



REPUBLIC OF KENYA

MINISTRY OF EDUCATION

NATIONAL RESEARCH PRIORITIES 2018 - 2022

JUNE 2019



National Commission for Science, Technology and Innovation
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 National Commission for Science, Technology and Innovation



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FOREWORD

The Kenya Vision 2030 recognizes the critical role played by research and development in accelerating economic development and proposes to intensify the application of Science, Technology and Innovation to raise productivity and efficiency levels across the economic, social and political pillars of the Vision. The generation of new knowledge through scientific research underpins the realization of the Government 'Big 4' Agenda on Food and Nutrition Security, Affordable Housing, Manufacturing and Universal Health Care coverage.

Recognizing that resources to support research are finite, the government has set research priorities that address the most immediate needs of the nation and respond to the national development aspirations. The implementation of these priorities is expected to result in increased research and development investment in areas critical to national development. This will result in employment creation and improved living standards. The priorities will be reviewed every three years.

I call upon Government Ministries, Departments and Agencies, universities, research and technical and vocational education and training institutions,

development partners and the private sector to initiate strategic collaborations around these research priorities.

A handwritten signature in black ink, appearing to read 'G. A. O. Magoha', written in a cursive style.

**Prof. George A. O Magoha, CBS
Cabinet Secretary**

PREFACE

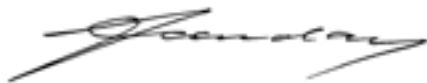
The Government recognizes that Research and Development (R&D) is critical to achieving the desired socio-economic transformation. The returns on investment in R&D are realized where research is demand driven and the outputs are utilized to address fundamental societal challenges.

The National Research Priorities is a sector-wide initiative provided for in the Science Technology and Innovation Act of 2013. These research priorities have been developed through wide stakeholder consultative process to enhance coordination and cooperation on national research agenda among the actors.

The National Research Priorities document is a five-year plan focusing on Food and nutrition security; Manufacturing; Health and Housing. The overall goal is to increase productivity, achieve sustainable economic growth, create employment, promote equity and improve the national well-being. In implementing these research priorities, stakeholders are expected to mainstream appropriate financing models, environmental

sustainability, climate smart initiatives, national values and devolution considerations. We are committed to supporting public research agencies and other partners to achieve the expected research outputs and outcomes in these priority areas.

I take this opportunity to thank all those involved in the development of this document comprising relevant government departments, private sector actors, civil society and development partners. I am grateful to the National Commission for Science, Technology and Innovation for spearheading the development of the National Research Priorities.



Prof. Collette A. Suda, PhD, FKNAS, CBS

Chief Administrative Secretary and Principal Secretary

State Department for University Education and Research

PREAMBLE

1. Science, Technology and Innovation (ST&I) is critical for the development of a knowledge-based economy. Kenya seeks to transform into a middle-income country providing high quality of life to its citizens in a clean and secure environment by 2030. This transformation is outlined in the country's Vision2030, which is implemented in five-year Medium-Term Plans. The Vision identifies ST&I as one of the enablers on which the Economic, Social and Political pillars are anchored.
2. Research is a key component in advancing the role of ST&I. There are diverse research areas that are critical for economic development. However, the available resources are limited and should be targeted to areas of utmost importance to the country.
3. The Science, Technology and Innovation Act, 2013 mandates National Commission for Science, Technology and Innovation (NACOSTI) to set priorities in scientific, technological and innovation activities

in Kenya. NACOSTI in consultation with stakeholders developed the National Research Priorities which were informed by the prevailing Government socio-economic policies. Formulation of the Research Priorities also took cognizance of the Constitution, Kenya Vision 2030 and its Third Medium Term Plan, and Sector Plans. It is also anchored on international commitments including the Sustainable Development Goals (SDGs), the Science, Technology and Innovation Strategy for Africa (STISA) 2024 and the African Development Agenda 2063.

4. The following criteria was used in identifying the national research priorities:
 - (i) Potential impact of research in the specific field especially those addressing the Big Four Agenda and the Third Medium-Term Plan;
 - (ii) Addressing national needs/gaps unlikely to be met by other mechanisms of financing;
 - (iii) Cost effectiveness and sustainability; and

- (iv) Potential for multiplier effects on the national development process.
5. The research institutions, universities and non-governmental institutions will be guided by the National Research Priorities to carry out research and generate knowledge for the economy. With the various players in the economy, working together towards a common goal, it will be possible to address the research needs of each sector. S&T sector is expected to provide leadership in implementation of the priorities.
 6. In the Medium-Term period 2018-2022, the ST&I sector lays emphasis on the “Big 4 Agenda” on Food and Nutrition Security, Manufacturing, Housing and Universal Health Coverage. The overall goal is to increase productivity, achieve sustainable economic growth, create employment, promote equity and improve the national well-being.
 7. In implementing these research priorities, stakeholders are expected to mainstream

appropriate financing models, environmental sustainability, climate smart initiative, national values and devolution considerations.

8. These priorities will be subjected to a mid-term and end-term review.

RESEARCH PRIORITY AREAS

Food and Nutrition Security

9. The access to affordable, adequate, safe and nutritious food, in sufficient quantity and quality is recognized as a basic human need to meet their dietary requirements for an active and healthy life. Low agricultural productivity, high post-harvest losses, inefficient value addition processes, poor distribution and marketing of agro-products and climate change are an impediment to this basic right. To achieve 100 percent food and nutrition security, the country will need to double agricultural production, reduce losses, enhance value addition, mitigate the effects of climate change and reverse micronutrient deficiency or hidden hunger.

10. Government Departments, Agencies and partners should give priority to research that will lead to:

- (i) Enhanced agricultural productivity, through novel technologies, better management of pests and diseases and sustainable use of soil, water and biodiversity;
- (ii) Reduced post-harvest losses through increased efficiency in food processing, storage, distribution and supply chains;
- (iii) Increased technology up-take through effective technology transfer system, sustainable provision of extension services, farmer education and public outreach programmes;
- (iv) Increased diversity of food sources by addressing the socio-economic, cultural and religious factors that limit the utilization of diverse food sources; and
- (v) Promotion of sustainable products utilization; water management, rehabilitation, conservation and

management; indigenous traditional knowledge; biodiversity and environment management; strengthening environmental governance; and, mitigation and adaptation to climate change.

Affordable Housing

11. Kenya has an estimated annual demand of 244,000 housing units in different market segments against an estimated annual supply of less than 50,000 units. This has outpaced supply and has culminated in housing deficit over the years. Majority of Kenyans are still unable to access housing due to high cost, unfriendly mortgage regime, a rigid land tenure system and weak policy, legal and regulatory framework. The country needs to develop affordable housing programmes covering all urban centers across the country that will incorporate innovative, cost effective and efficient delivery models. These will entail the use of affordable environmentally friendly building materials, efficient construction technologies and techniques.

12. Government Departments, Agencies and partners should give priority to research that will lead to:

- (i) Development of affordable building materials and technologies;
- (ii) Development of technologies for greening the building and construction sector to make it climate smart;
- (iii) Responsive land use and urban planning;
- (iv) Viable and innovative financing models including Public Private Partnerships;

Manufacturing

13. The manufacturing sector is a key driver for economic growth and development through job creation and value addition. The overall goal is to increase the sector's contribution to Kenya's GDP from about 9.2% to 15%. This is constrained by high cost and unstable energy, inconsistent supply of quality raw materials, reliance on obsolete technologies, limited access to affordable credit and counterfeiting of products.

14. Government Departments, Agencies and partners should give priority to research that will lead to:

- (i) Technologies that enhance efficiency in processing and value addition;
- (ii) Appropriate climate smart manufacturing processes, energy efficiency, effectiveness and diversification;
- (iii) Effective quality assurance and standardization of processes and products;
- (iv) Fabrication of simple power and hand driven tools/equipment used in farming and industries; medical and laboratory equipment; innovative construction machinery and spare parts production;
- (v) Manufacturing of plant equipment, components and accessories for energy generation including: photovoltaic cells, solar panels, wind turbines, biogas digesters, burners, batteries, inverters, energy saving bulbs, bio-fuels, distribution lines and cables;

- (vi) Increased efficiency in the execution of the textile, apparel and leather value chains to overcome limitations and tap on their potential to contribute to wealth generation and employment creation; and
- (vii) Efficient production of steel, plastics and rubber, paints and adhesives, leather, electrical and electronics, sheet and fiber glass and petroleum products, auto financial /insurance services, sales and repairs, auto parts and accessories.

Universal Health Coverage

15. The high cost of health care, weak public health and sanitation systems, poor disease diagnosis and the emergence of infectious and non-communicable diseases present a serious impediment to the attainment of Kenya's ambition of attaining 100 percent Universal Health Coverage. Although great progress has been achieved in the roll-out of the National Hospital Insurance Fund (NHIF), the cover has been out of reach for the majority of citizens due to accessibility and cost limitations. As a hospital and not a health insurance cover,

NHIF is technically limited in the extent to which the regime can assure universal health coverage.

16. Government Departments, Agencies and partners should give priority to research that will lead to:

- (i) Novel health care delivery and public health systems supported by modern technologies including Information Communication Technology (ICT) and Nanotechnology;
- (ii) Promotion of healthier lifestyles and address non-communicable diseases including mental health;
- (iii) New technologies to enhance disease surveillance, prevention, diagnosis and treatment;
- (iv) Disease prevention-focusing on infectious and non-infectious diseases pharmaceuticals, vaccine development, alternative medicine and emergencies;

- (v) Early diagnosis and treatment of diseases; and
- (vi) Environmental health-focusing on water and sanitation, pollution control, occupational health and safety and effect of climate change on health.

Academic Research and Development

17. Universities play a key role in the development of human resource for all production sectors of the economy through training and conducting research and development for the generation, curation and dissemination of new knowledge. University research programmes are critical in the development of theoretical foundations in basic sciences that underpin applied research. A great proportion of research funding initiatives focus more on applied research, seen to generate quick gains as opposed to basic research, whose benefits are not always apparent. The research portfolio at universities has been declining over the years due to low funding and greater focus on training.

18. Government Departments, Agencies and partners should give priority to:

- (i) Enhanced research portfolio and capacity at universities and research institutions to address the research agenda;
- (ii) Strengthening the existing models of linking academia, industry, community and government for effective technology transfer;
- (iii) Enhanced effectiveness of teaching Science, Technology, Engineering and Mathematics (STEM) subjects and assure equity in enrolment to STEM programmes at all levels of education; and
- (iv) Generating data and statistics for R&D.

IMPLEMENTATION, MONITORING AND EVALUATION

19. The National Commission for Science, Technology and Innovation in collaboration with the National Research Fund (NRF), will

facilitate the establishment of five research consortia to address the five priority areas. Further, NACOSTI will lead the tracking, monitoring and support the implementation of the research priorities.

20. Monitoring and evaluation of the performance of the identified research priorities will be conducted through collection and analysis of administrative data and periodical R&D reviews. National targets will be set and appropriate indicators aligned to the internationally accepted ones integrated into the framework. The Sectors will also formulate sector-specific monitoring Indicators for each priority research area.
21. The implementation framework will constitute the National Steering Committee, the Research Priorities Delivery Secretariat and Sector Working Groups (Figure 1).
22. A National Steering Committee on research will be established comprising of the Principal Secretary responsible for Science, Technology

and Innovation, The National Treasury and Principal Secretaries in state departments in charge of areas of focus in the National Research Priorities. The National Steering Committee will be convened by the Principal Secretary in charge of Science, Technology and Innovation. The Steering Committee will provide strategic direction to the Priorities Delivery Secretariat.

23. To support the National Steering Committee, the Delivery Secretariat will be established with the mandate of spearheading the implementation of the Research priorities in collaboration with relevant line ministries and other agencies in the planning and monitoring of programmes implementation by the sector working groups. The Secretariat will comprise of the National Commission for Science, Technology and Innovation, National research Fund, Kenya National Innovation Agency, Commission for University Education, State Department in charge of Research Science and Technology and Representatives appointed from the other supporting sectors and the

private sector. The Secretariat will be chaired by the Director General NACOSTI.

24. Each of the sectors aligned to the research priority areas will establish a Sector Working Group to coordinate the respective sector initiatives including, resource mobilization, capacity development and monitoring of progress. Each sector will identify a lead agency to chair their Sector Working Group.

25. The National Research Fund will take lead role in mobilization of financial resources for research. The NRF will align the funding of research programmes to the national research priorities. In addition, sector aligned public agencies will mobilize resources through the Medium-Term Expenditure Framework in their respective MTEF Sector Working Groups. The sectors will also establish collaborations with private sector investors and other partners to mobilize additional funding.

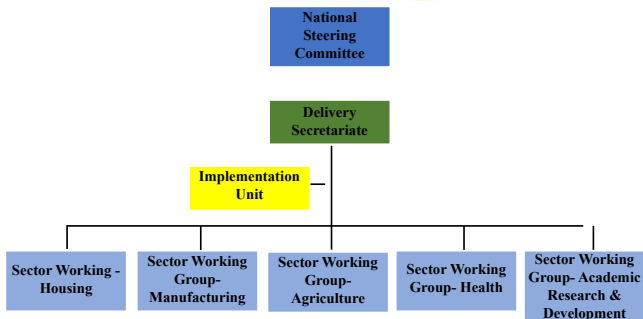


Figure 1: Organogram of Implementation Framework

Table1: Matrix on Research Priority areas and Consortium Institutions

S/No	Priority Research Area	Consortium Institutions
	Food and Nutrition Security	Ministry in charge of Agriculture, Fisheries & Livestock
		Research Institutions
		Ministry of Health
		County Governments
		Universities

Affordable Housing	Ministry in charge of Housing
	National Housing Corporation
	Universities
	County Governments
	Technical Institutions
	Private Sector
Manufacturing	Ministry in charge of Manufacturing
	Kenya Industrial Estates
	Kenya Industrial Research and Development Institute
	Kenya Association of Manufacturers
	Universities
	County Governments
	Private Sector

Universal Health Coverage	Ministry of Health and relevant agencies
	County Governments
	Universities
	Manufacturers of pharmaceutical & medical equipment
	Research Institutions
	Private Sector
	National Hospital Insurance Fund & other health insurance providers
Academic Research and Development	Ministry in charge of University Education & Research
	Commission for University Education
	National Commission for Science, Technology and Innovation
	Universities Funding Board
	Higher Education Loans Board
	County Governments
	Universities

Constitution of the Research Consortia

**The Agencies will elect the Chair to the Sector Working Group during their first meeting*

**This list is by no means comprehensive and additional ones may be taken on board as need arises*

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