D

The KAM targets 20% contribution to the GDP on full implementation of the industry's 20BY30 agenda. This compares closely to China's manufacturing sector contribution to the Country's GDP at 28.4%.

According to the 2023 Kenya's Economic Report, manufacturing sector contribution to the Country's GDP in the FY 2022 /2023 was 7.8%, performance - **Fail**

Development of industrial spaces, with favourable investment incentives, ongoing. Athi River EPZ operational; construction of Sagana EPZ commenced, Del Monte EPZ land set aside, construction of Egerton Agro Industrial Parks commenced, plans for the construction of Uasin Gishu ICDC and Nasewa EPZ at advanced stages. Plans also underway to create County Aggregation and Industrial Parks in all counties. Score - **Fair**

Kenya Bureau of Standards tasked with the responsibility of enforcing quality standards in the manufacturing sector, with an aim of achieving international quality standards for the locally produced goods, as well as the imported raw materials and finished products - **Fair**

TELECOMMUNICATIONS

B

According to Communications Authority of Kenya's First Quarter Sector Statistics Report Financial Year 2023/24, mobile penetration in Kenya stood at 67.1%. When compared to the global Superpowers like the USA, France, UK, Germany at above 80%, Average score – **Fair**

The Ministry of Information, Communications and the Digital Economy in the 2023 – 2027 strategic plan notes that the National Optic Fibre Backbone Infrastructure (NOFBI) The Ministry installed 8,900 Km of National Optic Fibre Backbone Infrastructure against the targeted 9,500 Km. Score – **Excellent**

The report notes that Last Mile Country Connectivity Project (LMCCP) connected 443 Government buildings, 91 hospitals and 23 police stations to the government backbone network in the Counties for enhanced service delivery. Score - **Good.**

Provision of Broadband Connectivity to schools under Universal Service Obligation so as to increase access to internet services and e-learning, the Ministry connected 884 public secondary schools out of the targeted 896. Score - **Good**.

County	Energy, Oil, and Gas	Production / Manufacturing	Building	Water Supply	Sanitation	Roads	Aerodromes	Railway	Agriculture	Telecoms	Health	Education	AVERAGE PERFPRMANCE INDEX PER COUNTY
Mombasa	B	A	E	C	A	A	D	C	E	B	A	C	C
Kwale	C	E	E	E	D	C	C	A	E	B	B	C	D
Kilifi	C	D	E	B	B	D	E	E	E	B	B	C	D
Tana River	D	E	E	E	E	E	D	E	E	B	C	B	D
Lamu	B	E	E	D	B	E	D	E	E	B	A	B	D
Taita Taveta	B	E	E	C	A	D	E	A	E	B	A	B	C
Garissa	D	E	E	E	D	E	E	E	E		C	C	E
Wajir	E	E	E	E	E	E	E	E	E		C	C	E
Mandera	E	E	E	D	D	E	E	E	E		C	C	E
Marsabit	D	E	E	E	E	E	C	E	E	C	B	B	D
Isiolo	D	E	E	D	D	E	C	E	E	C	B	B	D
Meru	C	E	E	D	A	B	E	E	A	B	C	B	C
Thakara – Nithi	D	E	E	C	A	B	E	E	E	B	A	B	D
Embu	C	E	E	B	A	B	D	E	E	B	B	B	C
Kitui	C	E	E	C	A	C	E	E	D	C	C	B	D
Machakos	B	B	E	D	A	B	E	C	D	B	B	B	C
Makueni	C	E	E	C	A	B	D	A	E	C	C	B	C
Nyandarua	C	E	E	D	A	A	E	D	C	B	B	B	C
Nyeri	B	E	E	B	A	A	E	D	D	C	B	B	C
Kirinyaga	B	E	E	C	A	A	E	E	D	B	B	B	C
Murang'a	C	E	E	B	A	A	E	D	C	B	B	B	C
Kiambu	A	B	D	B	A	A	E	C	C	B	A	B	B
Turkana	E	E	E	E	E	E	A	E	E	B	D	D	D
West Pokot	E	E	E	E	E	C	E	E	E	C	D	C	E
Samburu	E	E	E	C	E	D	D	E	E	C	B	B	D
Trans Nzoia	C	E	E	E	A	C	E	E	D	B	C	C	D
Uasin Gishu	B	E	E	D	A	A	E	E	D	B	B	B	C
Elgeyo Marakwet	C	E	E	D	A	B	E	E	D	C	C	B	D
Nandi	C	E	E	E	A	A	E	E	C	C	C	B	D
Baringo	C	E	E	E	A	D	E	D	E	C	C	B	D
Laikipia	C	E	E	C	A	B	D	E	E	C	A	B	C
Nakuru	B	D	E	C	A	B	E	C	B	B	C	B	C
Narok	C	E	E	E	A	D	A	E	C	B	D	B	D
Kajiado	B	E	C	D	A	D	C	A	E	C	A	B	C
Kericho	C	E	E	E	A	A	E	D	D	B	B	B	C
Bomet	C	E	E	E	A	A	E	E	C	C	C	B	D
Kakamega	C	E	E	D	A	A	E	D	C	B	C	C	C
Vihiga	C	E	E	E	A	A	E	E	E	C	B	B	D
Bungoma	C	E	E	E	A	A	E	D	C	B	C	C	D
Busia	C	E	E	D	A	A	E	E	E	B	C	C	D
Siaya	B	E	E	C	A	A	E	E	E	B	C	C	D
Kisumu	B	D	E	C	A	A	E	D	E	B	B	B	C
Homa Bay	B	E	E	E	A	A	E	E	D	B	B	B	D
Migori	C	E	E	E	A	B	E	E	D	B	C	C	D
Kisii	C	E	E	D	A	A	E	E	C	B	B	B	C
Nyamira	C	E	E	E	A	A	E	E	D	B	B	B	D
Nairobi	A	A	B	B	A	A	C	B	E	A	A	C	B

DEATAILED SECTORIAL STUDY

ENERGY, OIL AND GAS SECTOR

INSTITUTIONAL STRUCTURE

The energy sector in Kenya is governed by the Constitution of Kenya, 2010 (CoK), the Energy Act, 2019, and other regulatory instruments that may be in place from time to time. The sector has advanced in electricity generation, transmission, distribution, and retailing. This arises from the implementation of various reforms, notably the Electric Power Act of 1997, Sessional Paper No. 4 of 2004, the Energy Policy of 2018, and the Energy Act of 2019. The Energy Act, 2019 repealed the Energy Act, 2006, the Kenya Nuclear Electricity Board Order No.131 of 2012 and the Geothermal Resources Act, 1982. The reforms in the energy sector have seen a complete re-organization of functions, driven by the need to place responsibilities on specific institutions that would specialize in the mandate vested on them to enhance efficiency. The institutional structure in the electricity sub-sector in Kenya comprises the following:

Sector	Role
Kenya Electricity Generating Company (KenGen)	Manages and develops all public power electricity generating facilities
Kenya Renewable Energy Portal	Provide easy access to relevant information about administrative entry requirements and procedures for operating a power plant based on renewable energy, the legal and regulatory framework for such investments (e.g., tariff regulation) and relevant market information.
Independent Power Producers (IPPs)	build, own and operate power stations and sell the power to local service providers
Energy & Petroleum Regulatory Authority (EPRA)	Energy & Petroleum Regulatory Authority (EPRA) Reviews electricity tariffs and enforces safety and environmental regulations in the power sector
Ministry of Energy	Formulates policy on the energy sector
Rural Electrification and Renewable Energy Corporation (REREC)	Implements rural electrification projects
Kenya Electricity Transmission Company (KETRACO)	Mandated to construct new transmission lines with government funding.
Geothermal Development Company (GDC)	Develops steam fields to reduce upstream power development risks to promote the rapid development of geothermal electric power.
Kenya Nuclear Electricity Board (KNEB)	Tasked with driving the nuclear energy generation programme for Kenya.
Kenya Power and Lighting Company PLC	Owns and operates most of the electricity transmission and distribution system in the country and sells electricity to end consumers
Geothermal Development Company (GDC)	GDC is a fully owned Government Special Purpose Vehicle (SPV) to undertake surface exploration of geothermal fields; exploratory, appraisal, and production drilling; managing proven steam fields, early generation and selling steam to investors.

ELECTRICITY SECTOR IN KENYA

Sector development

EPRA Energy Petroleum Statistics Report for the financial year ended 30 June 2023, indicated that in the electricity supply sector, the real Gross Value Added (GVA) grew by 4.9% in 2022 compared to 5.3% in 2021. The growth was mostly attributed to the increase in total electricity generated from 12,126.7 GWh in 2021 to 12,669.4 GWh in 2022. Despite the increased prices in the energy sector and high inflationary pressure, electricity consumption increased from 12,652.74 GWh in the previous review period to 13,289.63 GWh and a peak demand of 2,149MW

Installed capacity

In the financial year ended 30th June 2023, the installed grid-connected capacity increased by 275MW to stand at 3,311.1MW representing an increase of 7.46%. This was attributed to the commissioning of the 35MW Sossian Geothermal power plant in Menengai, the 40MW Alten Solar Photovoltaic plant in Kesses and the importation of 200MW from Ethiopia via the Kenya-Ethiopia High Voltage Direct Current (HVDC) transmission line. Geothermal and hydro accounted for 51.66% of the total installed capacity, while the share of solar and wind generation increased to 22.87% reads the EPRA, Energy Petroleum Statistics Report for the financial year ended 30 June 2023.

EPRA Energy Petroleum Statistics Report, 2023 indicated that the 310MW Lake Turkana Wind Power (LTWP) plant which is the largest wind power plant in the country; The 225MW Gitaru hydro-electric plant and the 220MW Olkaria 1AU Geothermal plant are the largest hydro and geothermal plants respectively; while Garissa Solar Plant is the largest solar power plant in the country at 50MW.

Captive generation (own-use generation) increased to 402.3MW on the backdrop of growing interest in own-use generation by commercial and industrial consumers. This accounts for 10.83% of total installed capacity. Solar photovoltaic generation was the most preferred mode of captive generation accounting for 38.5% of the total installed captive capacity. Bioenergy (biomass, bagasse and biogas) and waste heat recovery generation followed representing 26.3% and 20.7% respectively. The 55 MW Devki Steel Mills waste heat recovery plant in Kwale County is the largest captive generation plant. (EPRA Energy Petroleum Statistics Report, 2023)

Electrical Energy Generated

Electrical energy generated refers to energy that was delivered to the national grid by the various power producers in the country.

The total electrical energy generated grew by 5.03% from 12,652.74GWh in the 2021/2022 financial year to 13,289.63GWh in the review period. Geothermal energy generated increased by 21.84 % from 4,953.15 GWh to 6,035.00 GWh. The increase is attributed to additional geothermal capacity from Olkaria 1 Unit 6 and the Sossian Geothermal plants. The decrease in hydro generation was compensated by energy imports from the Ethiopia- Kenya HVDC link, wind and solar resources. Electricity imports increased by 90.83% while wind and solar generation increased by 7.28% and 41.84 % respectively. The increase in solar generation is attributed to the additional capacity from Alten Solar Plant in Kesses. The generation from thermal plants decreased by 15.31 % following increased energy imports and the lapse of power purchase agreement for Muhoroni Gas Turbine Power Plant. (EPRA Energy Petroleum Statistics Report, 2023)

Table A comparison of energy generated between the financial year 2021/2022 and 2022/2023

Technology	2021/2022	2022/2023	% Change
Hydro	3,348.71	2,569.18	-23.28%
Thermal	1,647.75	1,395.49	-15.31%
Wind	2,052.26	2,201.72	7.28%
Geothermal	4,953.15	6,035.00	21.84%
Bagasse/Biogas	0.38	0.21	-44.83%
Imports	337.50	644.07	90.83%
Solar	312.99	443.95	41.84%
Total	12,652.74	13,289.63	5.03%

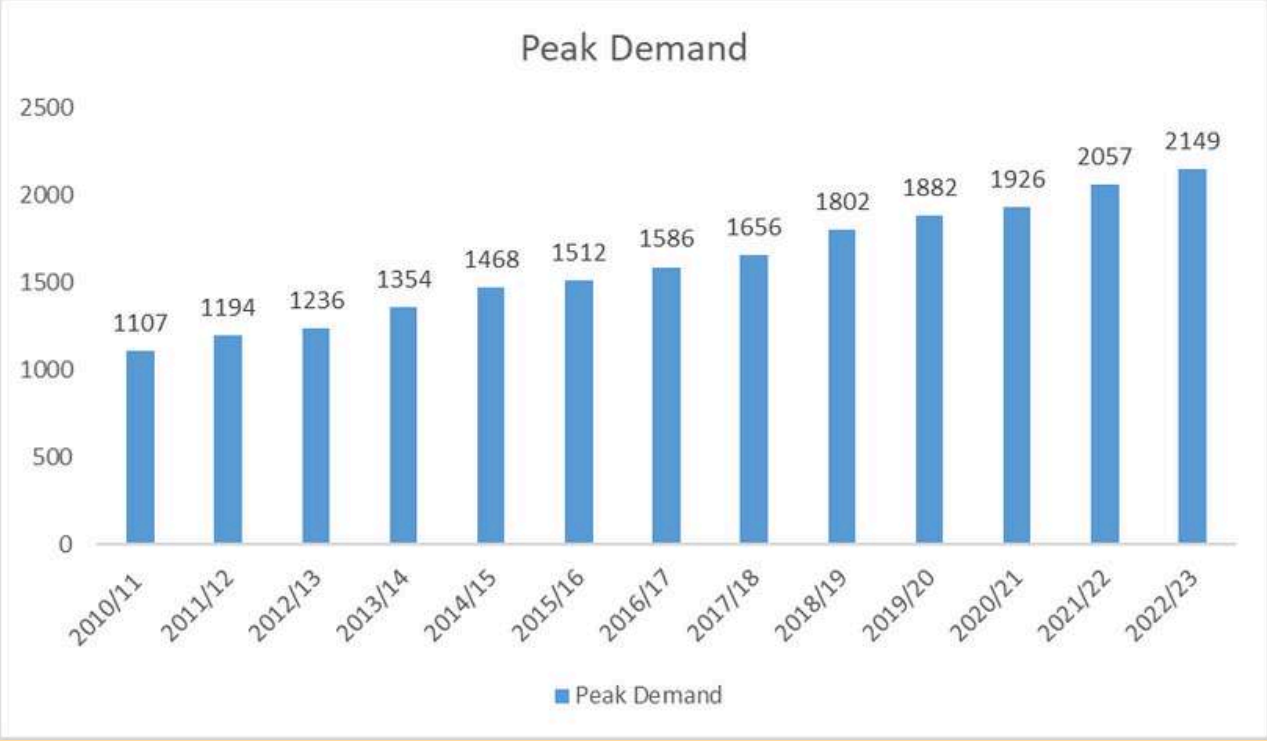
Source: EPRA energy & petroleum statistics report for the financial year ended 30th June 2023

Electricity Monthly Peak Demand

Peak demand is a measure of the highest load demand in the interconnected network for a specified period. It occurs between 2000hrs and 2030hrs in the Coastal region and 1930hrs and 2000hrs for the rest of the country. The peak demand for the year under review was 2,149 MW which was recorded on 14th December 2022. In comparison, the peak demand for the previous financial year was 2,056.67 MW indicating a 4.5% growth. (EPRA Energy Petroleum Statistics Report, 2023)

The peak demand has registered a consistent year-on-year growth since 2010. The increase in peak demand has a positive correlation with GDP growth. Other contributing factors include increased connectivity where previously underserved areas were brought into the national grid. Garissa and Lamu, for instance, were previously served with off-grid thermal generators but were connected to the national grid during this period.

2010 /11	2011 /12	2012 /13	2013 /14	2014 /15	2015 /16	2016 /17	2017 /18	2018 /19	2019 /20	2020 /21	2121 /22	2022 /23
1107	1194	1236	1354	1468	1512	1586	1656	1802	1882	1926	2057	2149



Source: EPRA energy & petroleum statistics report for the financial year ended 30th June 2023

Electricity Reliability Indices

Reliability indices are metrics that measure the reliability of a power system. They give a measure of how often power supply is interrupted and for how long the interruption lasts. These indices comprise:

- Customer Average Interruption Duration Index (CAIDI)

This index measure the average outage duration in hours that interrupted customers in a power system experience and is calculated as;

$$CAIDI \frac{Sum\ of\ customer\ interruption\ durations\ per\ reporting\ period}{Total\ number\ of\ customers\ interrupted\ per\ reporting\ period}$$

- The System Average Interruption Duration Index (SAIDI)

SAIDI is the average outage duration in hours for each customer served. It describes how long, on average, each customer was without power in the reporting period. SAIDI is calculated as;

$$SAIDI = \frac{Sum\ of\ all\ customer\ interuptions}{Total\ Number\ of\ \ customers\ served\ per\ reporting\ period}$$

- - The System Average Interruption Frequency Index (SAIFI)

Is the average number of interruptions that any given customer experiences, and is calculated as:

$$SAIFI \frac{Total\ Number\ of\ customers\ interupted\ per\ reporting\ period}{Total\ number\ of\ customers\ served\ per\ reporting\ period}$$

Figure Trend in the reliability indices in the period ended 30th June 2023

	July 22	Aug 22	Sep 22	Oct 22	Nov 22	Dec 22
CAIDI (Hrs)	**2.29**	**2.18**	**2.32**	**1.96**	**2.36**	**2.36**
SAIDI (Hrs)	**6.9**	**6.07**	**6.68**	**6.76**	**10.63**	**8.5**
SAIFI	3.05	2.78	2.88	3.45	4.51	3.61
	Jan 23	**Feb 23**	**Mar 23**	**Apr 23**	**May 23**	**Jun 23**
CAIDI (Hrs)	2.14	1.54	2.78	2.26	2.55	2.3
SAIDI (Hrs)	**7.65**	**8.47**	**12.75**	**9.97**	**9.88**	**6.22**
SAIFI	3.58	5.51	4.59	4.41	3.87	2.71

Source: EPRA Energy Petroleum Statistics Report, 2023

The Customer Average Interruption Duration Index (CAIDI) for the period under review averaged 2.25hrs per month. The longest outage was 2.7hrs per customer and was recorded in March 2023 while the shortest outages per customer was recorded the preceding month at 1.54hrs. On average customers lacked power for 8.37 hrs per month. This index was highest in November 2022 (10.63hrs) and March 2023 (12.75) due to system disturbances that resulted in national blackouts. (EPRA Energy Petroleum Statistics Report, 2023)

On average, customers experienced an average of 3.75 outages per month during the year under review. Just like SAIDI, SAIFI was highest in the months of November 2022 and March 2023 due to the system-wide blackouts that were experienced in those months.

Electricity Access

Access to electricity refers to the share of the population having the possibility to access electricity. Between July 2022 and June 2023, a total of 280,624 new customers were successfully connected to the grid. This noteworthy achievement contributed to a 2% increase in the total number of connected customers, which rose from 8,919,584 as of June 2022 to a total of 9,212,581 customers. The expansion of the customer base was primarily attributed to the ongoing densification of the national grid and the effective implementation of the Last Mile Connectivity Program (LMCP).

2018	2019	2020	2021	2022	2018	2019
61.18	69.7	71.49	76.54		61.18	69.7

Source: EPRA energy & petroleum statistics report for the financial year ended 30th June 2023

The Kenya Off-Grid Solar Access Project for Underserved Counties (KOSAP) is the World Bank's energy sector's contribution to NEDI, and is being implemented by the Ministry of Energy and Petroleum (MoEP), Kenya Power and Lighting Company (KPLC), and the Rural Electrification Authority (REA), with support from Lighting

EPRA Energy Petroleum Statistics Report, 2023 noted that the North and North Eastern regions of Kenya, however, are lagging behind, with much lower penetration of off-grid solar than the Kenyan average. These regions are also scoring much lower on a number of development indices, for example; poverty levels are at 70%, while electricity access is only at 7%. In light of this disparity, the World Bank launched the North & North Eastern Development Initiative (NEDI) to increase investments to the region and complement the ongoing government efforts to improve equity as well as reduce extreme poverty. The Kenya Off-Grid Solar Access Project for Underserved Counties (KOSAP) is the World Bank's energy sector's contribution to NEDI, and is being implemented by the Ministry of Energy and Petroleum (MoEP), Kenya Power and Lighting Company (KPLC), and the Rural Electrification Authority (REA), with support from Lighting Africa, between 2018 – 2023, in fourteen counties.

Areas of implementation The 14 counties where KOSAP is being implemented (Garissa, Isiolo, Kilifi, Kwale, Lamu, Mandera, Marsabit, Narok, Samburu, Taita Taveta, Tana River, Turkana, Wajir, and West Pokot) collectively represent 72 percent of the country's total land area and 20 percent of the country's population. Their population is highly dispersed, at a density four times lower than the national average. There are profound infrastructure deficits, including lack of access to roads, electricity, water, and social services.

Electricity Transmission Infrastructure

Transmission refers to the bulk transfer of electrical power/energy from its point of generation to just near its point of use, after which distribution takes over. Due to the often-lengthy distances involved, transmission is conducted at high voltages to minimize power losses. Specifically, high voltage is defined as voltages equal to or exceeding 66kV. However, for the scope of this report, we will focus on transmission at voltages exceeding 132kV, as 66kV is primarily utilized for primary distribution within the Nairobi region.

As of June 2023, Kenya's high voltage transmission infrastructure comprised a total of 97 transmission lines, covering an extensive circuit length of 9,177km. While no new transmission lines were commissioned during the review period, significant progress was made in completing the pending work at the Suswa Converter Station, enabling the energization of the 500kV Ethiopia-Kenya HVDC transmission line.

Transmission lines in Kenya are operated at 132kV, 220kV, 400kV and 500kV. These lines are owned by either KETRACO or KPLC. There are ve (5) 400kV transmission lines, twenty-two (22) 220kV lines and sixty-nine (69) 132kV lines. KPLC owns 56 of these transmission lines while KETRACO owns 41. Among the five (5) 400kV transmission lines, only the Suswa-Isinya line currently operates at its rated voltage, with the other four operating at 220kV until the completion of works at their terminal substations. Table 2.8 shows the number of lines owned by each utility at each voltage level.

Regional peak loads in 2023

REGION	PEAK LOADS	
	MW	MVAr
Nairobi	1108.8	351.3
Coast	358.8	111.1
Mt. Kenya	236.1	72.4
Central Rift	212.6	64.2
North Rift	93.6	36.8
Western	210.6	65.7

Source: KETRACO, 2023

Challenges with the Transmission Network

Equipment/ Substation/Lines	Remarks	Cause
Juja-Dandora lines	Highly loaded at Peak.	Increased demand
Suswa-N/North lines	Highly loaded normally.	The line has less resistance
Muhoroni-Chemosit line	Highly loaded at Peak.	Increased demand
Kisumu-Muhoroni line	Highly loaded at peak.	Increased demand
Garissa 132kV busbar	Over voltages	Low demand
Bomet transformer	Highly loaded at Peak.	Increased demand
Turkwel-Lessos	Curtailment of generation to accommodate the solars from Selenkei	Limited transformation capacity at Lessos
Kibos substation	Normally very high voltages with no reactive power control equipment especially at night and low demand days	Lack of termination at Lessos
System Frequency	Regulation challenges	Increased integration of Variable Renewable Energy generation and inadequate spinning reserve
Coast Region TLs and substations	Severe voltage swings	System disturbances, especially during low demand periods, and operation of static reactors.
Nanyuki Substation	Very low voltages in the evenings and at peak	Increased demand

Source: KETRACO, 2023

Regional Interconnectors

The purpose of regional power interconnectors is to facilitate regional power trade through the access of cheaper power from, and export of excess power to neighbouring countries. The first regional power interconnection between Kenya and a neighbouring country was done in 1955; the Kenya-Uganda 132kV line which connected the power generation at the Owen Falls Hydroelectric power station with the load centres in Kenya, traversing through Tororo, Musaga, Lessos, Lanet and Nairobi. Currently there are four interconnectors (https://renewableenergy.go.ke/resources/power-transmission-and-distribution-system/)

Kenya-Uganda Interconnector

Also known as the Lessos-Tororo transmission line, this project with a capacity of 1,200MW linking Kenya to Uganda, and further to Rwanda, Burundi and Eastern part of DR Congo. This new Kenya-Uganda link is expected to increase the power transfer capacity between the two countries to 350MW.(KETRACO)

Kenya-Ethiopia Power interconnection

A 1045km long 500kV DC transmission line with a power transfer capacity of 2,000MW is at an advanced stage of implementation. The line, with 612km in Kenya, originates from Welayta Sodo in Ethiopia and terminates at Suswa in Kenya. (KETRACO https://renewableenergy.go.ke/resources/power-transmission-and-distribution-system/)

Kenya-Tanzania Power Interconnection

This interconnection starts from our Isinya substation south of Nairobi and passes through Arusha before terminating at Singinda in Tanzania. It is will be operated at 400kV and have a power transfer capacity of at least 1600MW. (KETRACO, https://renewableenergy.go.ke/resources/power-transmission-and-distribution-system/)

Nile Equatorial Lakes Subsidiary Action Program (NELSAP) Power Interconnection

The project which is being implemented under the umbrella of the Nile Basin Initiative will add a new 220kV line from Lessos to Bujagari Hydropower station in Uganda and also interconnect Uganda, Rwanda, Burundi and Eastern Democratic Republic of Congo. The Kenyan transmission line component is to be constructed at 400kV rating.

Electricity Regulatory Index (ERI) 2022 Performance

The African Development Bank (AfDB) Electricity Regulatory Index (ERI) measures the level of development of elec¬tricity sector regulatory frameworks in African countries and the capacity of regulatory authorities to effectively carry out their relevant functions and duties.

The ERI is made up of three pillars or sub-indices: The Regulatory Governance Index (RGI); the Regulatory Substance Index (RSI); and the Regulatory Outcome Index (ROI). The Regulatory Governance Index (RGI) assesses the level of development of the legal and institutional set up of the regulatory framework of a country. The Regulatory Substance Index (RSI) assesses how the regulator has operationalized the mandate bestowed on it by the RGI in developing and implementing key regulatory instruments and frameworks for the sector. The Regulatory Outcome Index assesses the outcomes of regulatory decisions, actions and processes on the sector from the perspective of regulated entities.

The ERI assessment has been undertaken for the last five (5) years from 2018 to 2022. Kenya emerged position 5 in the 2022 edition, which featured 43 out of 45 countries with established regulatory authorities. Kenya has participated in the ERI study for the last five years and has consistently ranked among the top 5 countries. This can be attributed to a robust legal and regulatory framework. Table 2.10 shows a summary of the performance of the top ten (10) countries in 2022.

COUNTRY	RGI	RSI	ERIGS	ROI	ERI	RANK
Uganda	0.944	0.975	0.959	0.747	0.846	1
Egypt	0.804	0.850	0.827	0.745	0.785	2
Senegal	0.714	0.783	0.748	0.674	0.710	3
Ghana	0.738	0.870	0.804	0.625	0.709	4
Kenya	0.920	0.880	0.900	0.537	0.695	5
Zimbabwe	0.733	0.655	0.694	0.678	0.686	6
Tanzania	0.915	0.937	0.926	0.493	0.675	7
Sierra Leone	0.815	0.599	0.707	0.612	0.658	8
Algeria	0.832	0.699	0.765	0.542	0.644	9
Liberia	0.825	0.501	0.663	0.595	0.628	10
COUNTRY	RGI	RSI	ERIGS	ROI	ERI	RANK

Table 2.10: Electricity Regulatory Index 2022 Ranking
Source: AfDB, ERI Report 2022

Electricity sector performance in the East African Community (EAC)

Installed capacity

As of June 2023, the East African Community (EAC) boasted a total installed capacity of 7,252MW. This marked a significant increase of 503MW, representing a robust 7.3% growth from the 6,794MW recorded in December 2022. Notably, the region's installed capacity had already grown by 6.82% between December 2021 and December 2022, indicating a notable increase in investment within the region's energy sector. Kenya held the distinction of possessing the highest installed capacity in the region, with a total of 3,311MW, constituting 46% of the entire regional installed capacity. Tanzania and Uganda followed closely, contributing 25.53% and 22.06%, respectively. In the first half of the year ending on June 30, 2023, both Kenya and Uganda demonstrated the most substantial improvements in installed capacity, with Kenya adding 235MW and Uganda contributing 201MW. In the same period, Tanzania and Rwanda increased their installed capacity by 39MW and 20MW, respectively, while Burundi and Zanzibar's installed capacity remained unchanged.

The region's installed capacity is anticipated to experience exponential growth with the completion of flagship generation projects, notably the 2,115MW Julius Nyerere Hydroelectric Power plant in Tanzania and the 600MW Karuma Hydroelectric Power plant in Uganda. These developments are poised to significantly enhance the region's energy generation capabilities.

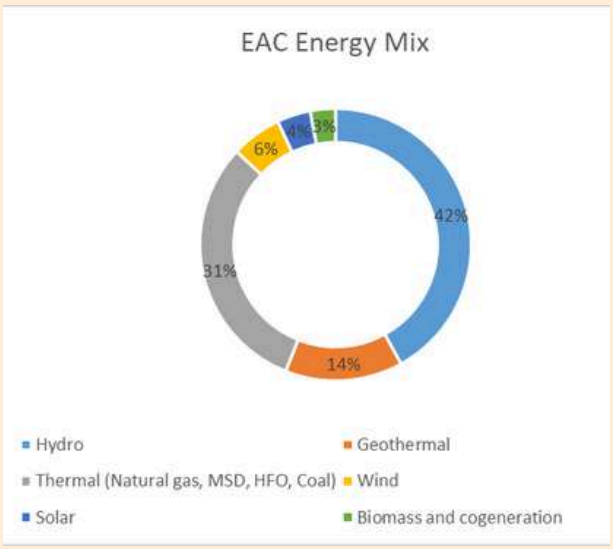
Peak Demand in EAC

The region's peak demand at June 2023 was 4,680MW. This is an increase of 173MW from the peak demand recorded in 2022 and a 547MW increase from the peak demand in 2021. The increase in peak demand signifies increase in electricity usage and may be directly related to electricity access or economic activity. Kenya and Tanzania are the only countries in the region with peak demand exceeding 1,000MW. Kenya leads the region with a peak demand of 2,149MW with Tanzania a distant second at 1,470MW.

Energy mix within the EAC

As of June 30, 2023, the energy mix within the East African Community (EAC) was primarily composed of renewable sources, accounting for 69%. Within this renewable category, hydropower was the dominant source, contributing a substantial 41% to the installed generation capacity. Notably, Uganda, Rwanda, and Burundi primarily relied on hydropower for their electrical energy needs, with Uganda boasting the highest proportion of hydropower at 81.2% of its total installed capacity. Thermal generation stood as the second most prevalent mode of generation, comprising 31% of the region's energy mix. It played a pivotal role in Tanzania, where it accounted for a significant 68% of the country's total installed capacity and 58.6% of the entire thermal installed capacity in the region.

Tanzania's rich deposits of Natural Gas serve as a valuable resource for power generation. Geothermal energy contributed 14% to the total installed capacity, with Kenya being the exclusive source of this resource within the region. Geothermal power was the primary source of energy in Kenya, showcasing its unique position in this regard. Although geothermal exploration has taken place in all EAC countries, Kenya remains the sole nation with a commercially viable geothermal resource in the region. The adoption of renewable energy technologies such as wind and solar played an essential role in the region, representing 10% of the total installed capacity. Notably, 86% of this capacity was located in Kenya. Biomass and cogeneration jointly accounted for 3% of the installed capacity within the region. Uganda led in this category with 135MW, followed by Rwanda with 85MW.



Source: EPRA energy & petroleum statistics report for the financial year ended 30th June 2023

Domestic power distribution

The Kenya Power and Lighting Company PLC (Kenya Power) owns and operates most of the electricity transmission and distribution system in the country and sells electricity.

The Economic Survey 2023, KNBS reported that total domestic demand for electricity increased by 4.6 % to 10,008.4 GWh in 2022 and local electricity generation increased by 4.5% to 12,669.4 GWh in 2022, while imports of electricity increased by 9.7% to 316.0 GWh, in the same period.

Total electricity demand increased from 12,414.7 GWh in 2021 to 12,985.4 GWh in 2022. Domestic electricity demand increased by 4.6% to 10,008.4 GWh in 2022. Sales to domestic and small commercial consumer rose by 5.0 % to 4,291.5 GWh in 2022, while sales to the street lighting declined by 5.4% to 94.2 GWh in 2022. Transmission and distribution losses amounted to 2,955.7 GWh, accounting for 29.5% of total domestic electricity generation in 2022

The pricing model is take-or-pay pricing model for Power Purchase Agreements (PPA) that factors in the fixed capacity charges or deemed energy generation, which is currently unfavorable to the off-taker in the absence of the anticipated demand growth. The un-realized sales have consistently resulted into lower-than expected revenues, leading to eroded financial performance for the off-taker. Due to lower -than expected demand growth, the off-taker is pursuing rescheduling of planned generation capacity projects to obtain an optimal power demand-supply balance.

The table shows tariff rates from 2018 to 2023. The prices have been on the rise making costs be higher.

Category	Tariff rates 2018 Ksh/Kwh	Current tariff April 2023 Ksh/Kwh
Domestic customer 30-100 KWh	21.99	26.10
Domestic customer category >100 kWh	27.92	31.75
Category	Tariff rates 2018 Ksh/Kwh	Current tariff April 2023 Ksh/Kwh

Source: Kenya Power and Lighting Company

Greenhouse Gas Emissions

The Kenya National Bureau of Statistics Economic Survey of 2023, indicated that 87.5 percent of all electricity generated in the country is from renewable sources. Data from the Energy and Petroleum Regulatory Authority 2022 indicate that Kenya Power and Lighting Company (KPLC) has 8,837,978. of 100kWh and below from a projected population of about 55 million representing only 16% of the population in the grid as at 2023 projection.

The greenhouse gas (GHG) emissions for electricity are estimated based on the electrical energy generated at a period and the prevailing grid emission factor. The national grid emission factor for Kenya is 0.5tCO2/MWh. To facilitate the attainment of the 100% transition to renewable energy by 2030, the government has prioritized the development of geothermal, wind, and solar energy plants for grid-interconnected projects. The installed capacity of renewable energy sources was 2,613.1 MW as of December 2022 which accounts for 76.93% of the total installed capacity and 87.42% of the total energy generated was obtained from renewable energy resources.

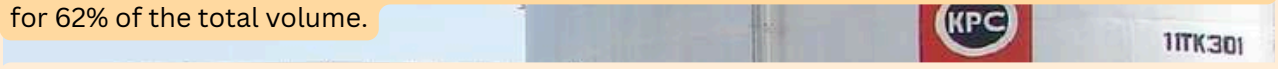
Hydro	Geothermal	Wind	Bioenergy	Solar
•867.54mw	•953.7MW	•436.1MW	•89.48MW	•266.31MW

Source: EPRA

Oil and Gas subsector

Installed capacity, Storage and Distribution

The Ministry of Energy and Petroleum coordinates the importation of petroleum products through a tender system referred to as the Open Tender System (OTS). A total of 4,451,472.64 m3 was imported through OTS by Dec 2022. The share of volumes for the domestic market accounted for 62% of the total volume.

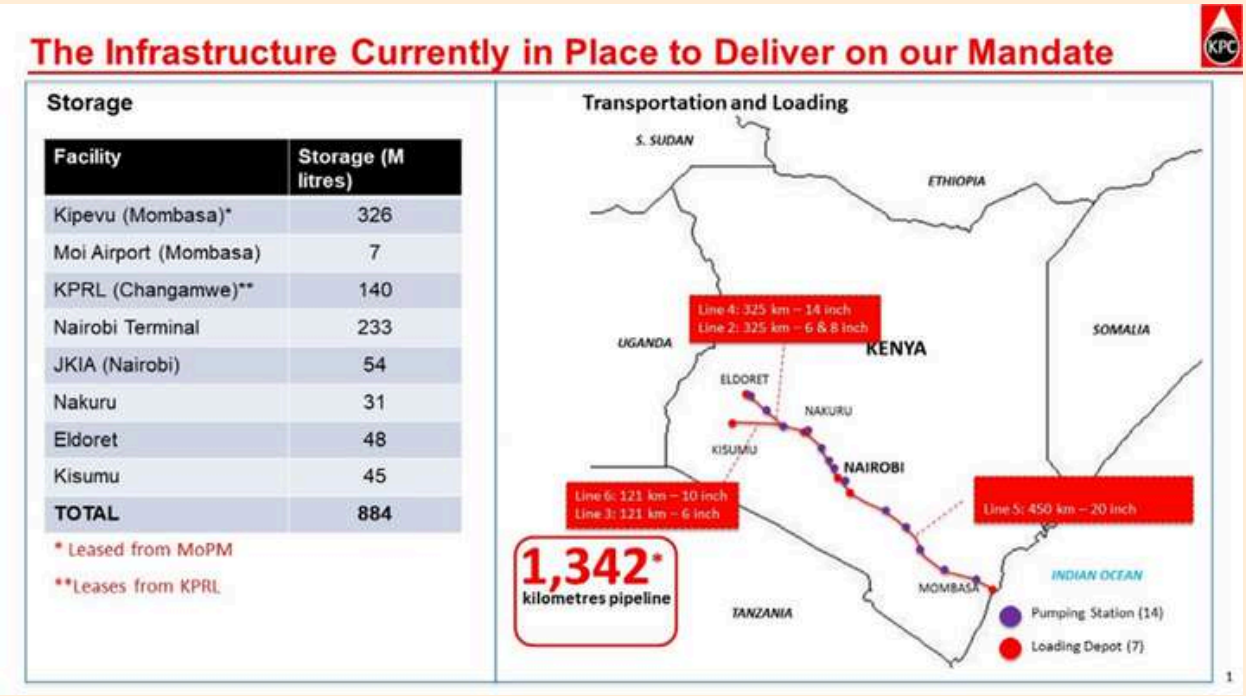


The total domestic demand for petroleum products decreased by 2.58% to 2,802,129.80 m3 compared to a similar period in 2021. The decreased consumption could be attributed to suppressed demand occasioned by high fuel prices in the local and international markets. The total supply in 2022 was 5,142.1 000' tonnes

The Kenya Pipeline Company has developed the requisite infrastructure for the smooth operation of the industry. The focus has been on the expansion of throughput, storage capacity, and building jetties that facilitate the exportation of petroleum products to neighbouring countries with current storage capacity of 884 million litters

Exploration activities in Kenya are active both onshore and offshore. Out of the sixty-three (63) gazetted petroleum exploration blocks, twelve (12) are currently licensed to four (4) oil exploration companies. Forty (51) blocks are open for licensing. Pipeline network is approximately 1,792km operated by the Kenya Pipeline Company Limited (KPC).

The county markets can easily access oil and gas products due to a good transportation network of pipeline in transportation



Challenges

The extent of the apparent surplus capacity in the market, which may affect the incentives facing potential new entrants in the generation sector and creates risks that the off-taker may be exposed to the costs of spare capacity, especially where there are take-or-pay provisions in the PPAs.

The financial performance of key sector participants, particularly the off-taker in the context of spare capacity, demand not growing as fast as anticipated, PPA obligations, increasing fixed costs arising from electrification, and relatively high technical and commercial losses.

The extent to which the regulatory and legislative arrangements promote the development of new capacity by IPPs under merchant arrangements to customers and not just for sale to the single off taker under sovereign guarantees as under the current arrangement.

The high cost of power distribution in the country makes consumers pay significantly higher rates for electricity and lack of willingness for new connections.

The growing adoption of solar energy for domestic and captive use which could potentially reduce the regulator's electricity tariff revenues; greater adoption of electrical cars which would require new legislative provisions and infrastructural developments; increasingly litigious stake.

PRODUCTION/MANUFACTURING SECTOR

Overview

Under Vision 2030, Kenya aspires to be a middle-income, rapidly industrializing country and globally competitive by 2030. To achieve this, Kenya's GDP must grow by US$4-6 billion per year, which is a growth rate of 10% per year.

To achieve this target, the State Department for Industry has formulated eleven state corporations and one training institution to spearhead these endeavours. Major entities under this department include:

Table : Players in the Production / Manufacturing sector.

Entity	Role
Kenya Bureau of Standards (KEBS)	To enforce standards, quality, and conformity.
Kenya National Accreditation Services (KENAS)	Advancing ISO standards in Kenya and the region to improve business governance by offering accreditation to conformity assessment bodies
Numerical Machining Complex	Steel production, manufacture of machinery, and spare parts
Kenya Industrial Research and Development Institute (KIRDI)	Mandated to undertake multidisciplinary research and development in industrial and allied technologies
Kenya Industrial Property Institute (KIPI)	Administers industrial property rights; provides technological information to the public; promotes inventiveness in Kenya, and provides of training on industrial property
Scrap Metal Council	Licensing of scrap metal dealers and collectors
Anti-Counterfeit Authority	Combats counterfeiting
Kenya Industrial Training Institute (KITI)	Trains artisans, craftsmen, technicians, engineering graduates, engineers and entrepreneurs to work in the existing industries

Kenya Industrial Estates (KIE) role is to promote small-scale and micro enterprises by financing their development activities.

The Investment Promotion Act, 2004, mandates the Kenya Investment Authority (KenInvest) to promote investments in the country through policy advocacy, investment promotion, and facilitation.

The African Growth and Opportunity Act (AGOA) from 2018 to 2022 main goal is to increase exports, especially of apparel from accredited Sub-Saharan Africa (SSA) countries to the United States of America (USA).

OWNERSHIP

The manufacturing/production sector in Kenya is either state-owned or privately owned. The sector is led, managed, operated, and maintained by local professionals and technocrats who are highly trained and skilled. Legislative policies have enabled competition in the market to improve efficiency and expand the scope of resource mobilization which encourages private sector growth.

Key stakeholders in the manufacturing and production sector in Kenya typically include a diverse range of entities, organizations, and individuals involved in or affected by the industry operations and performance. Government agencies such as the Ministry of Industries, Trade and Investments (MITI), Kenya Bureau of Standards (KEBS), and Export Processing Zones Authority (EPZ), industry associations such as Kenya Manufacturer Association (KMA), Federation of Kenya Employees (FKE), Trade Unions such as Central Organization of Trade Unions (COTU), manufacturers, financial institutions and research organization plays a vital role in the sector for the sector growth.

Contribution to the GDP

Economic Survey 2023 indicated that total credit approved by both commercial banks and industrial financial institutions rose to KSh 529.6 billion from KSh 465.4 billion in 2021. The total amount of credit advanced by industrial financial institutions increased from KSh 1.4 billion in 2021 to KSh 2.4 billion in 2022. The Export Processing Zones (EPZ) Program experienced an upward trend in performance with total sales increasing by 16.7% to KSh 115.3 billion in 2022. Exports from the EPZ increased by 17.6% to KSh 106.1 billion while imports increased by 31.7% to KSh 63.6 billion in 2022.

The sector has also seen an increase in its formal employment. Employed persons in the formal manufacturing sector increased by 4.7% from 336.8 thousand in 2021 to 352.6 thousand in 2022, accounting for 11.7% of the total number of persons engaged in the formal sector in the country in 2022. The number of local employees in EPZ enterprises rose by 25.3% to 82.8 thousand in 2022.

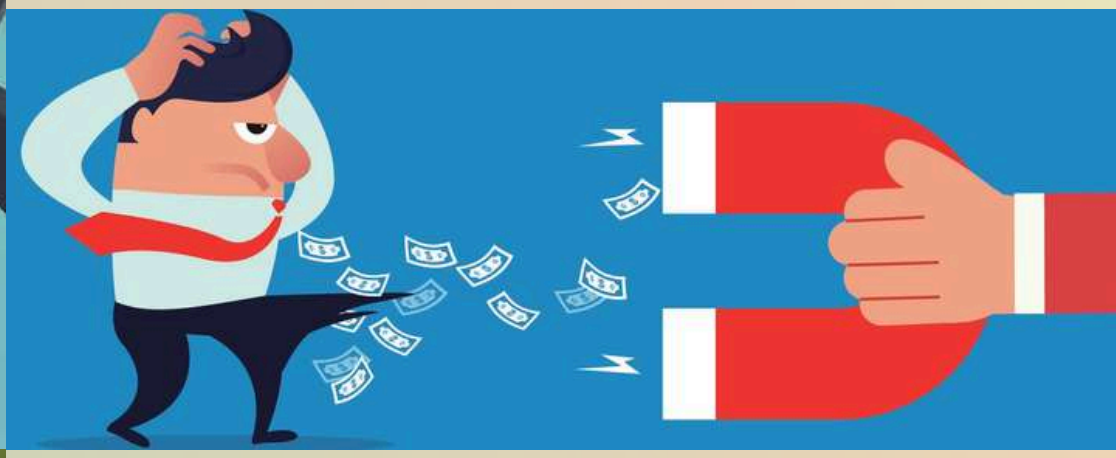
The Producer Price Index (PPI)

The Producer Price Index (PPI) is valued at basic prices and measures changes in the price of goods over time as they leave the producer. In 2022, overall inflation as measured by Producer Price Index rose by 15.01% to 125.98 from 109.54 in 2021. The increase in the PPI was witnessed in all subsectors except in electricity which reduced by 1.65% in 2022. The highest increase in index was in Mining and Quarrying at 39.0% followed by Manufacture of Chemicals and Chemical products at 31.46% in 2022. Manufacture of Pharmaceutical, Medicinal Chemical and Botanical Products (28.6%); Mining of Metal Ores (25.78%); and Manufacture of Paper and Paper products (23.73%) in 2022 also had increased PPI.

Tax Regime

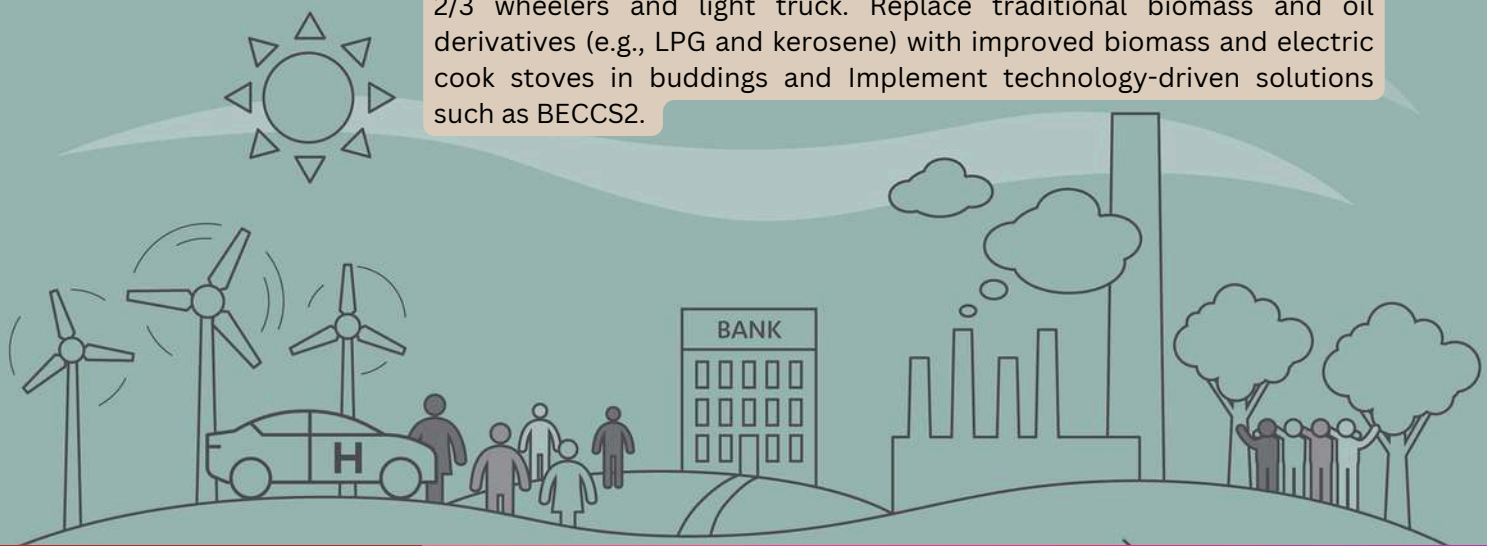
Taxation should drive global competitiveness for locally produced goods and services, which, in turn, boost economic growth. Kenya has been enacting tax laws that disincentivize manufacturing despite the low capital investment in the country. These tax laws include introduction of 16% VAT on imported plant and machinery, reversal of investment deductions allowance (IDA), and limiting interest deductibility to 30% of earnings before interest, taxes, depreciation (EBITDA). This has major unintended consequences such as raising income tax on capital intensive businesses to 60%+ and bankrupting businesses.

The manufacturing sector is heavily dependent on imported industrial inputs. Some of more imported materials are food and beverages (primary for industries), food and beverages (processed for industries), industrial supply (non-food) and transport equipment.



Decarbonization Policies

Measures in place for decarbonization and green energy adopted by manufacturers such as replacing fossil fuels through electrification, power provided by solar, wind, geothermal, and potentially nuclear energy in combination with energy storage and energy efficiency. Decarbonise industrial and/or high-temperature heating processes by capturing energy and process-related CO2 streams (e.g., in steel BFBO, cement or chemicals), Substitute fossil fuels as a heat source and/or feedstock with green and blue hydrogen and hydrogen derivatives (e.g., ammonia, synfuels) in Industry and Transport. Replace internal combustion engines with electric batteries, primarily for passenger cars, 2/3 wheelers and light truck. Replace traditional biomass and oil derivatives (e.g., LPG and kerosene) with improved biomass and electric cook stoves in buddings and Implement technology-driven solutions such as BECCS2.



Challenges in the manufacturing sector

Reducing the Regulatory Burden; Key levels of government have over time had overlapping mandates and roles in matters revolving around reducing fees, levies, and charges and the turnaround time for granting permits to businesses among others.

Access to Quality, Affordable, and Reliable Energy for Manufacturing. The cost of energy is higher for Kenya compared to other countries in the EAC region.

Country	Country Average Industrial electricity tariff (2022/23) - Equivalent of KES
Kenya	16.95
Ethiopia	2.86
Egypt	4.8
Morocco	9.0
South Africa	9.59
Tanzania	12.5

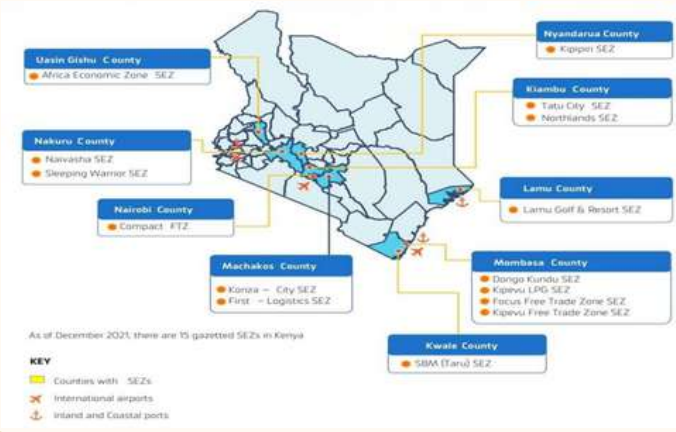
Source: Globalpetrolprices.com

Fight against illicit Trade. Illicit trade is a global menace affecting many industries. According to the OECD data on counterfeiting and international trade, the total value of counterfeit and pirated goods was about $1 Trillion in 2013 and was expected to grow to close to $3 trillion in 2022.

Special Economic Zones

Incentives include: 10-year Corporate Tax Holiday, 10-year Withholding Tax Holiday, 100% investment deduction on new investment, Perpetual exemption from payment of stamp duty on legal instruments, Perpetual exemption from VAT and customs import duty on inputs, Operation under essentially one license issued by EPZA, Rapid Project approval and licensing, No Exchange Controls – liberalized foreign exchange regime, Onsite customs documentation and inspection by Customs Staff, Unrestricted investment by foreigners, One-Stop-Shop service for facilitation and aftercare, Quality infrastructure for lease

Gazetted Special Economic Zones



Source: SEZA, 2021

County	Former Province	Number of zones 2021	Number of zones 2022
Nairobi	Nairobi	6	7
Machakos	Eastern	6	6
Kajiado	Rift Valley	1	1
Mombasa	Coast	26	27
Kilifi	Coast	12	14
Taita Taveta	Coast	1	1
Kiambu	Central	4	5
Kitui	Eastern	1	1
Muranga	Central	1	1
Elgeyo Marakwet	Rift Valley	1	1
Uasin Gishu	Rift Valley	1	1
Laikipia	Rift Valley	1	1
Nandi	Rift Valley	2	2
Meru	Eastern	2	2
Bomet	Rift Valley	4	3
Nakuru	Rift Valley	3	3
Kwale	Coast	6	7
Embu	Eastern	2	2
Narok	Rift Valley	1	1
Homabay	Nyanza	1	1
Kirinyaga	Central	0	1
Kisumu	Nyanza	0	1
Total: 22	**6**	**82**	**89**

REGIONAL INTERGRATION

Kenya belongs to the East African Regional Economic (EAC) block, alongside Burundi, Democratic Republic of Congo, Kenya, Rwanda, South Sudan, Tanzania, and Uganda. We are also a member of Intergovernmental Authority on Development (IGAD), along with Djibouti, Eritrea, Ethiopia, Kenya, Somalia, South Sudan, Sudan, and Uganda. Common Market for Eastern and Southern Africa (COMESA) is also another regional economic block where Kenya is a member state alongside Burundi, Comoros, Democratic Republic of the Congo, Djibouti, Egypt, Eswatini, Eritrea, Ethiopia, Kenya, Libya, Madagascar, Malawi, Mauritius, Rwanda, Seychelles, Somalia, Sudan, Tunisia, Uganda, Zambia, and Zimbabwe.

Assessment of the level of integration in terms of African Multidimensional Regional Integration Index (AMRII) on a scale of 0 - 1:

Integration	EAC	IGAD	COMESA
Free movement of persons	0.96	0.56	0.67
Social integration	0.79	0.42	0.6
Trade integration	0.85	0.49	0.79
Infrastructure integration	0.7	0.61	0.66
Financial integration	0.66	0.46	0.73
Monetary integration	0.65	0.63	0.6
Environmental integration	0.58	0.56	0.62
Political and institutional integration	0.77	0.53	0.73

Source: African Integration Report, 2021

Assessing the East African Integration Strategy (source: East Africa Regional Integration Strategy Paper 2023–2027):

Regional transport: Regional transport infrastructure is poorly connected due to missing links on cross-border transport corridors and fiber optic networks. Also lacking are hard and soft infrastructure in inland waterways, and—in the case of the region's island states—adequate regional maritime transport and effective regional shipping services. Poor regional transport infrastructure increases the cost of doing business, especially for landlocked and island countries. Bottlenecks at East Africa's borders also create considerable delays and increase the cost of cross border trade, transport, and logistics. One-stop border posts (OSBPs) are part of the solution. For example, the EA-RISP 2018-2020 Completion Report revealed that the Namanga OSBP reduced travel time between Arusha, Tanzania and Nairobi, Kenya from one day to under four hours.

Digitizing corridors using ICT-enabled OSBP systems, electronic windows, and electronic cargo tracking would reduce transit times and cut costs further. The development of the aviation sector provides further opportunities to accelerate regional connectivity, overcome barriers related to the physical landscape, enhance trade, and spur tourism. Initiatives to integrate the sector include establishing a seamless upper airspace to increase efficiency, interoperability, and safety in line with the Single African Air Transport Market launched by the AU in January 2018.

Industry/Manufacturing: Manufacturing value added (MVA) was estimated at 9% in 2020, compared to 11% for all of Africa, 25% for North Africa, 16% for Southern Africa, 13% for West Africa, and 11% for Central Africa. The manufacturing sub-sector is dominated by the processing of non-complex primary products with little value addition. Challenges include is unreliable and costly electricity supply, poor transport infrastructure, low stock of skills, and protectionist policies. Opportunities for manufacturing in the region include food and beverages, leather and textiles, non-metallic mineral products such as cement and ceramics, processed tea and tuna products, and pharmaceuticals. The AfCFTA's entry and the new Horn of Africa Initiative promise better access to markets in Africa to spur industrialization. Initiatives for regional economic communities (RECs), to facilitate trade include streamlining border procedures, standardizing and harmonizing trade-related information and dismantling non-tariff barriers to trade (NTBs).

BUILDING SECTOR

The National Construction Authority (NCA) was established under Act No. 41 of 2011 Laws of Kenya. NCA's mandate is to regulate, streamline, and build capacity in the construction industry. The NCA also is mandated to register and regulate the performance of local and foreign contractors and accredit skilled construction workers and site supervisors.

Table Players in the building sector.

Entity	Role
The State Department for Lands and Physical Planning	Coordinate sustainable management of land resource for socio-economic development.
State Department for Housing and Urban Development	Facilitates access to adequate and decent housing and prepare urban plans for sustainable development
The Civil Servants Housing Scheme Fund (CSHSF)	Offers enabling environment for employers to facilitate their employees to acquire housing
Kenya Slum Upgrading Programme (KENSUP)	Aims to improve lives and livelihoods of people working and living in slums through various initiatives and interventions
Estates Management Department	Charged with the development and management of government housing
Department of Housing	Housing Policy Management and Implementation, Human Settlements, Housing Finance and Incentives, Appropriate Building Materials and Technology (ABMT); and Housing Sector Monitoring and Evaluation.
Urban and Metropolitan Department	Formulate, coordinate and administer policy in respect to Nairobi Metropolitan region
State Department for Public Works	Charged with the responsibility of planning, designing, construction and maintenance of Government assets in the field of built environment and infrastructure development. It comprises Architectural, Design, Electrical Engineering, Mechanical Engineering, Quantities and Contracts, Structural Engineering, Building Research Centre, and Inspectorate.

Project registration is a main function of the NCA under Section 17 of the NCA Regulations 2014. It is the responsibility of the owner of the project to register the project which is done online free of charge. The process of registration has been outlined on the NCA website available to the public.

The online approval of building plans and construction permits and the streamlining of Nairobi's e-construction permit system make approval of buildings easier.

According to the Architectural Association of Kenya's (AAK) Built Environment Report 2023, the National Construction Authority (NCA) received 4,770 applications from January to October this year. Notably, 70.3% of these applications, totalling 3,354, were successfully registered.

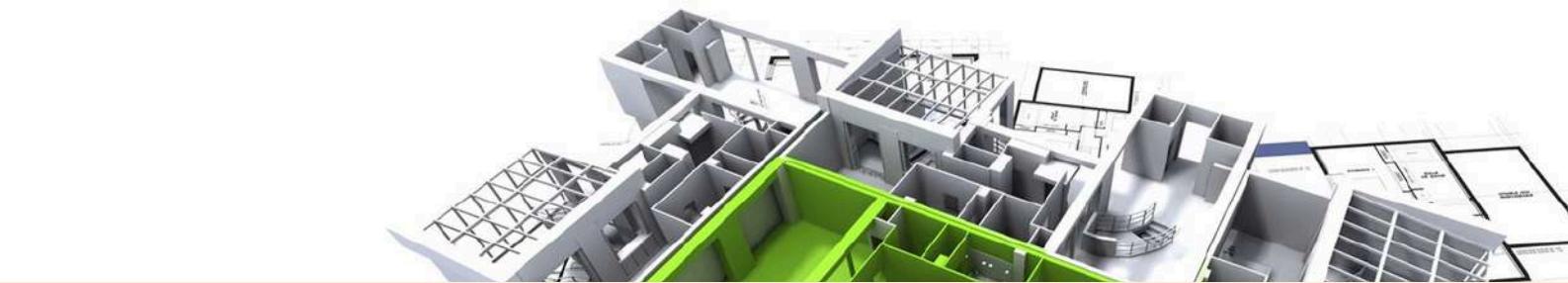
Residential development constituted the majority at 1,821, representing 54% of the total, compared to 2022 when it accounted for only 60% of the overall projects.

Mixed-use development constituted 30% of the projects, while commercial development at 15%, both of which recorded growth. In 2022, they recorded 24% and 11% respectively.

Nairobi City County Government recorded the highest number of building applications, totalling 1,985 from January to November 2023 with a cumulative value for developments during this period amounting to Sh176 billion. However, this reflected a marginal decrease compared to the same period in 2022, which saw 2,078 applications valued at Sh191.6 billion. In the same period, the county generated revenue through approvals amounting to Sh1.9 billion.

By 2022, the number of projects approved by the NCA were 4280 projects with Nairobi County having 896, Kajiado County 500 and Kiambu county 496 as counties with most approved projects.

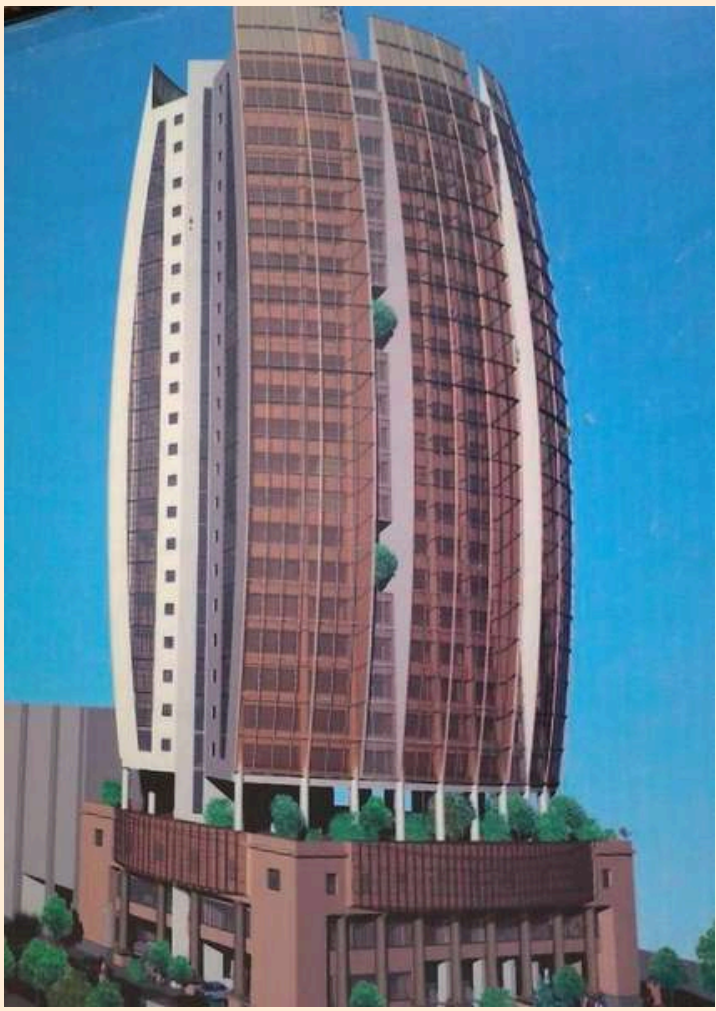
Source: National Construction Authority



Various counties have different by-laws regarding the transportation of building materials and quarry operations. Most building materials are available in hardware across counties depending on the nature of the construction.

Uptake of the Internet of Things (IoT) technology in the construction industry remains slower and less beneficial than in the manufacturing industry in Kenya. Some of the adopted technologies in the building sector in Kenya are;

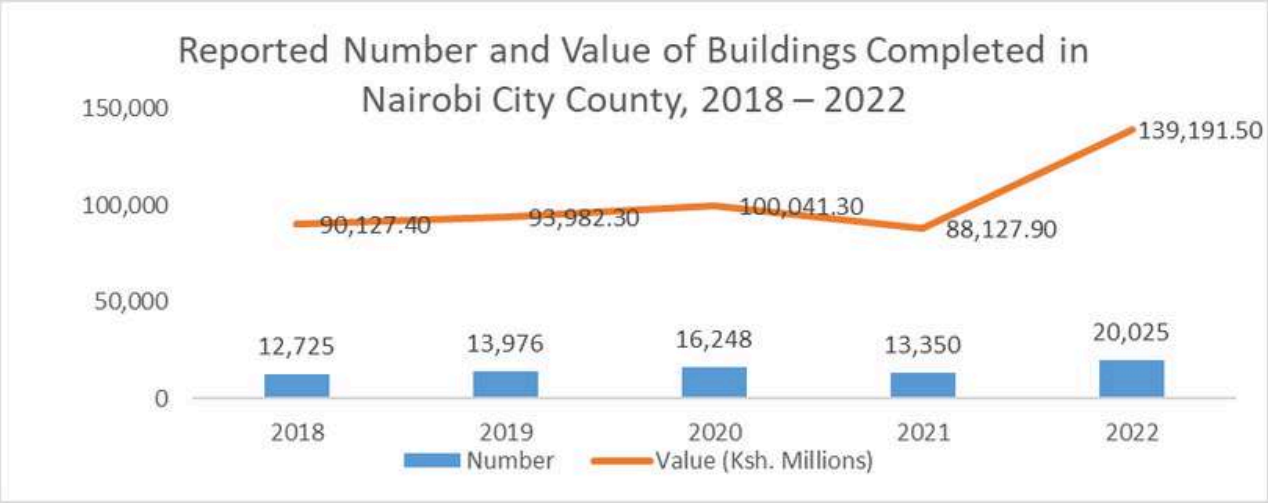
- The ability to 3D-print complex structures, both small and large, has endeared the technology to property developers seeking to improve work efficiency while cutting labour costs and construction timelines.
- IoT and advanced analytics tools are helpful when working in dangerous construction sites.
- Offsite construction. Construction of building components in a factory setting, and transportation of the same to a construction site for assembly.



The Construction Input Price Index (CIPI) measures changes in the cost of the inputs into the construction industry, such as materials, hiring of equipment, labour, transportation, and fuels. As per the KNBS Economic Survey 2023, the index rose from 106.12 in the fourth quarter of 2021 to 113.65 in the fourth quarter of 2022. Consequently, construction input inflation rose from 3.44 percent in December 2021 to 7.10 percent in December 2022.

Kenya's urban population for 2022 was 15,669,052, a 3.75% increase from 2021, population for 2021 was 15,102,890, a 3.78% increase from 2020, population for 2020 was 14,553,419, a 3.84% increase from 2019, population for 2019 was 14,015,215, a 3.8% increase from 2018. The urban population in Kenya has an average increase of 3.79%.

The reported number and value of buildings completed in Nairobi City County (NCC) for 2018 to 2022 increased from 13,350 reported in 2021 to 20,025 in 2022. Similarly, the value of building works completed in the NCC rose by 58.0 percent to KSh 139.2 billion in 2022 from KSh 88.1 billion in 2021, as per the KNBS Economic Survey of 2023, source from Nairobi City County data.



Source: Nairobi City County

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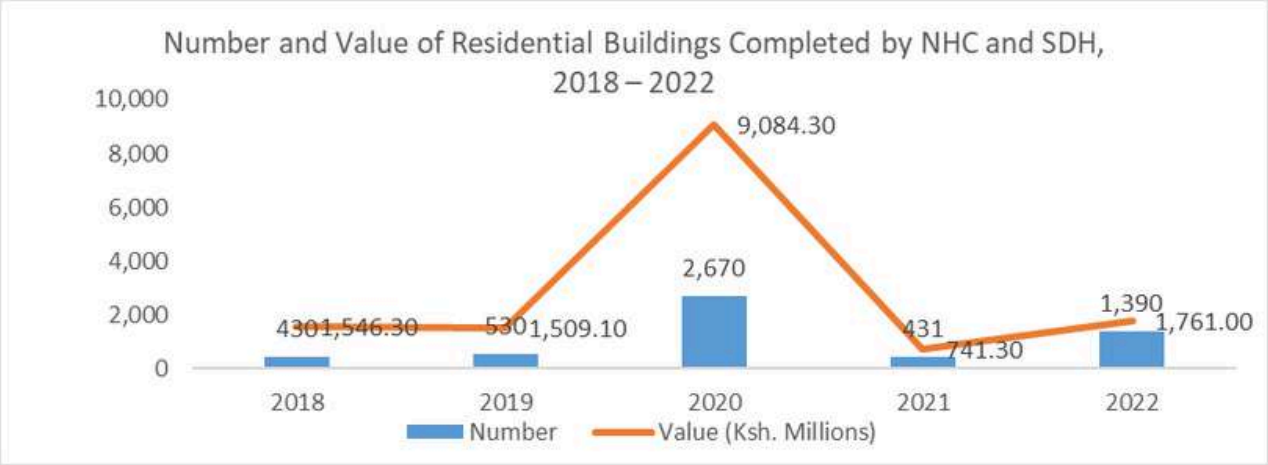


Source: National Housing Corporation and the State Department for Housing

Water and sewer connectivity increased by 1.0% points to 55.8% and 19.0% in 2020 from 54.8% and 18.0% in 2019, respectively in the NMA. Kenya's electricity coverage also stood at 70.0%, which represents a 0.3%-point increase from the 69.7% realized in 2019. (Cytonn).

Data from KNBS on the 2023 Economic Survey indicates that the government's spending on housing is anticipated to rise by 34.7 percent to KSh 19.0 billion in 2022/23. Actual expenditure on housing declined from KSh 25.6 billion in 2020/21 to KSh 10.0 billion in 2021/22. The utilization rate of budgeted expenditure declined to 70.6% in 2021/22 compared to 93.9% in 2020/21. The low utilization rate was partly due to underperformance in Appropriation-in-Aid (AiA). The SDH completed 1,390 residential housing units in 2022, including 192 units for the national police service, 463 units for the Mavoko Sustainable Neighbourhood Programmes for Social Housing, and 735 units for the Appropriate Building Materials and Technologies (ABMT). As a result, the value of completed residential housing units by the SDH increased from KSh 741.3 million in 2021 to KSh 1,761.0 million in 2022, following government-enabling policies for affordable housing.

Green Building is the practice of creating structures and using environmentally responsible and resource-efficient processes throughout a building's life cycle, which entails; siting to design, construction, operation, maintenance, renovation, and demolition. According to the Kenya Green Building Society (KGBS), the number of buildings either registered or certified was 100 in 2022, an increase from the previous year. As of June 2022, there were 64 certified buildings as compared to 25 in 2021.

Cost of construction

A report by Integrum Construction Project Managers indicated that in 2023, the construction costs in Kenya averaged about Sh41,600 per square meter for a standard bungalow and Sh100,800 per square meter for luxurious high-rise towers in the city of Nairobi. However, in 2022, the average cost ranged from Sh34,650 to Sh77,500 per square meter, respectively. The construction cost, therefore, rose by between 20.06% and 36.22% over the past year as of June 2023. This spike was attributed to the increased costs of construction materials and fuel, exemplified by the surge in the price of steel reinforcement bars from Sh140.60 per kilo in December 2022 to Sh160.26 in December 2023, marking a 14.29% increase. Similarly, the cost of cement rose from Sh650 per 50kg bag in December 2022 to Sh750 in December 2023, an increase of 15.38%.

Affordable housing

With a total project pipeline of 838,876 units, the government has completed 584 units and launched 39,879 units and some 34,355 units were waiting to be launched as of November 2023.

Building Safety

Study by National Building Inspectorate Report, June 2023, across 26 Counties revealed that around 5% of the total buildings were unsafe for occupation. The buildings were either structurally unsound, lacked basic fire suppressing equipment, neither followed due approval process before construction, or lacked occupancy certificates.

WATER AND SANITATION SECTOR

Water Sector

With a fast-growing population and affordable housing projects, there is a high water demand. The Ministry of Water and Irrigation in collaboration with other stakeholders has been engaged in providing clean water through drilling of boreholes and maintenance of modest Water Purification Points (WPPs). Some of the notable players in this sector include:

Table : Players in water sector

Ministry / Department / Agency	Responsibility
Ministry of Water and Irrigation	Policy formulation and sector coordination.
Water Services Regulatory Board	Regulation and Monitoring of water service provision
National Environment Management Authority	Environmental regulation
Water Works Development Agencies Asset management	Asset management
Water Service Providers	Service provision
Water Appeals Board	Water sector arbitration

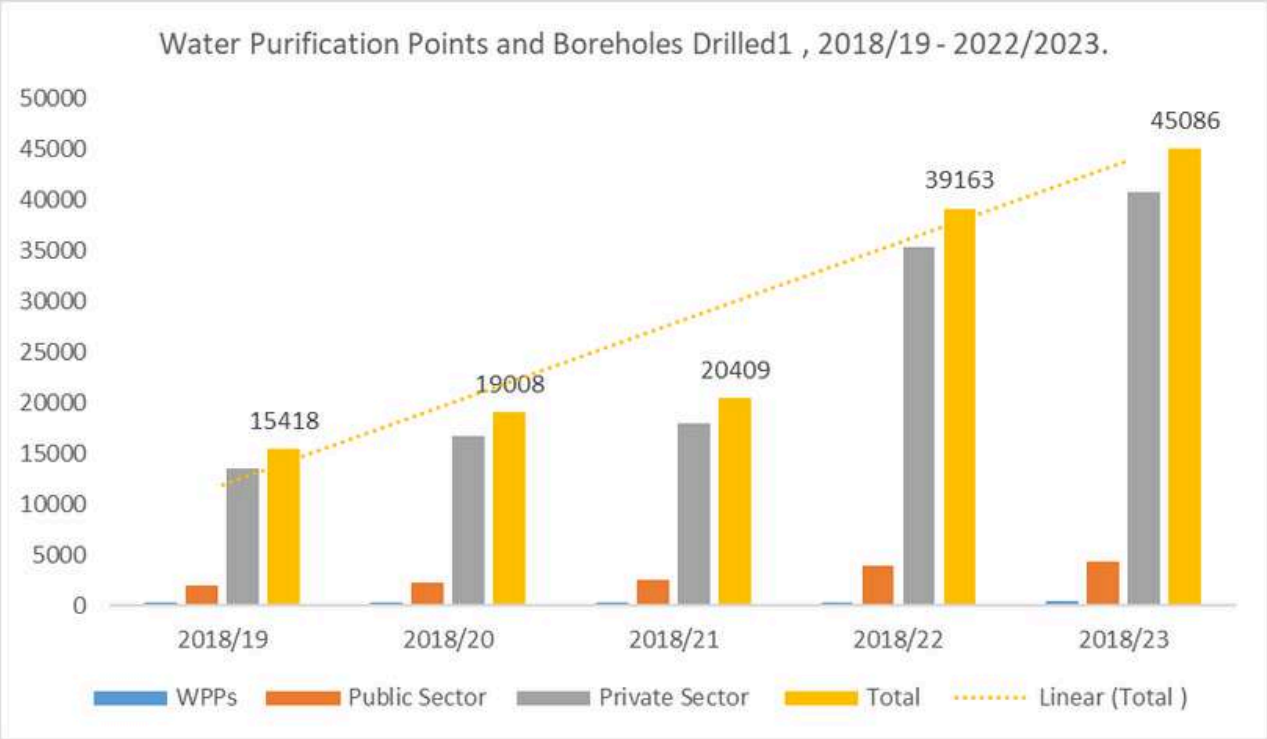
Sanitation Sector

As the population increases, the constrains on the available resources also increases, 59% of people in Kenya have access to safe drinking water while 29% of people in Kenya have access to improved sanitation facilities. To increase the number of those who have access to improved sanitation, the government has come up with the sanitation policy tagged The Kenya Environmental Sanitation and Hygiene Policy 2016-2030 (KESHP) which envisions a clean, healthy and economically prosperous Kenya free from sanitation and hygiene related diseases and seeks to ensure universal access to improved sanitation, clean and healthy environment by 2030. Some of the notable players in this sector include:

Table Players in Sanitation sector

Ministry / Department / Agency	Responsibility
Ministry of Health	Develop policies on public health and sanitation
Ministry of water and sanitation	Develop policies for wastewater treatment
Kenya Water for Health Organization	Implement Water, Sanitation, and Hygiene Promotion

The number of Water Purification Points (WPPs) is expected to increase from 343 in 2021/22 to 355 in 2022/23. The increase is attributed to the expected completion of Siyoi Muruny, Habasweni, and Karimenu II water projects, as well as the rehabilitation of water supply projects at Ijara, Marsabit, and Mandera among other ongoing water projects. The number of boreholes drilled in 2021/22 as an alternative source of water has also increased as noted in the report following unreliable water supply. This number is expected to further increase by 15.1% to 45,086 in 2022/23 with the private sector accounting for 90.4% of the total boreholes drilled. (Economic Survey 2023)



Source: Ministry of Water, Sanitation and Irrigation

Access to clean water is the availability of water produced from various sources that is good for human consumption versus the population. A total volume of water abstracted increased from 32.3 billion cubic metres in 2021 to 32.4 billion cubic metres in 2022 with surface water abstractions accounting for more than 90.0 percent of the total volume of water abstracted by Dec 2022. Groundwater abstraction increased from 220.4 million cubic metres in 2021 to 230.8 million cubic metres in 2022. (Economic Survey 2023).

Water Service Regulatory Authority, 2023 IMPACT Performance Report of Kenya's Water Services Sector - 2021/22, states that the growth in coverage is two percentage points against a required average of at least four percentage points. The Water Services Regulatory Board (WASREB's) Impact report highlights that NMA's average water coverage declined by 4.0% to 51.8% in 2021 from 55.8% in 2020 despite water connections increasing during the period under review. This was attributed to high population and urbanization growth rates outpacing the development of water infrastructure services. According to the Kenya National Bureau of Statistics, the population in the Nairobi Metropolitan Area (NMA) increased by 1.8% to 9.8 million people in 2021, from 9.6 million in 2020, and is projected to continue growing at the same rate to reach 10.1 million persons in 2023. Additionally, the World Bank puts urbanization rates in Kenya at 3.7%. These factors have put a strain on existing water systems to meet increasing demand thus leading to water coverage declines

Sanitation Sector

UNICEF report on water, sanitation, and Hygiene 2020, indicated that only 29% of people in Kenya have access to improved sanitation facilities, and 1,765 villages are certified as open defecation-free. Achieving universal access to drinking water and sanitation by 2030 will be challenging given current levels of investment, projected population growth, and climate change.

The access rate to at least basic sanitation services is 35% in urban areas, and in rural areas, the access rate is a meager 2% (UDAID, Global water strategy, 2022-2027).

The water services providers are mandated with supplying water to the consumers. Currently, 89 registered WSPs are consisting of 14 very large WSPs serving over 35,000 consumers, 32 large WSPs serving over 10,000 consumers, 16 medium-sized WSPs serving over 5,000 consumers and 25 small WSPs serving less than 5,000 consumers. The WSPs however do not cover the entire population. Areas not covered have Community water schemes that supply water to a significant population.

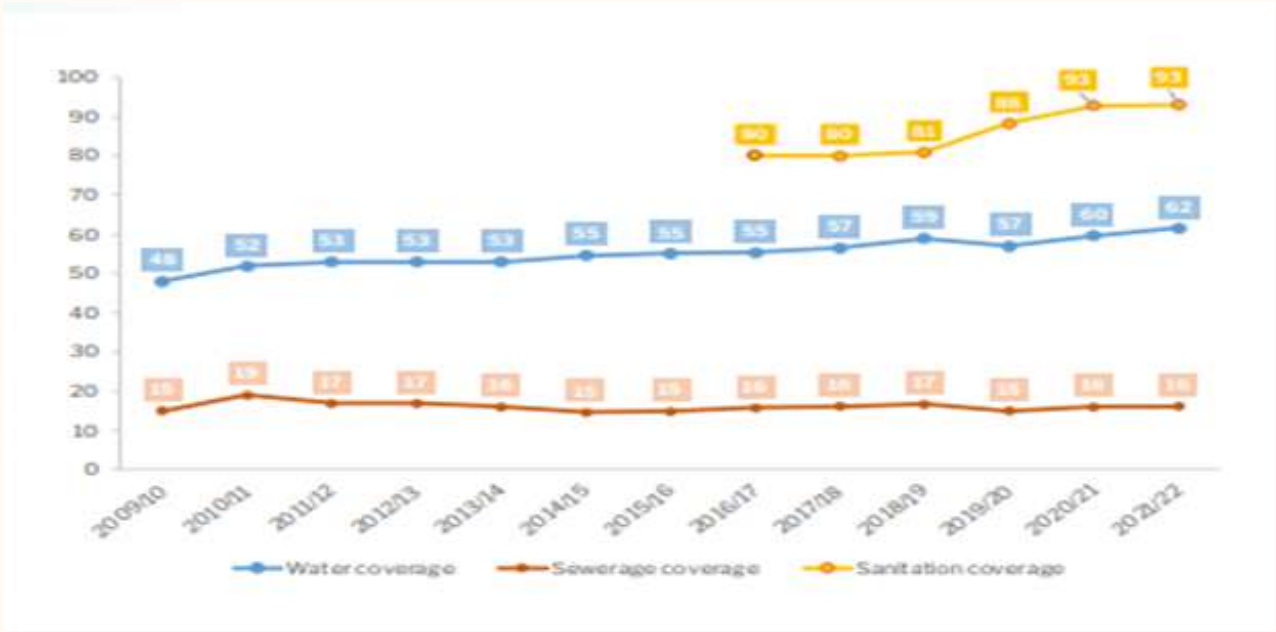
Access to sanitation is measured by the percentage of the population with access and using improved sanitation facilities. Improved sanitation facilities usually ensure separation of human excreta from human contact, and include: Flush or pour-flush toilet/latrine (to Piped sewer system, Septic tank or Pit latrine); Ventilated improved pit (VIP) latrine; Pit latrine with slab or composting toilet.

The table shows access to water and sanitation

Parameter	2019/20 (a)	2020/21 (b)	2021/22 (c)	Variance, % (c-b)
Total Population in Service Area	25,660,154	26,271,419	26,731,200	1.8
Total Population Served with Water	14,677,969	15,679,774	16,473,785	5.1
Population Served with Sewer	3,922,437	4,093,204	4,324,983	5.7
Population Served with Sanitation Services	22,650,723	24,376,379	24,878,702	2.1
Total Water Produced, m3	449,572,682	455,313,593	459,361,140	0.9
Total Water Billed, m3	237,825,974	249,998,802	254,261,544	1.7
Total Water Billed (domestic), m3	166,452,523	172,704,926	164,284,639	-4.9
Total Revenue, Kshs	22,796,171,562	23,171,877,070	24,624,564,304	6.3
Per capita production, l/c/d	83.9	79.6	83.4	4.8
Per capita consumption,l/c/d	31.1	30.2	28.3	-6.1
Total number of connections, water	1,306,743	1,268,209	1,359,577	7.2
Total number of connections, sewer	419,258	340,131	370,220	8.8

Accessibility of water and sanitation

Water coverage in regulated areas improved from 60% to 62% while sewerage coverage remained at 16% despite the number of people served increasing by 5.7%. Similarly, the total sanitation coverage remained constant at 93%. WASREB Performance Report of Kenya's Water Services Sector - 2021/22



Source WASREB Performance Report of Kenya's Water Services Sector - 2021/22

Compare the performance against the global UNSDGs

By 2030, achieve universal and equitable access to safe and affordable drinking water for all. Kenya has an access rate of 63%.

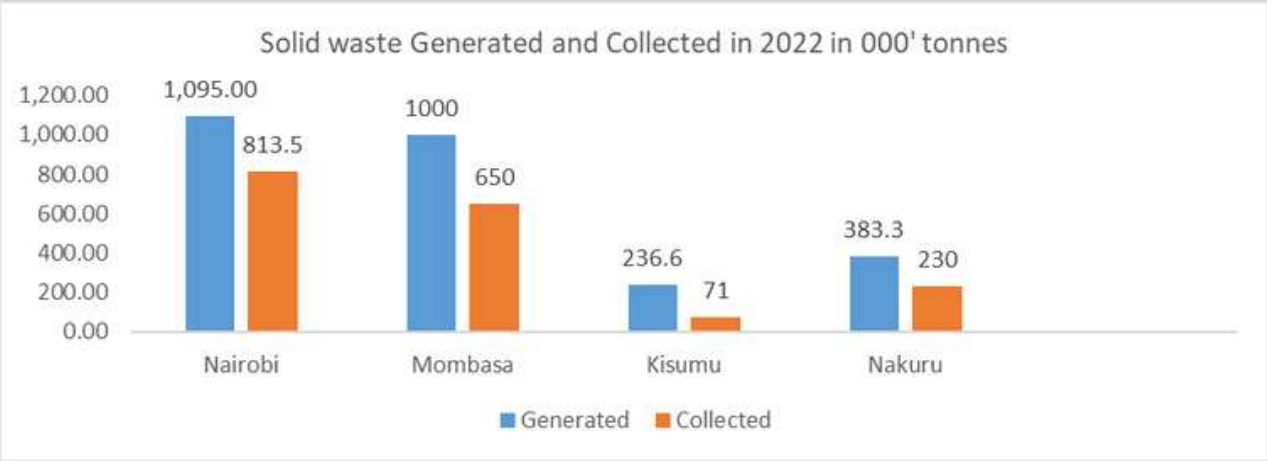
By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations We are at a good place, 93% of the population has access to sanitation.

By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally. This remain a challenge for us as a country, as our waste disposal is at 16%.

By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity.

Solid waste Management

Solid waste generated and collected by the Nairobi City, Nakuru, Kisumu, and Mombasa County Governments shows the following trends on how the four counties manage their solid waste. In the year 2022, Nairobi City, Mombasa, Kisumu, and Nakuru counties collected 74.3, 65.0, 30.0 and 60.0 percent of their generated waste, respectively. (Economic Survey ,2023)



Source: Nairobi City, Nakuru, Kisumu & Mombasa County Governments

Challenges in waste management

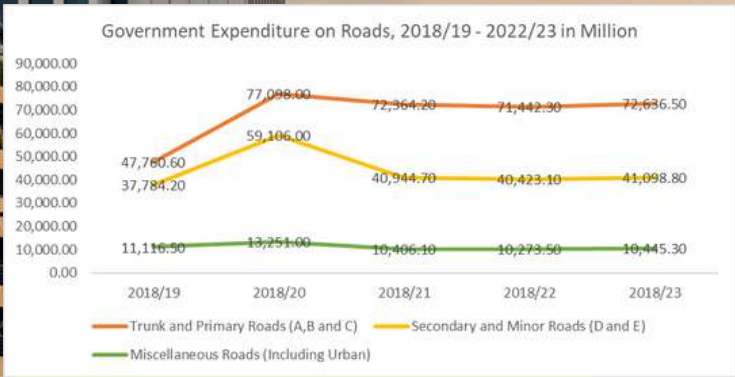
- Proper waste management infrastructure, including waste collection, transportation, and disposal facilities.
- Rapid urbanization has resulted in increased waste generation, putting additional strain on already limited waste management resources.
- Enforcement can be weak due to various reasons, including limited resources, corruption, and insufficient penalties for violations. Lack of strict enforcement can lead to non-compliance and continued littering.
- Proper waste segregation at the source is often lacking, making recycling efforts more challenging. Without proper separation of recyclable materials, the potential for resource recovery is reduced.
- Waste management in Kenya often lacks an integrated approach that considers the entire lifecycle of products, from production to disposal. This approach is necessary to promote waste reduction and sustainable consumption patterns

TRANSPORTATION SECTOR

State Department of Roads

Adequacy and conditions of road network in the three levels

Economic Survey 2023, put road transport as the leading contributor to the value output of the transport and storage sector, accounting for 77.5% of the sector's value output at Kshs 2.2 tn. This stood in contrast to the overall value output of the entire transport and storage sector which amounted to Kshs 2.8 tn, indicating that road transport is the predominant mode of transportation in the country.



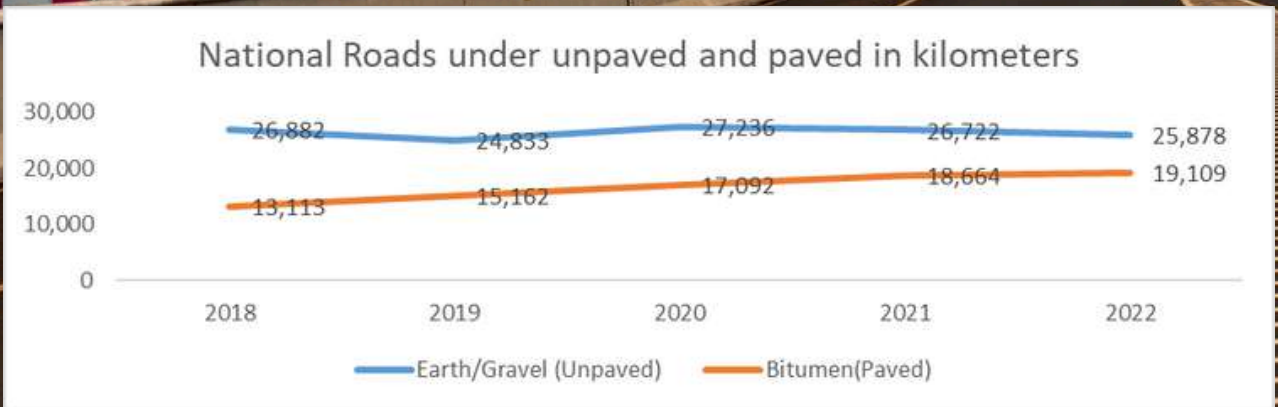
Source: State Department for Infrastructure and the Kenya Roads Board

The length of bituminous roads increased by 2.8 percent to 22.4 thousand kilometers as of June 2022, national roads under bitumen increased from 18.7 thousand kilometers in 2021 to 19.1 thousand kilometers in 2022 while the length of county roads increased from 3.2 thousand kilometers to 3.3 thousand kilometers in the review period. The length of unpaved roads declined from 140.0 thousand kilometers in 2021 to 139.6 thousand kilometers in 2022. (Economic Survey, 2023).

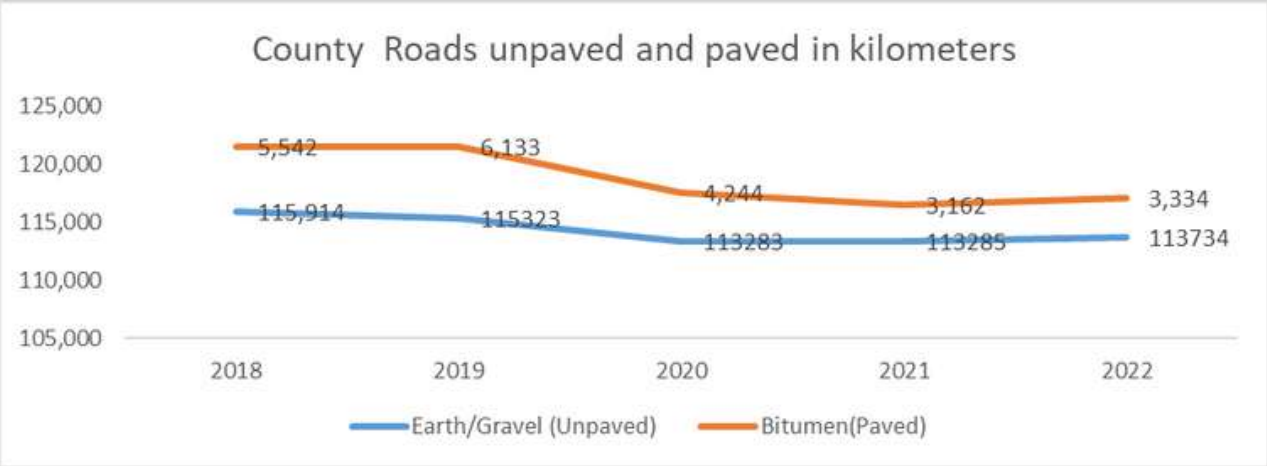
Kilometres of Roads by Type and Classification as at 30th June, 2018 - 2022

Surface Type	Earth/Gravel (Unpaved)					Bitumen(Paved)				
Year	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022
National Roads Super Highway (S) 0	0	0	0	0	0	81	81	157	157	157
International Trunk Roads (A)	3,008	2,623	2,539	3,112	3,110	4,609	4,994	5,266	5,350	5,469
National Trunk Roads (B)	6,743	6,260	8,798	7,625	6,869	4,109	4,592	5,565	5,632	5,872
Primary Roads (C)	17,131	15,950	15,899	15,985	15,899	4,314	5,495	6,104	7,525	7,611
Subtotal	**26,882**	**24,833**	**27,236**	**26,722**	**25,878**	**13,113**	**15,162**	**17,092**	**18,664**	**19,109**
County Roads Secondary Roads (D)	9,424	9,224	8,551	9,150	7,846	1,699	1,899	1,225	1,432	1,432
Minor Roads (E)	12,843	12,643	10,539	11,523	11,523	1,205	1,405	717	645	717
Special Purpose Roads (F)	9,122	9,057	8,954	9,091	9,091	504	569	465	365	465
Unclassified Roads (G)	84,525	84,399	83,524	83,521	85,274	2,135	2,261	1,837	720	720
Subtotal	115,914	115,323	111,567	113,285	113,734	5,542	6,133	4,244	3,162	3,334
Grand Total	**142,796**	**140,156**	**138,803**	**140,007**	**139,612**	**18,655**	**21,295**	**21,336**	**21,826**	**22,443**

Source: Kenya Roads Board



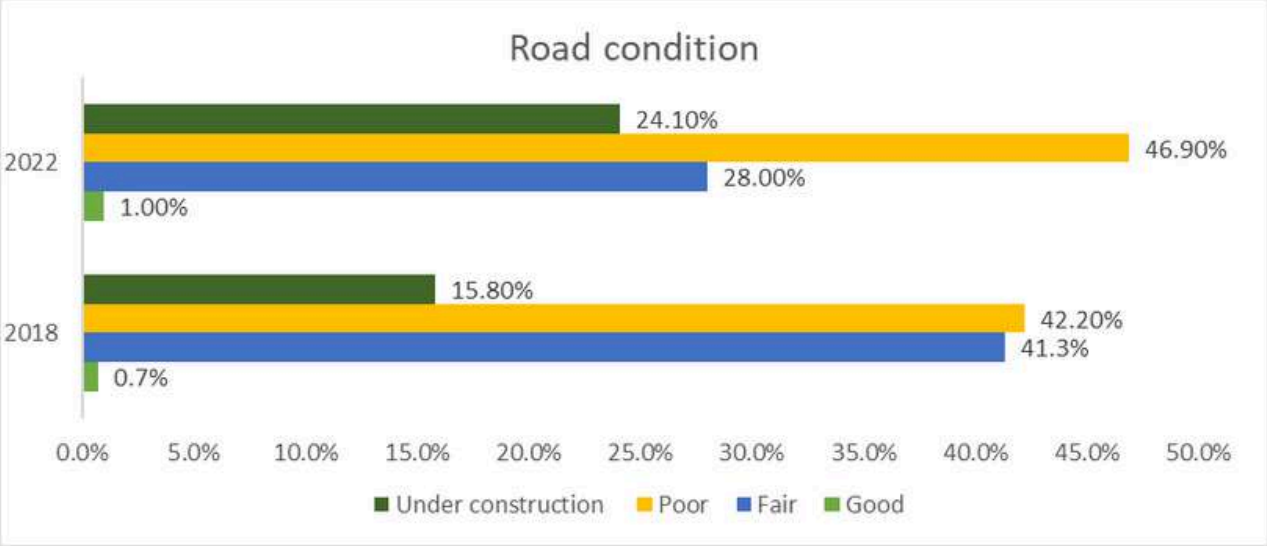
Data from Kenya National Highways Authority and Kenya Urban Roads Authority indicated that by December 2022, 2,886.59 kilometers of roads are still under construction across the country at a cost of Ksh.295, 356.73 million



The length of roads changes over time due to reclassification of roads

Adequacy and conditions of road network in the three levels

According to Kenya Roads Board Strategic Plan FYs 2023/24– 2027/28, the road condition in Kenya has significantly improved due to the continuous huge investment and focus by the Government in their maintenance, rehabilitation and development over years.



Source: Kenya Roads Board (KRB)

RICS 2022 SUMMARIES:

Table: Total inventoried network

Classified (Km.)						
NTR	KeNHA	KeRRA	KURA	Sub-Total	New (Km.)	Total
	22,320.12	18,377.44	3,931.86	44,629.42	219.84	44,849.26
County (All 47 Counties)				120,337.17	73,935.30	194,272.47
Total				164,966.59	74,155.14	239,121.74

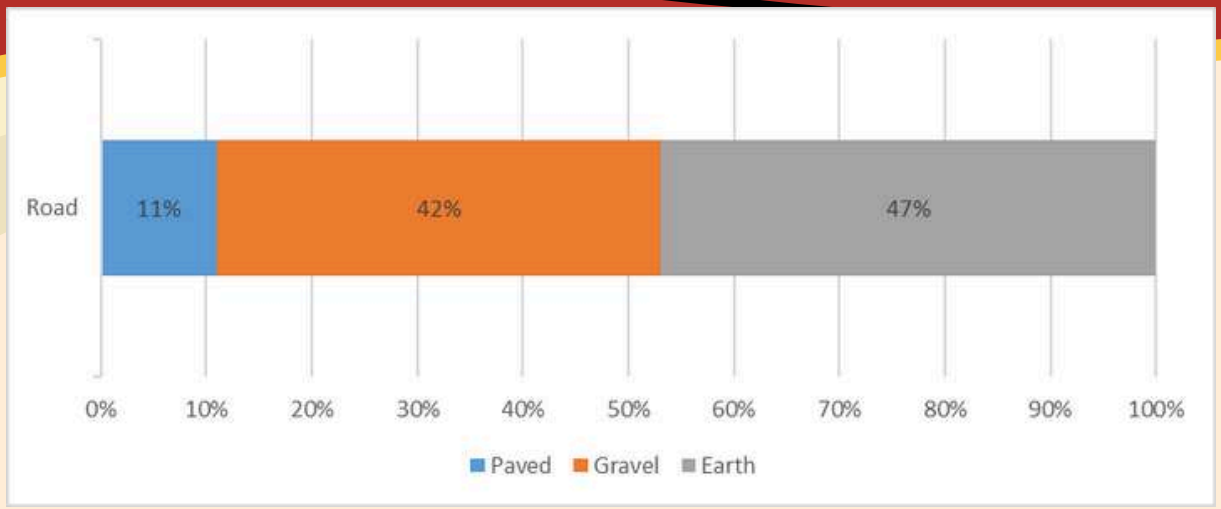
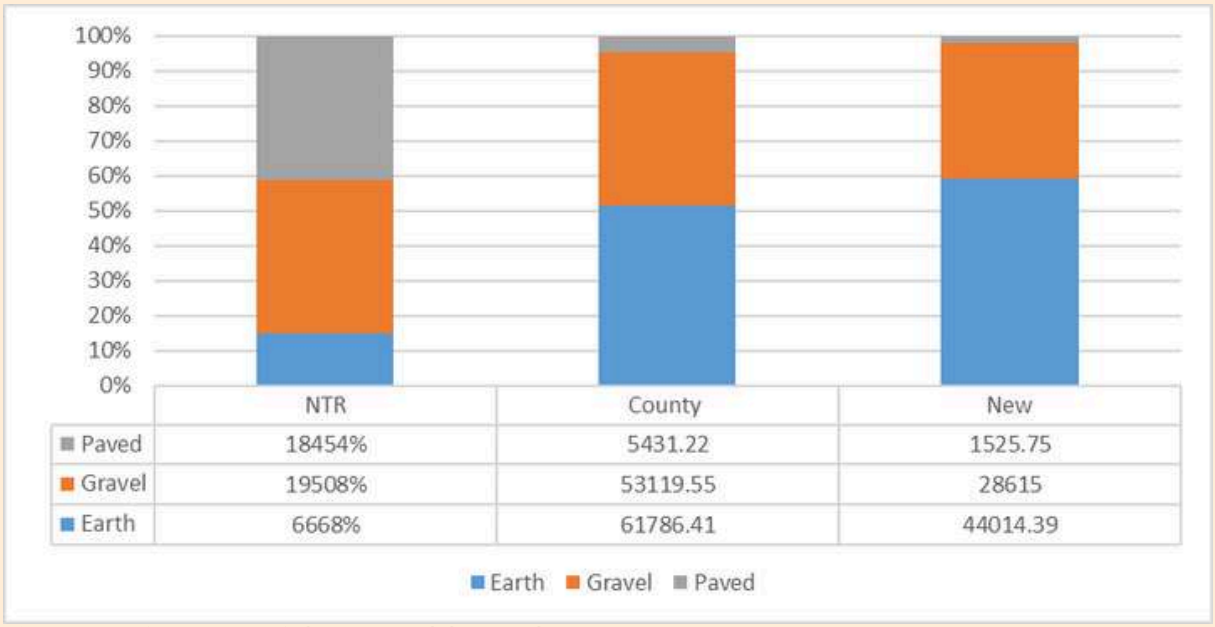


Figure: Composition of total road network by surface type

Source: KRB Maps, February 2024



	NTR	County	New
Paved	18454%	5431.22	1525.75
Gravel	19508%	53119.55	28615
Earth	6668%	61786.41	44014.39

Figure : Surface type of the network by road agency

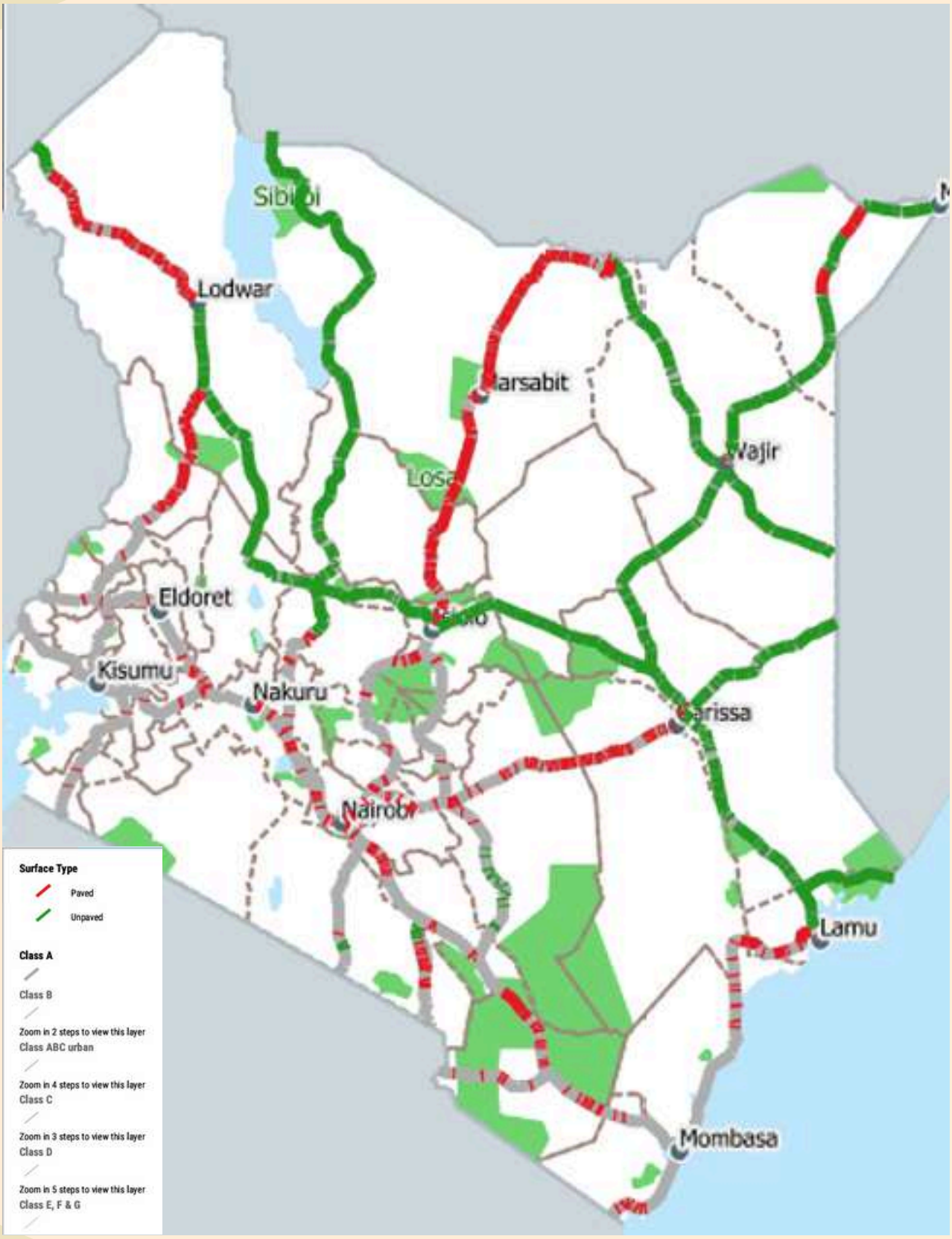
Source: KRB Maps, February 2024

	2018	2023	2018	2023	2018	2023	2018	2023
	Good		Fair		Poor		Under Construction	
NTR	10,645.	15,451.	17,160.	18,000.	11,450.	10,121.	746.03	1,055.8
County	18,760.	22,118.	53,666.	58,462.	48,850.	38,734.	542.01	1,021.5
New	4,511.4	10,482.	14,851.	32,997.	14,932.	28,864.	355.69	1,810.2

Figure: Changes in surface condition of the total road network

Source: KRB Maps, February 2024

ROAD NETWORK SURFACE TYPE MAP



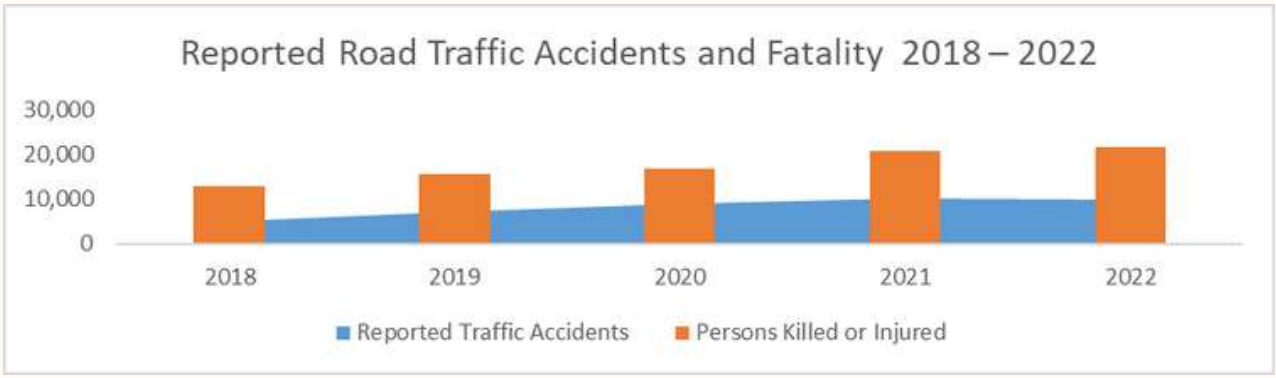
Source: KRB Maps, February 2024

Road Accidents

The number of reported road accidents, persons injured, and fatalities from 2018 to 2022 indicates there was a slight decrease in the number of reported road accidents from 10,210 reported in 2021 to 9,976 in 2022. However, there was an increase of 5.5 percent in number of road accident casualties from 20,625 in 2021 to 21,757 in 2022. The number of persons slightly injured decreased from 10,050 in 2021 to 9,935 in 2022, while the number of deaths arising from traffic accidents rose by 2.4 percent to 4,690 in 2022.

	2018	2019	2020	2021	2022
Reported Traffic Accidents	5,158	7,184	8,919	10,210	9,976
Persons Killed or Injured	12,877	15,747	16,970	20,625	21,757
Killed	3,158	3,586	3,975	4,579	4,690
Seriously Injured	4,673	6,952	8,026	10,050	9,935
Slightly Injured	5,046	5,209	4,969	5,996	7,132

Source: Traffic Department, Kenya Police Service



Economic contribution

The country's road assets are estimated at over Kes. 3.5 trillion, representing one of the largest public investments in Kenya according to Kenya Road Board, Strategic Report 2023-2027. The report further states that the transportation and storage sector contributed 10.7 per cent to the country's Gross Domestic Product (GDP) in 2022.

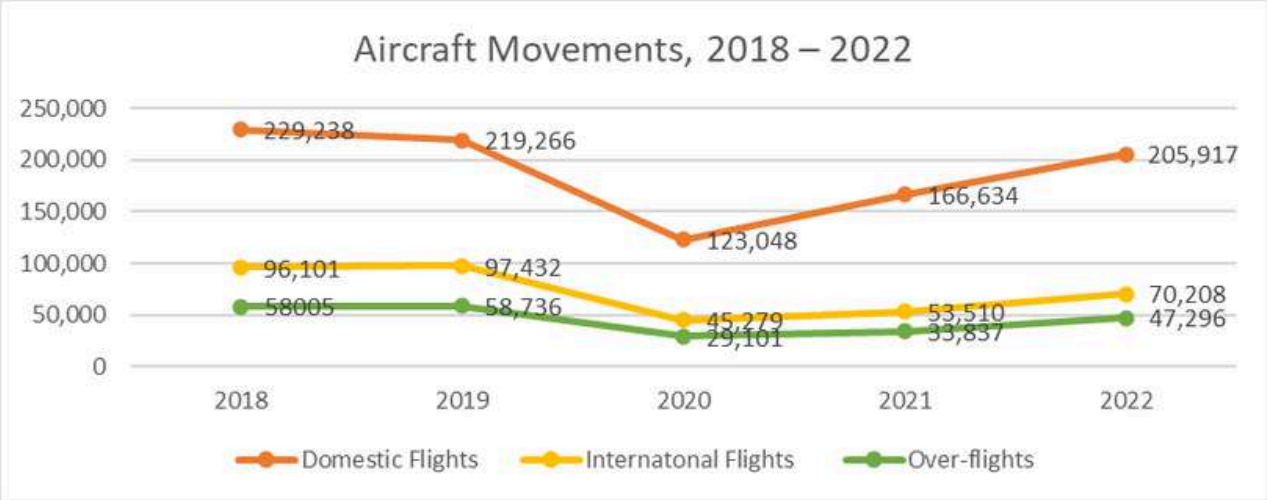
Air Transport

Kenya Civil Aviation Authority (KCAA) was established on 24th October 2002 by the Civil Aviation (Amendment) Act, 2002 with the primary functions towards; Regulation and oversight of Aviation Safety & Security; Economic regulation of Air Services and development of Civil Aviation; Provision of Air Navigation Services, and Training of Aviation personnel KCAA; as guided by the provisions of the convention on international civil aviation, related ICAO Standards and Recommended Practices (SARPs), the Kenya Civil Aviation Act, 2013 and the civil aviation regulations.

To plan, develop, manage, regulate and operate a safe, economically sustainable and efficient civil aviation system in Kenya, in accordance with the provisions of the Civil Aviation Act, 2013.

Kenya Airports Authority owns and operates the following airports a total of 19 airports and airstrips in Kenya distributed in various regions.

The number of aircraft movements through the Kenyan airport grew by 27.3% from 253,981 in 2021 to 323,421 in 2022. The number of landings increased by 25.2% from 110,706 in 2021 to 138,638 in 2022, while take-offs increased by 25.6% from 109,438 in 2021 to 137,487 in December 2022. Similarly, over-flights rose by 39.8% from 33,837 in 2021 to 47,296 in 2022, Economic Survey, 2023.

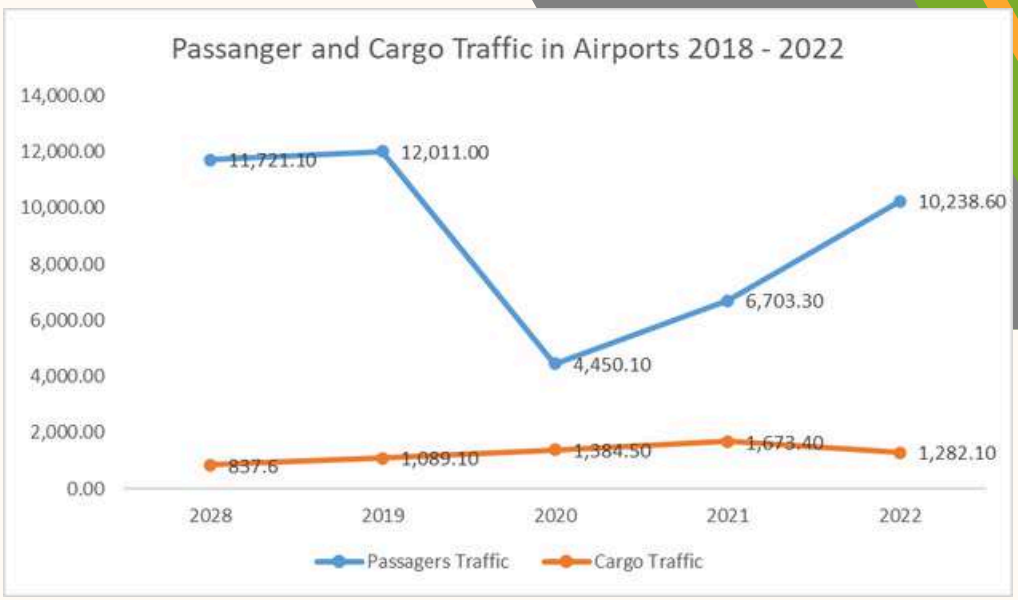


Source: Kenya Civil Aviation Authority

According to KAA report, the airports they are operating are in good except few with recurrent failure conditions. The runways and taxiways are all paved.

The number of passengers handled at Kenyan airports significantly rose from 6,703.3 thousand passengers in 2021 to 10,238.6 thousand passengers in 2022. The number of international passengers handled at Kenyan airports increased by 80.4% to 5,169.4 thousand in 2022. Similarly, domestic traffic rose by 32.1% from 3,837.8 thousand passengers in 2021 to 5,069.2 thousand passengers in 2022. Passenger traffic through Jomo Kenyatta International Airport (JKIA) increased by 65.0% from 3,974.1 thousand passengers in 2021 to 6,556.5 thousand passengers in 2022, while Moi International Airport (MIA) and other airports passenger traffic increased by 41.9%t and 31.3%, respectively in 2022. (Kenya Airports Authority)

The total volume of cargo traffic decreased from 375.8 thousand tonnes in 2021 to 375.3 thousand tonnes, while mail traffic decreased from 1.7 thousand tonnes in 2021 to 1.3 thousand tonnes in 2022. JKIA handled 363.0 thousand tonnes of cargo traffic in 2022 compared to 361.5 thousand tonnes in 2021, while MIA handled 2.3 thousand tonnes compared to 2.0 thousand tonnes, over the same period. All other airports handled 10.0 thousand tonnes in 2022 compared to 12.3 thousand tonnes in 2021. (Kenya Airports Authority)



Source: Kenya Airports Authority

Ownership and Management of Aerodromes Kenya has approximately 584 airfields distributed nationally as per the Aerodrome Information Publication (AIP) of 20 20 [unpublished]. 18 of these airfields are managed by Kenya Airports Authority (KAA), 8 by the Military for surveillance; 50 airfields are operated by the Kenya Wildlife Services (KWS) for the management of the National Parks and Game Reserves; 196 overseen by the respective County Commissioners; and 312 private ones used for emergency, security, picnic, agriculture and general socio-economic activities. The above 584 aerodromes have the following types of pavement surfaces:

- Paved runways: Bitumen 58, Concrete 2
- Unpaved runways: Earth/Murram/Sand 345 and Grass 179

KAA owns and operates the following airports and airstrips in Kenya.

Airport
Jomo Kenyatta International Airport (JKIA) Nairobi
Moi International Airport (MIA) Mombasa
Kisumu International Airport
Eldoret International Airport
Wajir Airport
Wilson Airport
Manda (Lamu)
Lodwar Airport
Lokichoggio Airport
Malindi Airport
Nanyuki civil Airstrip
Ukunda Airport
Eldoret Boma Airstrip
Garissa Airstrip
Isiolo Airport
Kakamega Airstrip
Kitale Airstrip
Kabunde (Homabay) Airstrip
Migori (Suna) Airstrip
Suneka Airstrip

Agency Managing the Aerodromes	Total Number	Type Bitumen/ Asphalt	Grave1/ Murram/ Sand	Concrete	Grass
KAA	19	19	0	0	0
Military	8	4	2	1	1
KWS	50	6	32	0	12
Government (MOTIH&UD, OP)	196	24	150	0	22
Private Airstrips	312	6	161	1	144
Sub Total	584	58	345	2	179
Helipads	20				

The number of aviation personnel licenses went up by 3.8% from 12,025 in 2021 to 12,486 in 2022. Private Pilot Licenses (PPL) issued also rose by 5.5% from 1,829 in 2021 to 1,929 in 2022. Airport Transport Pilot License (ATPL), Student Pilot License (SPL), and Aircraft Maintenance Engineers (AMEL) increased by 4.0%, 4.0% and 3.8%, respectively, in 2022. The number of Valid Operational Licenses rose marginally from 1,327 in 2021 to 1,353 in 2022. The number of Flight Dispatcher License and Approved Training Organizations (ATOS) went up by 12.8% and 11.8%, respectively, in 2022.

The number of aerodromes rose from 561 in 2021 to 562 in 2022. This was occasioned by the commissioning of one Class C airstrip in 2022. The number of CAA Inspectors and Air Traffic Controllers increased by 7.0% from 285 in 2021 to 305 in 2022. Flight Operations inspectors went up by 16.7% to 28, while Personnel Licensing rose by 12.5% to 18, over the same period.

Commercial ports

Kenya Ports Authority is a wholly owned State Corporation established through an Act of Parliament in January 1978 and is mandated to manage and operate all scheduled seaports along Kenya's coastline and Inland waterways such as Mombasa, Lamu, Kisumu, Malindi, Kilifi, Mtwapa, Kiunga, Shimoni, Funzi and Vanga including the Inland Container Depots in Nairobi and Naivasha.

The Port of Mombasa is the gateway to East and Central Africa and is one of the busiest Ports along the East African coastline. The Port provides direct connectivity to over 80 Ports worldwide and is linked to a vast hinterland comprising Uganda, Rwanda, Burundi, Eastern Democratic Republic of Congo, Northern Tanzania, Southern Sudan, Somalia and Ethiopia by road. A railway line also runs from the Port to Uganda and Tanzania. The port is divided into two sections designated for conventional cargo operations comprising nine berths and container handling terminals comprising eleven berths, bringing the total berths at Mombasa to twenty. Container section is served by two terminals which make up the total container capacity of the Port to 2.2 million TEUs annually. The terminals are adequately equipped with shore and yard equipment to ensure faster and more efficient movement of cargo. The port operates specialized berths for the express handling of specified cargo within the port.

The port of Lamu is a major component of the (LAPSSET) corridor project and the second commercial port in the country. Through the LAPSSET project, the port will be connected to an extensive new transport corridor that comprises roads network, Standard Gauge Railway, oil pipeline, oil refinery, an International airport, and resort cities. The first three berths of the envisaged 23 berths port are already complete with operations at berth one dedicated for containerized cargo underway.

The port of Kisumu is one of the biggest ports that offer organized shipping services on the lake, facilitating trade between the three East Africa countries and the growing economy of the western Kenya region. The transit port focuses on transit cargo from Mombasa to the EAC region; the export of regional products and import of local products from Uganda and Tanzania, passenger ferrying, and a logistics hub with an annual cargo handling capacity of 25,000 TEUs. The port has recently undergone massive rehabilitation works including dredging of the channel to accommodate larger vessels, upgrade of physical infrastructure and the improvement of safety and reliability of the lake transport system. Currently, the port has a berth length of 300 meters and is envisaged to get an additional 400 meters of docking area upon completion of dredging.

Inland container depots at Nairobi, Naivasha and Eldoret are linked to the Port of Mombasa by a rail-trainer service. Imports are delivered directly from Mombasa to the depots on a Through Bill of Lading, while exports can also be consolidated at the ICDs and railed to the Port for shipping.

Due to continued rehabilitation of the ports have seen an increase in container handling and ship docks within the ports. According to Economic Survey 2023, the volume of export traffic at the port of Mombasa increased by 3.4% from 4,612 thousand metric tonnes in 2021 to 4,771 thousand metric tonnes in 2022. The quantity of dry general cargo export went up by 7.2 per cent to 4,263 thousand metric tonnes in 2022.

Traffic Handled at the Port of Mombasa, 2018 – 2022

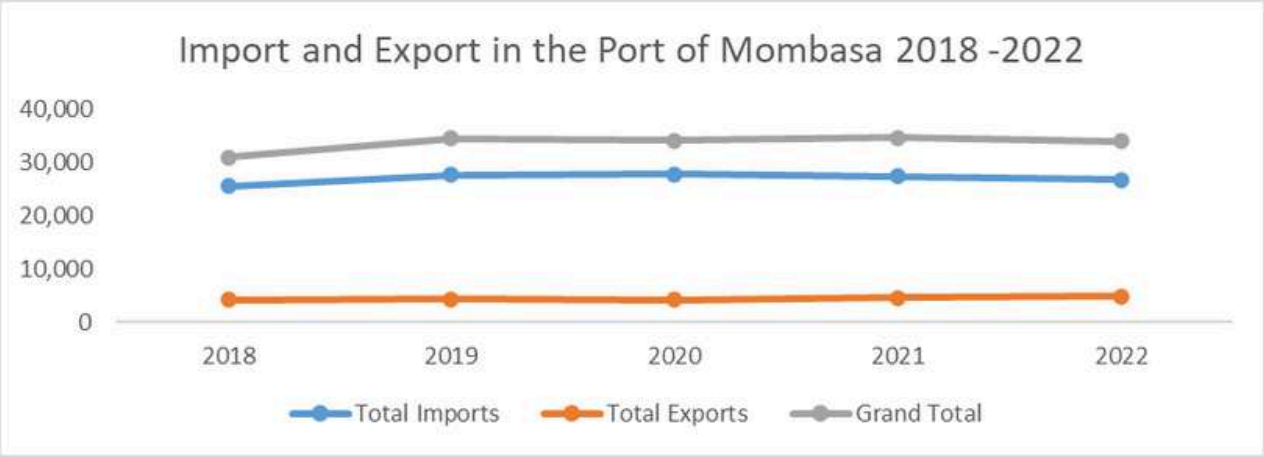
Unit		2018	2019	2020	2021	2022
Container Traffic	TEUs	1,303,862	1,416,654	1,359,579	1,435,250	1,449,863
Ships Docking	No.	1,605	1,675	1,621	1,635	1,561

Operationalization of Phase II of the Mombasa Port Development Project began in July 2022, increasing capacity by 450,000 TEUs, bringing the Mombasa Port's capacity to 2.1 million TEUs. The New Kipevu Oil Terminal (KOT) at Mombasa Port commenced operations in April of 2022. The new facility not only improves the safety of operations but also allows the handling of four post-Panamax vessels of up to 170,000 DWT capacity at ago. This capability will enable the KPA to leverage economies of scale by supporting the growing demand for port infrastructure in the East African region. KPA plans to enhance its regional presence by opening a liaison office in eastern DRC and South Sudan. This will bring port services closer to the KPA's customers in the area, boosting trade and logistics between the two EAC partners.

Number of imports and exports through the port of Mombasa data as provided by KNBS

	Unit	2018	2019	2020	2021	2022
Total Imports	000'MT	25,475	27,558	27,771	27,332	26,713
Total Exports	000'MT	4,125	4,277	4,205	4,612	4,771
Grand Total	000'MT	30,923	34,440	34,116	34,551	33,880

Source: KPA

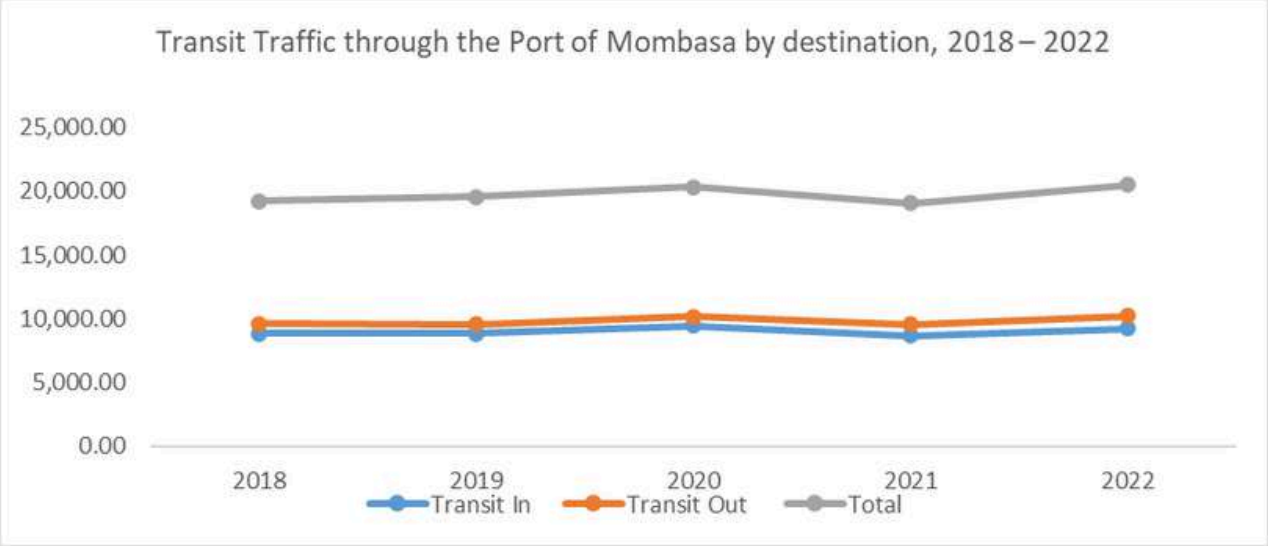


Water transport contributed KSh 54.8 billion in 2022 as value output in the economy which was 2.0% decline from the previous year as recorded by KNBS as shown in the table in Ksh Million

	2018	2019	2020	2021	2022
Water Transport	52,750	54,868	54,649	55,915	54,792

Source: Kenya Ports Authority

Transits of goods in and out of the country through the port of Mombasa is as indicated below in the table as reported by KNBS in the Economic Survey 2023.



Support services offered at the ports by KPA and private companies are Firefighting, Health and Safety management, Pollution control, Garbage collection, Maritime search and rescue, Freshwater provision, Ship chandelling services, Bunkering and ship repair. Other services include, Marine services (pilotage, tidal information, and tuggage), Stevedoring services, Cargo handling services (shore handling and stevedoring) and Ferry services. Categories of ships in Kenya

Category	Type
Cargo Ships	Bulk Carriers
	Container Ships
	General Cargo Ships
Tankers	Oil Tankers
	Chemical Tankers
	Liquefied Natural Gas (LNG) and Liquefied Petroleum Gas (LPG) Carriers
Passenger Ships:	Cruise Ships
	Ferries
Fishing Vessels	Trawlers
	Longlines
	Purse Seiners
Naval and Military Ships	Warships
	Submarines
Specialized Ships	Ro-Ro (Roll-on/Roll-off) Ships
	Offshore Support Vessels
	Research Vessels
Yachts and Leisure Craft	Yachts
	Boats for Water Sports
Auxiliary and Support Vessels	Tugs and Towboats
	Pilot Boats
	Dredgers
Training and Educational Vessels	Training Ships
Research and Survey Ships	Hydrographic Survey Vessels
	Oceanographic Research Vessels
Icebreakers	Icebreaking Ships
Cable-Laying Ships	Cable Layers
Hospital Ships	Floating Hospitals
Container Feeders	Short-Sea Feeders

The total volume of white petroleum products transported via pipeline decreased from 7,619.4 thousand cubic metres in 2021 to 7,548.9 thousand cubic metres in 2022. White petroleum products throughput for domestic consumption rose to 4,674.4 thousand cubic metres in 2022 from 4,636.4 thousand cubic metres in 2021. The highest increase in volumes for domestic consumption was recorded in jet fuel, rising from 671.9 thousand cubic metres to 801.9 thousand cubic metres, during the period under re view. Volumes of kerosene illuminating oil and motor spirit transported for domestic consumption dropped by 12.8% and 2.5%, respectively in 2022, (Economic Survey 2023). The total volume of white petroleum products for re-export through the pipeline dropped by 3.6 per cent from 2,983.0 thousand cubic metres in 2021 to 2,874.5 thousand cubic metres in 2022. (Economic Survey 2023).

	2018	2019	2020	2021	2022
Motor Spirit (Premium)	739.3	948.3	1,039.0	1,319.1	1,268.6
Illuminating Kerosene	60.8	56.1	50.5	56.7	52.8
Light Diesel Oil	926.6	1,136.7	1,165.7	1,405.9	1,302.3
Jet Fuel	232.7	217.7	188.7	201.3	250.8
Total	**1,959.5**	**2,358.8**	**2,443.9**	**2,983.0**	**2,874.5**

Source: Kenya Pipeline Company

Fishing Ports

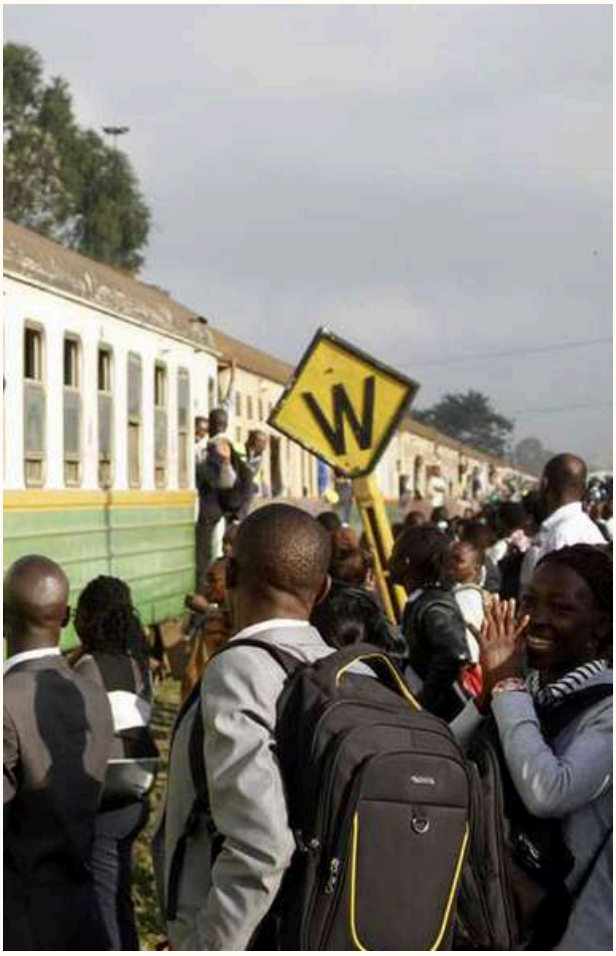
The port of Shimoni situated off Wasini Island in South Coast of Kenya, presently at a distance of about 4 km along the access channel to the open sea, with the area secure for navigation and fishing activities is to be Kenya premier fishing port. Currently, KPA is working in collaboration with the County Government of Kwale to develop a modern jetty measuring 75x30 meters and a causeway of 135x7 meters adjacent to the existing jetty. The industrial fishing port infrastructure will include a multi-purpose berth that will incorporate fish and conventional cargo handling, cold storage facilities, reefer stations, and value addition including fish processing plants. The existing jetty will also be rehabilitated to continue serving the local fishermen and support tourism. Shimoni, with current volumes of approximately 10,000 metric tons, by far is the largest port of all coastal small ports in the field of coastal trade where the destination is mostly to Pemba Island and Zanzibar. The volumes are anticipated to increase tenfold once the new infrastructure is complete. The current jetty acts as the only facility of community transportation, including: tourism, fishing and trade. Shimoni has a wide well-sheltered deep channel for large seagoing vessels and is located along a well-sheltered creek with a few patches of mangrove vegetation.

Kenya Ports Authority through the Port's 2018-2050 Masterplan intends to facilitate development of small ports taking due cognizance of the long-term development framework as outlined under Vision 2030. The KPA is responsible for the coastal small ports such as Funzi, Shimoni and Vanga located in the south coast, Mtwapa, Kilifi, Malindi, Lamu and Kiunga further north. Apart from these ports, an assessment has been made regarding potential other port sites along the coast namely Takaungu and Ngomeni which do not fall under the KPA Act as yet.

Railways Transport

The Government of Kenya has since the year 2014 implemented railway projects within the Republic of Kenya. The developments are aimed at expanding the railway network, as well as ensuring there is interconnectivity of available railway systems. The following activities taking action.

1st Jan 2015: Actual construction of the Nairobi – Mombasa Standard Gauge Railway line commenced
30th May 2017: Commissioning of the Madaraka Express Freight Services at Port Reitz Freight Station
31st May 2017: Commissioning of the Madaraka Express Passenger Services between Mombasa and Nairobi
19th October 2019: Launch of the Madaraka Express Passenger Services between Nairobi and Suswa station
17th December 2019: Launch of the Madaraka Express Freight Services to the Naivasha Inland Container Depot
November 10, 2020: Commissioning of the Kenya Railways Transit Shed, Diesel Multiple Unit trains and Refurbished Nairobi Central Railway station. (Kenya Railways)



Heavy Haul and Freight Lines

Construction of the 472km Standard Gauge Railway (SGR) line connecting Mombasa to Nairobi (2014 – 2017),
Construction of the 120km SGR line connecting Nairobi to Naivasha (2017 – 2019),
Revitalization of the 177km Meter Gauge Railway (MGR) line connecting Thika and Nanyuki (2019 – 2020),
Construction of a new 250m MGR extension line connecting Nanyuki station line with Vivo Energy Depot in Nanyuki (2020)

Rehabilitation of the 5.5km MGR line connecting Kisumu port and the National Cereals and Produce Board (NCPB) facility in Kisumu (2019), Construction of new 1.8km MGR extension line connecting NCPB and Kenya Pipeline Company (KPC) Depot (oil terminal/fueling point, in Kisumu).

The Government has also re-fitted the Wagon-Ferry, Marine Vessel (MV) Uhuru and her tug-boat MV Peeda (2019), and MV Uhuru is currently providing cargo transport services to Port Bell in Uganda. This has provided a road and rail connection with water transport.

The 465km MGR section connecting Longonot and Malaba, the 217km MGR branch line connecting Nakuru and Kisumu.

The 78km MGR branch line connecting Gilgil and Nyahururu, the 456km MGR section connecting Mombasa and Konza.

The 165km Commuter Rail network within Nairobi Metropolitan Area.

Construction of the 23.5km new MGR link connecting Naivasha ICD and Longonot MGR station. This later link is providing interconnectivity between the SGR line and the MGR line. There is also operational interconnectivity between the MGR and the SGR at the Nairobi Inland Container Depot (ICD), where the two lines exist side by side.

Cargo Improvement for the MGR and SGR Lines

According to Kenya Railways Corporation (KRC), the volume of cargo transported via MGR increased by 21% from 797,000 tons in 2022 to 1,955,000 tons in 2023, while SGR volume increased by 7% from 6,90,000 tons to 6,533,028 tons.

Passenger Lines

Passenger services are being offered on a medium and long-distance basis, on the Mombasa - Nairobi - Naivasha SGR lines (Phase 1 SGR and Phase 2A SGR), as well as on the Thika - Nanyuki MGR Branch Line.

Commuter services (short distance) is being offered on:

- The 165km Commuter Rail MGR Network, which covers; Nairobi - Kikuyu, Nairobi - Ruiru, Nairobi - Syokimau - Athi River - Lukenya, Nairobi - Makadara - Embakasi Village
- The 34km SGR section covering Nairobi - Ongata Rongai – Ngong

Train	Routes	Time
Madaraka Express Passenger Service	Mombasa – Nairobi	Inter-County train: Departs both Mombasa and Nairobi Termini simultaneously at 8:00 am every day. This service entails scheduled stops at Mariakani, Miasenyi, Voi, Mtito Andei, Kibwezi, Emali, and Athi River stations. Afternoon Express train: Departs both Mombasa and Nairobi Termini simultaneously at 3:00 pm and includes a stop-over at Voi station. Night train: Departs both Mombasa and Nairobi Termini simultaneously at 10:00 pm. This service does not entail stops during the journey
	Nairobi Terminus to Suswa station	The long distance passenger service operates between Nairobi Terminus and Suswa station in Narok County with stop overs at Ongata Rongai, Ngong and Maai Mahiu stations on Fridays, Saturdays and Sundays.
The Kisumu Safari train	Kisumu - Nairobi	The Kisumu Safari train makes the trip from Nairobi every Friday with stopovers in Naivasha, Nakuru, Njoro, Molo, Elburgon, Fort Ternan, Londiani, Muhoroni, Miwani, Chemelil, Kibigori, and Kibos stations to drop and pick passengers. The train departs at 1830hrs and arrives in Kisumu at 0630 hrs.
The Nairobi Commuter Rail	Town service	From 600am -600pm
Nairobi to Nanyuki Service	Nairobi – Nanyuki	From Nairobi Central Railway Station, the branch line traverses six counties namely; Nairobi, Kiambu, Murang'a, Kirinyaga, Nyeri and Laikipia Counties. Stations along the Nairobi to Nanyuki corridor are at Nairobi, Makadara, Dandora, Kahawa, Ruiru, Kalimoni,Thika. Mitubiri, Makuyu, Maragua, Murang'a, Sagana, Karatina, Kiganjo, Naromoru and Nanyuki.

Source: Kenya Railways Corporation

The Government has also planned to Revitalize the 69km MGR section connecting Kisumu and Butere, the 65km MGR branch line connecting Leseru and Kitale, and a new 4.7Km MGR line connecting Mai Mahiu SGR station with the Naivasha ICD – Longonot station new MGR link. This link is to be used for connection of passenger services. Further, the Government has plans for development of SGR line extension along the Northern Corridor Route to connect Naivasha and Kisumu (262km), and Kisumu to Malaba (107km). There are also plans for development of SGR lines along the Lamu Port, South Sudan, and Ethiopia Transport (LAPSSET) corridor to connect Lamu and Isiolo, Isiolo and Moyale, Isiolo and Nairobi, and Isiolo, Lodwar

AGRICULTURE SECTOR

According to KNBS Economic Survey 2023, Agriculture remained the dominant sector, accounting for about 21.2 per cent of the overall GDP in 2022.

This sector falls under the Ministry of Agriculture and Livestock Development whose core functions include;

- Formulation, implementation and monitoring of agricultural legislations, regulations and policies
- Supporting agricultural research and promoting technology delivery
- Facilitating and representing agricultural state corporations in the government
- Development, implementation and coordination of programmes in the agricultural sector
- Regulating and quality control of inputs, produce and products from the agricultural sector
- Management and control of pests and diseases
- Collecting, maintaining and managing information on agricultural sector

IRRIGATION PROJECTS

	2013- 2015	2016 – 2022
No. of projects	79	54
Amount spent	9,103,542,625	10,900,839,631
Area put under irrigation (acres)	55,548	114,640
Average amount spent per acre	163,886	95,087
Annual Gross income	8,178,600,000	11,241,750,000

Source: National Irrigation Authority

Large-Scale Irrigation Projects

The Irrigation Act 2019 defines large-scale irrigation schemes as schemes whose area is above 3,000 acres. Towards this end, the Authority has seen successful operation of the largest irrigation scheme – Mwea irrigation scheme.

Smallholder/Community Managed Irrigation Projects

These are schemes that are owned and managed by the communities to boost their agricultural production. Smallholder Irrigation Schemes are initiated by the Government, development partners, or farmers. In line with the Irrigation Act 2019, the sector at the national level, is responsible for smallholder irrigation schemes with acreage ranging from 100 to 3,000 acres. These projects are well distributed in various counties across the country. The sector has earmarked 610 projects with a total area of 531,574 acres.

Agricultural roads are well defined with the rural developments of roads under KeRRA, whose role is the development, rehabilitation, maintenance, and management of rural roads in the country, as stated in the Kenya Roads Act 2007. The Authority is responsible for the following categories of roads; D,E,F,G,K,L,P,R,s,T,u,W.

REF INSTITUTION PORTFOLIO LENGTH PORTFOLIO			
	COMPLETED	ONGOING	PLANNED
R2000	275.13	44.9	139
Conventional	801.61	356.52	
R10000 LVSR	4,208.4	4,003.1	112
Rehabilitation/Reconstruction	410.61	200.92	
Total	**5,595.8**	**4,605.4**	**251.00**

Source: KeRRA

The main types of mechanization in the country include the use of animal-drawn and motorized machinery, implements and equipment. Development and promotion of these mechanization initiatives have been carried out by the Government in collaboration with the private sector. In line with the Kenya Vision 2030 agricultural mechanization is expected to play a critical role in putting more land into agricultural production.

The National Agricultural Mechanization Policy document of 2021, by the Ministry of Agriculture and Livestock, Fisheries and Cooperatives, it identified the following as the challenges in mechanization in the country.

- Access and Distribution of Agricultural Machinery such as high cost of agricultural machinery and equipment and inadequate distribution mechanism of agricultural machinery and equipment.
- Agricultural Mechanization Quality Assurance such as insufficient performance data and information on different agricultural machinery and technology, inadequate national agricultural mechanization standards, testing procedures and certification mechanisms, and existence of substandard agricultural machinery and equipment.
- Investment in Agricultural Mechanization such low public funding for agricultural mechanization, low private sector investment in agricultural mechanization and inadequate knowledge on investment opportunities in agricultural mechanization.
- Training, Extension and Technology adoption such as unregulated training curriculum for agricultural mechanization, lack of a certification authority for licensing agricultural machine operators, low accessibility and adoption of agricultural mechanization technologies and inadequate agricultural mechanization extension framework.
- Research and technology development such as uncoordinated agricultural mechanization research efforts, low level of funding towards research and technology development in agricultural mechanization, ineffective research-extension-producer linkages in agricultural mechanization development, limited research on fisheries mechanization and inadequate infrastructure for agricultural mechanization research.
- Sustainable Agricultural Land management and Climate Change such as inadequate investment and development in mechanized soil and water conservation, poor land use and management practices, underdeveloped alternative energy for mechanization, inadequate agricultural machinery inspection regulations to enforce emission.

FOOD SECURITY

PREVALENCE OF INSUFFICIENT FOOD CONSUMPTION IN EAST AFRICA

Due to overdependence on rain-fed agriculture, as of January 31, 2024, 32.6 million people across five selected East African countries did not have sufficient food for consumption, representing a 4.2% drop from the November 2023 level. This indicates an improvement in the food security situation across the countries, with most countries contributing to this trend. Notably, 8.88% (Tanzania) and 29.09% (South Sudan) of the total population have insufficient food for consumption. However, the number of people insecure about food in the region is lower than in 2023 (40.1 million) and 2022 (34.3 million). (The AGRA Food Security Monitor)

Table Prevalence of insufficient food consumption across East African countries (January 2024)

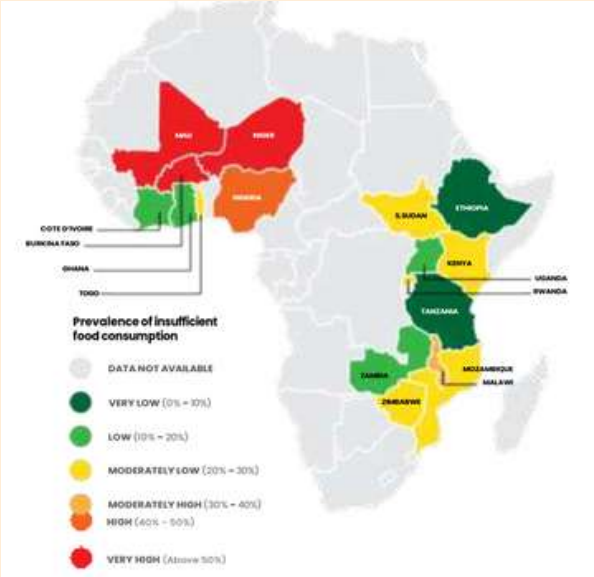
Country	Total Population (Million)	People with Insufficient food consumption (Million)	Percentage of total population with insufficient food consumption %	Change in people with insufficient food consumption from 2 years ago %
Kenya	51.40	14.20	26.46	100.00
Rwanda	12.30	3.50	27.76	12.00
South Sudan	11.00	3.30	29.09	51.52
Tanzania	53.30	4.70	8.88	16.28
Uganda	42.70	8.30	18.74	-43.26
Total		**5,595.8**	**4,605.4**	**251.00**

Source: The AGRA Food Security Monitor 43 edition December 2023 – January 2024

AGRICULTURAL MECHANIZATION

According to International Food Policy Research Institute (IFPRI) publication titled Food Systems Transformation in Kenya, December 2023, the mechanization level of agriculture in Kenya was estimated at 0.14 hp/ha in 2019.

Prof. Gumbe, 2019, notes that mechanization of agriculture to achieve greater yields is the only way to achieve the Kenya Vision 2030 objectives on sustainable food production in the country. The National Agricultural Mechanization Policy 2021, enshrined in our development goals, intends to create an enabling environment for mechanization development, build capacity for training, research, and technology development, promote mechanization for increased productivity, and provide quality assurance.



Source: The AGRA Food Security Monitor 43 edition December 2023 – January 2024

From assessment, Kenya, South Sudan, and Rwanda are the most food insecure countries in east Africa.

Agricultural Category	Activity	Mechanization
Crop production	Land preparation	tractors, planting machinery and implements
	Weeding	weeding row crop cultivators, hoeing machines
	Harvesting combined harvesters; root crop harvesters; and fruit harvesters	combined harvesters; root crop harvesters; and fruit harvesters
	Biochemical systems	seed production, processing, storage and marketing, herbicide production and marketing, and pest control chemicals.
	Crop production structures	greenhouses, farm fences, vertical farming, and urban agriculture structures.
	Primary processing and storage	cleaning, washing, threshing, washing, cooling, drying, size reduction, cane sugar processing, coffee processing, drying, size reduction, mixing, heating, cooking, refrigeration, condition storage and transport, packaging, and marketing.
Livestock production systems	Intensive and semi- intensive	chicken houses, pig houses, milking parlors, and slaughterhouses and slabs
	Primary processing of livestock products	collection, cleaning and packaging of eggs; milking of animals and cooling of milk; slaughter of animals; drying of meat; shearing of wool; and Packaging of products
Fisheries production systems	Capture systems	artisanal fishing and semi-industrial fishing
	aquaculture	land based in ponds or water based in cages
	Fish processing	washing, gutting, cutting, drying, smoking, and packaging.

The Keynote Presentation by Prof. Gumbe, at KAFACI International Evaluation Meeting for Baseline Survey on Agricultural Mechanization in Africa, August 2019, noted that the challenges facing agricultural mechanization in Africa and Kenya include inadequate machinery, inadequate staff; plant operators and mechanics, inadequate mechanization extension, inadequate access to mechanization technologies, lack of adequate credit and finance to farmers and private contractors, inadequate after sales and service back-up, decreasing land sizes, enterprises that do not support mechanization business model, vast area of coverage for government mechanization stations, inadequate resources/ funding for stations, gender and youth imbalance in agriculture, and aged farming citizens.

Energy production for or from agriculture

The assessment will be done on institutional capacity and produced capacity.
According to EPRA, Biogas in Kenya is widely produced with over 8000 biogas plants utilizing various raw materials e.g. agricultural wastes, slaughterhouse waste, municipal wastes, etc. However, the situation is amorphous in the sense that there is no consolidated data on biogas production making it a challenge in determining the country's overall capacity.

Biogas potential in Kenya has been identified in Municipal waste, sisal and coffee production. The total installed electric capacity potential of all sources ranges from 29-131MW, which is about 3.2 to 16.4% of the total electricity production in 2022.

Biomass

Bio-energy is the energy derived from various sources of solids, liquids and gaseous biomass, including fuel wood, charcoal, ethanol, bio-diesel and biogas. Biomass contribution to Kenya's final energy demand is 70 per cent and provides for more than 90 per cent of rural household energy needs. The main sources of biomass for Kenya include charcoal, wood-fuel and agricultural waste.

Institutional infrastructure

The AGRICULTURAL SECTOR TRANSFORMATION and GROWTH STRATEGY TOWARDS SUSTAINABLE AGRICULTURAL TRANSFORMATION and FOOD SECURITY IN KENYA, adopted by the ministry of Agriculture, Livestock, Fisheries and Cooperatives in 2019, for the 10 year strategy, 2019 – 2029. The strategy gives;

- Increase small-scale farmer, pastoralist, and fisher folk incomes– Raise average annual small-scale farmer incomes from KES 465/day to 625/day (~35% increase). Directly benefit 3.3 million Kenyan farming households.
- Increase agricultural output and value add– Expand agricultural GDP from KES 2.9 trillion to KES 3.9 trillion (6% CAGR).– Increase the contribution of agro-processing to GDP by KES 130 billion over five years (50% increase over KES 261 billion in 2018).
- Boost household food resilience– Reduce the number of food-insecure Kenyans in the arid and semi-arid lands (ASAL) regions from an average of 2.7 million to zero while reducing the cost of food and improving nutrition. Protect households against environmental and fiscal shocks.

Agricultural Waste Management infrastructures

Generally, agricultural waste is classified into four types: crop waste (rice husk, wheat straws, sugarcane bagasse), animal waste (animal excreta, dead animals), processing waste (packaging material, fertilizer cans), and hazardous waste (pesticides, insecticides) the wastes are generally recycled for fuel, fodder, and fertilizer.

TELECOMMUNICATIONS SECTOR

The Communications Authority of Kenya (CA) is the regulatory authority for the communications sector in Kenya. Established in 1999 by the Kenya Information and Communications Act, 1998, the Authority is responsible for facilitating the development of the information and communications sectors including; broadcasting, cybersecurity, multimedia, telecommunications, electronic commerce, postal and courier services.

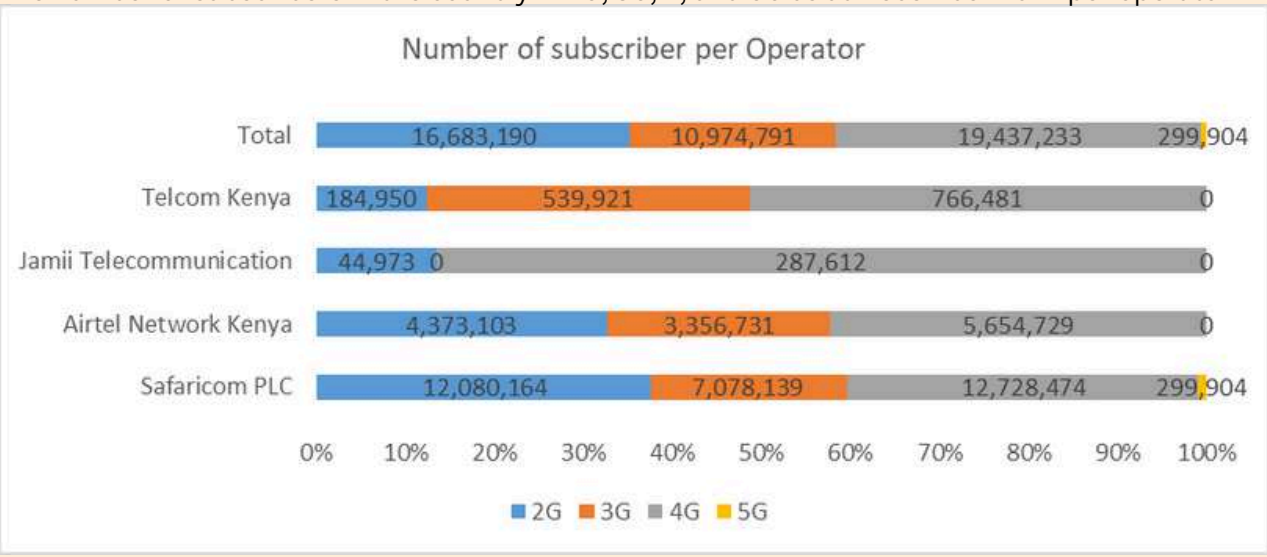
This responsibility entails:

- Licensing all systems and services in the communications industry, including; telecommunications, postal, courier and broadcasting.
- Managing the country's frequency spectrum and numbering resources.
- Facilitating the development and management of a national cyber security framework.
- Facilitating the development of e-commerce.
- Type approving and accepting communications equipment meant for use in the country.
- Protecting consumer rights within the communications environment.
- Managing competition within the sector to ensure a level playing ground for all players.
- Regulating retail and wholesale tariffs for communications services.
- Managing the universal access fund to facilitate access to communications services by all in Kenya.
- Monitoring the activities of licensees to enforce compliance with the licence terms and conditions as well as the law.

Mobile coverage per operator (Safaricom, Telcom, Airtel and Jamii Telcom) country wide and per county

Connectivity Technology	Network coverage
2G	98% coverage countrywide
3G	98% coverage countrywide
4G	97% coverage countrywide
5G	Nairobi, Mombasa, Kisumu, Kericho, Nakuru, Kisii, Kiambu, Machakos, Kilifi, Kwale, kajiado, uasin Gishu, kakamega, Garissa, marsabit, Meru, Nyeri, Siaya, Vihiga.

The number of subscribers in the country in 2G, 3G, 4, and 5G as at December 2022 per operator

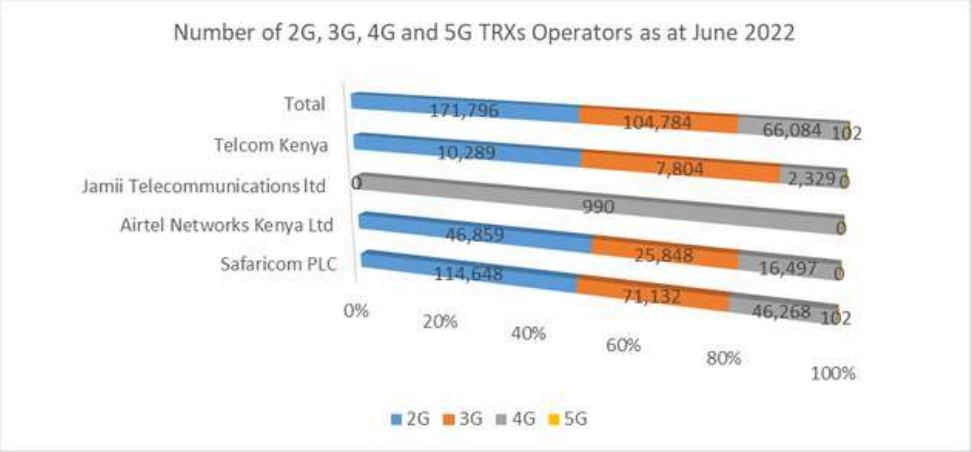


Source: Communication Authority of Kenya

The number of enterprise internet each subscriber has is the **Fibre-To- Fibre officer (FTFO)** as at December 2022 is **43,219.**

CAK has licensed a total of 639 radio and TV stations to be operating in Kenya as at 30th June 2023, operating the vernacular dialects, English and Kiswahili.

Number of 2G, 3G, 4G and 5G TRXs Operators as at June 2022



Source: Communication Authority of Kenya

ICT projects – Digital City

The internet connectivity Internet subscriptions increased from 45.4 million in 2018 to 48.0 million in 2022. A key driver of this growth was increase in Fibre to the Home (FttH) subscriptions from 129, 979 in 2018 to 566,901 subscriptions in 2022, accounting for 67.7% of total fixed broadband subscriptions. The expansion reflects the country's commitment to enhancing digital connectivity.

Mobile broadband is the most preferred internet technology for individual customers due to its availability and affordability compared to fixed broadband. However, fixed broadband especially the fibre optic is increasingly being preferred by businesses and homes due to its bandwidth. (KNBS Economic Survey 2023)

National Optic Fibre Backbone Infrastructure (NOFBI) The Ministry installed 8,900 Km of National Optic Fibre Backbone Infrastructure against the targeted 9,500 Km. this extended the fiber network to the Sub-County headquarters. So far, a total of 5,134 centers across the 47 counties (https://ict.go.ke/last-mile-county-connectivity-project-lmccp/)

Government Common Core Network (GCCN) The Ministry connected 26 more Ministries Departments and Agencies (MDAs) to the Government Common Core Network (GCCN) Programme resulting in a total of 78 connected MDAs against a target of 100 within Nairobi. This ensured the provision of reliable and stable interconnectivity between MDAs for efficient delivery of Government services.

Last Mile Country Connectivity Project (LMCCP) The Ministry connected 443 Government buildings, 91 hospitals and 23 police stations to the government backbone network in the Counties for enhanced service delivery.

Provision of Broadband Connectivity to schools under Universal Service Obligation. To increase access to internet services and e-learning, the Ministry connected 884 public secondary schools out of the targeted 896.

East Africa Trade Facilitation Programme. To enhance regional connectivity, the Ministry rehabilitated 630 Kms of Fibre Optic Cable from Eldoret to Nadapal at the common border with South Sudan

HEALTH SECTOR

Overview

In 2013, Kenya transitioned into a devolved system of governance comprising two levels: the national government and 47 county governments. Under the new system, the health service delivery function was assigned to county governments while the national government was responsible for health policy and regulatory functions, technical assistance to counties, and management of national referral health facilities.

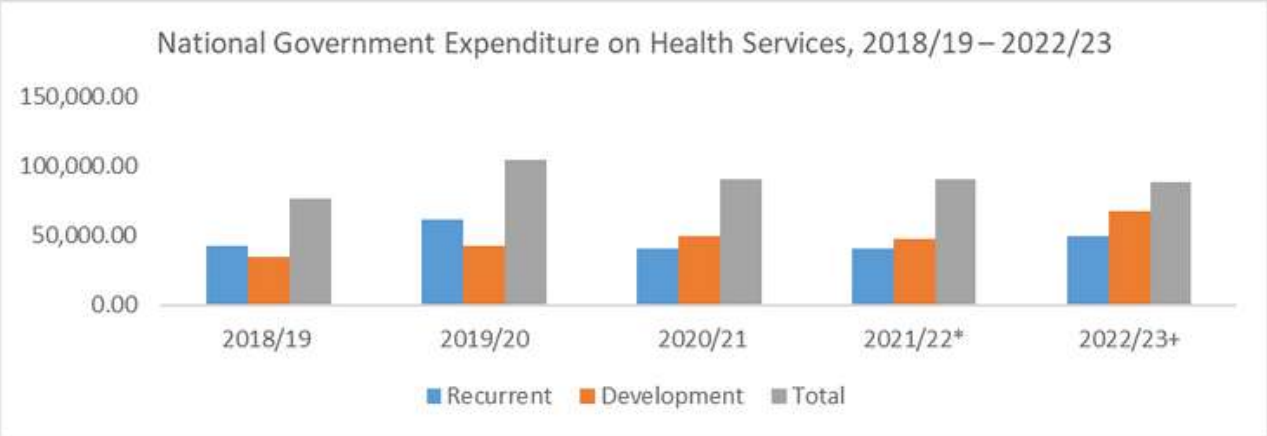
Health sector is an important contributor to the national economic growth and in the realization for sustainability of the nation's human capital base. One of the core pillars of the Government Manifesto is healthcare. Through this, it aims at providing affordable, accessible and quality healthcare services to all its citizens. To achieve this, the Government continuously endeavours to increase resources towards the health sector as well as creating an enabling environment for investments in the healthcare service delivery ecosystem. The Government is also focusing on provision of a social health insurance scheme that will cover all Kenyans, ensuring that no one is left behind. Further, there is concerted effort towards the digitization of health ecosystem to improve the portability of data and interconnectivity of health information.

Economic Survey 2023, indicates that National Government total expenditure on health services was KSh 88.2 billion in 2021/22 and is expected to rise by 33.1 per cent to KSh 117.4 billion in 2022/23. County Governments' total expenditure on health services was KSh 108.3 billion in 2021/22 and is expected to grow to KSh 109.8 billion in 2022/23. The ratio of National Government expenditure on health to total National Government expenditure is anticipated to rise to 4.0 per cent in 2022/23.

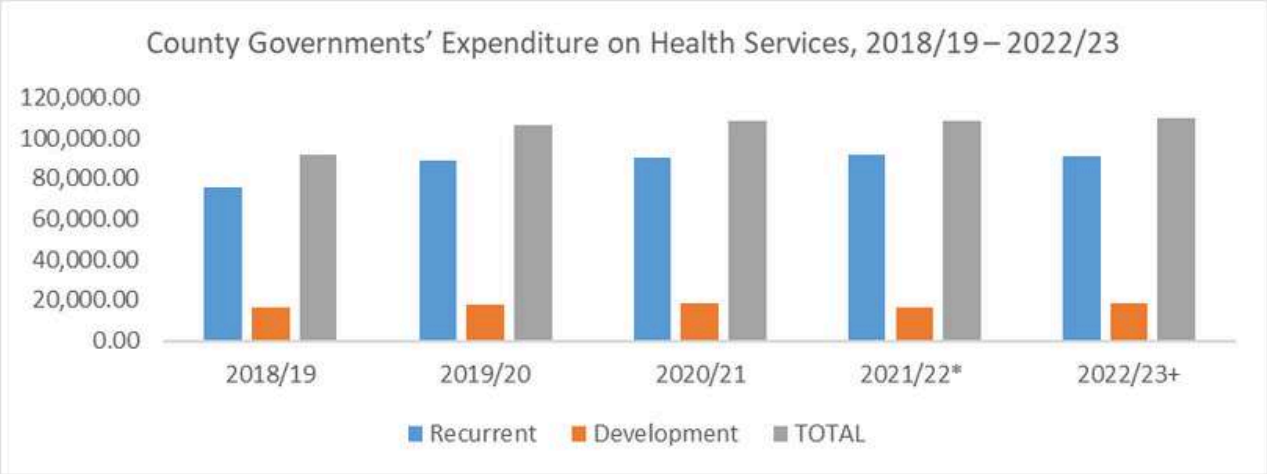
National Government Expenditure on Health Services, 2018/19 – 2022/23

	2018/19	2019/20	2020/21	2021/22	2022/23+
Recurrent					
Outpatient services	2,650.0	2,633.7	234.5	207.8	2,481.0
Hospital services	22,952.4	27,496.3	22,267.0	23,204.7	25,917.1
Public health services	9,897.8	12,740.0	3,987.9	2,114.4	2,492.9
Health expenditure n.e.c	6,971.9	18,517.6	14,334.0	14,623.6	18,705.1
Sub-Total	**42,472.1**	**61,387.6**	**40,823.4**	**40,150.5**	**49,596.1**
Development					
Outpatient services	9,364.0	6,681.2	7,189.7	8,615.9	8,970.0
Hospital services	487.2	2,349.7	1,728.9	1,963.7	2,881.5
Public health services	23,993.1	32,233.2	37,259.3	28,650.0	44,025.8
Health expenditure n.e.c	367.6	1,507.0	3,799.0	8,809.2	11,886.6
Sub-Total	**34,211.9**	**42,771.1**	**49,976.9**	**48,038.8**	**67,763.9**
TOTAL	**76,684.0**	**104,158.8**	**90,800.3**	**90,800.3**	**88,189.3**
TOTAL OUTLAYS	**2,944,798.04**	**2,595,755.80**	**2,731,663.75**	**2,989,647.48**	**3,362,917.02**

*Source: National Treasury, *Provisional, + Estimates*



County Governments' Expenditure on Health Services, 2018/19 – 2022/23

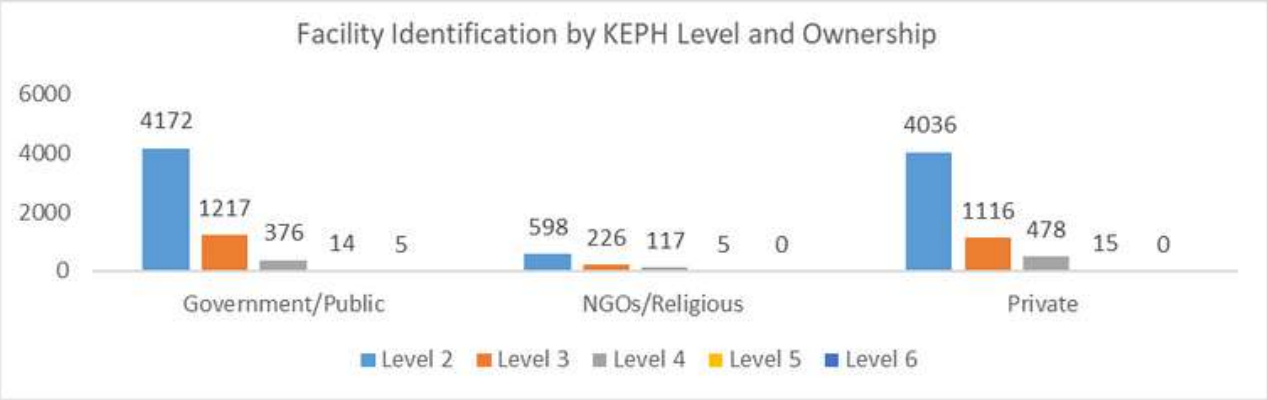


*Source: The National Treasury *Provisional + Estimates*

From the graphs, it's evident that county governments spend more on recurrent expenditure than development.

The number of health facilities increased by 2.2% to 16,517 in 2022, due to increase in the number of level 3 facilities. In 2022, level 2 and level 3 facilities accounted for 77.6% and 16.4% of the total facilities, respectively. Primary care hospitals increased by 68 facilities to 958 accounting for 5.8% of the total facilities in 2022. Secondary care hospitals increased by 2 facilities while the tertiary referral hospitals remained the same at 6 facilities in 2022. The government was the main owner of primary care, secondary care and tertiary referral hospitals. (Economic Survey 2023)

According to the Kenya Health Facility Census Report, 2023, by Ministry of Health (MoH), government owned facilities constitute of 4172 (72%) Level 2 facilities, 1217 (21%) Level 3, 376 (7%) Level 4, 14 Level 5 and 5 Level 6 facilities. Distribution of levels of care within privately owned facilities are almost similar to government-owned facilities with 4036 (72%) Level 2 facilities, 1116 (20%) Level 3. However, private sector seems to own more Level 4 facilities (478) compared to public sector (376). It was also noted that only the public sector offers care at KEPH Level 6.



The number of hospital beds rose by 5.0% to 94,925 while the number of hospital cots increased by 4.7% to 10,306 in 2022. The number of hospital beds in private hospitals surpassed the number in public hospitals in the review period. The number of cots in private hospitals were higher than those in public hospitals for the second year in a row.

Hospital Beds and Cots by Ownership, 2018 - 2022

Ownership	2018		2019		2020		2021		2022	
	Beds	Cots	Beds	Cots	Beds	Cots	Beds	Cots	Beds	Cots
Public	35,556	3,723	36,267	3,773	37,069	3,867	38,132	3,952	39,210	4,177
Private	21,835	2,557	24,154	2,903	30,496	3,413	36,817	4,104	39,883	4,321
FBO	13,253	1,472	13,323	1,476	13,277	1,421	14,068	1,615	14,396	1,627
NGO	957	130	1,124	151	1,249	165	1,400	176	1,436	181
Total	**71,601**	**7,882**	**74,868**	**8,303**	**82,091**	**8,946**	**90,417**	**9,847**	**94,925**	**10,306**

*Source: The National Treasury *Provisional + Estimates*

No. of beds per level of care

	Total	Level 2	Level 3	Level 4	Level 5	Level 6
Number of functional inpatient beds (Excluding delivery beds)	100,827	6920	22908	57453	9262	4284
Number of Functional Cots	7,918	463	1618	4481	554	802
Number of Emergency Casualty beds	3,556	277	938	2067	216	58
High Dependency Unit (HDU) Beds	919	8	32	696	165	18
Maternity Beds	18,655	1278	4999	10674	1476	228
Delivery Beds	3,768	431	1475	1694	145	23
Isolation Beds	3,470	205	637	2155	381	92
ICU Adults beds	899	5	20	538	221	115
ICU Paediatric beds	196	3	1	128	39	25
ICU Neonatal beds	258			164	65	29
Overall total	**140,466**	**9,590**	**32,628**	**80,050**	**12,524**	**5,674**

Source: KENYA HEALTH FACILITY CENSUS REPORT, 2023, by Ministry of Health (MoH)

There was an increase in the number of registered health professionals for all cadres in 2022. The proportion of registered professionals per 100,000 population remained as it was in 2021 except for pharmaceutical technologists, graduate and registered nurses, diploma clinical officers, public health officers, and diploma physiotherapists. The proportion of registered nurses increased from 155 per 100,000 population in 2021 to 161 per 100,000 population in 2022.

The proportion of registered professionals per 100,000 population by cadre

Ownership	2018+		2019+		2020+		2021+		2022*	
Number	No. Per 100,000 Population	Number	No. Per 100,000 Population	Number	No. Per 100,000 Population	Number	No. Per 100,000 Population	Number	Number	No. Per 100,000 Population
Medical Practitioners and Dentists										
Medical Officers	7,863	17	8,353	18	8,590	18	9,298	19	9,638	19
Dentists	823	2	872	2	844	2	924	2	937	2
Pharmacists and Pharmtechs										
Pharmacists	2,572	6	2,864	6	3,025	6	3,344	7	3,684	7
Pharmaceutical Technologists	8,580	18	9,306	20	9,934	20	10,234	21	10,943	22
Nurses										
Graduate Nurses	5,961	13	7,242	15	7,959	16	9,112	18	9,937	20
Registered Nurses	57,564	124	58,247	122	63,580	130	76,878	155	81,564	161
Enrolled Nurses	23,783	51	28,822	61	38,120	78	38,776	78	39,458	78
Clinical Officers										
Graduate Clinical Officers	428	1	608	1	715	1	896	2	1,125	2
Diploma Clinical Officers	20,216	44	21,131	44	22,930	47	24,481	49	25,679	51
Public Health Officers and Technicians										
Public Health Officers	1,775	4	3,087	6	4,021	8	5,016	10	6,031	12
Public Health Technicians	329	1	657	2	750	2	836	2	996	2
Medical Laboratory Techs										
Laboratory Technologists	11,687	25	13,144	28	14,219	29	15,635	31	15,653	31
Laboratory Technicians	3,602	8	3,886	8	3,979	8	4,160	8	4,237	8
Nutritionists and Dieticians										
Nutritionists and Dieticians	3,066	7	3,570	8	3,795	8	4,235	9	4,405	9
Nutrition and Dietetic Technologists	4,430	10	5,282	11	5,775	12	6,340	13	6,543	13
Nutrition and Dietetic Technicians	813	2	921	2	951	2	1,046	2	1,162	2
Physiotherapists										
Physiotherapists (Degree)	201	0.4	285	1	296	1	335	1	423	1
Physiotherapists (Diploma)	846	2	1,147	2	1,521	3	1,687	3	1,876	4

EDUCATION SECTOR

Overview

The Ministry of Education derives its mandate from the Constitution of Kenya, Chapter Four Articles 43, 53, 54, 55, 56, 57, and 59 which provides for children's right to free and compulsory basic education, including quality services, and to access education institutions and facilities for persons with disabilities.

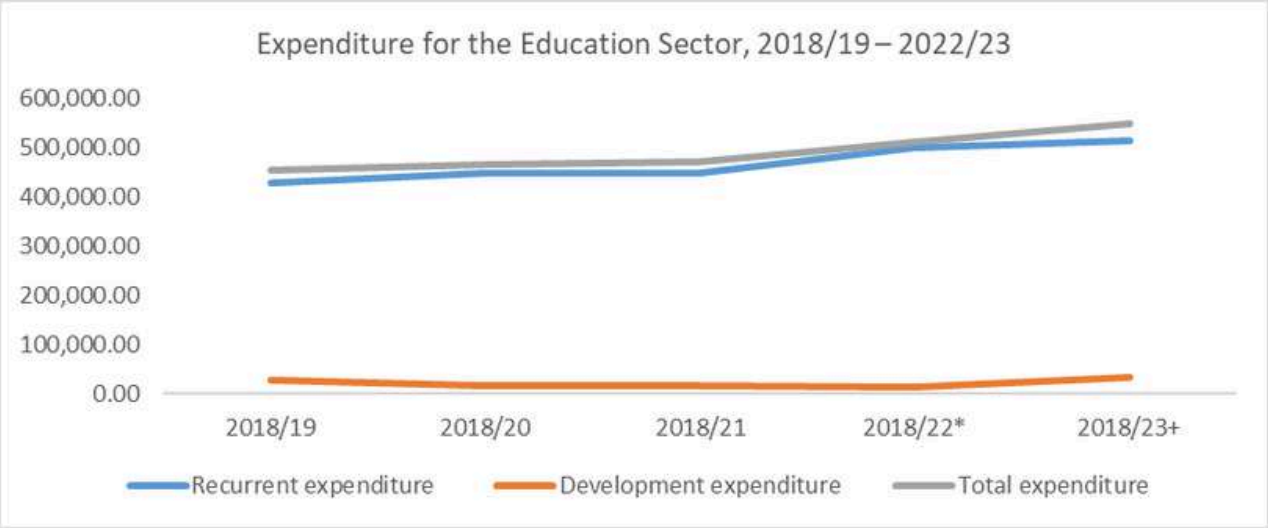
Under Executive order No. 1 of 2023 (Revised) on the Organization of the Government of the Republic of Kenya, the Ministry is headed by a Cabinet Secretary, assisted by three (3) Principal Secretaries, each heading a State Department. The three State Departments are The State Department for Basic Education; the State Department for Vocational and Technical Training and; the State Department for Higher Education and Research.

In 2022, the first cohort of Competency Based Curriculum (CBC) undertook an examination assessment in grade 6. At the same time, the Government allocated substantial resources in schools infrastructure development in preparation for the smooth transition of the grade 6 learners to Junior Secondary education. The 2022 school year for basic education started in April and ended in December 2022.This was per the revised calendar with Kenya Certificate of Primary Education (KCPE) and Kenya Certificate of Secondary Education (KCSE) examinations being undertaken as planned. In the same period, three university constituent colleges were given charters to be fully-fledged universities. These include Kaimosi Friends University, Tharaka-Nithi University and Tom Mboya University. In 2023, the last group of 8-4-4 system in primary school came to an end as the last KCPE was done.

Total development expenditure by the Ministry of Education, Science and Technology is expected to more than double from KSh 13.1 billion in 2021/22 to KSh 32.4 billion in 2022/23 mainly on account of infrastructure development especially construction of additional classrooms and science laboratories as well as purchase of furniture in readiness for the large number of learners expected to join Junior Secondary Education. The development expenditure for State Department of Early Learning and Basic Education is expected to greatly increase from KSh 6.9 billion in 2021/22 to KSh 23.5 billion in 2022/23 and will account for 72.5% of the total development expenditure in the review period. In the 2022/23 financial year, development expenditure for Teachers Service Commission and all the state departments is expected to increase except that of the State Department for Post Training and Skills Development with no development expenditure. (Economic Survey 2023)

	2018/19	2019/20	2020/21	2021/22	2022/23+
Recurrent expenditure	428,200.60	449,366.50	449,366.50	498,802.00	515,836.46
Development expenditure	26,879.24	15,320.67	15,304.00	13,115.00	32,413.21
Total expenditure	455,079.84	464,692.19	472,376.00	511,917.00	548,249.67

*Source: The National Treasury * Provisional + Revised budget estimates*



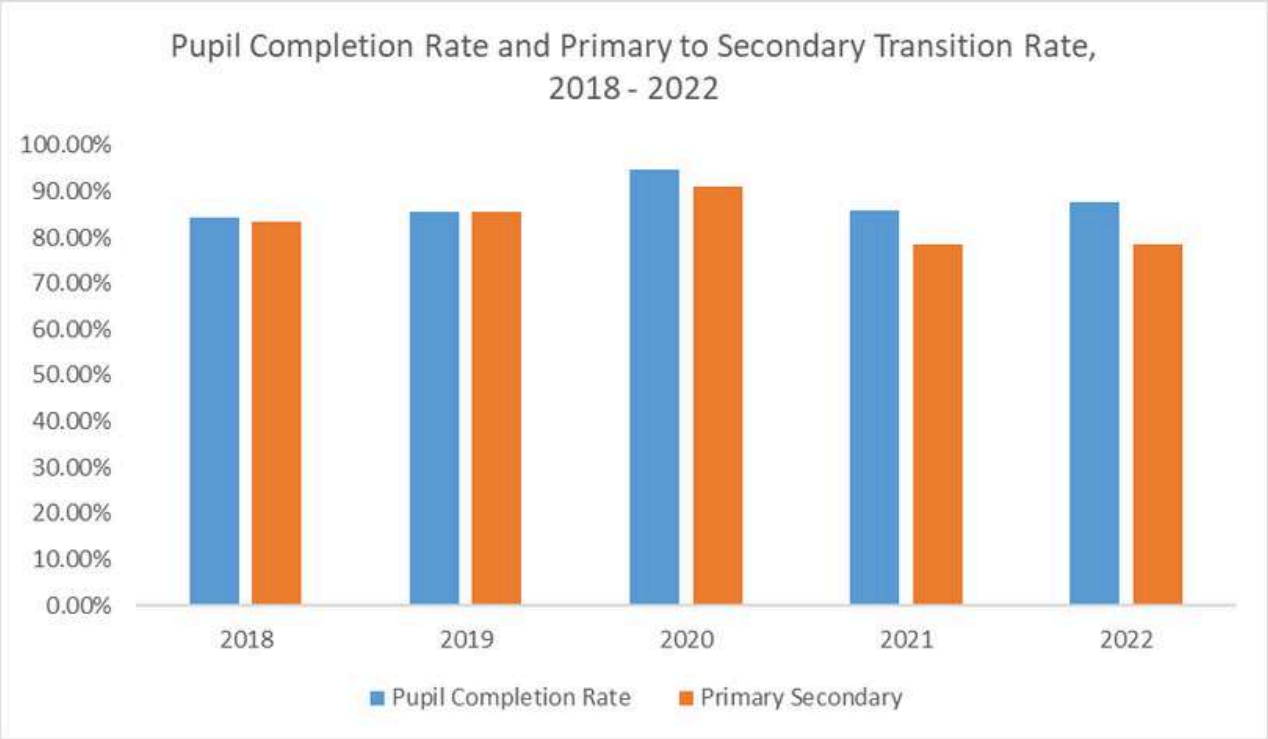
The total number of pre-primary, primary and secondary schools declined by 2.7% from 83,747 in 2021 to 81,454 in 2022. Registered pre-primary schools decreased by 5.4% to 38,483 in 2022. The number of primary schools went down by 0.4% from 32,594 in 2021 to 32,469, mainly attributed to the decrease in the number of private primary schools by 2.1% to 8,838 in 2022. The number of secondary schools went up by 0.2% to 10,502 in 2022. The total number of Technical and Vocational Education and Training (TVET) institutions rose by 5.7% from 2,271 in 2021 to 2,401 in 2022. The number of public universities increased from 32 in 2021 to 35 in 2022, due to awarding of charters to Kaimosi Friends University, Tom Mboya and Tharaka-Nithi University

Category	Number in 2022
Registered Pre-Primary	38,483
Primary	32,469
Secondary	10,502
Teacher Training Colleges	67
TVET Institutions	2,401
Universities	68

Source: Ministry of Education/ Council of Governors/TVET Authority

Transition Rate from Primary to Secondary

Pupil Completion Rate (PCR) and Primary to Secondary Transition Rate (PSTR) from 2018 to 2022 is shown below. The transition rate presented is based on enrolment of Standard 8 pupils in 2021 and enrolment of Form 1 students in 2022. The PCR rose from 85.8 per cent in 2021 to 87.8 per cent in 2022.The PSTR increased slightly from 78.5 per cent in 2021 to 78.6 per cent in 2022.



Source: MoE

Tertiary Education

The total number of students placed to undertake degree, diploma, certificate and artisan courses in universities, middle level colleges and TVET institutions went down by 6.3% from 272,776 in 2021/22 to 255,612 in 2022/23. The placement of female students to these institutions reduced by 3.8% to 129.5 thousand while that of male students dropped by 8.7% to 126.1 thousand. Students' placement to undertake degree programmes at the universities decreased by 2.9% to 124,585 with a higher reduction of males (6.0 %) than females (1.1%). The total number of students placed in the middle level colleges to undertake diploma, certificates and TVET courses decreased by 9.3% from 144,440 in 2021/22 to 131,027 in 2022/23. Placement of students at middle level colleges to pursue diploma courses went down by 12.6% to 78,773 while those placed to undertake certificate courses declined by 5.1% to 41,492 in 2022/23. The number of students placed to pursue artisan courses increased marginally by 1.3% from 10,623 in 2021/22 to 10,762 in 2022/23.

Adult Education

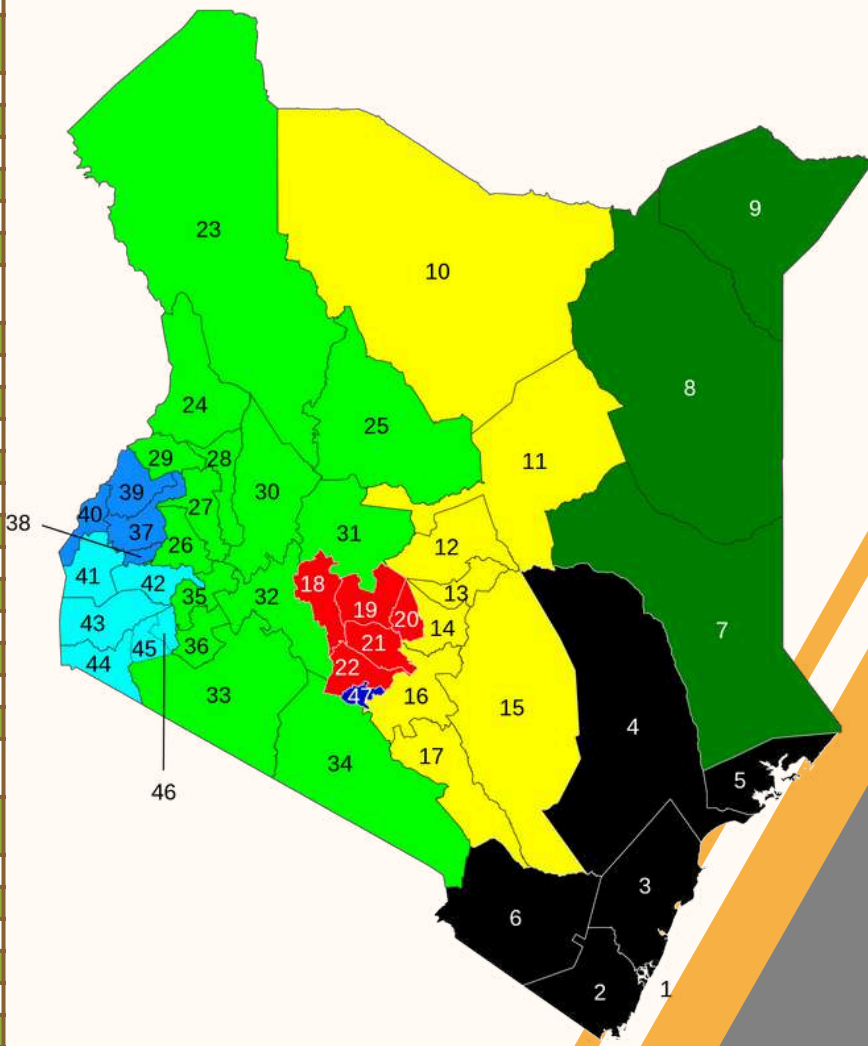
The overall enrolment in adult education centres increased by 7.6% to 138,628 in 2022. The number of male and female learners rose by 15.6% and 3.3% to 51,766 and 86,862 in 2022, respectively. Over the four years, enrolment in adult education centres in Mombasa and Bungoma counties has a consistent decline and dropped further from 2,263 and 4,368 in 2021 to 1,456 and 3,651 in 2022 respectively. Turkana County has recorded a consistent increase in enrolment of adult education centres in the same period.

COUNTY LEVEL INFRASTRUCTURAL ANALYSIS

Kenya counties

Code	County	Area (km2)	2019 Population	Capital
1	Mombasa	212.5	1,208,333	Mombasa
2	Kwale	8270.3	866,820	Kwale
3	Kilifi	12245.9	1,453,787	Kilifi
4	Tana River	35875.8	315,943	Hola
5	Lamu	6497.7	143,920	Lamu
6	Taita Taveta	17083.9	340,671	Wundanyi
7	Garissa	45720.2	841,353	Garissa
8	Wajir	55840.6	781,263	Wajir
9	Mandera	25797.9	867,457	Mandera
10	Marsabit	66923.1	459,785	Marsabit
11	Isiolo	25336.1	268,002	Isiolo
12	Meru	7003.1	1,545,714	Meru
13	Thakara – Nithi	2609.5	393,177	Kathwana
14	Embu	2555.9	608,599	Embu
15	Kitui	24385.1	1,136,187	Kitui
16	Machakos	5952.9	1,421,932	Machakos
17	Makueni	8,008.9	987,653	Wote
18	Nyandarua	3107.7	638,289	Ol Kalou
19	Nyeri	2361.0	759,164	Nyeri
20	Kirinyaga	1205.4	610,411	Kutus
21	Murang'a	2325.8	1,056,640	Murang'a
22	Kiambu	2449.2	2,417,735	Kiambu
23	Turkana	98597.8	1,504,976	Lodwar
24	West Pokot	8418.2	621,241	Kapenguria
25	Samburu	20182.5	310,327	Maralal
26	Trans Nzoia	2469.9	990,341	Kitale
27	Uasin Gishu	2955.3	1,163,186	Eldoret
28	Elgeyo Marakwet	3049.7	454,480	Iten
29	Nandi	2884.5	885,711	Kapsabet
30	Baringo	11075.3	666,763	Kabarnet
31	Laikipia	8696.1	518,560	Rumuruti
32	Nakuru	7509.5	2,162,202	Nakuru
33	Narok	17921.2	1,157,873	Narok
34	Kajiado	21292.7	1,117,840	Kajiado
35	Kericho	2454.5	901,777	Kericho
36	Bomet	1997.9	875,689	Bomet
37	Kakamega	3033.8	1,867,579	Kakamega
38	Vihiga	531.3	590,013	Mbale
39	Bungoma	2206.9	1,670,570	Bungoma
40	Busia	1628.4	893,681	Busia
41	Siaya	2496.1	993,183	Siaya
42	Kisumu	2009.5	1,155,574	Kisumu
43	Homa Bay	3154.9	1,131,950	Homa Bay
44	Migori	2586.4	1,116,436	Migori
45	Kisii	1317.9	1,266,860	Kisii
46	Nyamira	912.5	605,576	Nyamira
47	**Nairobi**	**694.9**	**4,397,073**	**Nairobi**

In the 2010 constitution, Kenya was divided into 47 counties for administrative purposes, grouped according to the former province they were separated from, with their areas and populations as of the 2009 and the 2019 census shown below:



COORDINATION WITH THE NATIONAL GOVERNMENT

The state department of devolution, anchored in the office of the deputy president, is responsible for supporting County Governments through policy formulation, capacity support and intergovernmental relations. Additionally, the state department manages the shared function of disaster risk management between the National and County governments.

STAKEHOLDERS

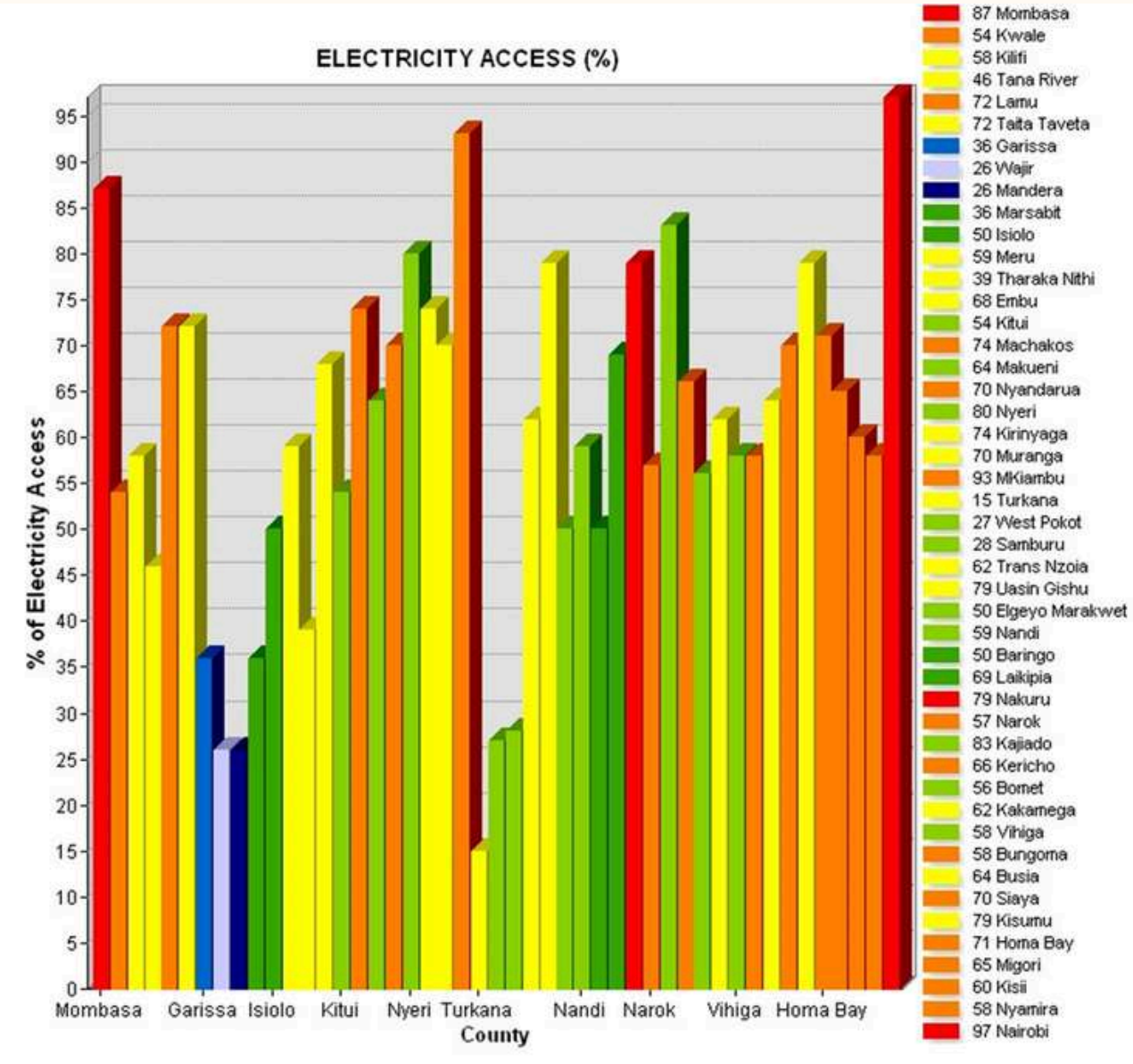
Entity	Responsibility
Directorate of Devolution and Intergovernmental Relations	Policy and Research, promote intergovernmental relations, carryout capacity building and technical assistance
Intergovernmental Consultative Sectoral Forum	consultative for a on sectoral issues of common interest to the national and county governments.
National and County Government Coordinating Summit	Composed of the President who is the chair or in his absence the Deputy President, and governors of the forty-seven counties Provides a forum for consultation and co-operation between the national and county governments.
Council of County Governors (COG)	COG provides a mechanism for consultation amongst County Governments, share information on performance of the counties in execution of their functions, facilitate capacity building for Governors, and consider reports from other intergovernmental forums on national and county interests amongst other functions
Intergovernmental Relations Technical Committee (IGRTC)	• The Committee is responsible for the day-to-day administration of the Summit and Council of Governors (CoG) by facilitating the activities of the Summit and Council of Governors and implementing their decisions. • Convening a meeting of the forty-seven County Secretaries within 30 days preceding every Summit meeting. • Any other function as may be conferred on it by the Summit, the Council, the Intergovernmental Relations Act or any other legislation.

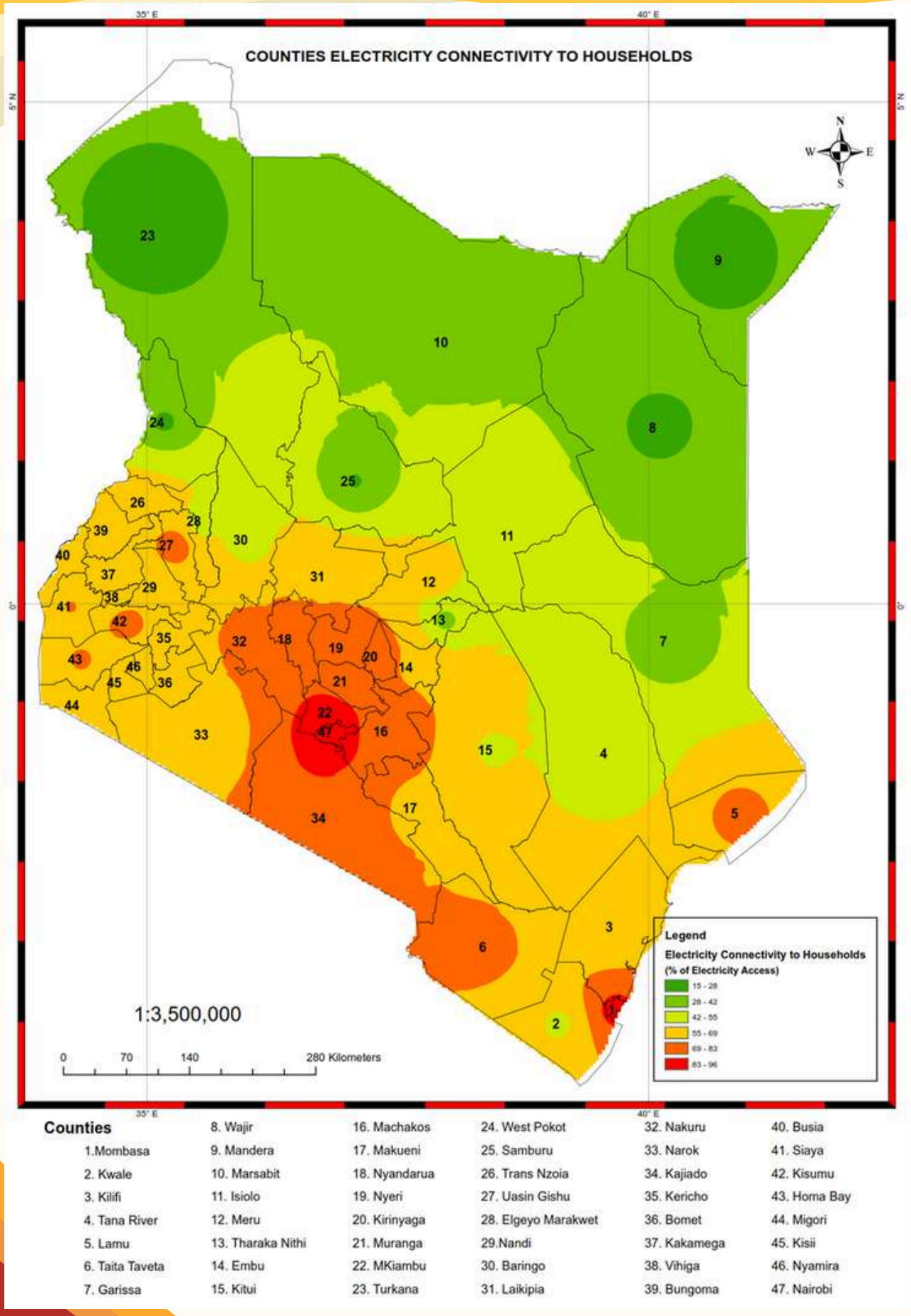
ENERGY, OIL AND GAS SECTORS

Electricity Connectivity to Households

From the 2019 population and housing census socio-economic data, it was established that Nairobi, Kiambu, and Mombasa Counties lead on grid connected power supply, while Siaya and Homa Bay counties lead on solar power supply to households. On the other hand, Turkana, Samburu, and West Pokot counties had the lowest combined grid and solar power connections to households.

To bridge the gap in electricity accessibility, the Kenya Off-grid Solar Access Project (KOSAP) seeks to reach 1.58 million people in the underserved Counties of Kenya with modern energy. In particular, it seeks to have 250,000 households served by Stand-alone Solar Systems (SSS) and 60,000 households served by Clean Cooking Solutions (CCS) by its projected completion in May, 2025. KOSAP further targets the construction of 137 mini-grids in the targeted Counties that will be used to connect about 54,589 households with power. Similarly, about 567 public facilities, including secondary schools, health clinics as well as administrative offices will be supplied with solar power under the project. Some 380 boreholes that currently use diesel will benefit from the installation of renewable, solar pumps. Targeted Counties in this program include Narok, West Pokot, Turkana, Samburu, Marsabit, Wajir, Mandera, Garissa, Isiolo, Lamu, Tana River, Taita Taveta, Kilifi and Kwale



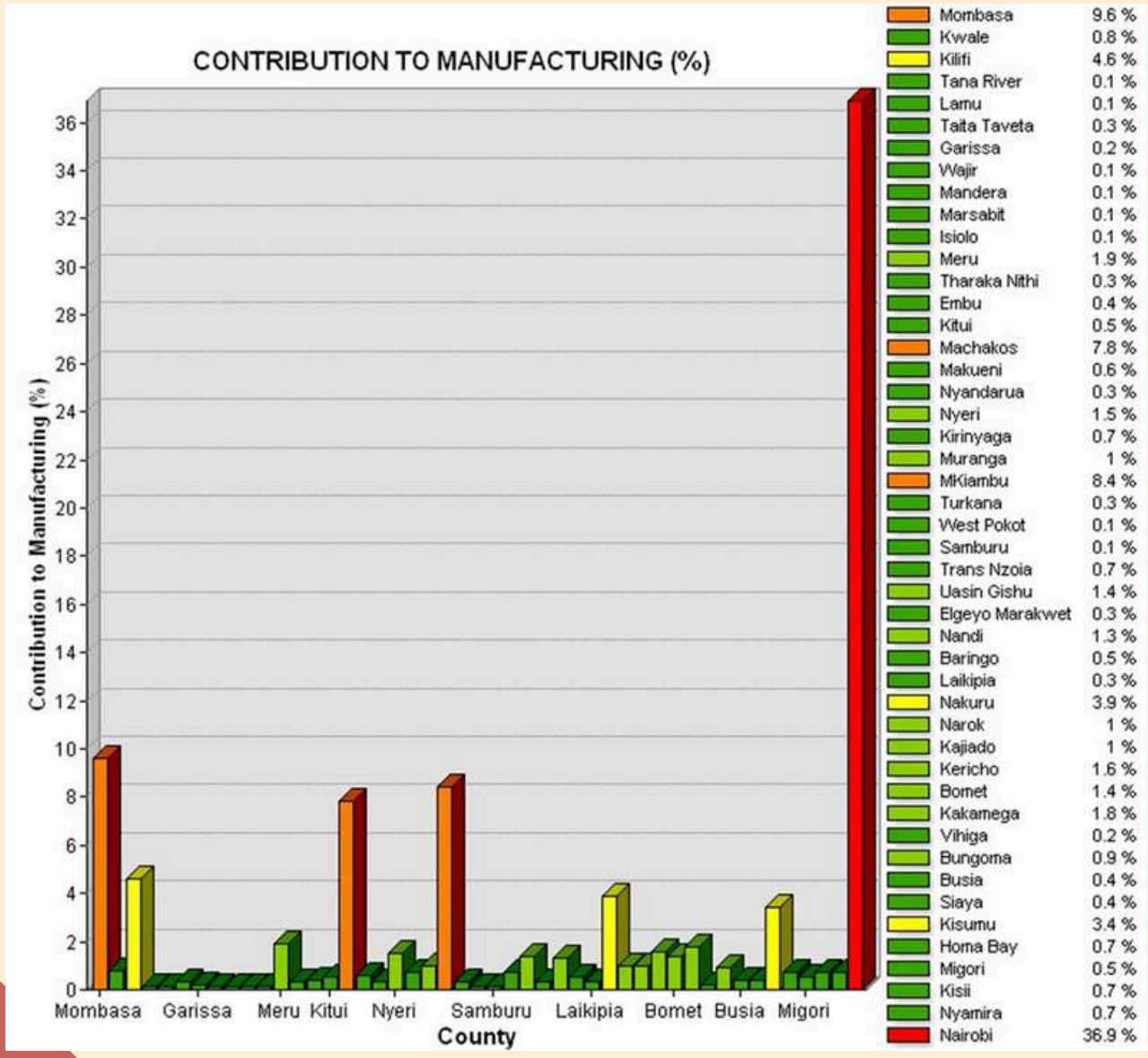


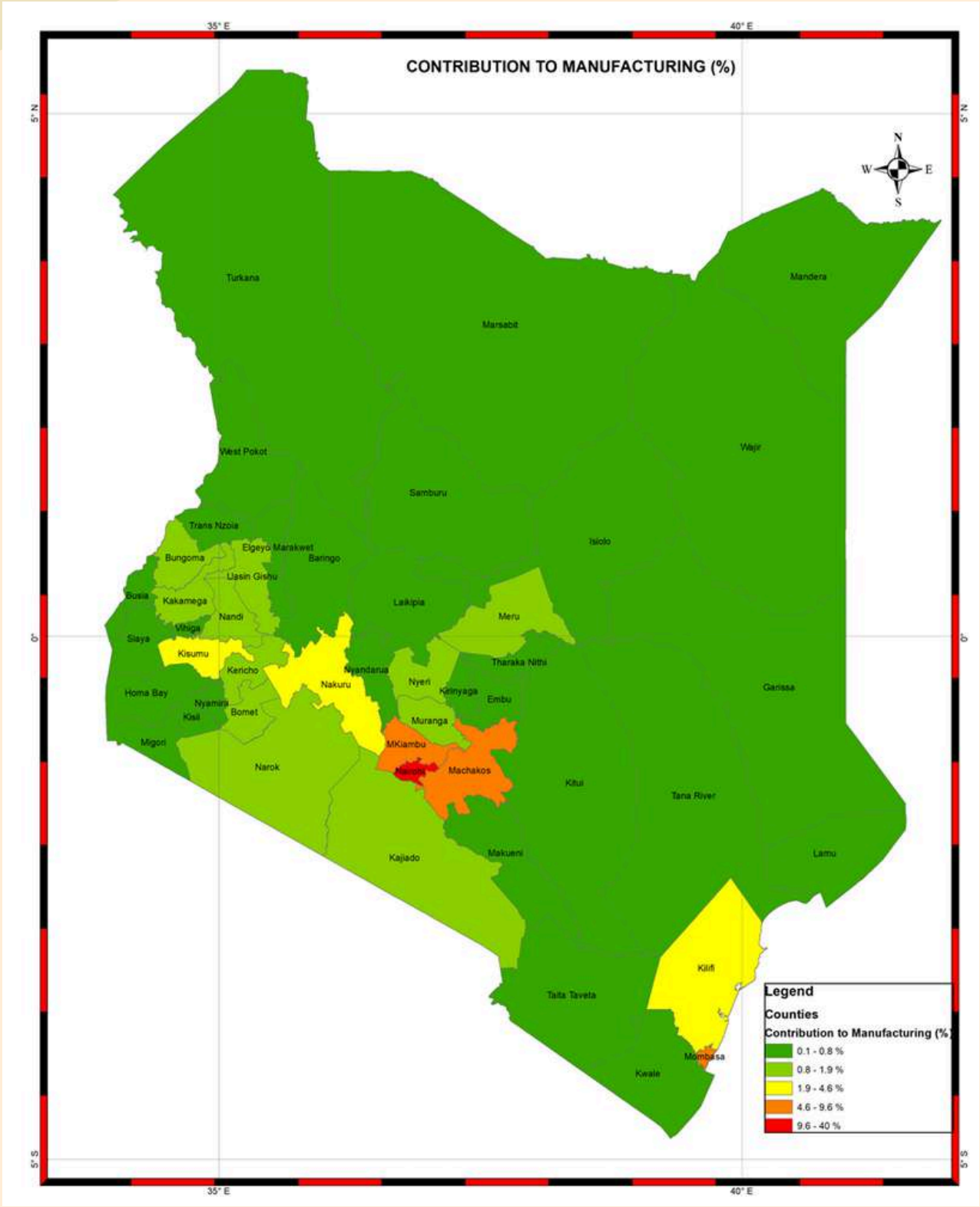
Counties

1.Mombasa	8. Wajir	16. Machakos	24. West Pokot	32. Nakuru	40. Busia
2. Kwale	9. Mandera	17. Makueni	25. Samburu	33. Narok	41. Siaya
3. Kilifi	10. Marsabit	18. Nyandarua	26. Trans Nzoia	34. Kajiado	42. Kisumu
4. Tana River	11. Isiolo	19. Nyeri	27. Uasin Gishu	35. Kericho	43. Homa Bay
5. Lamu	12. Meru	20. Kirinyaga	28. Elgeyo Marakwet	36. Bomet	44. Migori
6. Taita Taveta	13. Tharaka Nithi	21. Muranga	29.Nandi	37. Kakamega	45. Kisii
7. Garissa	14. Embu	22. MKiambu	30. Baringo	38. Vihiga	46. Nyamira
	15. Kitui	23. Turkana	31. Laikipia	39. Bungoma	47. Nairobi

Production / manufacturing sector

From the KNBS 2023 Gross County Product Report, for the period between 2018 – 2022, Nairobi was the highest contributing County to the country's manufacturing sector at 36%, distantly followed by Mombasa, Kiambu, and Machakos Counties at 9.6%, 8.4% and 7.8% respectively. In the same period, Isiolo, Marsabit, Tana River, West Pokot, Mandera, Wajir, Lamu, and Samburu were the lowest contributing Counties to the country's manufacturing sector at 1%.




CONTRIBUTION TO MANUFACTURING (%)
35° E
40° E
5° N
0°
5° S
N
W
E
S
Turkana
Mandera
Marsabit
West Pokot
Wajir
Samburu
Trans Nzoia
Isiolo
Elgeyo Marakwet
Bungoma
Baringo
Uasin Gishu
Busia
Kakamega
Laikipia
Meru
Nandi
Vihiga
Siaya
Kisumu
Tharaka Nithi
Kericho
Nyandarua
Nakuru
Nyeri
Garissa
Kirinyaga
Homa Bay
Embu
Nyamira
Bomet
Muranga
Kisii
Migori
MKiambu
Narok
Nairobi
Machakos
Kitui
Tana River
Kajiado
Makueni
Lamu
Kilifi
Taita Taveta
Mombasa
Kwale
Legend
Counties
Contribution to Manufacturing (%)
0.1 - 0.8 %
0.8 - 1.9 %
1.9 - 4.6 %
4.6 - 9.6 %
9.6 - 40 %

INCENTIVES

Power incentives

As from April 1 2023, Kenya's Energy and Petroleum Regulatory Authority (EPRA) set a uniform electricity tax rate of KES. 10 (US$0.06) per kilowatt hour for special economic zones (SEZs) across Kenya. At Olkaria - Kedong Special Economic Zone in Naivasha, power rates at KES. 5 (US$0.03) per unit.

Public Special Economic Zones in Kenya include:

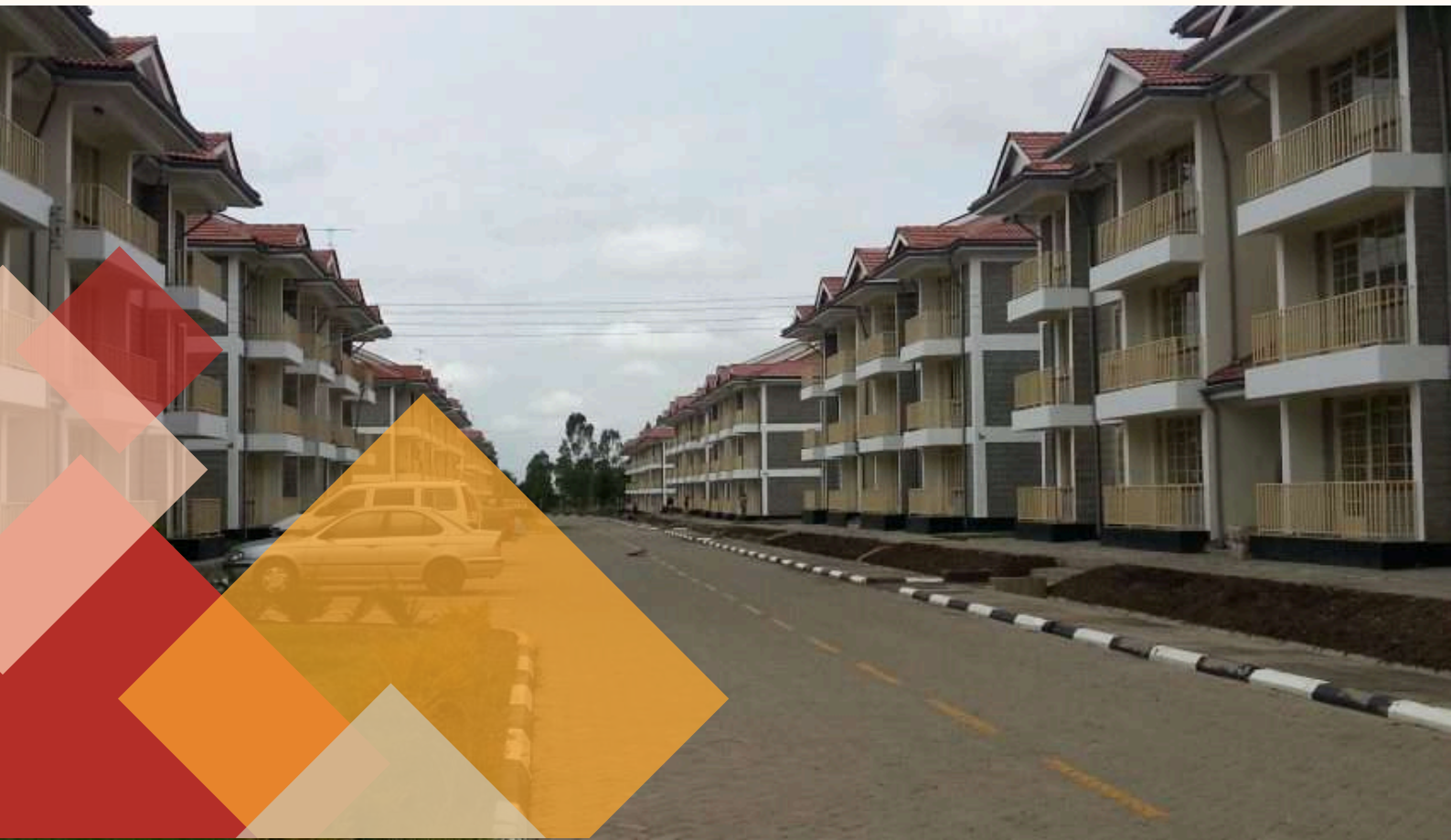
1. Dongo Kundu Special Economic Zone in Mombasa County
2. Naivasha Special Economic Zone in Nakuru County
3. Konza Technopolis in Makueni, Machakos and Kajiado Counties

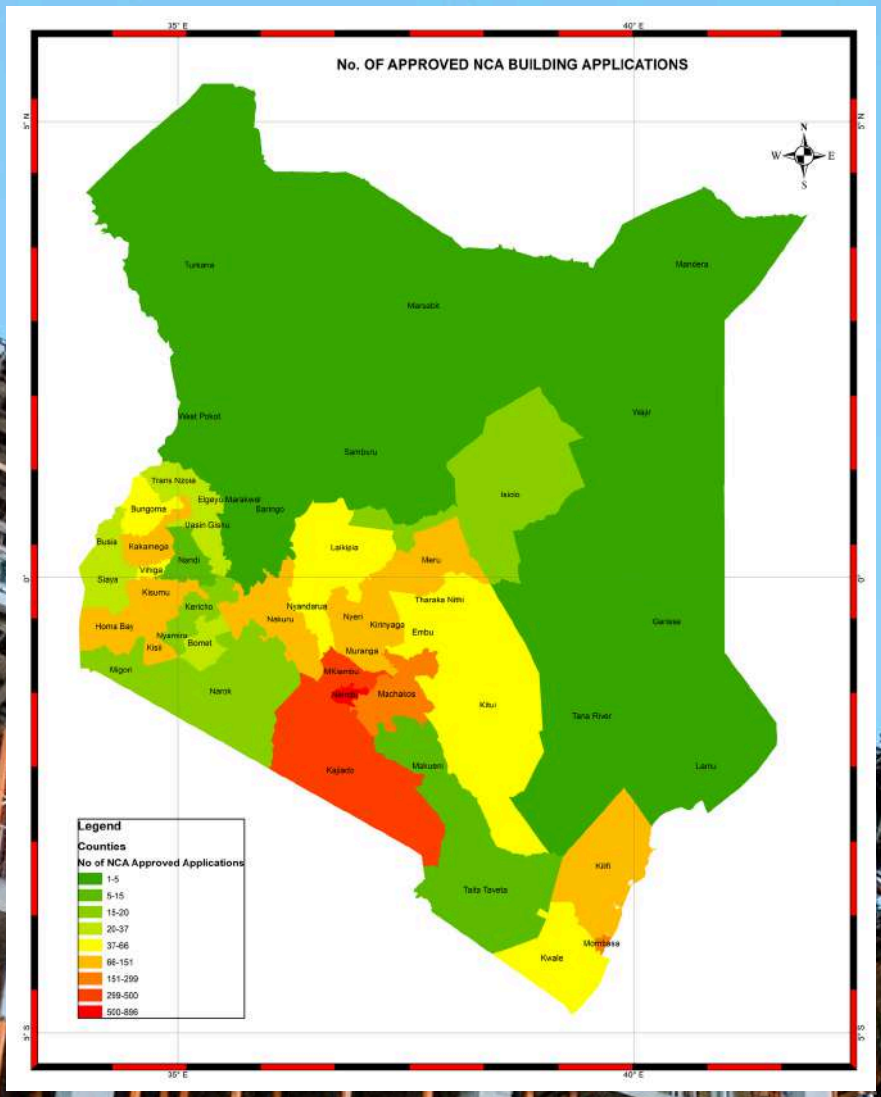
Private Special Economic Zones in Kenya include:

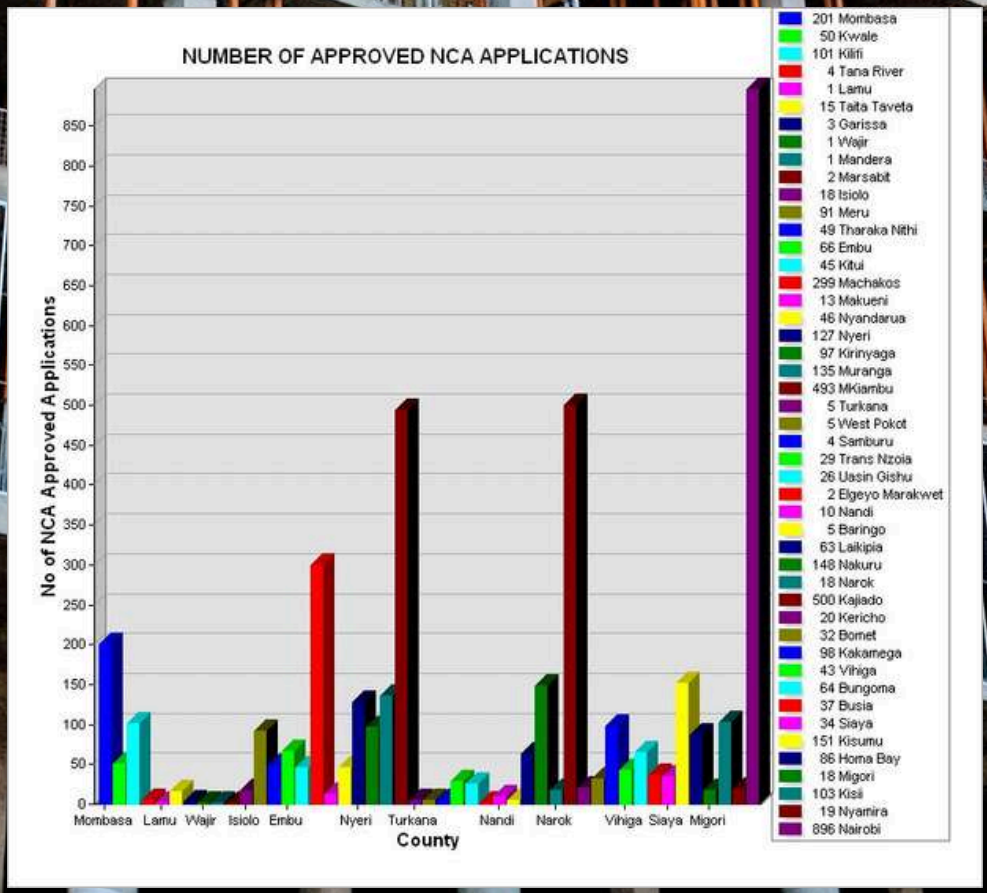
1. Northlands Special Economic Zone, Nairobi County
2. SBM Special Economic Zone, Kwale County
3. Tatu City Special Economic Zone, Kiambu County
4. Compact FTZ, Nairobi County
5. Africa Economic Zone, Uasin Gishu County
6. Mt. Kipipiri Golf & Resort SEZ, Nyandarua County
7. East Africa Free Zone SEZ,
8. Mombasa Industrial Park, Mombasa County
9. Two Rivers International Finance and Innovation Centre SEZ, Nairobi County.

Building Sector

Building sector report for other counties, apart from Nairobi, were scanty and inconclusive. According to the KNBS Quarterly Gross Domestic Product Report, December 2023, the value of building plans approved in Nairobi City County declined from KSh 45.3 billion in the third quarter of 2022 to KSh 37.0 billion in the third quarter of 2023. Credit advanced to enterprises in the construction sector increased by 8.6 per cent to stand at KSh 149.6 billion in September 2023.



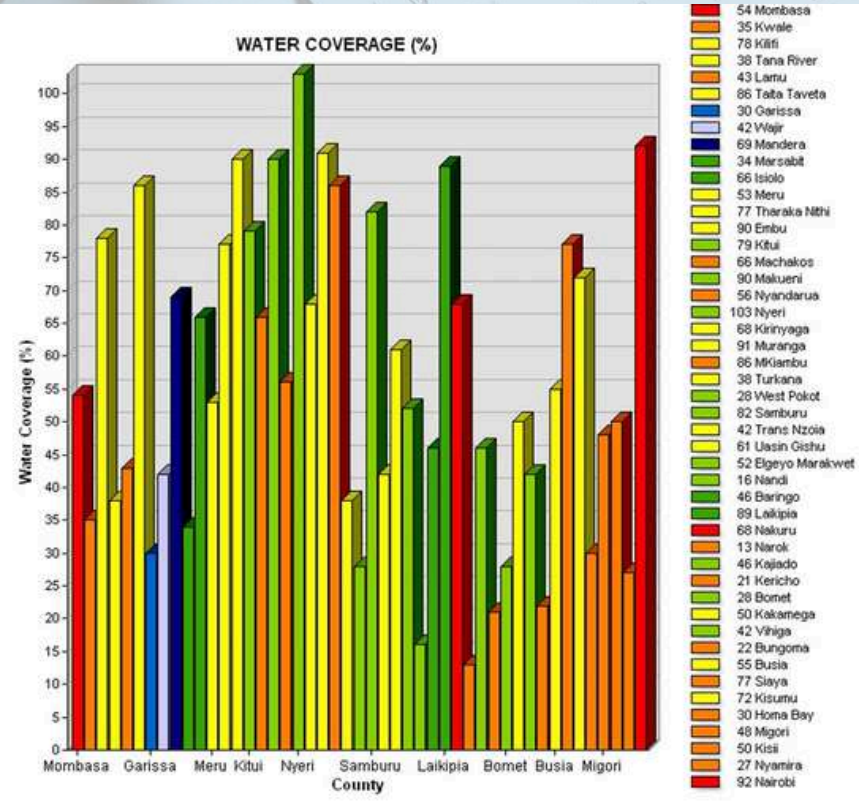

No. OF APPROVED NCA BUILDING APPLICATIONS
35° E
40° E
5° N
0°
5° S
N
W
E
S
Turkana
Mandera
Marsabit
West Pokot
Wajir
Samburu
Trans Nzoia
Elgeyo Marakwet
Baringo
Bungoma
Uasin Gishu
Busia
Isiolo
Kakamega
Laikipia
Meru
Nandi
Vihiga
Siaya
Kisumu
Tharaka Nithi
Kericho
Nyandarua
Nakuru
Nyeri
Kirinyaga
Embu
Garissa
Homa Bay
Nyamira
Bomet
Kisii
Muranga
Migori
MKiambu
Narok
Nairobi
Machakos
Kitui
Tana River
Kajiado
Makueni
Lamu
Kilifi
Taita Taveta
Kwale
Mombasa
Legend
Counties
No of NCA Approved Applications
1-5
5-15
15-20
20-37
37-66
66-151
151-299
299-500
500-896

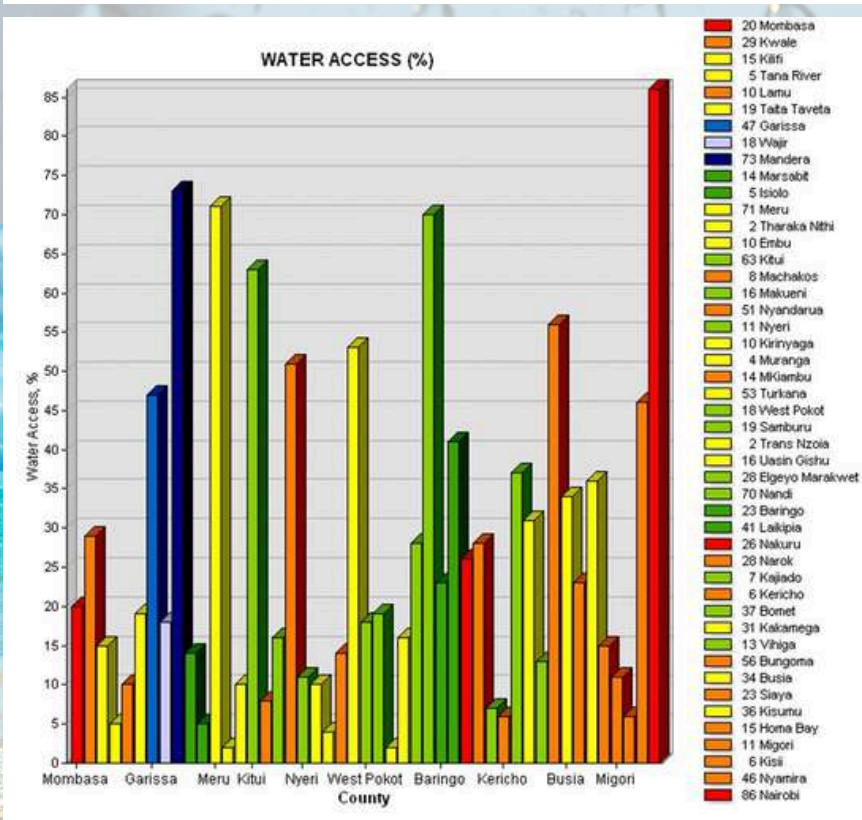

NUMBER OF APPROVED NCA APPLICATIONS
No of NCA Approved Applications
0
50
100
150
200
250
300
350
400
450
500
550
600
650
700
750
800
850
Mombasa
Lamu
Wajir
Isiolo
Embu
Nyeri
Turkana
Nandi
Narok
Vihiga
Siaya
Migori
County
201 Mombasa
50 Kwale
101 Kilifi
4 Tana River
1 Lamu
15 Taita Taveta
3 Garissa
1 Wajir
1 Mandera
2 Marsabit
18 Isiolo
91 Meru
49 Tharaka Nithi
66 Embu
45 Kitui
299 Machakos
13 Makueni
46 Nyandarua
127 Nyeri
97 Kirinyaga
135 Muranga
493 MKiambu
5 Turkana
5 West Pokot
4 Samburu
29 Trans Nzoia
26 Uasin Gishu
2 Elgeyo Marakwet
10 Nandi
5 Baringo
63 Laikipia
148 Nakuru
18 Narok
500 Kajiado
20 Kericho
32 Bomet
98 Kakamega
43 Vihiga
64 Bungoma
37 Busia
34 Siaya
151 Kisumu
86 Homa Bay
18 Migori
103 Kisii
19 Nyamira
896 Nairobi

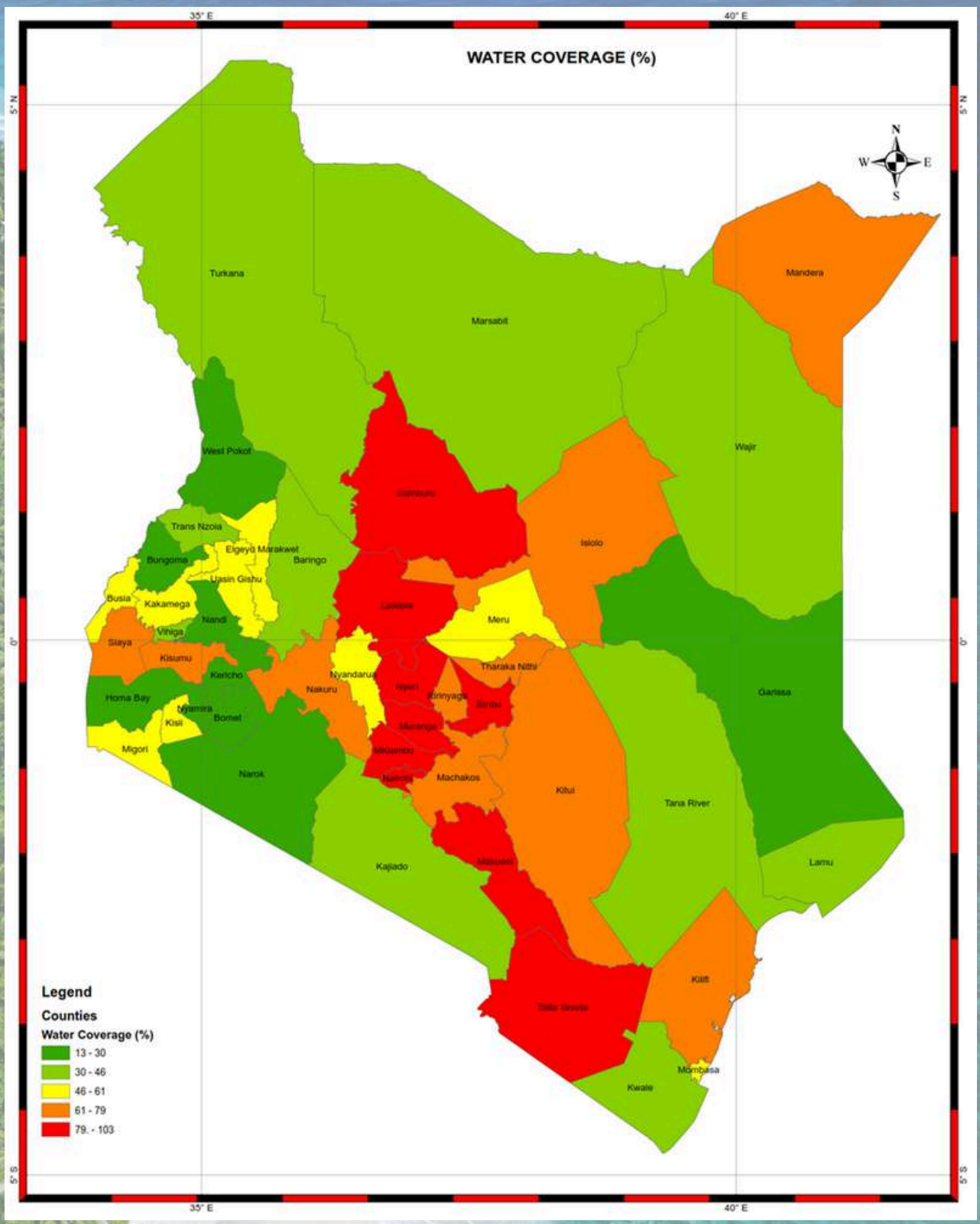
Water and sanitation

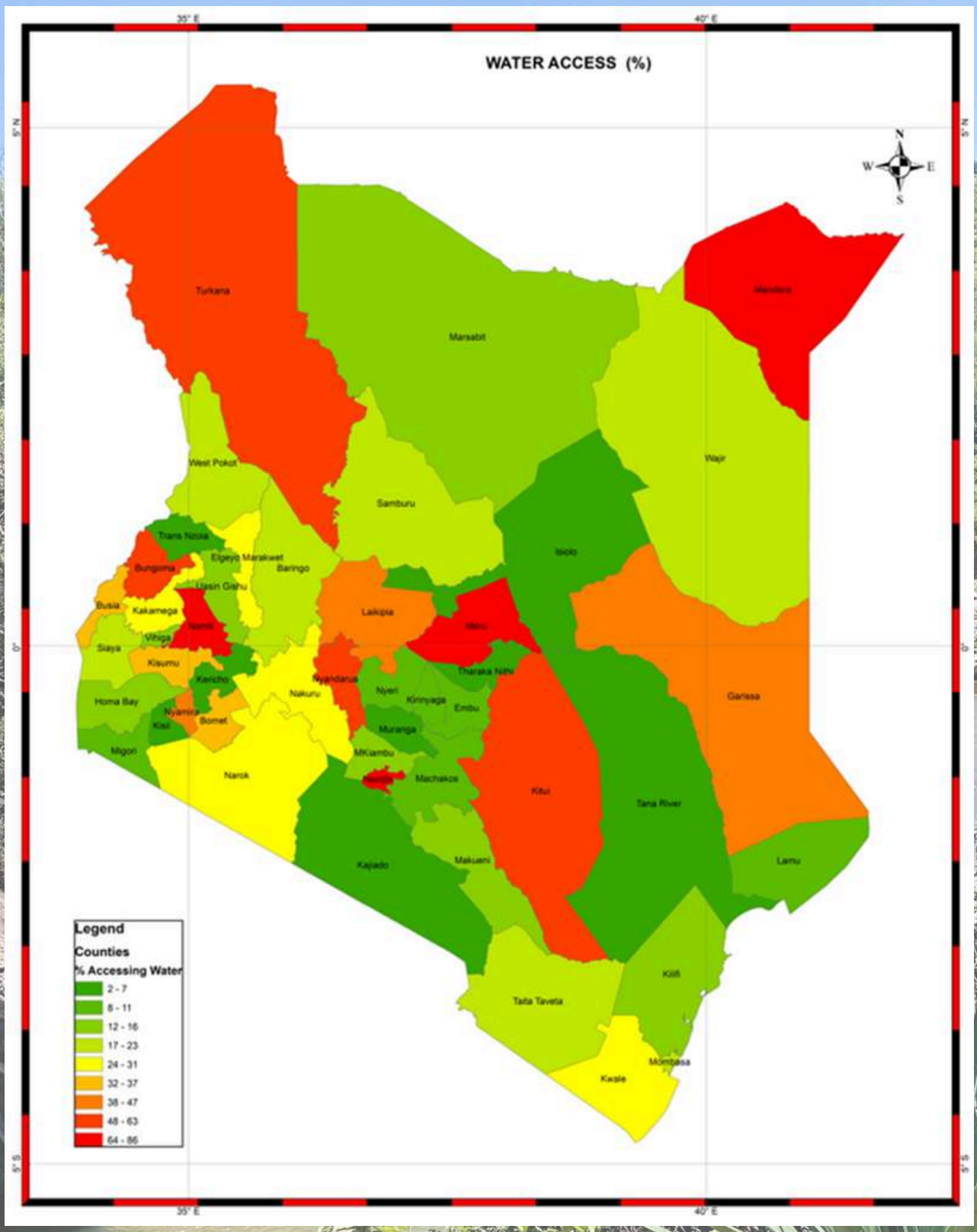
Water services provision

In the WASREB Impact 15 Report, assessing Kenya's water services sector for 2021/22, West Pokot, Wajir, and Narok Counties recorded the lowest access to water services provision at combined 2% for the former, and 4% for the latter. Nairobi, Kilifi, Murang'a, and Kiambu Counties topped the access to water services provision chart, at 86%, 73%, 71%, and 70% respectively.





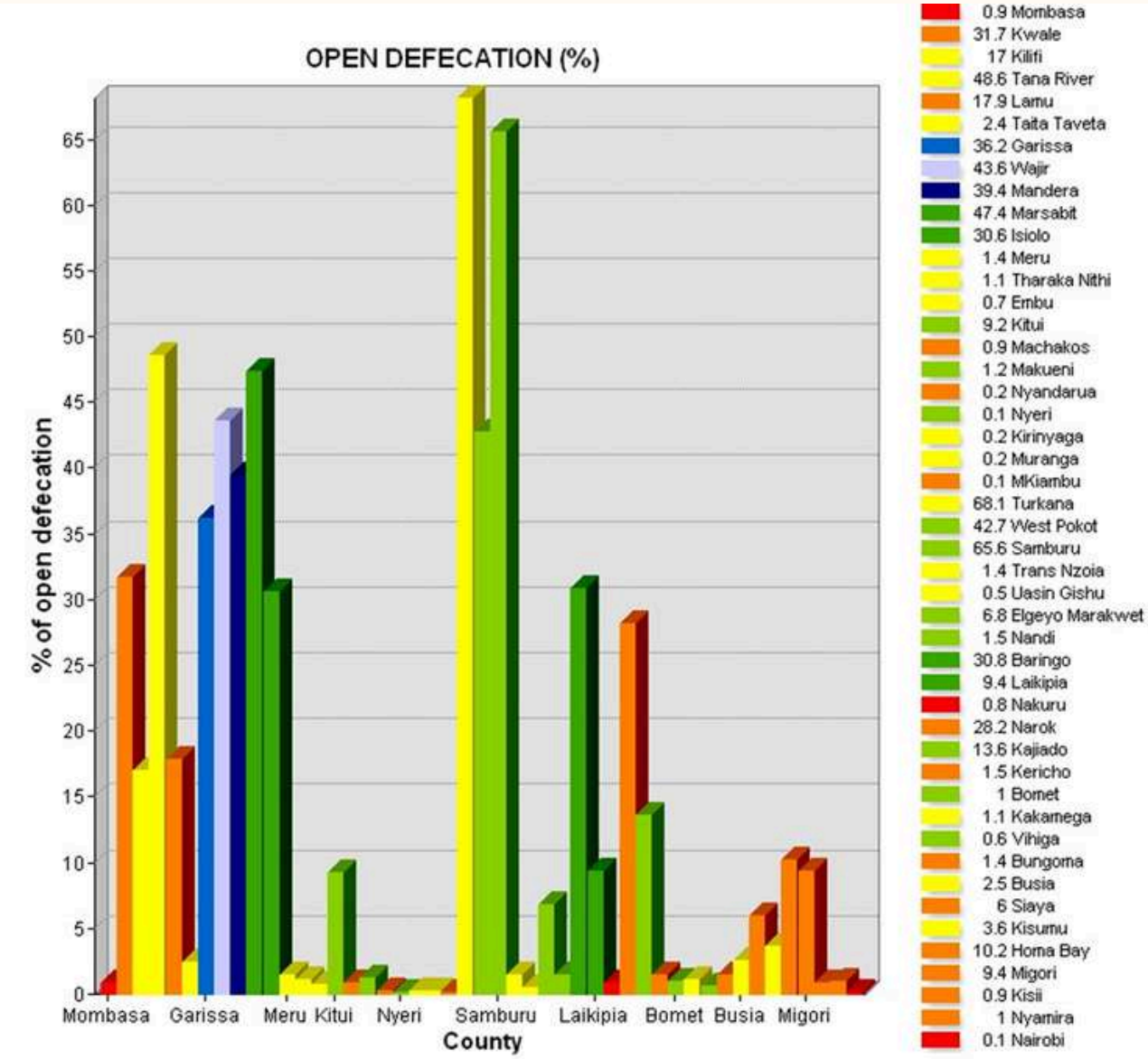

WATER COVERAGE (%)
35° E
40° E
5° N
0°
5° S
N
W
E
S
Turkana
Marsabit
Mandera
Wajir
West Pokot
Samburu
Trans Nzoia
Elgeyo Marakwet
Baringo
Isiolo
Bungoma
Uasin Gishu
Busia
Kakamega
Nandi
Laikipia
Meru
Vihiga
Siaya
Kisumu
Tharaka Nithi
Kericho
Nyandarua
Garissa
Nakuru
Nyeri
Kirinyaga
Homa Bay
Embu
Nyamira
Bomet
Kisii
Muranga
Migori
Makambo
Narok
Nairobi
Machakos
Kitui
Tana River
Kajiado
Makueni
Lamu
Kilifi
Taita Taveta
Mombasa
Kwale
Legend
Counties
Water Coverage (%)
13 - 30
30 - 46
46 - 61
61 - 79
79. - 103

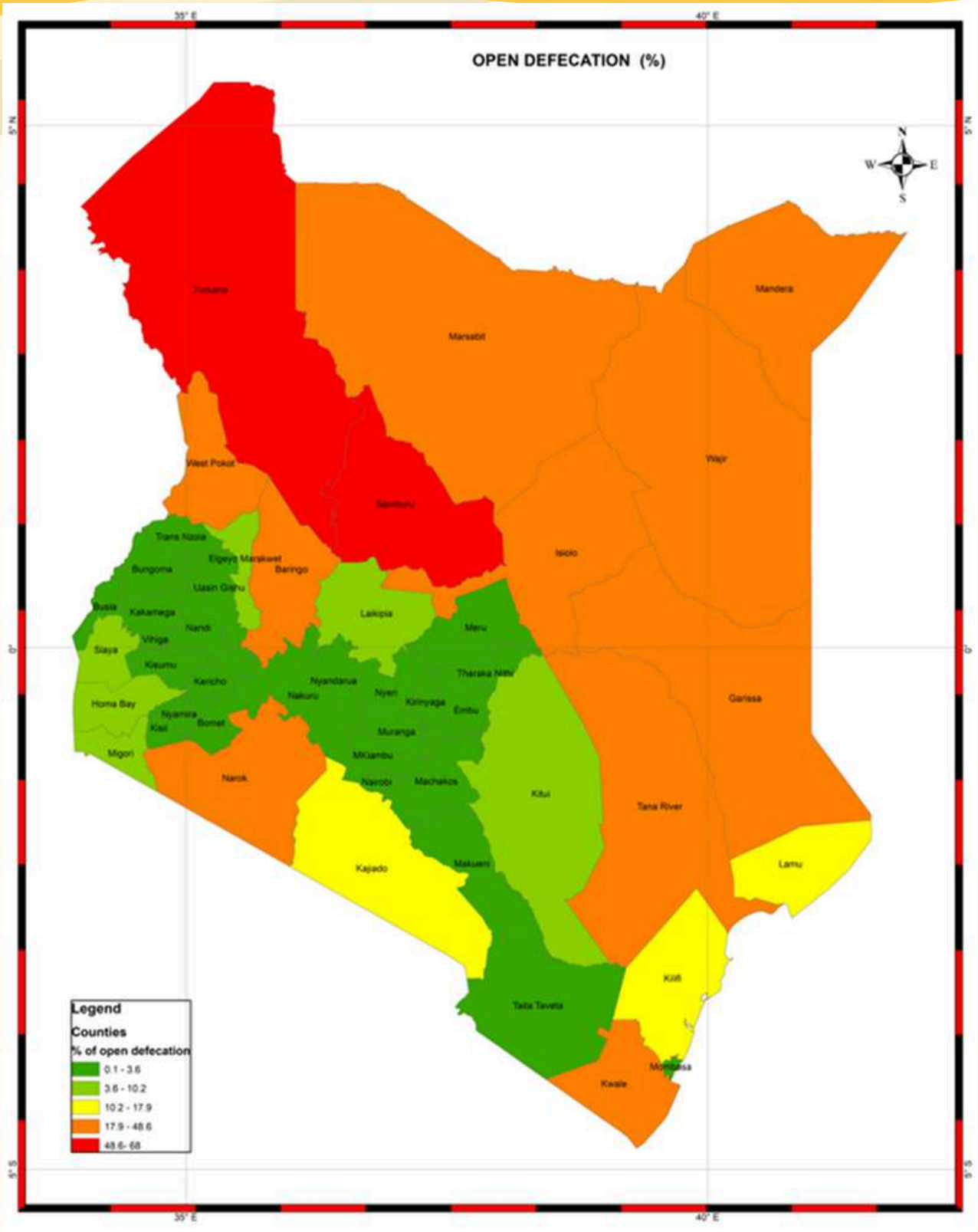

WATER ACCESS (%)
35° E
40° E
5° N
0°
5° S
N
S
E
W
Turkana
Marsabit
Mandera
West Pokot
Samburu
Wajir
Trans Nzoia
Elgeyo Marakwet
Baringo
Bungoma
Uasin Gishu
Isiolo
Busia
Kakamega
Laikipia
Meru
Nandi
Vihiga
Siaya
Kisumu
Tharaka Nithi
Kericho
Nyandarua
Nyeri
Kirinyaga
Embu
Nakuru
Homa Bay
Garissa
Nyamira
Kisii
Bomet
Muranga
Migori
Mt Kenya
Machakos
Narok
Kitui
Tana River
Kajiado
Makueni
Lamu
Kilifi
Taita Taveta
Mombasa
Kwale
Legend
Counties
% Accessing Water
2 - 7
8 - 11
12 - 16
17 - 23
24 - 31
32 - 37
38 - 47
48 - 63
64 - 86

Sanitation

In the WASREB Impact 15 Report, assessing Kenya's water services sector for 2021/22, sewer systems distribution remains the lowest in the country, with Nairobi County leading at 50%, followed by Laikipia at 44%. Most counties recorded 0%.

Open defecation data in the Volume 4 of the 2019 Population and Housing Census Data showed that open defecation remains a major challenge in ASAL Counties with Turkana and Samburu Counties taking the lion's share of 68.1% and 65.6% respectively.




OPEN DEFECATION (%)
35° E
40° E
5° N
0°
5° S
N
W
E
S
Turkana
Marsabit
Mandera
West Pokot
Samburu
Wajir
Trans Nzoia
Elgeyo Marakwet
Baringo
Isiolo
Bungoma
Uasin Gishu
Busia
Kakamega
Laikipia
Meru
Nandi
Vihiga
Siaya
Kisumu
Tharaka Nithi
Kericho
Nyandarua
Garissa
Nakuru
Nyeri
Homa Bay
Kirinyaga
Embu
Nyamira
Kisii
Bomet
Muranga
Migori
Mkiambu
Narok
Nairobi
Machakos
Kitui
Tana River
Kajiado
Makueni
Lamu
Kilifi
Taita Taveta
Mombasa
Kwale
Legend
Counties
% of open defecation
0.1 - 3.6
3.6 - 10.2
10.2 - 17.9
17.9 - 48.6
48.6- 68

Solid waste disposal

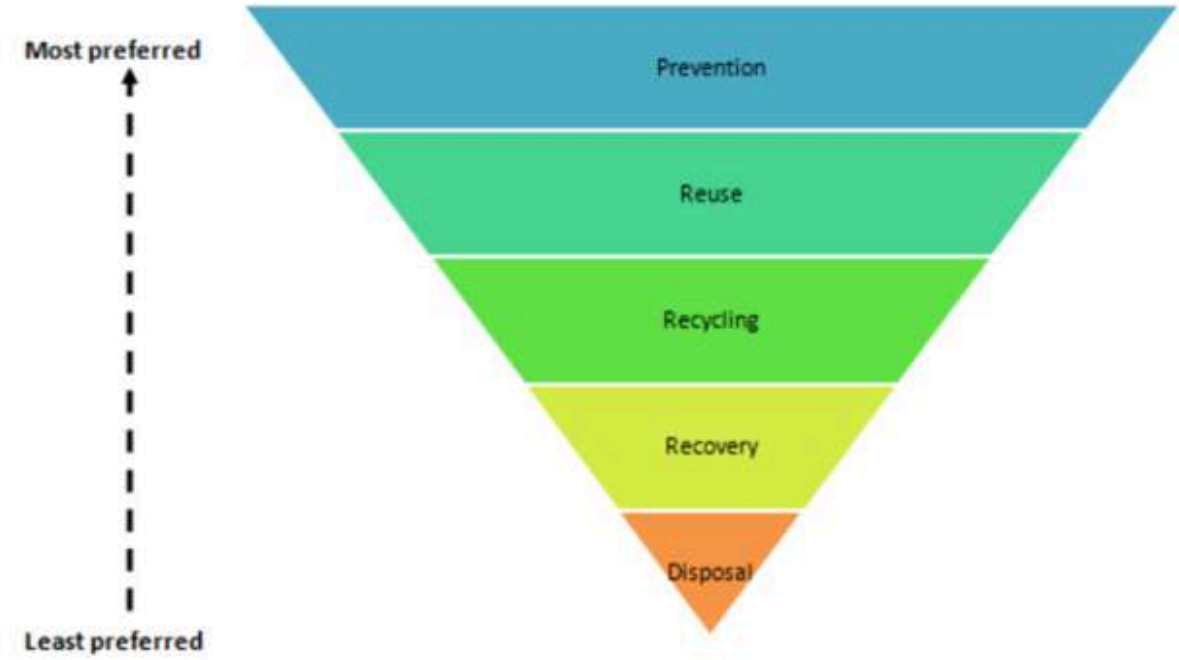


Figure 2.1: Waste management hierarchy

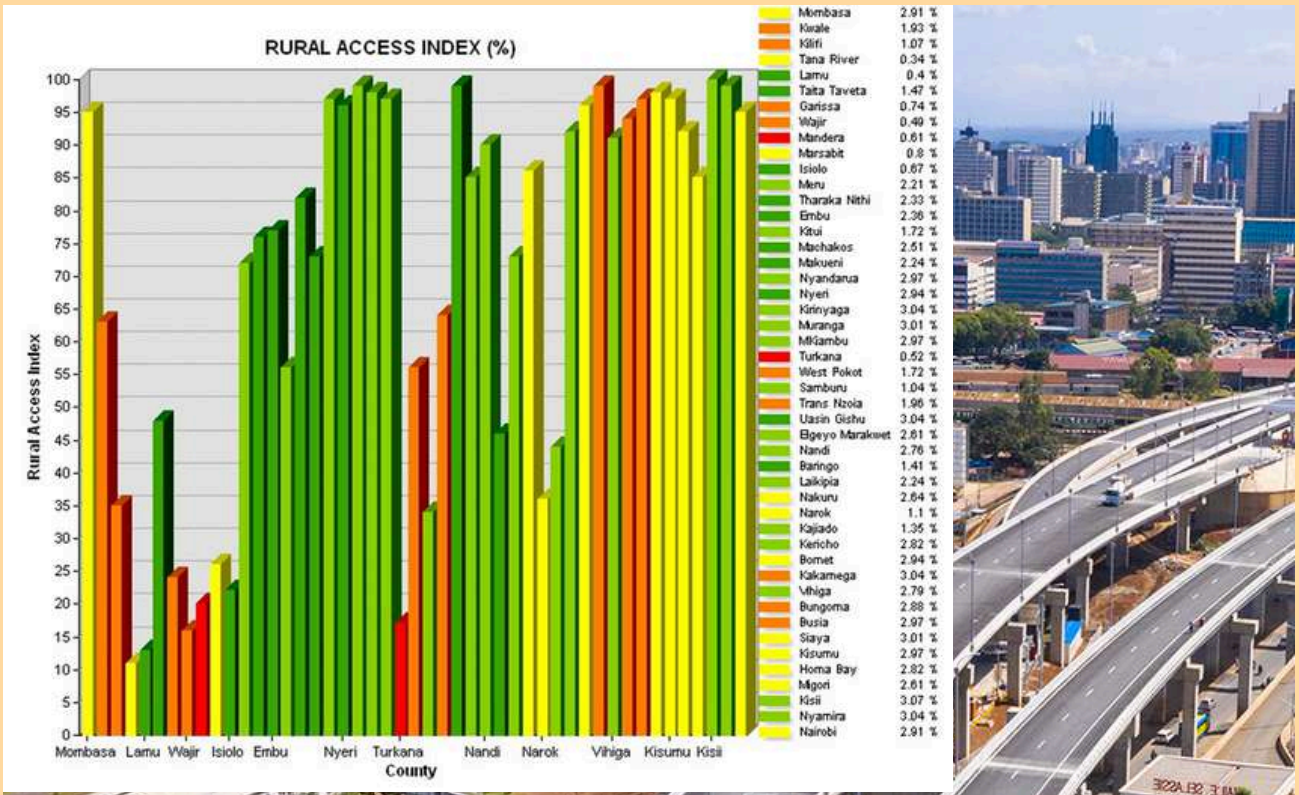
Source (UNEP, 2011).

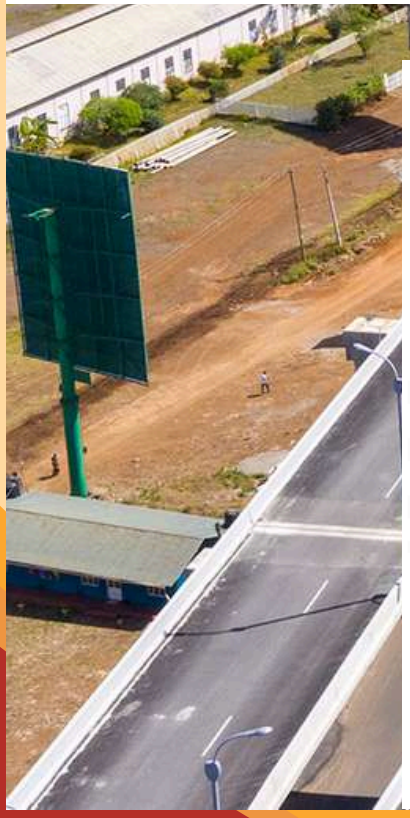
Volume 4 of the 2019 Population and Housing Census Data evaluated households' solid waste disposal mechanisms for counties reflected as a percentage of the households. Records of volume of wastes generated, and the handling mechanism per county were however scanty and inconclusive.

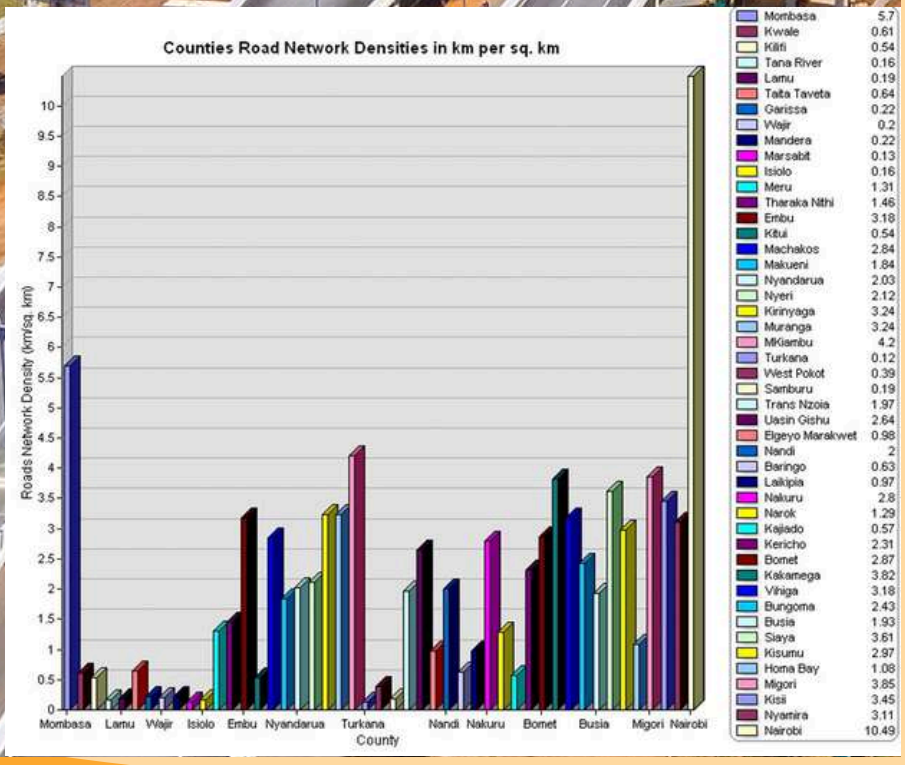
Transportation

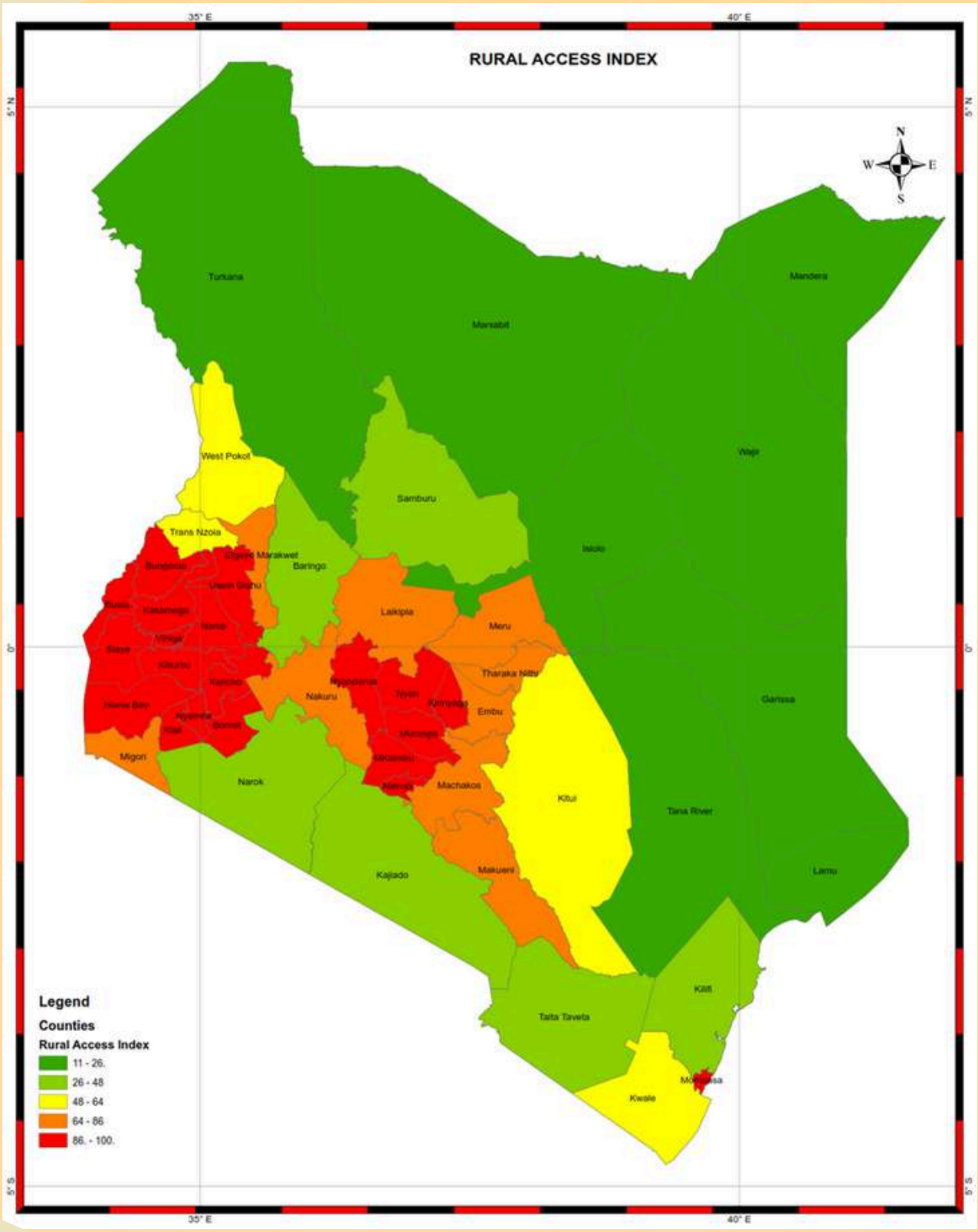
Rural Access Index (RAI)

According to Kenya Roads Board maps portal, Rural access index was highest in Busia, Bungoma, Kakamega, Uasin Gishu, Nandi, Vihiga, Siaya, Kisumu, Kericho, Bomet, Nyamira, Kisii, Homa Bay, Nyandarua, Nyeri, Murang'a, Kiambu, Nairobi, and Kirinyaga Counties. Counties in the ASAL regions recorded the lowest RAI.

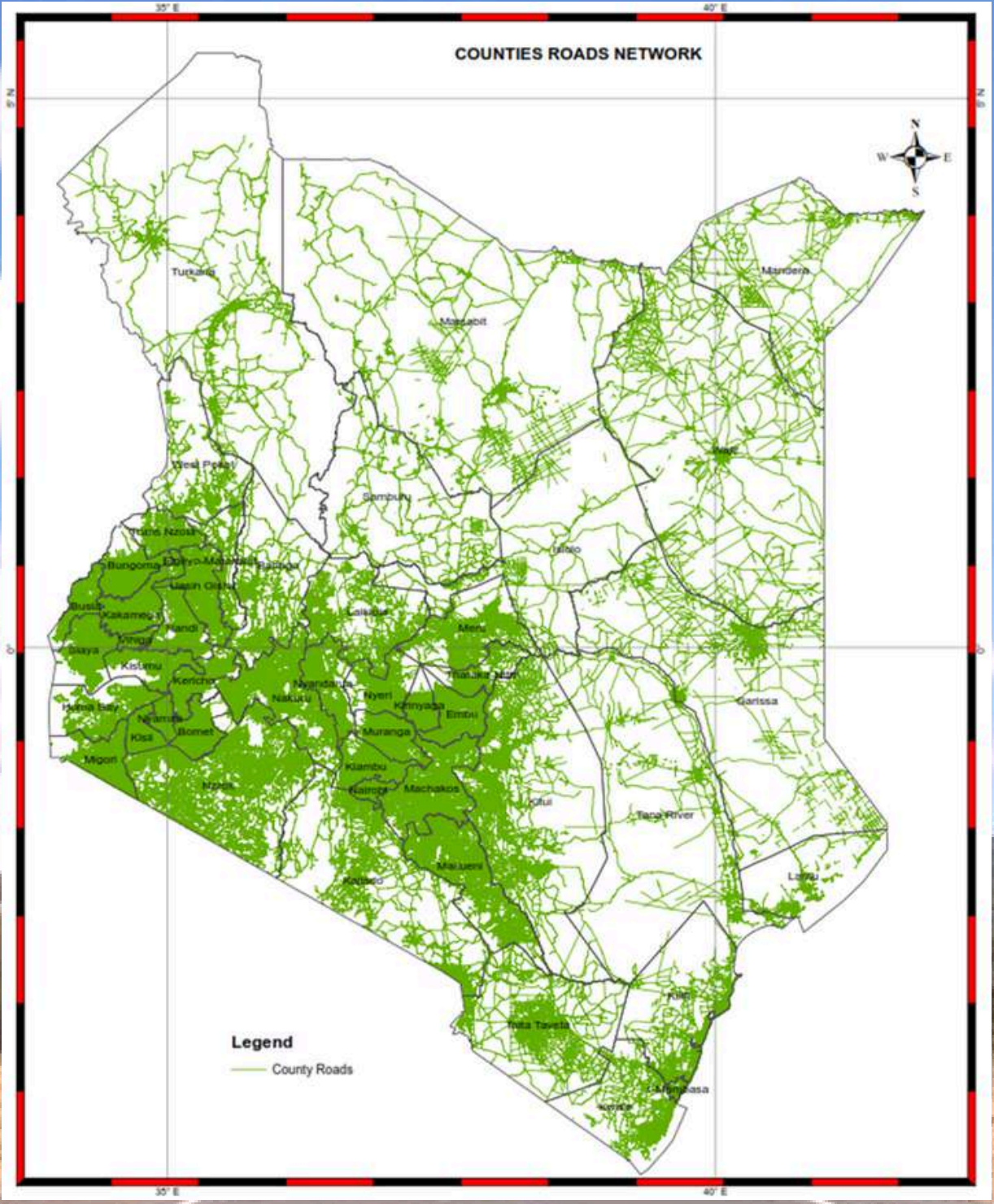







RURAL ACCESS INDEX
35° E
40° E
5° N
0°
5° S
N
W
E
S
Turkana
Mandera
Marsabit
West Pokot
Samburu
Wajir
Trans Nzoia
Isiolo
Baringo
Laikipia
Meru
Tharaka Nithi
Nakuru
Garissa
Embu
Migori
Narok
Machakos
Kitui
Tana River
Kajiado
Makueni
Lamu
Kilifi
Taita Taveta
Kwale
Legend
Counties
Rural Access Index
11 - 26.
26 - 48
48 - 64
64 - 86
86. - 100.

Road network coverage in Kenya



Aerodrome

Nearly all Counties in Kenya have airstrips for either commercial domestic flights or tourists' flights. Counties that do not have aerodromes include Nyamira, Nandi, West Pokot, Bomet, Kitui, Machakos, Murang'a, and Kiambu Counties. According to KCAA website, JKIA, Nairobi and MIA, Mombasa lead in the number of commercial cargo traffic handled in the period between 2014 to 2018. The same applies to domestic commercial passenger traffic within the same period. Details of traffic in the other airports were scanty.

Commercial ports

Commercial ports in Kenya, according to the Kenya Airports Authority website include Port of Mombasa and Port Reitz, in Mombasa County; Port of Lamu and Port of Kiunga in Lamu County; Port of Kilifi, Kilifi County; Kisumu Port, Kisumu County; ICD Nairobi, dry port in Nairobi County; ICD Naivasha, dry port in Nakuru County.

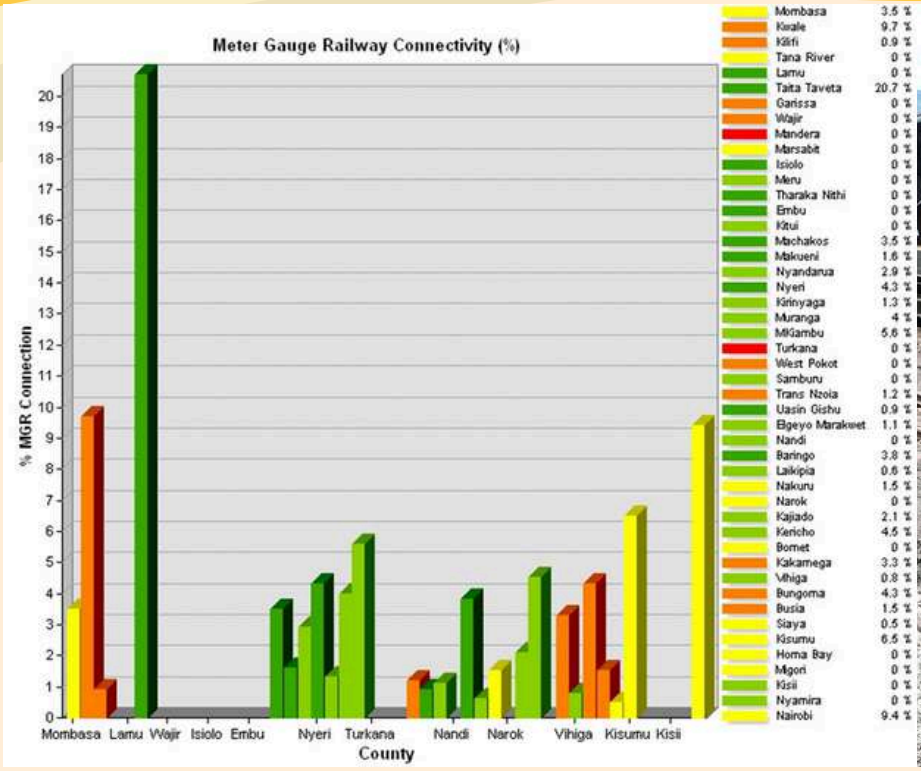
Fishing ports

Fishing ports available in Kenya include Port of Shimoni, in Mombasa County; Port of Kilifi and Port of Malindi, in Kilifi County; Port of Mtwapa, in Mombasa County; and Port of Kiunga in Lamu County.

Railway line coverage

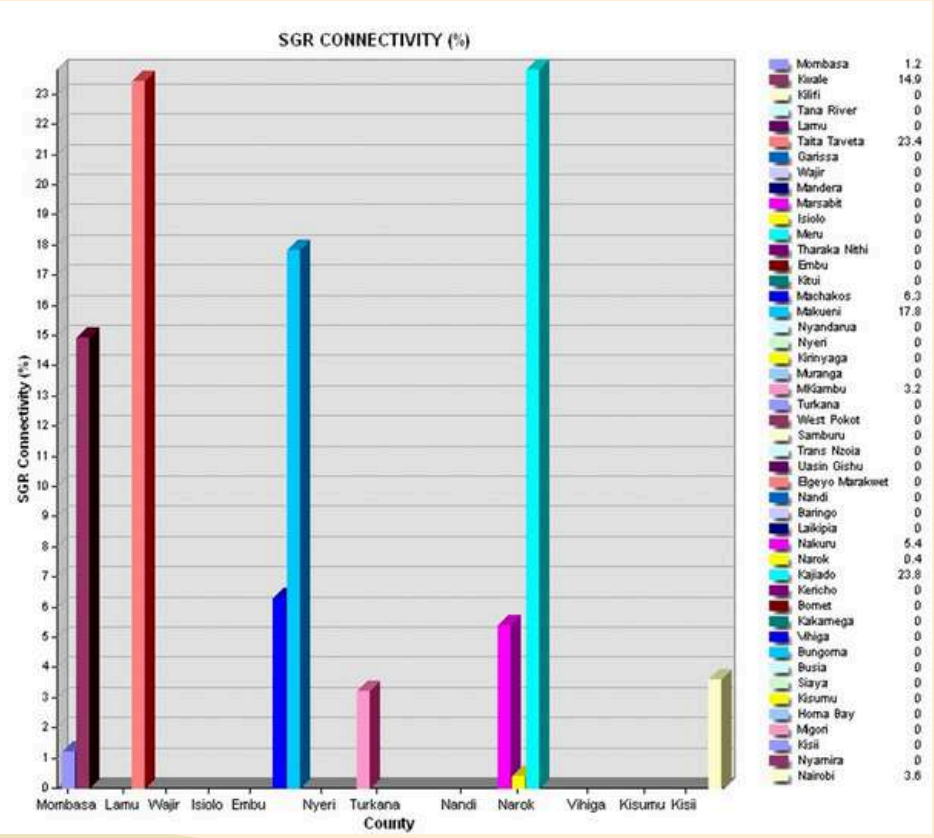
Rail transport in Kenya consists of a meter-gauge network and a new standard-gauge railway (SGR). Both railways connect Kenya's main port city of Mombasa to the interior, running through the national capital of Nairobi. The meter-gauge network runs to the Ugandan border, and the Mombasa–Nairobi Standard Gauge Railway.

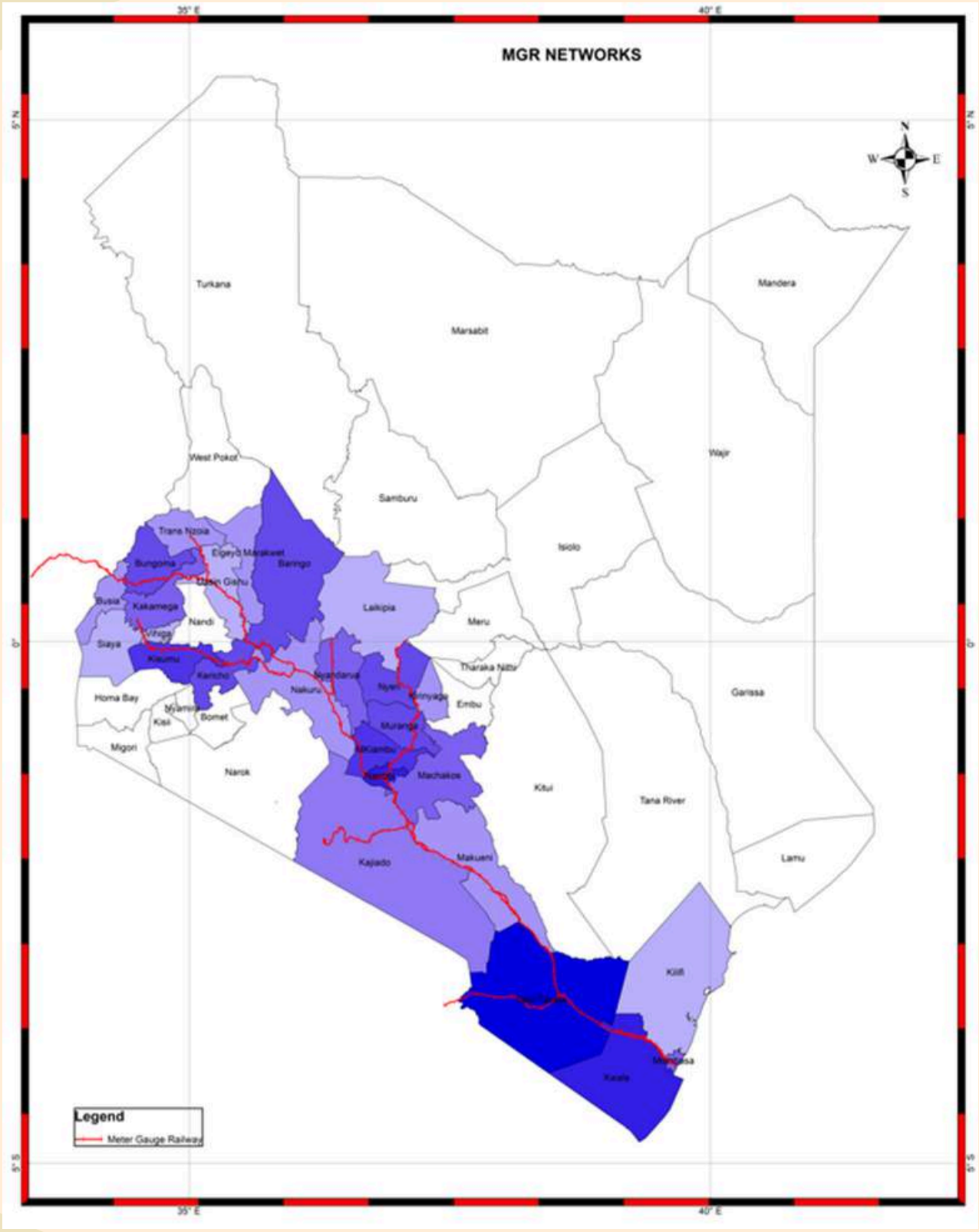
1. The meter gauge railway lines include:
2. The trunk Mombasa – Voi – Nairobi – Nakuru – Eldoret – Malaba line covering Mombasa, Kilifi, Kwale, Taita Taveta, Makueni, Kajiado, Machakos, Nairobi, Kiambu, Narok, Nakuru, Baringo, Kericho, Uasin Gishu, Elgeyo Marakwet, Kakamega, Bungoma, and Busia Counties.
3. Voi – Taveta Branch connecting to Moshi, Tanzania, and covers Taita Taveta County
4. Konza – Magadi line connecting Tata Chemicals Industries to the trunk line, and covers Machakos and Kajiado Counties;
5. Nairobi County branches connecting the industrial area and the JKIA to the trunk line
6. Nairobi – Nanyuki line covering Nairobi, Kiambu, Murang'a, Kirinyaga, Nyeri, and Laikipia Counties
7. Gilgil – Nyahururu line covering Nyandarua County
8. Nakuru – Kisumu line, connecting port of Kisumu to the trunk line, and covers Nakuru, Kericho, and Kisumu Counties;
9. Kisumu – Butere line, connecting Kakamega County to the trunk line, and covers Kisumu, Vihiga, and Kakamega Counties.
10. Eldoret – Kitale line, connecting the Kenya's bread basket to the trunk line and covers Uasin Gishu, Kakamega, and Trans Nzoia Counties

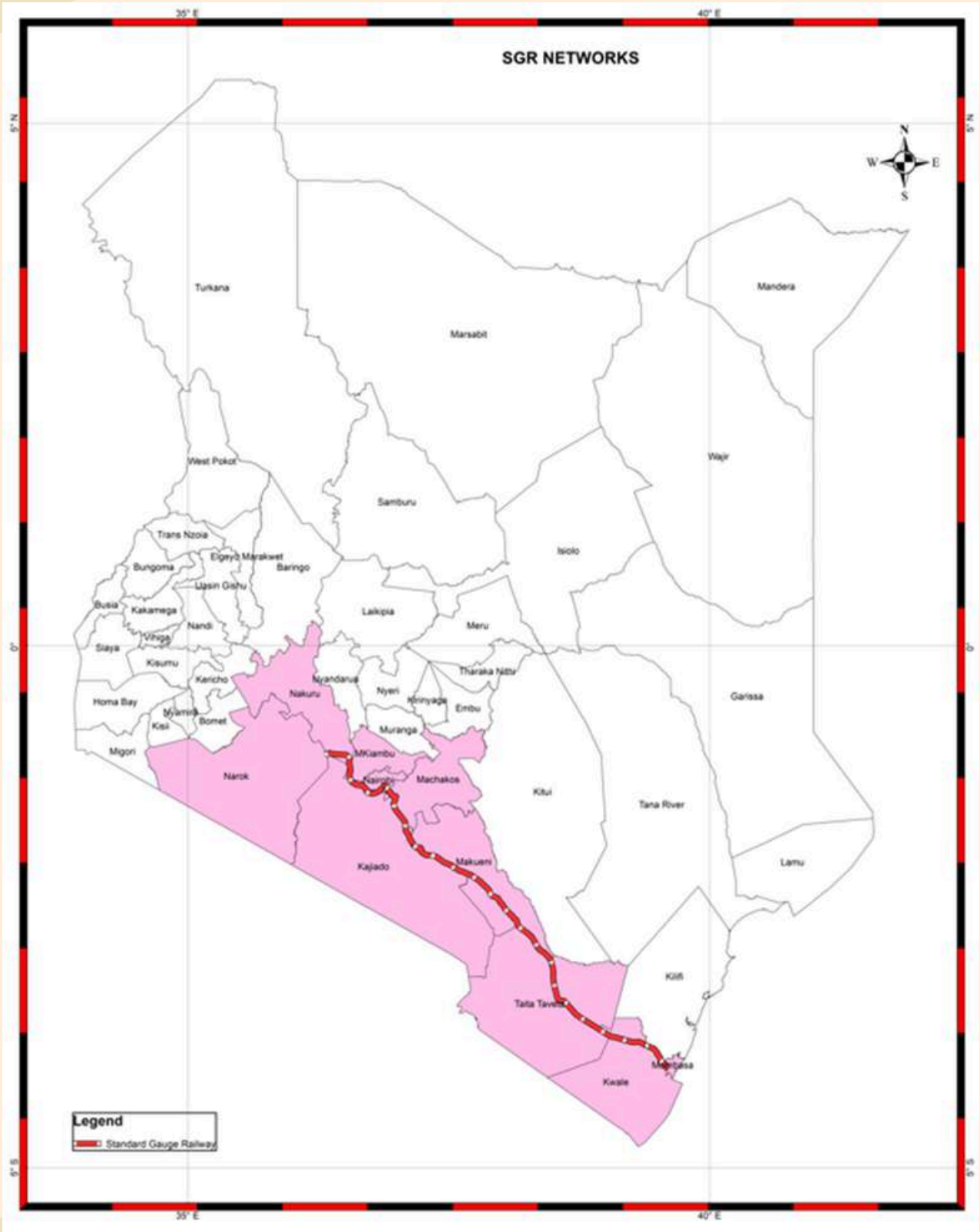


The standard gauge railway lines include:

1. Mombasa–Nairobi Section measuring 609 kilometres, and covers Mombasa, Kilifi, Kwale, Taita Taveta, Makueni, Kajiado, Machakos, and Nairobi Counties
2. Nairobi–Naivasha Section measuring 120 kilometres, and covers Nairobi, Kajiado, Narok, and Nakuru Counties
3. Proposed lines that include 267 km long Naivasha–Kisumu Section that traverses Nakuru, Narok, Bomet, Kericho, Nyamira, and Kisumu Counties; 130 km long Kisumu–Malaba Section covering Kisumu, Vihiga, Kakamega, Bungoma, and Busia Counties; 1,500 km long Lamu–Lokichar-Nakodok Section covering Lamu, Garissa, Wajir, Isiolo, Samburu, Marsabit, Laikipia, and Turkana Counties; 700 km long Nairobi–Moyale Section covers Nairobi, Muranga, Kiambu, Kirinyaga, Embu, Meru, Isiolo, and Marsabit Counties; and 460 km long Naivasha–Lokichar Section covering Nakuru, Nyandarua, Laikipia, and Turkana Counties.

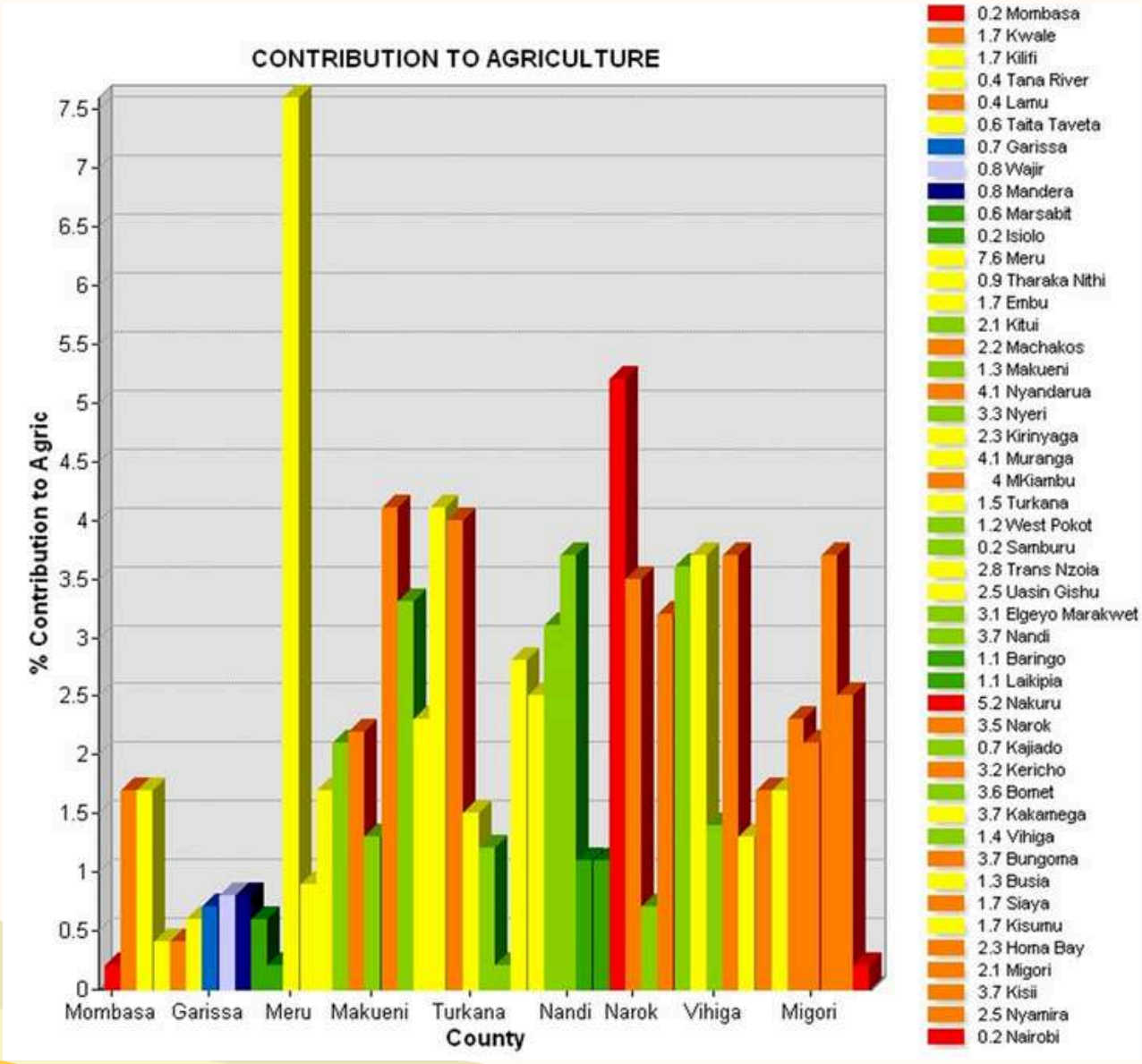


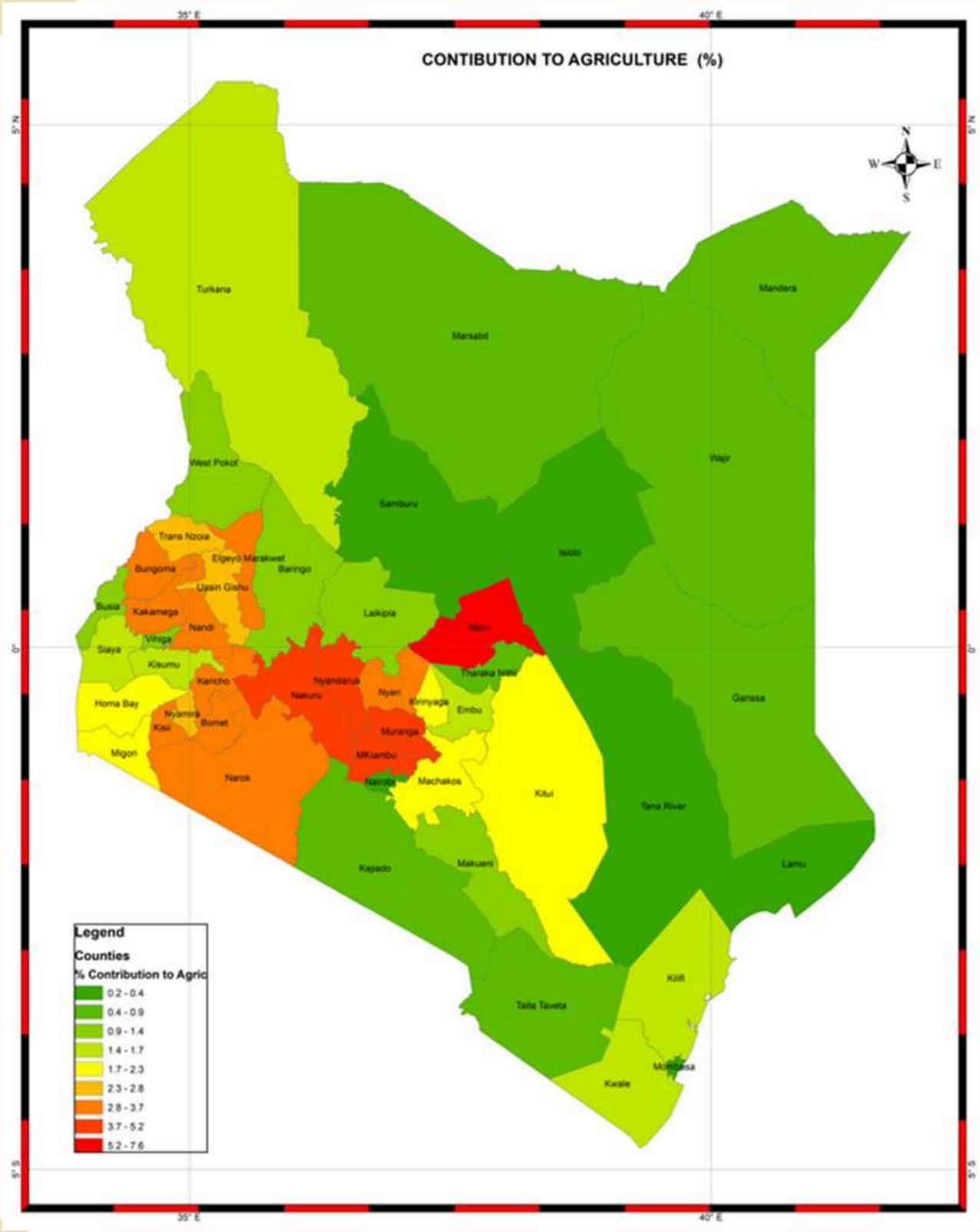

MGR NETWORKS
35° E
40° E
5° N
0°
5° S
N
W
E
S
Turkana
Marsabit
Mandera
West Pokot
Samburu
Wajir
Trans Nzoia
Elgeyo Marakwet
Baringo
Bungoma
Uasin Gishu
Busia
Kakamega
Laikipia
Nandi
Meru
Vihiga
Siaya
Kisumu
Tharaka Nithi
Kericho
Nyandarua
Nakuru
Nyeri
Kirinyaga
Embu
Garissa
Homa Bay
Migori
Kisii
Bomet
Murang'a
Kiambu
Nairobi
Machakos
Narok
Kitui
Tana River
Kajiado
Makueni
Lamu
Kilifi
Mombasa
Kwale
Legend
Meter Gauge Railway


SGR NETWORKS
35° E
40° E
5° N
0°
5° S
N
W
E
S
Turkana
Marsabit
Mandera
West Pokot
Samburu
Wajir
Trans Nzoia
Elgeyo Marakwet
Baringo
Isiolo
Bungoma
Uasin Gishu
Busia
Kakamega
Nandi
Laikipia
Meru
Vihiga
Siaya
Kisumu
Tharaka Nithi
Kericho
Nyandarua
Nakuru
Nyeri
Garissa
Homa Bay
Kirinyaga
Embu
Bomet
Kisii
Muranga
Migori
Narok
Machakos
Kitui
Tana River
Kajiado
Makueni
Lamu
Kilifi
Taita Taveta
Kwale
Legend
Standard Gauge Railway

Agriculture

According to the KNBS Gross County Product Report, 2023, in the period between 2018-2022, Meru, Nakuru, and Nyandarua led on the average county contribution to agriculture, forestry and fishing activities by 7.6%, 5.2% and 4.5% repectively. Mombasa, Isiolo, Samburu, and Nairobi were the lowest contributors at 2%.

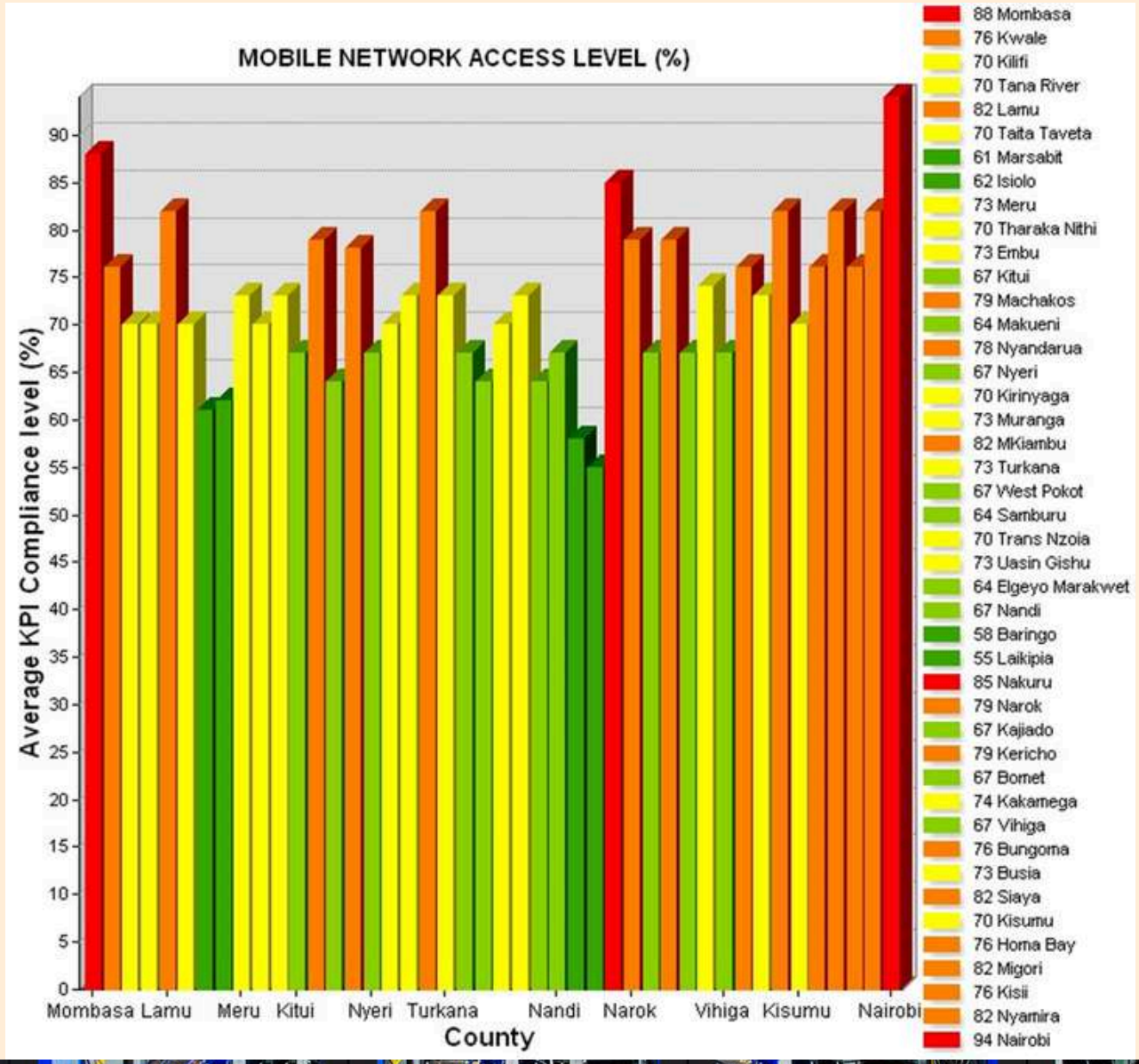


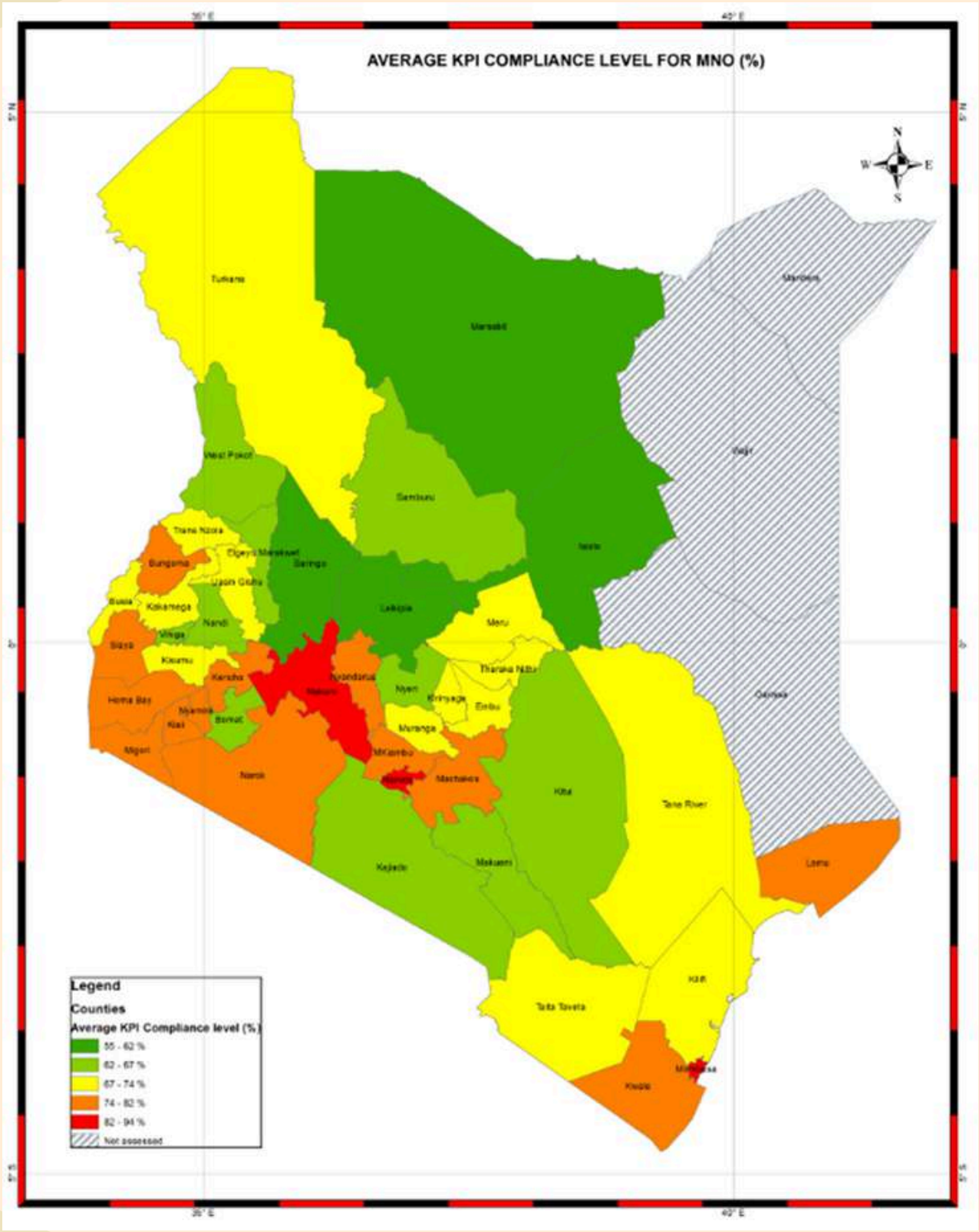

CONTIBUTION TO AGRICULTURE (%)
35° E
40° E
5° N
0°
5° S
N
W
E
S
Turkana
Marsabit
Mandera
West Pokot
Samburu
Wajir
Trans Nzoia
Elgeyo Marakwet
Bungoma
Baringo
Uasin Gishu
Busia
Kakamega
Laikipia
Isiolo
Nandi
Meru
Vihiga
Siaya
Kisumu
Tharaka Nithi
Kericho
Nyandarua
Nakuru
Nyeri
Kirinyaga
Embu
Garissa
Homa Bay
Nyamira
Bomet
Kisii
Muranga
Migori
Mkiambu
Narok
Nairobi
Machakos
Kitui
Tana River
Kajiado
Makueni
Lamu
Kilifi
Taita Taveta
Mombasa
Kwale
Legend
Counties
% Contribution to Agric
0.2 - 0.4
0.4 - 0.9
0.9 - 1.4
1.4 - 1.7
1.7 - 2.3
2.3 - 2.8
2.8 - 3.7
3.7 - 5.2
5.2 - 7.6

Telecommunication

According to the Communications Authority of Kenya's Report on Quality-Of-Service (QoS) Performance by Mobile Network Operators for FY 2022-2023, it was concluded that:

- Safaricom PLC scored 90% and hence achieved the minimum 80% KPI compliance threshold. The lowest score was 63.5% in Vihiga and Kajiado Counties.
- Airtel Networks Kenya Limited scored 79% and hence failed to meet the minimum KPI threshold of 80% in the quality of service measured. The lowest score was 45.45% in Baringo and Laikipia Counties. They shall be required to upgrade their network.
- Telkom Kenya Limited scored 65% and hence failed to meet the minimum KPI threshold of 80% in the quality of service measured. The highest performance was 72.73% in Vihiga, Mombasa, Nairobi and Nakuru. The lowest score was 36.36% in Muranga and Laikipia Counties. Telkom will be required to upgrade its network to full compliance.
- Telkom Kenya performed lowest in terms of both data services and coverage of signal, as shown by the large number of unsuccessful calls and internet failure. The network coverage in rural counties was found to be very poor and does not exist in some places.
- Airtel's best performance was in Machakos, Mombasa, Nairobi, Kericho, Siaya and Muranga, where they scored 90.91%. The lowest performance was recorded in Baringo, Laikipia and Homabay, where they scored 45.45%.
- Safaricom has better coverage in most counties compared to the other two operators. The peak performance places were Busia, Kiambu, Kwale, Mombasa, Lamu, Nyandarua, Nairobi and Mombasa. The lowest score was recorded in Vihiga and Kajiado.
- The Authority has, therefore, proceeded to levy a penalty for underperformance in offering quality of service in the mobile network subsector by Telkom Kenya and Airtel Networks. The penalty was accompanied by a notice of non-compliance, which requires the networks to improve on their current performance during the next assessment and failure for which an escalated sanction level will be applied.

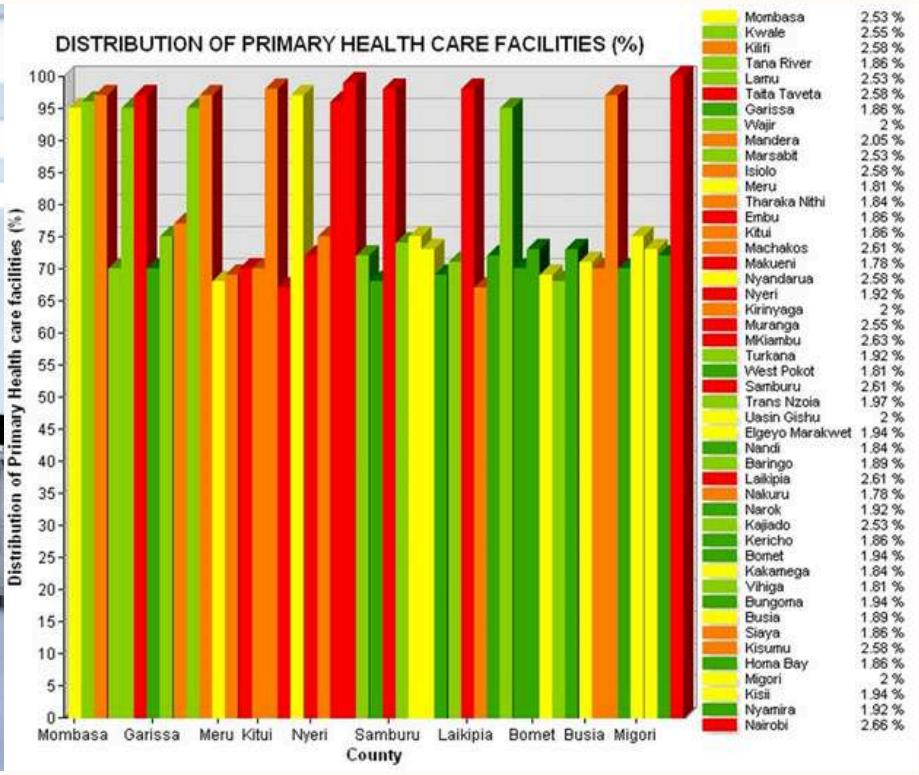



AVERAGE KPI COMPLIANCE LEVEL FOR MNO (%)
N
W
E
S
Turkana
Marsabit
Samburu
Isiolo
Meru
Tharaka Nithi
Embu
Kirinyaga
Murang'a
Nyeri
Laikipia
Baringo
West Pokot
Trans Nzoia
Elgeyo Marakwet
Uasin Gishu
Bungoma
Busia
Kakamega
Nandi
Vihiga
Siaya
Kisumu
Kericho
Nyandarua
Nakuru
Homa Bay
Kisii
Nyamira
Bomet
Migori
Narok
Kajiado
Makueni
Kitui
Machakos
Mwingi
Tana River
Lamu
Taita Taveta
Kilifi
Kwale
Legend
Counties
Average KPI Compliance level (%)
55 - 62 %
62 - 67 %
67 - 74 %
74 - 82 %
82 - 94 %
Not assessed

Health sector

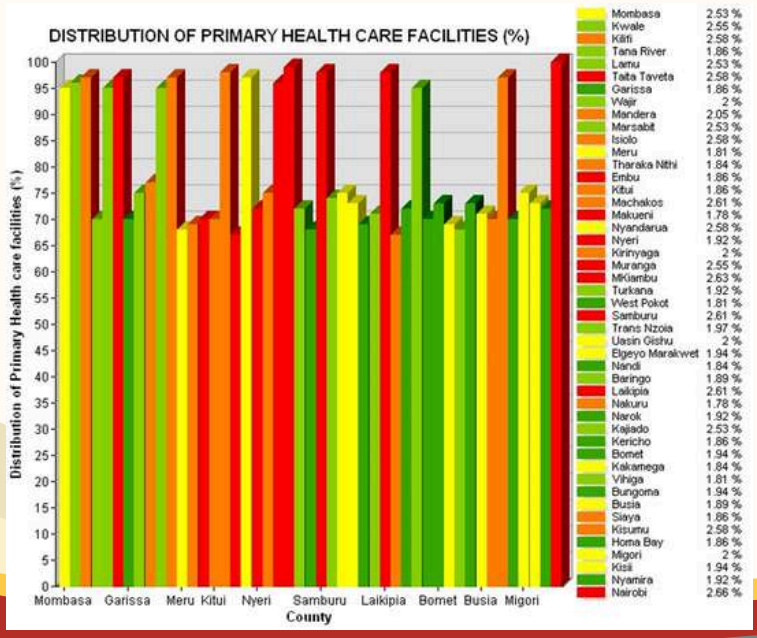
Availability of core health workforce

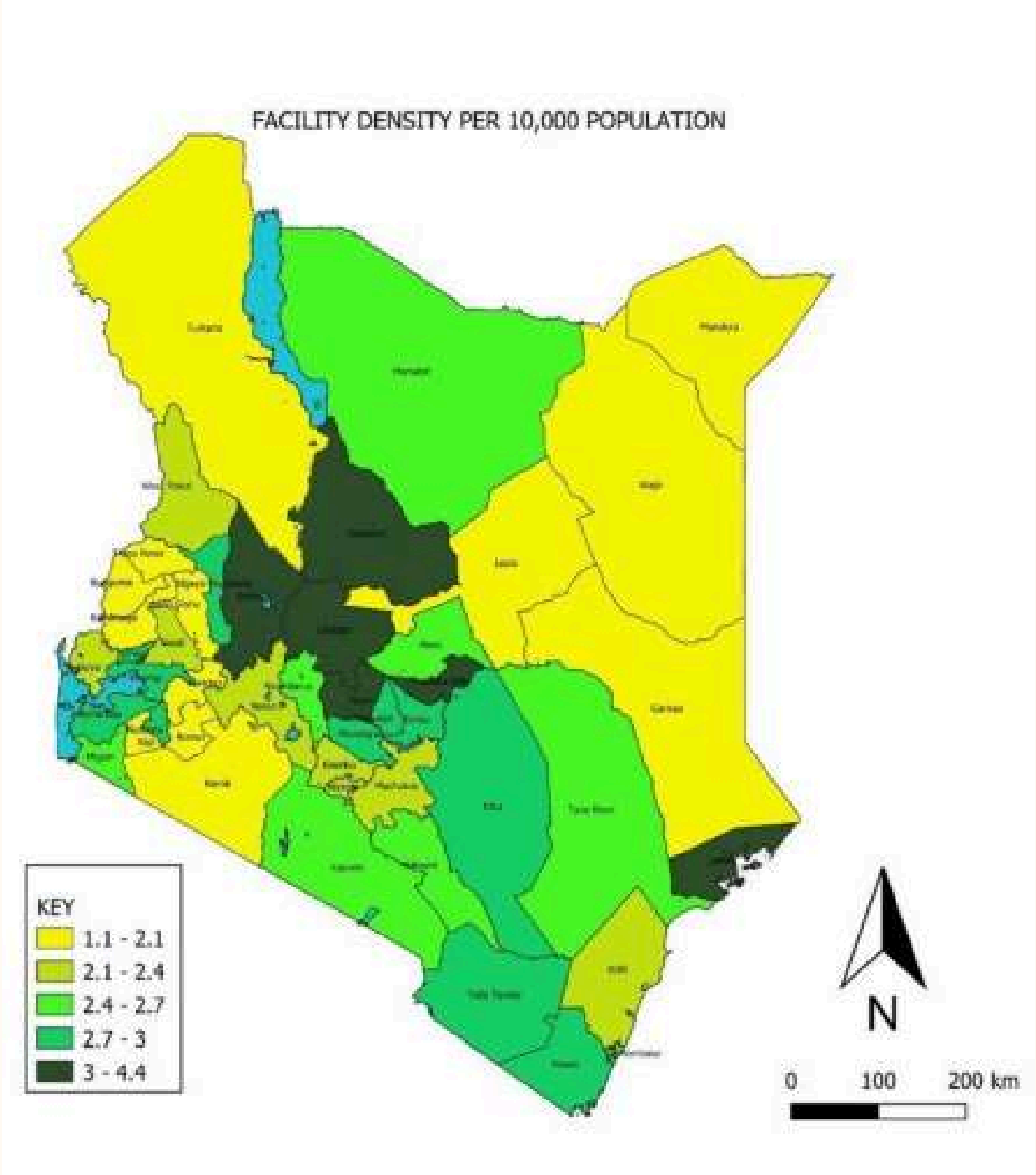
In the Ministry of health's, Kenya Health Facility Census Report of September 2023, it was reported that only 12 Counties met the required core health worker numbers per population (Nurse, Clinical officer, Doctor). The counties include Nairobi, Tharaka, Nyeri, Lamu, Vihiga, Mombasa, Uasin Gishu, Laikipia, Taita Taveta, Kirinyaga, Embu, and Kisumu. Narok, Turkana, West Pokot, and Wajir have the lowest.

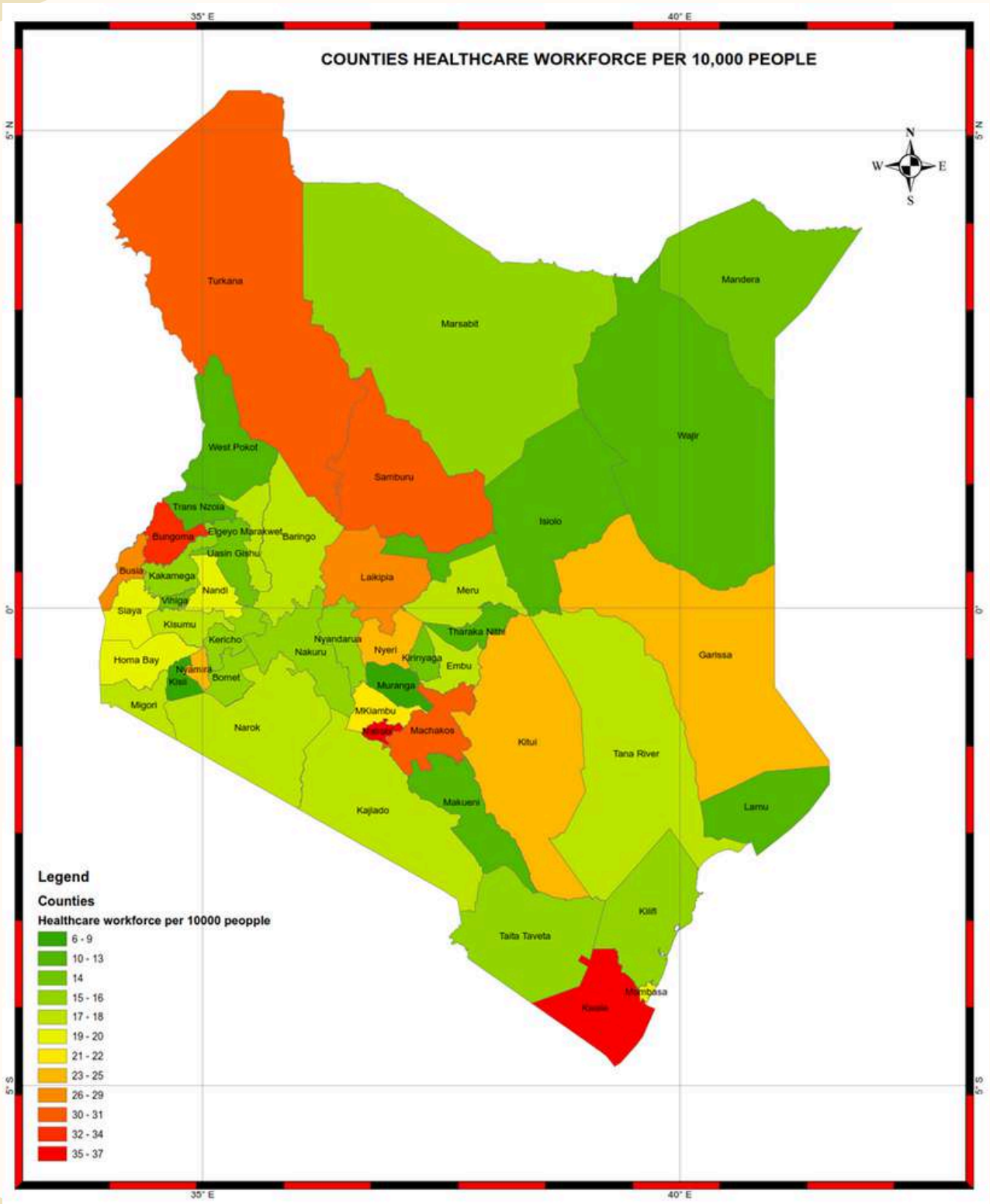


Distribution of primary health care facilities

IIn the Ministry of health's, Kenya Health Facility Census Report of September 2023, Bomet, Narok and Bungoma counties had the lowest facility density at 1.1, 1.4 and 1.4 per 10,000 population respectively while Nyeri Tharaka Nithi and Lamu had the highest facility density at 4.4, 4.3 and 3.9 per 10,000 population respectively.

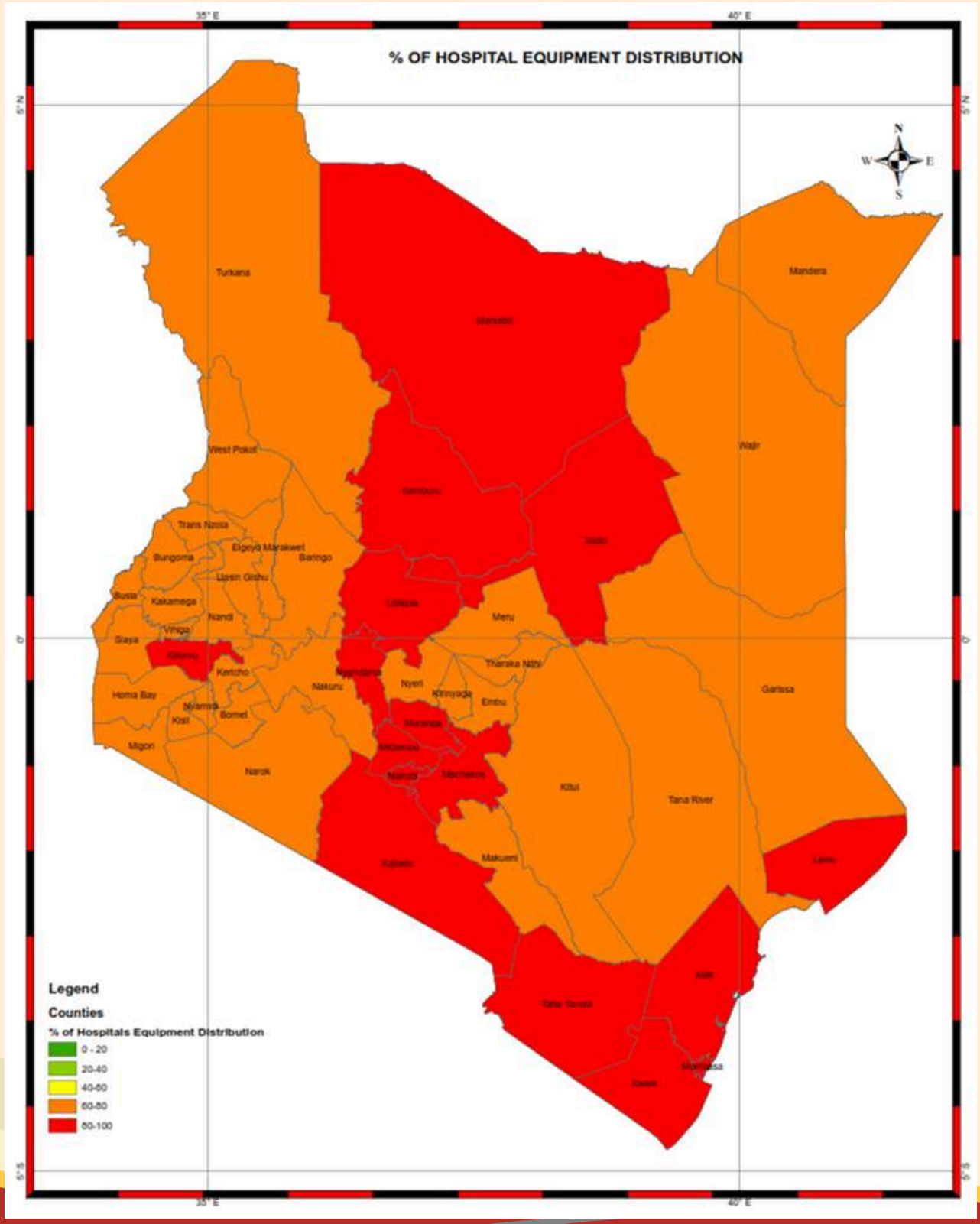



FACILITY DENSITY PER 10,000 POPULATION
KEY
1.1 - 2.1
2.1 - 2.4
2.4 - 2.7
2.7 - 3
3 - 4.4
N
0
100
200 km


COUNTIES HEALTHCARE WORKFORCE PER 10,000 PEOPLE
35° E
40° E
5° N
0°
5° S
N
W
E
S
Turkana
Marsabit
Mandera
West Pokot
Samburu
Wajir
Trans Nzoia
Isiolo
Elgeyo Marakwet
Baringo
Bungoma
Uasin Gishu
Laikipia
Busia
Kakamega
Nandi
Meru
Vihiga
Siaya
Kisumu
Tharaka Nithi
Kericho
Nyandarua
Nyeri
Garissa
Nakuru
Kirinyaga
Homa Bay
Embu
Nyamira
Kisii
Bomet
Muranga
Migori
MKiambu
Narok
Machakos
Kitui
Tana River
Makueni
Kajiado
Lamu
Kilifi
Taita Taveta
Mombasa
Kwale
Legend
Counties
Healthcare workforce per 10000 peopple
6 - 9
10 - 13
14
15 - 16
17 - 18
19 - 20
21 - 22
23 - 25
26 - 29
30 - 31
32 - 34
35 - 37

Equipment

In the Ministry of health's, policy brief dated November 2020 and titled, Availability and Management of Medical Equipment in Kenya, Insights from the Kenya Health Facility Assessment (KHFA) 2018, the counties that recorded top scores in basic medical equipment distribution included Marsabit, Samburu, Laikipia, Nyandarua, Murang'a, Kiambu, Nairobi, Machakos, Kajiado, Taita Taveta, Kwale, Mombasa, Kilifi, Lamu, and Kisumu. The rest had mean scores of between 60 – 80%.

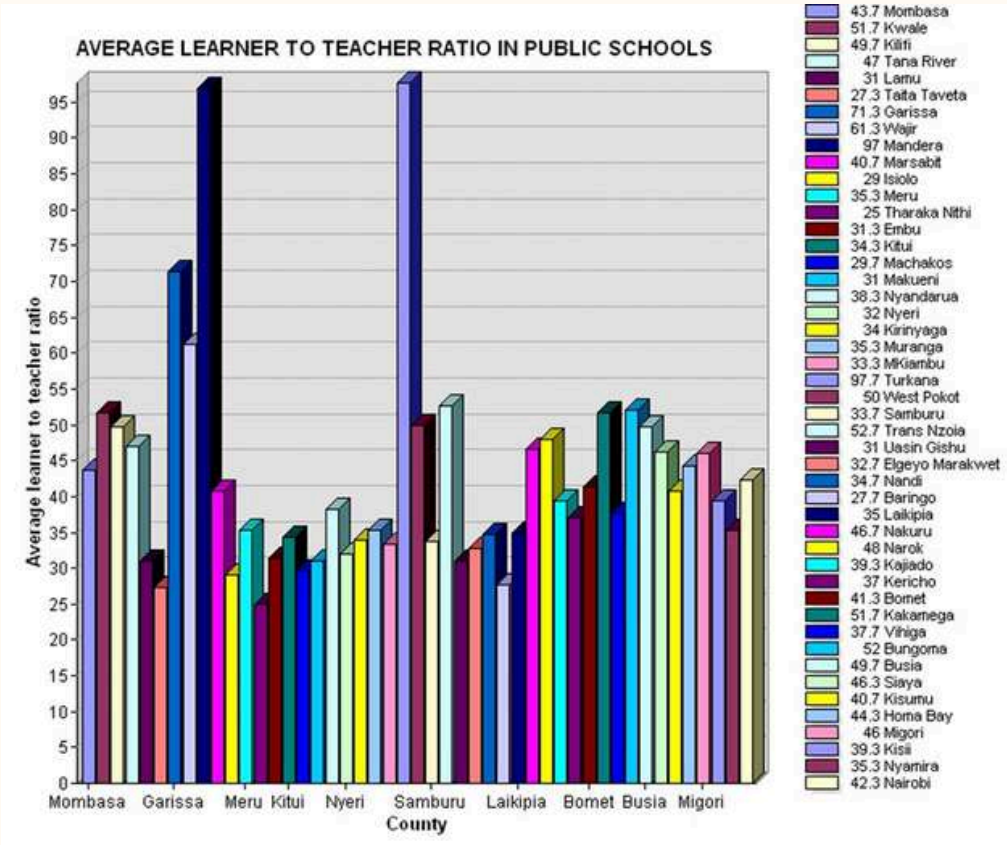


EDUCATION SECTOR

Education sector

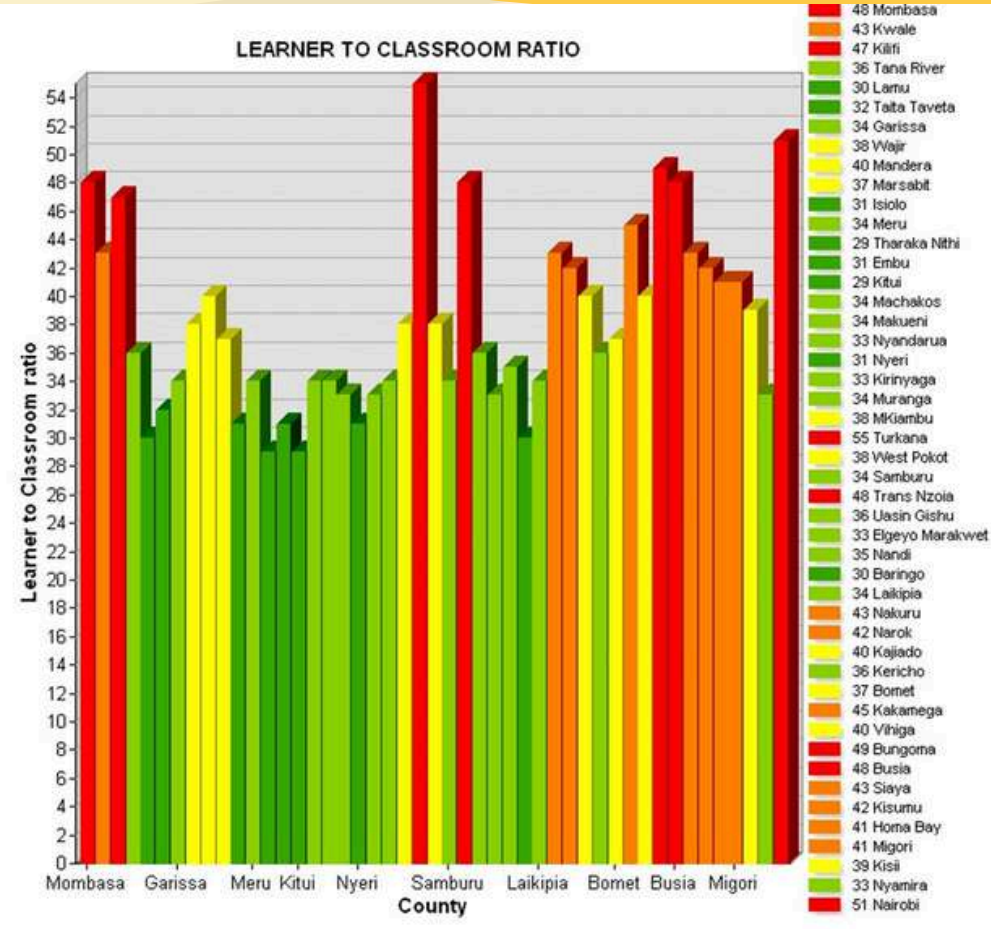
Learner to teacher ratio in public school

According to the **Ministry of Education's Basic Education Statistical Booklet, 2020**, in the public schools, there were lower learner to teacher ratios in Taita Taveta, Tharaka Nithi, Uasin Gishu, Baringo, Machakos and Kitui Counties, while higher ratios were recorded in Turkana, Mandera, Garissa, Tana River and Trans Nzoia. Turkana, Mandera, Tana River, West Pokot and Bungoma counties, showed poor learner to teacher ratio.



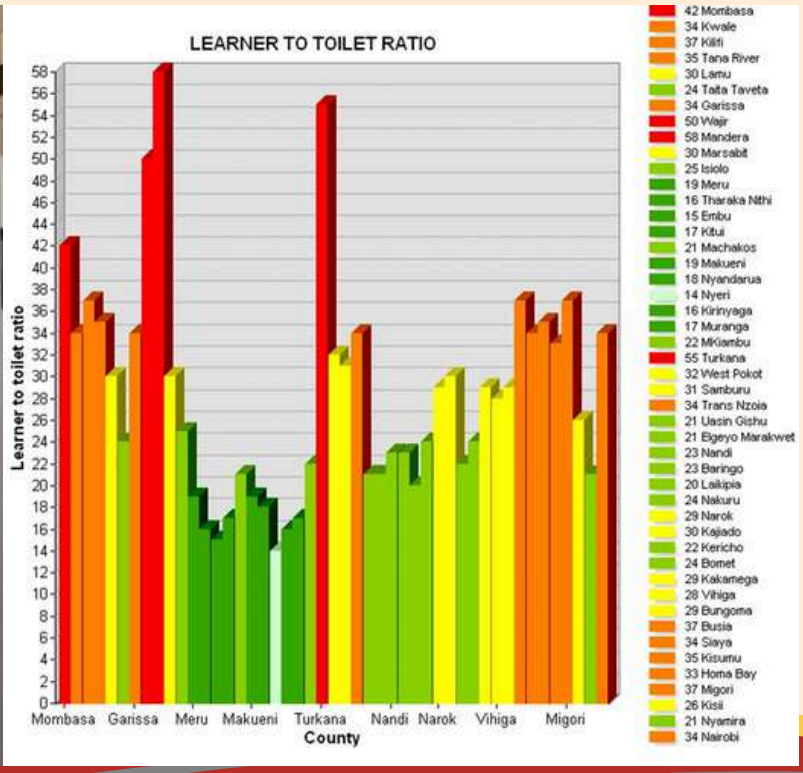
Learner to classroom ratio in public school

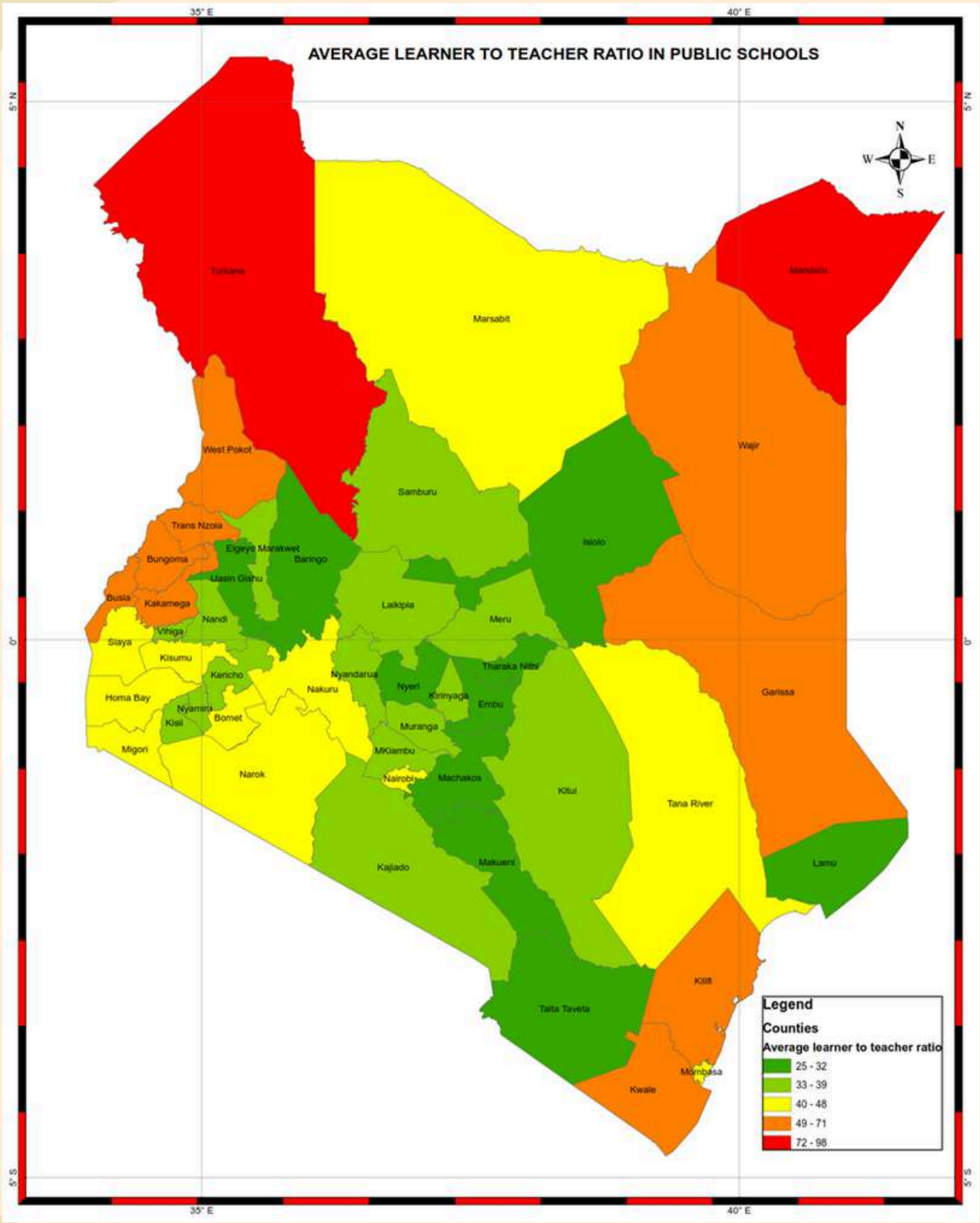
According to the Ministry of Education's Basic Education Statistical Booklet, 2020, in the public schools, there were lower learner to teacher ratios in Taita Taveta, Tharaka Nithi, Uasin Gishu, Baringo, Machakos and Kitui Counties, while higher ratios were recorded in Turkana, Mandera, Garissa, Tana River and Trans Nzoia. Turkana, Mandera, Tana River, West Pokot and Bungoma counties, showed poor learner to teacher ratio.

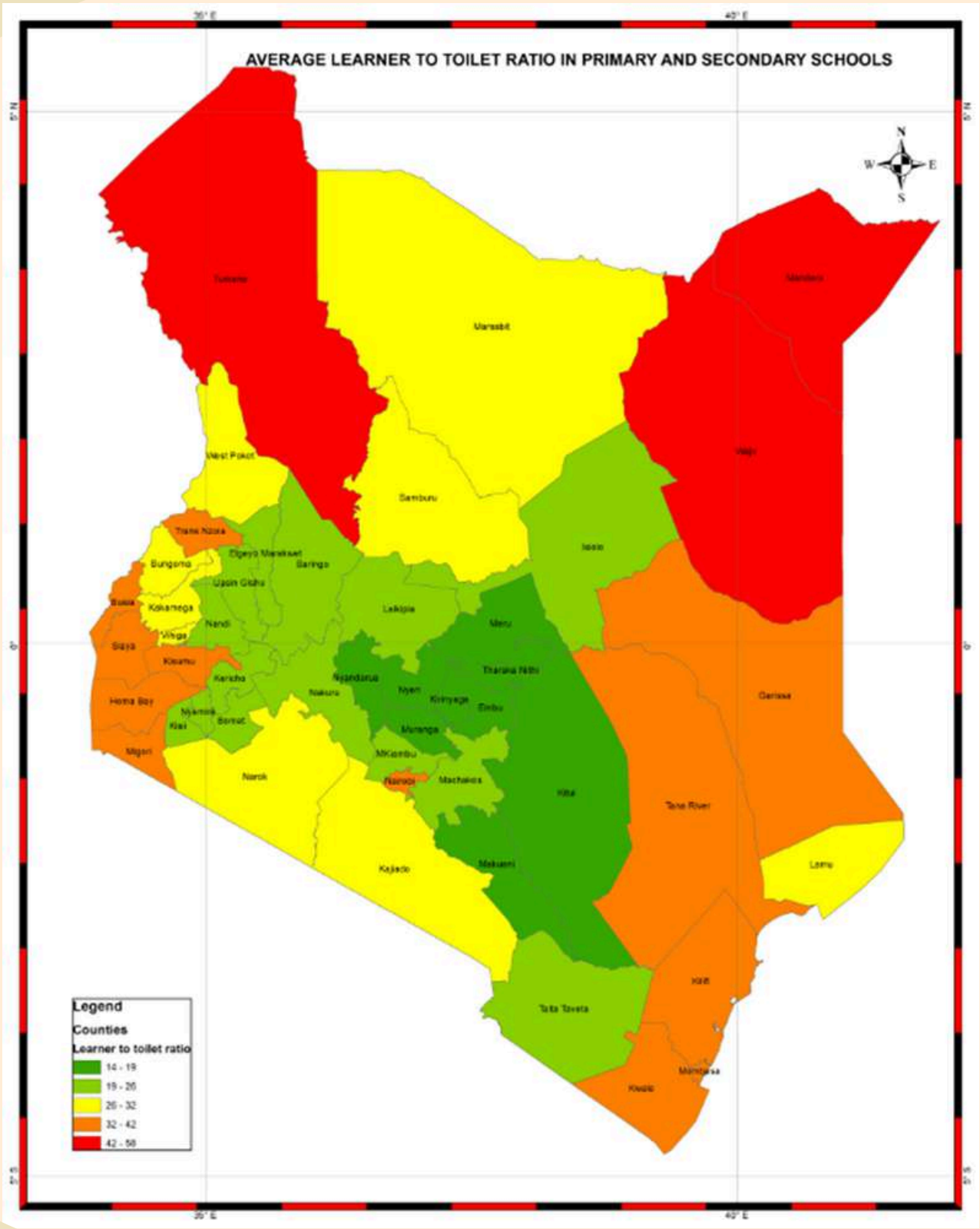


Learner to teacher ratio in public school

According to the report, Turkana, Mandera, Wajir and Tana River have the highest learner-to-toilet ratios, being 187, 185, 136 and 100 for boys and 176, 143, 113 and 88 for girls respectively.

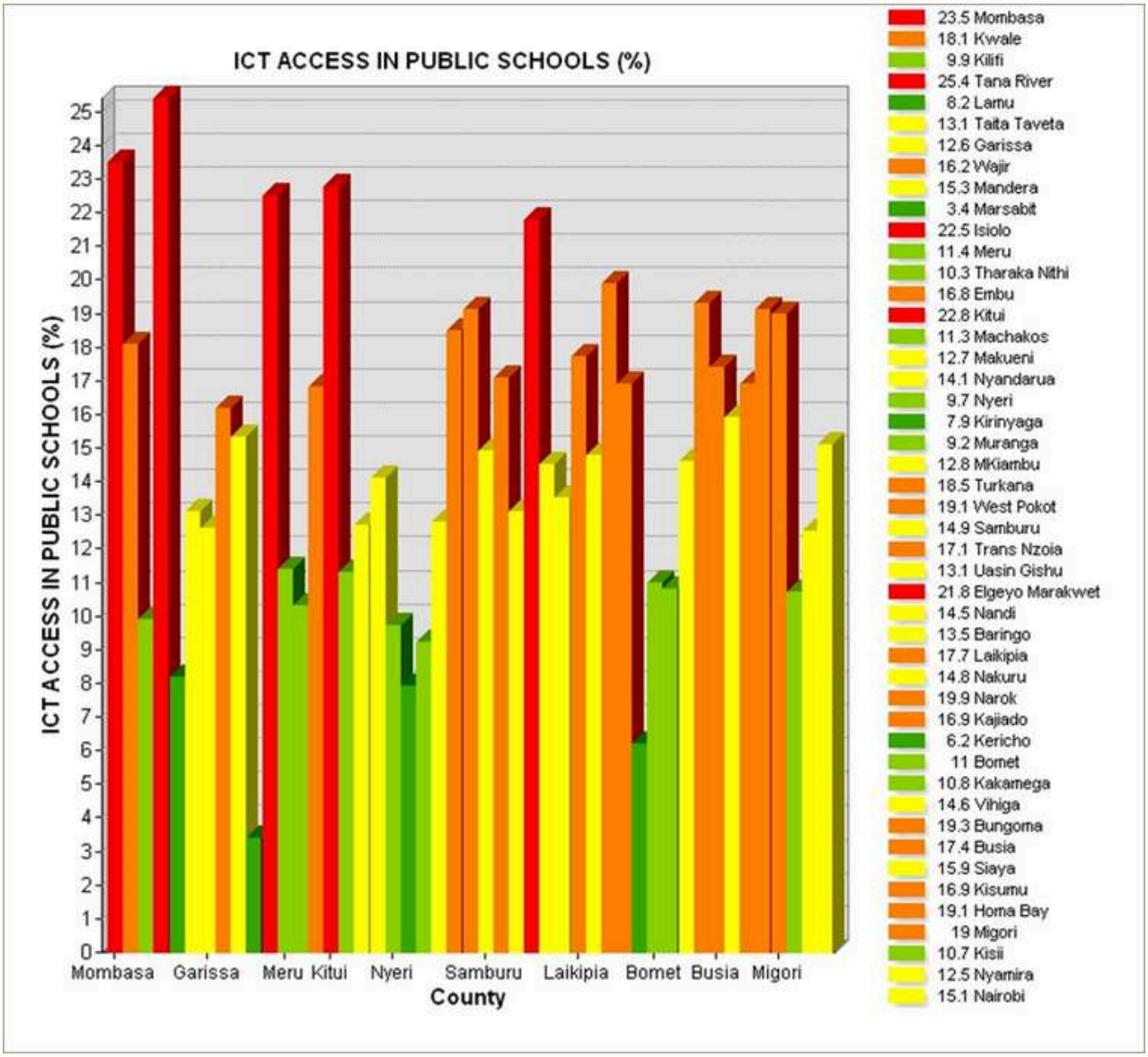


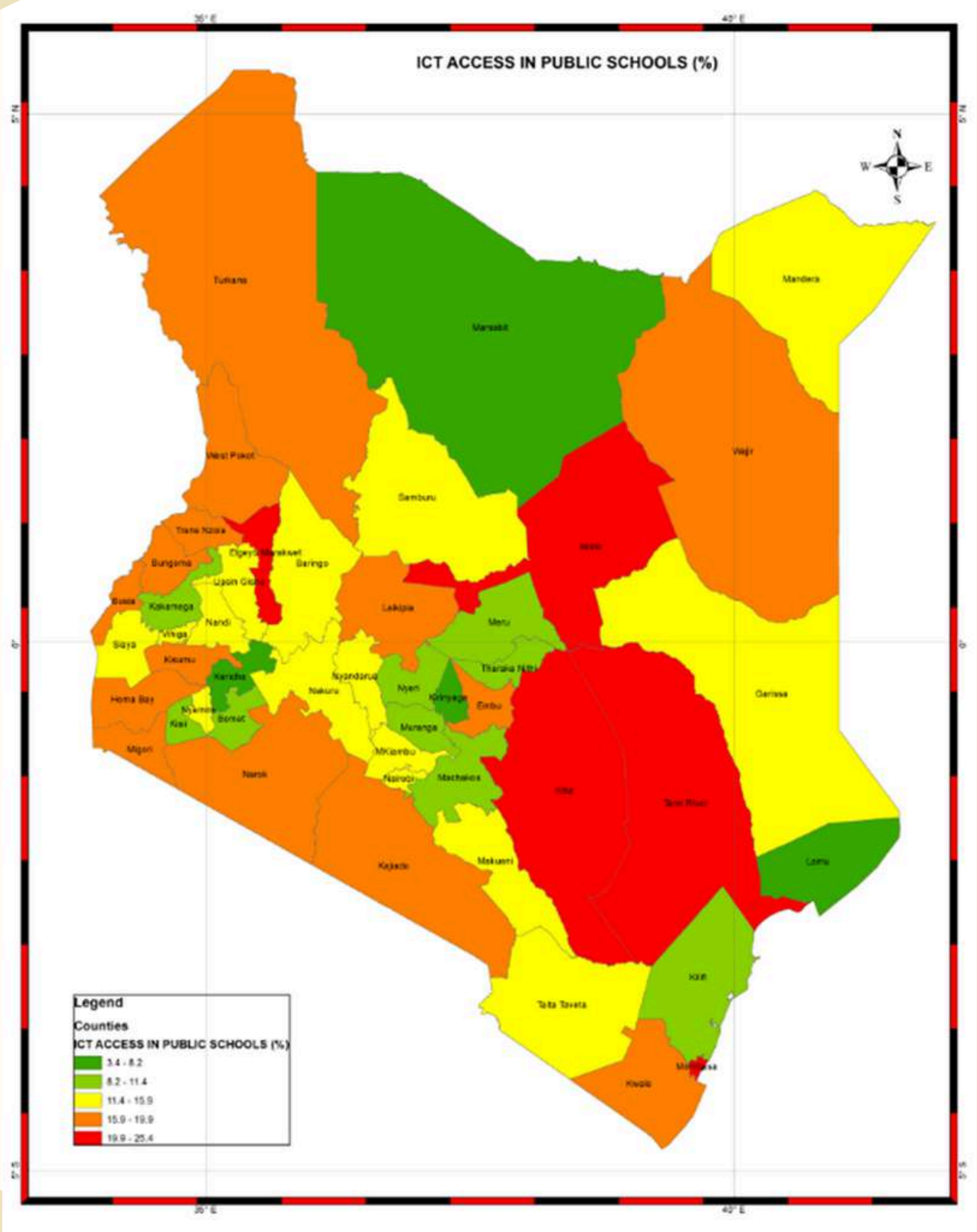

AVERAGE LEARNER TO TEACHER RATIO IN PUBLIC SCHOOLS
35° E
40° E
5° N
0°
5° S
N
W
E
S
Turkana
Marsabit
Mandera
West Pokot
Samburu
Wajir
Trans Nzoia
Elgeyo Marakwet
Baringo
Isiolo
Bungoma
Uasin Gishu
Busia
Kakamega
Laikipia
Nandi
Meru
Vihiga
Siaya
Kisumu
Tharaka Nithi
Kericho
Nyandarua
Nyeri
Nakuru
Kirinyaga
Garissa
Homa Bay
Embu
Nyamira
Kisii
Bomet
Muranga
Migori
MKiambu
Narok
Nairobi
Machakos
Kitui
Tana River
Kajiado
Makueni
Lamu
Kilifi
Taita Taveta
Mombasa
Kwale
Legend
Counties
Average learner to teacher ratio
25 - 32
33 - 39
40 - 48
49 - 71
72 - 98


AVERAGE LEARNER TO TOILET RATIO IN PRIMARY AND SECONDARY SCHOOLS
N
W
E
S
Turkana
Marsabit
Samburu
Isiolo
Laikipia
Meru
Tharaka Nithi
Embu
Garissa
Kitui
Tana River
Lamu
Makueni
Kajiado
Taita Taveta
Kilifi
Kwale
Mombasa
Narok
Kericho
Nakuru
Nyeri
Kirinyaga
Murang'a
Machakos
Nandi
Kisumu
Siaya
Busia
Vihiga
Bungoma
Trans Nzoia
Baringo
Legend
Counties
Learner to toilet ratio
14 - 19
19 - 26
26 - 32
32 - 42
42 - 58

Basic ICT facility

According to the report, Counties with better internet connectivity in public pre-primary schools were Tana River, Mombasa, Kitui, Isiolo and Elgeyo Marakwet, which had at least 20 % of the schools with functional internet. Marsabit, Kericho, Kirinyaga, Lamu, Murang'a, Nyeri and Kilifi had less than 10 % of the schools with functional internet.




ICT ACCESS IN PUBLIC SCHOOLS (%)
35° E
40° E
5° N
0°
5° S
N
W
E
S
Turkana
Marsabit
Mandera
Wajir
West Pokot
Samburu
Trans Nzoia
Baringo
Bungoma
Busia
Kakamega
Nandi
Laikipia
Meru
Siaya
Vihiga
Kisumu
Kericho
Nyandarua
Nakuru
Nyeri
Kirinyaga
Embu
Garissa
Homa Bay
Kisii
Nyamira
Bomet
Murang'a
Migori
Kiambu
Narok
Nairobi
Machakos
Tana River
Makueni
Kajiado
Lamu
Taita Taveta
Kwale
Legend
Counties
ICT ACCESS IN PUBLIC SCHOOLS (%)
3.4 - 8.2
8.2 - 11.4
11.4 - 15.9
15.9 - 19.9
19.9 - 25.4

CONCLUSION

The 2023 Report Card on Infrastructure has seen some incremental progress made from the previous one of 2021 toward building our nation's infrastructure even as some project's status remains the same. The 2023 grades range from a B to an E. 9 category grades — Energy, Water and Sanitation, Building, Transport (Rail, Aviation, Road, ports), Education, Health, Agriculture, Telecommunication and Production/manufacturing.

While we grade 18 categories individually, our infrastructure is a system of systems and more connected. We are looking at the low grades and analyzing the data behind them, there are three trends we must consider going forward.

1. Maintenance backlogs continue to be an issue, but asset management can help prioritize limited funding. Sectors like transport and wastewater have staggering maintenance deficits, but developing a clear picture of where the available funding is most needed improves overall system performance and public safety. The sanitation sector, for example, has embraced public-private partnerships and NGOs through programs such as WASH.
2. National and County governments have made progress in resource utilization. Increased investment or reform has also positively influenced certain categories. Political goodwill can improve most of our infrastructure development across the country through good legislation both at the national and county assemblies. Categories like ports, roads, and inland waterways have been the beneficiaries of increased National government funding.
3. There are still infrastructure sectors where data is scarce or unreliable. Sectors like school facilities, buildings, agriculture, and manufacturing still suffer from a lack of robust condition information or inventory of assets. To target investments and allocate funding, routine, reliable data should be the standard.

RECOMMENDATIONS

To strengthen our international competitiveness and compete fairly in standards, we need a strategic and holistic plan to renew, modernize, and invest in our infrastructure. This plan should make basic maintenance a centerpiece as we improve our legacy systems. Importantly, policymakers must come up with policies that bind us together as a nation. If our roadways become too rough and narrow to travel close to heavier traffic like ambulances, or if our resources protect one community at the expense of the one next door, the economy slowly stops.

Our infrastructural investment will only be possible with strong leadership, decisive action, and a clear vision for our country's infrastructure. All stakeholders all levels of government, business, labour, and non-profit organizations must come together and actualize this possibility. This we can achieve through

- Incentivize asset management and encourage the creation and utilization of infrastructure data sets across all sectors, streamlining the project permitting process across infrastructure sectors, while ensuring appropriate safeguards and protections are in place through a policy formulation.
- Ensuring that all investments are spent wisely, prioritizing projects with critical benefits to the economy, public safety, environment, and quality of life (e.g., sustainability), and leveraging proven and emerging technologies to make use of limited available resources.

Life cycle cost analysis to determine the cost of building, and any other infrastructure and maintaining the infrastructure for its entire life span. Supporting research and development of innovative materials, technologies, and processes to modernize and extend the life of infrastructure, expedite repairs or replacements, and promote cost savings. Innovation should include a component of integration and utilization of big data, as well as the "internet of things." Promote sustainability in infrastructure decisions, by considering the long-term economic, social, and environmental benefits of a project.

We must utilize new approaches, materials, and technologies to ensure our infrastructure can withstand or quickly recover from natural or man-made hazards. Advancements in resilience across all infrastructure sectors can be made by:

- Enabling communities, regardless of size, to develop and institute their resilience pathway for all their infrastructure portfolios by streamlining asset management, implementing life cycle cost analysis into routine planning processes, and integrating climate change projections into long-term goal-setting and capital improvement plans.
- Understanding that our infrastructure is a system of systems and encouraging a dynamic perspective that weighs trade-offs across infrastructure sectors while keeping resilience as the chief goal. Prioritizing projects that improve the safety and security of systems and communities, to ensure continued reliability and enhanced resilience.

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