TECHNICAL UNIVERSITY OF MOMBASA

OFFICE OF THE REGISTRAR PARTNERSHIP, RESEARCH AND INNOVATION

Internal Memo

Ref. No. : TUM/PRI/COM/11VOL.12 (36)

From : Registrar Partnership, Research and Innovation.

To : TUM Researchers/Innovators

Date : 1st November, 2018

Subject: CALL FOR RESEARCH/INNOVATION PROPOSALS 2018/2019 FINANCIAL YEAR

Technical University of Mombasa (TUM), through office of The Registrar Partnership, Research and Innovation, hereby announces a call for submission of Research Proposals for the 2018/2019 financial year. The funding target and level is as shown in the table given underneath.

S/No	Research Proposal Category	Funding ceiling in KES
1.	Inter-Faculty/Directorate/Institute	1,000,000
2.	Faculty/Directorate/Institute	750,000
3.	Departmental	250,000
4.	Supervised Student Innovations	50,000

The research proposals presented should be scholarly and in line with the University's Vision, and geared towards National Priorities i.e. Agenda Four (See the attached document). The research undertaking should result into outputs that qualify for publication in international peer reviewed publications and/or patentable innovations. Kindly be guided by the table above so that you indicate the category in which the proposal falls. In addition, the structure of the proposal should follow the format of: **i) Title, ii) Executive Summary, iii) Research Theme, iv) Linkages with TUM Vision and Agenda Four projects, v) Background, vi) Problem Statement, vii) Purpose, viii) Objectives, ix) Justification, x) Scope, xi) Research Method(s), including data analysis techniques xii) Results and Findings. For innovation research proposals, indicate potential generating products for patenting and/or commercialization, xiii) Research Schedule Plan and Budget, xiv) Log-Frame Matrix, xv) Details of Collaborators; and References**

The proposals should be emailed to: director.irie@tum.ac.ke followed by submission of two hard

copies of the same with a letter of recommendation from the hosting target applicants' group complete with copies of national IDs and CVs of the researches, specifying the role of each researcher. Student innovation research proposals should be endorsed by respective HODs/CODs before submission. The proposals should reach office of the Registrar Partnership, Research and Innovation on, or before close of business on **22nd November, 2018.**

Researchers currently administering internal TUM research grants and those with un-cleared imprests do not qualify to participate in this call.

Dr. Michael J. Saulo

Registrar Partnership, Research and Innovation.

CC: VC, DVC (ARE), DVC (AFP) Deans, Directors, CODS, FO.

National Research Priorities (Agenda Four)

1.1 Food and Nutrition Security

1.1.1 Research Areas

In order to address the challenges in the agricultural and natural resources sector, six (6) research thematic areas have been identified as follows:-

(i) **Agricultural technology development:** focusing on improving production, productivity, quality and utilization of crops, livestock, fish and natural resources.

(ii) **Technology adaption and rural service delivery/extension:** focusing on enhancing adaption of technologies, delivery of service and extension.

(iii) **Market and competiveness:** focusing on adopting a value chain approach and improving market access.

(iv) **Policies and investments:** focusing on increasing investments in agricultural enterprises.

(v) **Natural Resource Management:** focusing on promotion of sustainable products utilization; rehabilitation, conversation and management; indigenous traditional knowledge, biodiversity and environment management; strengthening environmental governance and, mitigation and adaption to climate change.

(vi) **Making the sector system work:** focusing on adaption of best-fit governance, business, coordination, extension and leadership models that promote agriculture research across value chains.

Detailed thematic areas for the Agriculture and Natural Resources are found in Annex 1.

1.2 Industrial Sector

1.2.1. Introduction

The sub-sectors includes: Manufacturing, Trade, Tourism, Energy, Mining and Petroleum Industrial sector has been identified as the key driver for economic growth and development in Kenya's Vision 2030.

1.2.2. Research Areas

The broad thematic areas for research and innovation under the industrial sector are:

(a) Technologies to improve the production of raw materials, products quality improvement and competitiveness;

(b) Development and review of policies and legislations to facilitate manufacturing;

(c) Development of graduated standards for products;

(d) Provision of energy which is affordable, stable and reliable; and

(e) Capacity building and development of centers of excellence.

Specific key areas that have been identified to drive the industrial activities in the Big Four Agenda for the Medium Term Plan period are in:-

(i) **Agro-processing** research and innovation opportunities in processing and value addition of crops (tea, coffee, nuts, legumes, cereals, fruits, vegetables, roots and tubers), livestock (dairy, meat) and fisheries (marine, fresh water and aqua culture).

(ii) **Textiles and apparel production** research opportunities in fiber production (cotton, silk and wool); better production methods for textiles and apparel including machinery; trade logistics; and innovative fashion designs and clothing/tailoring industries; equipping the centers of excellence for training and the KIRDI Laboratories in Nairobi and Kisumu.

(iii) **Leather and leather products** research and innovation opportunities in the areas of management of the quality of hides and skins; leather tanning; finished leather products; fashion designing; tools and equipment for cobblers; machinery for tanning; shoe soles production; marketing and logistics and skills development. In addition, equipping the centers of excellence and common manufacturing facilities for small and medium enterprises.

(iv) **Oil, gas and mineral Beneficiation and value addition** research and innovation opportunities in the areas of mineral concentration of the gold mining, fluorspar value addition, fabricate simple processing machinery; efficient logistics in mineral trading; and equipping mineral value addition centers (granite, gemstone, gold and gypsum)

(v) **Agro-machinery, medical machines, industrial machinery and spare parts** research and innovation opportunities in the fabrication of simple power and hand driven tools/equipment used in farming and industries (chuff cutters, carts, extractors, boilers, pumps, processors); medical and laboratory equipment; simple construction machinery and spare parts production.

(vi) **Energy and green products** research and innovation opportunities in the manufacture of plant equipment, components and accessories for energy generation including; photovoltaic cells, solar panels, wind turbines, biogas digesters, burners, batteries, inverters, energy saving bulbs, biofuels, distribution lines and cables among other products. In addition, there is need to equip Renewable Energies Laboratory; petroleum and Natural Gas Exploration Centre; and Internationally Accredited Mineral Certification Laboratory (IAMCL).

(vii) **Manufacture of electrical and electronics** research innovation opportunities in the designing, manufacturing, testing, distributing, and providing repair services for electrical products and components which include wiring and wiring devices; electric lighting equipment; domestic appliances; and electric motors, generators, transformers and electricity distribution and control apparatus, electronic audio and video equipment, public address systems and musical instruments amplification.

(viii) **Automotive motorcycles, components and auto-parts** research and innovation opportunities in steel production, plastics and rubber, paints and adhesives, leather, electrical and electronics, sheet and fibre glass and petroleum products, auto financial/insurance services, sales and repairs, auto parts and accessories.

(ix) Bio-technology and nano-technology research and product development.

(x) Market research on targeted products.

(xi) Market research on new niche market, local circuits and wildlife/safari packages including eco-tourism.

(xii) Market research on cooperatives niche products and services.

(xiii) Development of models for Meetings, Incentive Conference and Exhibition (MICE) facilities.

(xiv) Tourism promotion and marketing research.

(xv) Research into energy diversification from such sources as hydro, gas, solar, and nuclear power.

1.3 Health and Sanitation

1.3.1. Research Priorities

The following are the Key research areas of focus for the period:

(i) Health and Community Systems: This will cover Financing, Leadership, Governance, and Human Resource for Health and infrastructure.

(ii) Diseases: The thematic area will focus on key infectious and infectious diseases.

(iii) Social and Physical Determinants of Health: This includes: personal, social, economic and environmental factors that influence health status.

(iv) Health Technology: The area will cover application of organized knowledge and skills in the form of devices, medicines, vaccines, procedures and systems developed to solve a health problem and improve quality of lives.

(v) Health Equity: This will aim at ensuring that all people have full and equal access to opportunities that enable them to lead healthy lives.

(vi) Medicines and Vaccines: The area will cover medicines including; Alternative medicine/herbal medicine, vaccines and drug resistance.

(vii) Environmental Health: This will focus on the natural and built environments for the benefit of human health.

(viii) Life Course: This include the health of women before, during and after pregnancy, and of newborns, children, adolescents and older people, taking into account social determinants of health, gender, equity and human rights.

(ix) Emergencies: This will cover emergencies and natural disasters.

Detailed thematic areas for the Health and Sanitation sector are found in Annex 2.

1.4 Housing and Infrastructure

1.4.1 Research Areas

The government must encourage public-private partnerships where the private sector takes the lead. Alternatively, the government should just provide incentives and leave the private sector to execute affordable housing projects.

The identified research priority areas in housing includes:

(i) Material science, technologies and standards (Renewable sustainable building materials and technologies).

(ii) Service integrated housing construction Models/Designs using global best practices.

(iii) Viable and innovative financing models.

(iv) Governing policies and legislation on housing.

(v) Urbanization, Technology use (GIS, Traffic flow, axle loads) and its impact on Housing.

(vi) Land tenure and physical planning.

(vii) Population dynamics and social-cultural practices.

ANNEX 1 Agriculture and Natural Resources

1. Agricultural Technology Development

The research in this thematic area should focus on addressing:

- Improved crop, livestock and fish production, productivity and utilization.
- Appropriate agricultural machinery and equipment/implements.
- Increased use of technologies such as biotechnology and nanotechnology applications in agriculture and irrigation.
- Breeding for high yielding varieties/breeds and ensuring adoption through better germplasm supply systems.
- Testing/adoption of GMOs in the socio-ecological context of Kenya.
- Innovations on enhanced nutrition, food safety and quality assurance.
- Plant Health Issues (Plant and animal Pest and diseases).
- Post-harvest issues.
- ICT in Agriculture.
- Soil Health.
- Indigenous crops, wildlife, vegetables and fruits.
- Improved nutrition through dietary diversification, food fortification and supplementation.
- Indigenous traditional knowledge.

2. Technology adoption, Rural Service Delivery and Extension

The research in this thematic area should focus on:

- Investigating lack of demand (non-adoption) for technologies.
- Appropriate dissemination pathways for technologies (including competitive pricing).
- Packaging of practices and technologies available for farmers informed by context.
- Mobilization of farmers and stakeholders for scaling.
- Cost benefit analysis for alternative approaches.
- Approaches to strengthen agricultural extension systems (including commercialization of proven technologies).
- Models for scaling up pilot projects.
- Platforms for technology transfer informed by context.
- Capacity strengthening to sustain agricultural service delivery.

3. Marketing and Competitiveness

The research in this thematic area should focus on:

- Understanding markets including different value systems and links to competitive trade.
- Innovations around financing (and interest rates)
- Operational efficiency for reduction of production costs.
- Estimates of production volumes for investment decisions.
- How to link farmers with markets – investigating the nuclear middle.
- Conducive and supportive priorities (including support to the cottage industry).
- Identifying best-fit business models across value chains.
- Models of competitive agriculture that encourage entrepreneurship to thrive.
- Quality assurance for both local and export markets.

4. Policies and Investments

The research in this thematic area should focus on addressing:

- Incentives by government to increase investment in agricultural research (from 0.9 to 5%)
- Approaches for effective policy influencing.
- Stimulating increased investment in climate smart agricultural research.
- Sector policy analysis and implementation monitoring.
- Land tenure and land use review including expansion of urban space into prime agricultural and forest land.

5. Natural Resource Management

The research in this thematic area should focus on addressing:

- Balance between productivity and environmental services.
- Governance and benefits sharing and equity including gender.
- Incentives for natural resource management and impact at various scales and contexts.
- Environmental protection for sustainable agriculture, livestock management and aquaculture.
- Studies on ecosystem services (including provisioning).
- Studies for climate proofing agricultural, livestock and aquaculture investments including early warning systems.
- Biodiversity and conservation of genetic resources.
- Biosecurity measures for safe food and development of action plans for most serious diseases including those of farmed fish.
- Import control – biosecurity.
- Bio-remediation and conversion of waste into usable products.

6. Making the Sector System Work

The research in this areas should focus on addressing:

- Effective and inclusive coordination of the sector including policy harmonization.
- Elucidating research demand in the development agenda at various timescales and contexts.

- Capacity building at different levels.
- Gender, youth and other demographic aspects in sustainability – including effective models of attracting youth into agriculture.
- Cross sectoral integration/multi sectoral planning and monitoring (including aquatic systems).
- Public awareness of the influence of agricultural systems on livelihoods (including the marine environment).
- The science of communicating research outputs to policy and investments (how do you communicate science to stakeholders, including the policy makers and legislators).

ANNEX 2: Health and Sanitation

Key Research Areas	Specific Areas of Research
Health Community Systems: (Financing, Leadership, Governance, Human Resource, Facilities)	Devolution and health
	Community and Health systems impact on quality of health care
	Human Resource for health
	Healthcare models (biomedical, health systems governance, financing, referral systems, PPPs.
	Commodity management and security in supply chain management
	Policy/Health systems policy and Bioethics
Infectious and Non-Infectious Diseases	Surveillance prevention and management for emerging diseases & outbreaks e.g Multi-drug resistant TB, resistant HIV, Hemorrhagic fever infections
	Neglected Tropical diseases and emerging diseases and zoonoses
	Surveillance prevention and management for infectious, communicable diseases (HIV/Malaria/TB) and NCDs
Social and Physical Determinants of Health	Nutrition/Food safety/malnutrition and health
	The social and public health determinants of health
	Stress management, Mental health and Substance abuse
Health Technology	Use of ICT in Health/reliability of electronic data systems
	Medical Diagnostics, equipment and technology
	Medical technology/E-m Health for effective health/Telemedicine
	Medical Tourism
Health Equity	Universal health coverage
	Maternal health models – too hard to reach populations including nomadic and pastoralist communities
	Primary health care models to improve access to health care, models that cater for the needs of ageing populations
Medicines and Vaccines	Drug resistance
	Vaccines and medicines for diseases
	Alternative medicine/herbal medicine
Environmental Health	Water quality/Safety/Sanitation
	Pollution and diseases

	Occupational Health and safety- patients, public & provider
	Effects of climate change on health
Life Course	Maternal and neonatal health
	Pediatric and child health services
	Sexuality Reproductive Health (SRH)
Emergencies	Disaster/outbreak/Accident management