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Format for an IUC programme application – Concept note South

Call Institutional University Cooperation (IUC) 2022

GENERAL INFORMATION

Programme data	
Country and region of the programme:	
Kenya	
Programme title (linked to strategic/thematic focus area):	
Strengthening Jaramogi Oginga Odinga University of Science and Technology Capacity in Natural Resource Management, Food Security and Health	
Programme Summary (Focus of proposed strategic area(s) and institutional strengthening activity)	
Jaramogi Oginga Odinga University of Science and Technology (JOOUST) is one of the fastest growing public universities in Kenya having been granted Charter in 2013. Situated at the shores of the African largest fresh water lake, Lake Victoria, the University is at the heart of the efforts to address the unprecedented challenges facing LVB (Lake Victoria Basin) including the growing impact of climate change, degradation of biodiversity, food security, shifting food systems, and rising poverty levels. These challenges requires a different mix of expertise and multi-skilling not readily available in the current training and research methods. It is against this background that JOOUST is seeking to partner with Flemish Higher Education Institution to build capacity in training in research and outreach in the six key areas to address the challanges facing region. These include Agriculture and food security, Health, natural reseouce management, climate chnage, gender mainstreaming and ICT. The aim of the project is to bring tranformation in JOOUST training and research to better address the challenges of LVB.	
Applying local university (institution and proposed local coordinator)	
Full name of the institution (+ abbreviation)	**Jaramogi Oginga Odinga University of Science and Technology (JOOUST)**
Address	210-40601, Bondo, Kenya
Website	www.jooust.ac.ke
Name of proposed local coordinator (details in annex 3)	**Prof. Benson B.A. Estambale**
Name of the authority of the local university (Rector, Vice-Chancellor, President,...)	Prof Stephen G. Agong
Statute of the institute (private or public)	Public
Signature of the authority of the local university (Rector, Vice-Chancellor, President,...)	
Signature of the proposed local coordinator	

JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY
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PROGRAMME DESCRIPTION

1. Strategy of the institution

Briefly describe the overall institutional strategy. Highlight the institution's vision on its role as university and as a driver of change in society. Refer to other relevant internal policy documents, if relevant.

Jaramogi Oginga Odinga University of Science and Technology (JOOUST) was granted Charter in 2013. JOOUST's **Vision** is to be the beacon of excellence and global leader in University education for sustainable development. The University is currently implementing its second, five-year Strategic Plan (2016/17-2020/21), which is aligned to its core **Mission** of providing quality education that nurtures creativity and innovation through integrated training, research and community outreach for the advancement of humanity. This mission is anchored on the University's **Philosophy** of holistic approach to the service of humanity and other related areas of scholarship mediated through wisdom, science and technology, while keeping to its **Core values** of fairness, professionalism, equity, transparency and accountability, integrity and meritocracy. The University's key **Objectives,** to which we would want to contribute to through the IUC program include:

1. To become a center of excellence in training, research and community outreach services, offering practical and market oriented courses.
2. To be a premier institution of higher learning, offering relevant and quality, market-driven academic programs for steering economic development.
3. To focus on Kenya's cultural heritage through sustainable utilization of the vast natural resources for academic advancements and research purposes premised on improving the socio-economic status of the communities.

JOOUST identifies its niche areas for research and training as: natural resources management, food security; health; fresh water science and engineering; cultural heritage and renewable energy. JOOUST is strategically working with partners to realize its long-term, desired objectives to become the university of choice.

Elaborate on the capacity of the university to network with external actors: Governments, private sector, communities, civil society organisations, external funders, etc.

JOOUST has developed relevant policies and structures to enable amicable establishment and promotion of partnerships with external actors. Key among them is the establishment of a Center for Research, Innovation and Technology (CRIT) within the office of the Deputy Vice Chancellor for Research, Innovation and Outreach. CRIT is a directorate that coordinates research, innovation and technology transfer in JOOUST and between it and the external partners. It coordinates the development of policy documents, facilitates joint activities and mediates in areas of conflicts (conflict resolution). CRIT is also instrumental in knowledge transfer between to the local communities. The directorate promotes linkages, partnerships and collaborations with industry, research institutions and institutions of higher learning, for purposes of advancing mutual interests, shared goals, ideas and information, which is achieved through increased bilateral and multilateral agreements/ Memoranda of Understanding and Memoranda of Agreement (MOUs and MOAs). JOOUST also has a directorate of partnership and international linkages that determines and coordinates corporation with international partners. The University has invested considerable resources to develop ICT infrastructure and policy. The ICT center operates a Structured local area network (LAN) for rapid communication and well-established video conferencing facilities.

2. Context analysis

Provide a local context analysis, highlighting key development problems, their context, importance and underly-

ing causes. Take into account the transversal themes gender and environment in this analysis.

JOOUST is strategically located at the shores of Lake Victoria, which together with its watershed is a trans-boundary natural asset of global importance. As the world's second largest fresh water lake, with a surface area of about 68,800 km^2, it presents the East Africa region with enormous aquatic resources and opportunities. Lake Victoria Basin (LVB) occupies an area of 194,000 km^2, which is jointly shared by Tanzania (44%), Kenya (22%), Uganda (16%), Rwanda (11%) and Burundi (7%) (World Bank 2018). The Basin's rich aquatic and terrestrial biodiversity supports and sustains much of the economy and livelihoods of its 55 million people, about 30% of the entire population of East Africa, settled at a density much higher than the Africa's average. The Basin has a great potential based on its human resource, rich biodiversity, rich agricultural soils, abundant water resources, minerals, fisheries, wetlands, diverse forest resources, wildlife and tourism. The Lake and its tributaries are the main sources of domestic, industrial and irrigation water and support a fishing industry for export and local consumption. The Lake is also a waterway transportation corridor and hydropower generation source.

However, over 60% of the population in the LVB is poor, living below the poverty line and earns less than US$ 1.90 a day (United Nations 2017). Majority of the Basin's population depends directly on their immediate natural resources for their livelihoods, and hence there is immense pressure on these resources, a situation that has continued to undermine the sustainability of the natural resource base. Over 80% of the LVB's population relies on agricultural and livestock activities for their livelihoods and more than 60% of the population depends on rain fed agriculture. More than half a million fishermen and their families depend on daily fish catches for their basic living. The dense population, low capital investment, low levels of development and low numbers of trained manpower drive unsustainable use of natural resources and negatively impact the Basin (World Bank 21018).

LVB hosts many endemic aquatic and terrestrial species, but has experienced an alarming rate and magnitude of environmental degradation and biodiversity losses in the last four decades. There is increased water pollution due to unsustainable human activities, dense population and rural subsistence livelihoods within the Basin. Eutrophication of the water bodies, habitat degradation in the catchment, introduction of exotic species and overfishing have led to the loss of 80% of the endemic fish species, negatively affecting the basin's economy and livelihoods. High nutrient load in the water is supporting the invasion of aquatic weeds such as water hyacinth, inhibiting navigation. Over 70% of the forest and woodland cover in the catchment have been lost due to human settlements, urbanization, commercialization of timber and fish processing industries, need for agricultural land, unsustainable agricultural practices, increased energy demand, introduction of terrestrial invasive species and lack of appropriate technologies for forests and woodland conservation (UNEP 2006). Destruction of forest and woodland resources and the increase in general vegetation loss is associated with loss in catchment endowment values such as soil erosion and sedimentation; enhanced climate variability; reduced surface water quantity; reduced groundwater quality and recharge; and loss of biodiversity. While life-support systems of the riparian communities are increasingly threatened due to ecological degradation, ignorance, poor policies and low technology investments remain the major.

Food insecurity and malnutrition are a major challenge in the LVB, with more than 50 % of the population being food insecure (FAO, IFAD & WFP, 2015). Food insecurity here is largely due to extremely low levels of agricultural productivity caused by fluctuations in rainfall, inadequate (low) skills in agricultural value chain and slow uptake of technology. These challenges particularly affect women who constitute the majority in agricultural labor force in addition to barriers such as access to land, markets and finance (AGRA, 2014). Besides low productivity and chronic undernourishment, essential nutrients are lacking in the daily diets of most households, with irreversible consequences, especially for mental and physical development of children (Biesalki 2013). To remedy the food insecurity, production must increase more than 300 fold (Gabriel et al., 2009). This requires innovative thinking and strategic planning to exploit the hitherto non-conventional and underutilized sources of water and food, community-based seed multiplication and dissemination of more adapted seed systems technology, enhancing production, value addition and marketing among the small holder farmers.

Climate is a critical factor in the region's economy, since it affects all sectors of development including food security, biodiversity, water, health, energy and transport/communication. Studies show a general increase in temperature from the 1960s (Wandiga et al. 2006). The Basin has experienced increased intensities and fre-

quencies of severe, climate change-related weather events, causing significant interruptions of economic activities, destruction and losses (UNEP 2004). Climate change will increase the rate of environmental degradation, spread of disease vectors, frequency and severity of floods and droughts (will further drive erosion and increase sediment in runoff) and food insecurity.

The Lake's location at an elevation of >1000 m asl, the presence of diverse topographical features in the basin, together with the intense equatorial insolation provide a unique setting for strong mesoscale circulations over the lake and its surrounding regions (Anyah and Semazzi 2004). The interactions between the mesoscale circulations generated by orography and the lake itself, and the continental weather systems result in a uniquely unpredictable climate and weather patterns over the LVB (Ogallo 1988, Anyah and Semazzi 2004, Semazzi et al. 2011). Global Climate Models (GCMs) project a change in climate associated with decrease in rainfall in the LVB (IPCC 2007, Cook and Vizy 2013, Sillman et al. 2013). Extreme weather events are on the increase and have become more intense (Easterling et al., 2000; Treut et al., 2007) as evidenced by the prevalent extreme rainfall, frequent flooding and extended dry periods, thereafter, which are causing losses of lives, livelihoods and economies. Extreme weather is a major challenge to transport and communication (> 5,000 fetal marine accidents annually, Lake Victoria Basin Commission 2011), food security, health and power supply. Majority of the population in the basin is vulnerable to climate change, associated with increased poverty and loss of lives and income. Despite these challenges, integrated weather forecasting (for adaptation) for the basin is non-existent.

The Lake water is often a human health hazard, as untreated municipal waste increases spread of disease vectors and untreated industrial waste is also a major risk for human health. The main water-borne diseases in the Basin, which are influenced by scarcity of clean water, include cholera, typhoid, dysentery, and certain intestinal parasites. Weather events, particularly El Niño-related flooding has been associated with sporadic higher incidences of water-borne diseases. Malaria is the most important and widespread vector-borne disease in the Basin. High concentrations of mercury in the lake and river waters resulting from gold mining activities in the Basin lead to risk of central nervous system diseases. Disease prevalence and the vulnerability of the inhabitants in the Basin hinge on ignorance, lack of trained manpower, poverty status and livelihood activities (UNEP 20106).

Due to its location within the LVB, the University must play a significant role in finding solutions to the identified challenges facing the Basin. JOOUST, in partnership with local, regional and international partners seek to address some of these identified key challenges.

Provide an institutional context analysis, highlighting strengths and capacity constraints / needs of the institution. Take into account the transversal themes gender and environment in this analysis. Describe the position of your university in the national higher education landscape.

JOOUST has a total of 505 employees comprising of 158 academic staff, includes Professors, Lecturers, and research fellows and 347 administrative staff. The University has well-trained human capacity to mount and administer its training and research programs. The academic staff is actively involved in research and will provide adequate expertise required to manage the program. The University currently hosts 11,200 students out of which 1,560 (1,245 Masters and 315 are Ph.D.) are graduate students distributed across the 10 Schools. Thus there is an established infrastructure to take care of large numbers of graduate students as well as a model from which the project will benefit. JOOUST is a regional center of excellence in food security, hosting one of the three Phase 2 World Bank funded Africa Center of Excellence (ACE II) for sustainable use of insects for food and feeds (INSEFOODS) project. The University has, therefore, developed an elaborate local and regional networks, infrastructure and training program in food security. During the last five years, the university has hosted several large projects.

The university has enough space for setting up, modern teaching and research laboratories, a GIS center, ICT center and an engineering workshop to support teaching and research. As part of an ongoing expansion of facilities, the University is currently establishing additional modern laboratories and a library complex to accommodate the expanding student enrollment and changing research needs. Strategically, the University is currently constructing a modern research facility in one of its campuses based at the shores of lake Victoria with main

focus on lacustrine ecosystem research. This way the University intends to place itself as a leader in LVB resources management. The University has a Library that subscribes to over 20,000 International e-journals and e-books in addition to the bound material on the shelves. The library supports a repository platform that will support publications of research findings from the project for wider dissemination and impact.

The University has over 40 ha of farmland for teaching, demonstration, and research. There is a 1.32 ha located at Kapiyo (1.32ha), right at the shores of Lk. Victoria, earmarked for the establishment of an ecological botanic garden. At Miyandhe Campus there is a 15.25 ha which will host research complex to focus on research on LVB resources. At Muhoroni and Achego, the university has 2.4 ha, and 16.53 ha, respectively, which are earmarked for agriculture, practical training and technology transfer for food and nutrition security.

To spearhead its Research, Technology and Innovation agenda, the university has established a Centre for Research, Innovation and Technology (CRIT). The center coordinates all the research, innovation technology and entrepreneurships within the university. The proposed Project will benefit from this established structure. Further, the University has built strong linkage with industry for student and staff placement, internships, experiential learning and for co-curricular design and teaching. JOOUST exists as an academic institution, which seeks to address community, country, regional and global problems. The institution does not only promote basic and applied research but also actively contributes to national development through established programs with a strong focus on the practical application of knowledge and mutually benefiting community engagements.

JOOUST has a Quality Assurance Directorate in place to oversee quality of teaching, learning, research excellence and delivery of other services. The University is **ISO 9001:2015** certified and conducts regular audits. Despite these efforts, the University still faces quality related challenges such as inefficient financial management and procurement systems, weak audit systems (both academic and administrative), weak curriculum review process as well as disparity between the curriculum and market needs. The University has developed procedures in all its areas of operations and objectives according to ISO 9001:2015 requirements. In addition, the university is in the process of attaining certification for the Information Security Management System ISO 27000:2013.

JOOUST has a Directorate of Gender Mainstreaming and Development headed by a female professor, which champions gender issues a gender-based policy in awarding postgraduate fellowships. To promote female participation and retention in postgraduate degree programs, in the faculty and in other trades requiring highly-skilled human resources, JOOUST has developed gender and affirmative action; human resource that emphasizes staff gender ratio; code of conduct and staff development policies. Despite the vibrant gender policy, the University still lacks funds to propel women to higher levels of academics through affirmative action on scholarships and research fellowships. The University is in need of capacity building of University management on leadership and management skills to promote quality service delivery. There is also need to capacity build academic staff to adopt innovative pedagogical approaches and strengthen linkages with industry and communities by building strong outreach capacity.

Other key gap areas are: Inadequate staff to supervise PhD and Masters students. Lecturers therefore tend to be overworked, affecting quality and impacting research output, which currently stands at 0.23 per staff. Until recently, PhD programs were mainly by research. With a change in the national policy, the University is striving to implement “PhD by coursework and research”. However, there are challenges arising from inadequate numbers of academic staff capable of teaching at PhD level to comply with the changes. At undergraduate level, there is still high student to staff ratio in most schools.

There is low level of research dissemination, knowledge and technology transfer, which is caused by insufficient research-driven innovation and entrepreneurship, as well as limited administrative and technical capacity for research support. There are also limited linkages between academia and industry and government and the University still lack an efficient marketing and branding strategy for its innovations and products. The laboratories, which are less, equipped, with limited modern IT infrastructure and academic facilities to cater for the expanding student population are impacting on the quality of research and teaching.

3. Proposed programme strategy

Long term desired change(s):

JOOUST will adopt the University Third Mission of training, research, innovation, entrepreneurship and engagement with society. This requires capacity building and institutional transformation. The following strategy will be used for institutional capacity building for research and outreach:

1. MSc and PhD training

To produce graduates with the right skills to address societal, environment and economic challenges. This strategy will be engendered, through a transdisciplinary system approach in partnership with local and international partners. The goal is to prepare students as future leaders in research, teaching, applied science, creative production, policymaking, and public service. The strategy will include the following:

a) Curriculum development and delivery: JOOUST will focus on development of strategic and market-oriented MSc and PhD programmes. Currently JOOUST is developing MSc and PhD programme in Innovation and Development. **b) Pedagogical transformation**: With partners, JOOUST will design and implement experiential learning and innovative pedagogies particularly use of approaches such as the problem based learning (PBL) through the newly introduced competency based curriculum and e-learning pedagogies. There will be need to re-train JOOUST faculty to adopt these changes in delivery system through staff exchange programme. In addition JOOUST will implement internship programmes, student and staff exchange, design and create career development centers as well as business incubation hubs. **c) Institutional reforms**: Improvement of university leadership and management skills and adopt e-governance systems in all its operations, staff development and regionalization of student and staff. **d) Adaptive research**: The project will build capacity of JOOUST researchers/ staff to modern research mythologies in the key program domains

2. Up-scaling impacts

a) Policy development through policy labs: JOOUST will create an interactive innovation led policy labs that will contribute towards national and regional policy reforms through building capacity of policy makers and implementers and hosting policy labs. **b) Knowledge incubation hubs**: In pursuit of innovation driven, knowledge based economy in response to globalization, JOOUST will establish innovation hubs that will serve the purpose of capacity building and incubation of promising innovations and ideas particularly by women and youth, encourage partnerships with private sector, collaborative entrepreneurship programs with other community of practice including other institutions of higher learning.

3. Creating support structures

This project will focus on the following areas: 1) Strengthening the University Centre for Research, Innovation and Technology (CRIT) by building necessary structures to enhance its effectiveness to drive the University research agenda; 2) establishment of resource mobilization and Grants office; 3) building capacity of researchers through short term training and staff exchange programmes; 4) operationalization of the Technology Innovation and Support Centre (TISC) which will include strengthening intellectual property office and drafting of patents; 5) Strengthening of the Institutional Ethics Review Committee (IERC); and 6) Supporting University-industry-community linkages.

Domains of change:

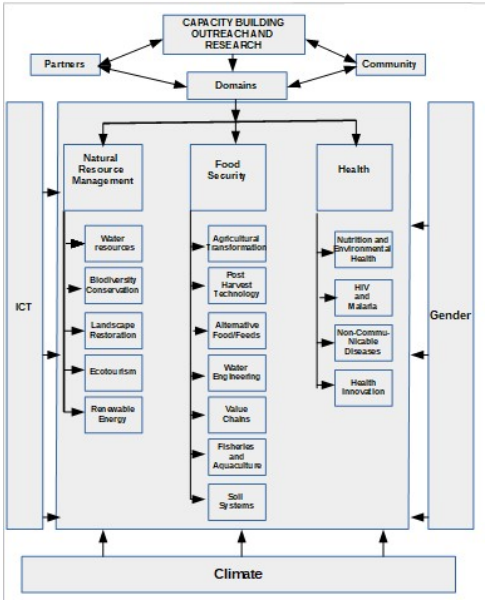

Fig. 1 Domains of change

LVB is facing unprecedented challenges including the growing impact of climate change, degradation of biodiversity, food security, shifting food systems, and rising poverty levels. These structural shifts require a different mix of expertise and multi-skilling of the increasingly youthful agricultural work force. Currently, the higher education institutions are not producing manpower with the right skills to address these gaps. Further there is a marked disconnect between research and practise. There has been pressure on universities to become more relevant in addressing the current social, economic and environmental challenges. The Universities have for instance, been under pressure to focus on promotion more relevant skills and competencies in emerging sectors such as agriculture, climate change, energy, agribusiness, industry, manufacturing, services, health and humanities.

Targeted domain change areas have been identified based on Kenya's national development priorities and JOOUST strategic plan and long-term objectives as shown in Figure 1: (1) Natural resource management (2) Food security; (3) Climate change mitigation and adaptation; (4) Health systems; (5) Transformative ICT ; In all the main domains, gender will be mainstreamed. Gender dimension will address the empowerment of women and the equality between men and women in society. Also, the issue of climate adaptation/resilience and ICT will be cross-cutting in all the domains.

Programme strategy:

Project 1: Management of the Lake Victoria Basin Natural Resources

Over the years the resources in LVB are facing numerous threats and stresses with significant consequences on the services and functions they provide. Agriculture and grazing lands are being degraded, water quality is declining, wetlands and forests are being lost, over exploiting is on an increasing trend, pollution from point and nonpoint sources is increasing and negative impacts of floods and droughts is intensifying. Overall, these threats represent a barrier to achievement of sustainable development in the LVB, which has been manifested in declining crop production, food growing food insecurity and poverty in the region. This project is seeking to address this situation through the following interventions:

i). Sustainable utilization of water resources – This will be done through mapping and profiling of above and below ground water resources; water resource monitoring and modeling; Building Institutional and technical capacities in research, assessment and management of water resources; developing policy framework for sustainable utilization of LVB water resources.

ii). Biodiversity conservation - Lake Victoria lost about 60 per cent of its cichlid taxa in the last decade and has been facing deterioration in water quality, partly due to over-exploitation of fish resources and human impact on the ecosystem. The project will: Carry out mapping, inventory and classification and valuation of LVB biodiversity; Support development of Biodiversity Action Plan (CBAP) by counties within the LVB; Establish Biodiversity monitoring and surveillance system; Support establishment of gene banks, seed banks, zoos and botanical gardens to conserve the biological diversity of valuable species; Support development of effective governance system to ensure inclusion of local communities in management of biodiversity resources and; Strengthen collaborative research amongst local, national and international partners.

iii). Resilient Landscape Restoration – The project will implement participatory resilient landscape restoration by supporting farmer managed natural regeneration (FMNR). The intervention with includes management

of invasive species, reforestation of degraded forest, afforestation of degraded land, reseeding of pastureland. In addition, the project will work with local and national government to develop and implement supportive policy and regulatory frameworks to ensure long-term conservation of the biodiversity.

iv). Ecotourism – LVB sits within the Western Kenya tourism circuit with a number of cultural and ecological sites suitable for ecotourism development. While of few of these sites have been developed for tourism e.g. Ruma National Park, Kisumu Impala Sanctuary, Ndere Island and Kakamega Forest as ecotourism destinations, the rest have not been fully developed or at worst have been neglected. In addition, the Lake's high pollution levels, low awareness and lack of strategic plan makes the region to lag behind as a tourist destination area. Further, changing climatic conditions are a threat to existing biodiversity and may encouragement proliferation of invasive species thus becoming a threat to tourism. The project will: Identify support development and protection of tourism sites including cultural and historic sites, botanical gardens, biodiversity high potential areas and sites with scenic beauty among others; Build capacity and raise awareness on ecotourism potentials of the region; Promote private sector investment to build infrastructure and; Building capacity of the communities to get involved in ecotourism.

v) – Harnessing renewable energy – LVB has abundant renewable energy resources, which include solar, wind, bioenergy and small hydros. Despite these potentials, over 90% of the residents of LVB are still using traditional biomass for cooking while kerosene is the predominant energy source for lighting. Use of traditional biomass and kerosene is associated with indoor air pollution related ailments such as respiratory diseases in children and women as well as forest destruction. The project will seek to harness renewable energy resource to enhance access to clean energy. The project will mainly focus on solar, small hydros, biogas and modern biomass technologies.

Project 2: Building Capacity for Transformative Agricultural Education

Agriculture, through provision of food, employment and cash income is the mainstay of Kenya's economy. Moreover, approximately 80% of Kenya's population lives in rural areas. It is for these reasons that JOOUST by providing highly trained manpower aims to produce a new generation of transdisciplinary problem solvers for agricultural development and to catalyze agri-food systems transformation in the LVB and in Kenya.

Objectives

- Delivering research-based training to produce a new generation of transdisciplinary problem solvers for agri-food development. This will be delivered through:
  - Program benchmarking/accreditation – more academic programs meeting international standards, esp. those critical to addressing regional key gap areas
  - Upgrading faculty's professional qualifications, including modern pedagogies and transdisciplinary approaches
  - Entrepreneurship training –skills for agri-food job-market, institutionalizing such training
  - Improved quality and relevance of training
  - Investment in infrastructure
  - Fostering university's practical and field-based research and outreach to agriculture sector stakeholders.

Project 3: Building Capacity for Research, Management and Control of Non Communicable Diseases

Non communicable diseases (NCDs) which include heart diseases, cancers, diabetes, and chronic respiratory diseases account for 27% of deaths suffered by Kenyans aged between 30 and 70 years, equivalent to almost 370 000 people per year, reducing productivity, curtailing economic growth and trapping the poorest people in chronic poverty. Currently, the probability of dying too young from an NCD in Kenya is 18%. The main risk factors for NCDs are exposure to tobacco use, lack of physical exercise,

unhealthy diets and harmful use of alcohol due to effects of globalization on marketing and trade, rapid urbanization and ageing population. Generally, the national statistics on the status of NCDs and other communicable diseases are reflected in many other regions of the country including the Lake Victoria Basin where projections show that by 2030, NCDs will be contributing about 47% of Kenya's national mortality rates taking over from communicable diseases (39%) and injuries at 16%.

The Lake Victoria region is a known epicenter for HIV epidemic in Kenya, with counties such as Homabay, Kisumu and Migori recording the highest HIV prevalence and jointly contributing more than half of all the new HIV infections in Kenya. Furthermore, these counties contribute 75% of new HIV infections among children in the region. The region is also endemic for other communicable diseases such as malaria (prevalence of 38 %), TB, diarrhoeal and acute respiratory diseases. Infant and child mortality rates range from 12 to 15% with 1 in 9 children born alive dying before age 5. The increase in NCD burden alongside endemic and chronic communicable conditions pose considerable health systems related challenges and therefore call for urgent attention.

Proposed project objectives will aim at:

- Building capacity for mapping out the NCD epidemic in the LVB to ensure they are not under reported or misunderstood;
- Collaboratively working to support the 14 county governments in the LVB to strengthen their health systems for improved diagnosis and management of NCDs;
- Strengthening capacity for NCD research at JOOUST and the region including development of healthcare staff through experiential training;
- Promoting greater use of implementation science focusing on factors impeding or enabling successful implementation programs;
- Identifying effective approaches for policy maker engagement and dissemination of research findings;
- Carrying out cost effectiveness studies to inform decision making;
- Carrying out equity analyses and evaluating innovative approaches for reaching out to vulnerable and neglected populations.

Project 4: Strengthening ICT infrastructure to Enhance Research, Teaching and Learning

Information and communications technologies (ICTs) are the backbone of today's digital economy and have a strong potential to hasten economic growth and improve people's lives in fundamental ways in developed and developing countries. ICT represents a key driving force in the achievement JOOUST's long-term objectives in natural resource management, food security and universal healthcare, cutting across the domains that we have enlisted for this program. The Government of Kenya has produced a blueprint that identifies the five pillars of the digital economy as follows: Digital Government, Digital Business, Infrastructure, Innovation-Driven Entrepreneurship and Digital Skills and Values. JOOUST, with its core mandate of capacity building, research and community service is well positioned to lead in technological advancement in order to produce work-force with relevant knowledge and skills to address these pillars as follows: 1) Establishment of JOOUST ICT Technology Research Park that will become a focal point for innovation, training and mentorship for ICT entrepreneurs and the local communities, 2) Establishment of a center for good data governance and management practices for improved decision making in Natural Resource Management, Food Security, Health and Renewable Energy, 3) Establish a center for dissemination of Green ICT and e-Waste.

Objectives

- Reinforce the School of Informatics and Innovative Systems such that it can participate in the emerging computer science research area of software tools for (big) data science, Artificial Intelligence, Machine Learning, Cyber Security, Internet of things and Block Chain in particular in the field of agro informatics, Health Informatics and Bioinformatics.

- Develop and equip researchers, students and the local community with digital skills and values on data management, security, Green ICT, Integrated ecosystem and emerging IT Trends which are relevant in transformation of Natural Resource Management, Food Security, Health and Renewable En-

ergy systems

- Build Institutional Capacity through Joint Training and Supervision of PhD and MSc, Staff and student exchange programs.
- Enhance institutional capacity Library and E-Learning programs by increasing use of e-resources within the university and local community. This will strengthen the Center for E Learning, Library and Information Management Services and ICT Infrastructure at the University.

Project 5: Climate Change Mitigation and Adaptation

From the local level to the global, climate change has become an economic, political, social, and environmental challenge and Africa is especially vulnerable to its adverse effects. This is because most of the continent's economies, including the LVB, depend on climate-sensitive natural resources and have very low levels of adaptive capacity and extreme levels of poverty. The impact of climate change is already evident in LVB, where the changes have impacted on locals whose livelihoods depend on the lake to support agriculture, fisheries, and livestock. The adverse effects of climate change in the LVB are expected to include eruptions of epidemic diseases such as malaria, which disrupt healthy systems, ecosystems as well as impacts on important infrastructure across the region.

The project aim is to strengthen climate resilience and adaptive capacity of communities in LVB through communities making good and sustainable decisions about the use of local natural resources. The project has three output areas:

Establishment of climate monitoring and modelling centre – The project will establish a state-of-the-art climate monitoring and climate-modelling centre for long-term monitoring of climate around LVB. Skilful climate forecasting and timely early warning forms the foundation of any operational climate centre.

Establishment of community friendly early warning and climate knowledge exchange mechanisms – The project will work with Kenya Meteorology Department (KMet) to package and disseminate community friendly early warning messages to support communities' climate risk preparedness and adaptation planning. The warning system will include forecasts on rainfall onset, cessation and distribution of dry/wet spells and temperature.

Strengthening community resilience – the project will enhance community resilience through promotion of diversification of resilient livelihoods interventions cage fish farming, indigenous poultry farming, bee keeping, etc.

How will the university ensure an appropriate institutional embeddedness of the programme?

The project will be incorporated within the JOOUST's administrative/organizational structures and domiciled within the Division of Research, Innovation and Outreach (RIO) and supported within the University framework, including regular funding allocation for its core businesses. This will ensure that staff within the project receives regular salaries and any other basic requirements for regular operations. The University will provide for the basic infrastructure, including space and hardware. The activities of the project will be linked to other relevant activities at institutional, County, National and Regional levels.

Explain how the proposed programme links to national/regional policies, strategies and/or priorities, and the VLIR-UOS country strategy (priorities and themes developed in the VLIR-UOS country strategy).

The proposed program is aligned to the Kenya's national short-term development goals known as the Big 4 agenda which include the 4 priority pillars for economic development namely; food security, affordable healthcare, affordable housing and job creation through manufacturing, the Vision 2030 Agenda for Sustainable Development and Agricultural Sector Transformation and Growth Strategy 2018-2028. The Kenya Constitution 2010, Chapter 5 part 269. (1) (a) ensures ustainable exploitation, utilization, management and

conservation of the environment and natural resources as well as equitable sharing of the accruing benefits. Kenyan univesities, JOOUST included, have a role to play in meeting the Kenya Vision 2030 by developing the necessary human resource in the key areas of health, natural resource management and development and food security, which are also the VLIR-UOS Country Strategy for Kenya. JOOUST's program will address natural resource management, food security and health in the LVB, with climate adaptation, gender equality and ICT cutting across the three key areas. At regional level, the program will build capacity and networks for knowledge sharing, an economy driven by scientific research, technology and innovation and peace across the region through intellectual collaborations. The proposed program will contribute to at least seven (7) of the sustainable development goals (SDGs) which include Goal 1: End poverty in all its forms everywhere; Goal 2: End hunger, achieve food security and improved nutrition, and promote sustainable agriculture; Goal 3: Good health and well-being; Goal 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all; Goal 5: Achieve gender equality and empower all women and girls;Goal 6: Clean water; Goal 7: Affordable, clean energy; Goal 12: Ensure sustainable consumption and production patterns; Goal 13: Climate action and; Goal 41, protection of Life under water; Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss. The program is aligned to East African Community Agriculture and Rural Development Strategy 2005-2030; East Africa Climate Change Policy; African Union Agenda 2063 and AU Science, Technology and Innovation Strategy for Africa (STISA - 2024).

4. Stakeholder analysis

In order for a programme to have impact, a thorough understanding of the key stakeholders is essential. Describe and analyse these **key** stakeholders These may include both internal and external (outside HEI) stakeholders, as well as direct and indirect beneficiaries.

Stakeholder	Analysis	Engagement strategy
Students	They are high impact stakeholders who will be the key beneficiary of the programme outputs. Benefits include increased quality training, scholarships, modernised laboratory and lab equipment, incubation centres, Academy to promote ICT ambition of female students, Joint Supervisions of Postgraduate Students and Exchange Programmes. They are primary stakeholders and their major interest is to gain knowledge. Two third gender rule will apply to all our progamme involvement.	Students will engage with the project through student thesis research, lectures, student exchnage programme and incubation hub.
Staff	They are high impact stakeholders who will benefit from capacity building in terms of staff exchange programme, Short but intensive trainings, support to attend scientific conferences. Highly Qualified and Experienced staff to be involved in the programme implementation. Academic staff will be involved in implementation of our curicular; teach and mentor students and other stakeholders Non academic staff will provide necessary support to the programme whenever needed. Two third gender rule will apply to all our progamme involvement. We will expect strong Commitment from them to	Correspondence will be through phone, email, letters, memos, formal meetings and Information Centres

	implementing change.	
Partner universities and university colleges in Flanders (Belgium)	Key Partners In this Project, They will be involved in Co-Development of the proposal, Implementation of the programme. Their Impact is high in this programme They will jointly with our University be responsible for the day-to-day management of the programme.	Consultations with them will be frequent through Phone Calls, Email Communication, Web Conferencing and formal meetings.
National Government Ministries, departments and agencies	They are high impact stakeholders They provide policies and legislations that enable conducive environment for programme implementation. They will use findings of our project to strengthen the government policies regarding participation of higher education Institutions in nation building and gender mainstreaming. Registration of patents and Intellectual Property Rights.	Correspondence will be through phone, email, letters, formal meetings
County governments	They are high impact stakeholders They provide policies and legislations that enable conducive environment for programme implementation. They will use findings of our project to strengthen the government policies regarding participation of higher education Institutions in nation building and gender mainstreaming.	Consultation Methods will be through the following:- • Phone / email / text messaging • One-on-one interviews • Formal meetings
Local Communities	They are medium impact stakeholders They will access knowledge from the programme through technology transfer hubs created. They will be involved in data collection during the programme implementation. They will have free opportunity to access information within our Resource Centre	Correspondence will be through public meetings, text messaging, Focus group meetings, Surveys, Information Centres, Print media and radio announcements so as to disseminate project information to large audiences and Inform stakeholders about consultation meetings
Non- Governmental Organizations	They are medium impact stakeholders We will partner with them to promote gender mainstreaming within the community. They will access our facilities for capacity building of their members. They will be providing their views on pertinent issues related to the programme We will provide a proper facility for their research. They will inform policy issues related to our project.	Correspondence will be through Phone/ fax/ email/ text messaging, One on one interviews, Focus group meetings and Information Centre
Business Community and Industry	They are low impact stakeholders Partnerships with the aim of hands on experience to our students; attachment and Internships. Developing business ideas that may enhance the quality of their production.	Correspondence will be through Phone/ fax/ email/ text messaging, One on one interviews, Focus group meetings and Information Centre
Professional and Regulatory bodies	They are medium impact stakeholders They provide professional advice to our Universities and alumni Responsible for creating regulations that enable conducive environment for programme implementation. They will use findings of our project to strengthen the regulatory policies regarding participation of higher education Institutions in nation building and gender mainstreaming.	Correspondence will be through Phone/ fax/ email/ text messaging, One on one interviews, Focus group meetings and Information Centre
Farmers around the University	They are high impact stakeholders They will directly benefit from the program in that they will	Correspondence will be through public meetings,

	use our ICT Resource Centre to access information regarding modern farming techniques and Markets. They will participate in data collection as respondents They will receive free agricultural trainings from the programme as part of community involvement.	Print media and radio announcements so as to disseminate project information to large audiences and Inform stakeholders about consultation meetings
Development Partners, Donors and other financiers eg VLIR-UOS	They are high impact stakeholders Involvement includes:- • Financial Support to the programme • Monitoring and Evaluation of the programme • Advisory services to the programme	Consultation Methods will be through the following:- • Phone / email / text messaging • One-on-one interviews • Formal meetings

5. Assumptions, preconditions & sustainability

Describe in detail the preconditions and external factors that can influence the realisation of the objectives of the programme (feasibility).

- There is conducive policy environment and existing capacity (scientific, managerial) to support implementation of the proposed programme
- There is good will and good working relationship between the University and stakeholders
- Integrate the programme within the University structures
- There is conducive political environment in the country
- No major changes in University education policy
- Potential to generate resources to continue the activities relative to the proposed programme
- Stable financial flow to the University

Describe the opportunities and challenges for the sustainability of benefits (capacity retention, continuation of research activities, outreach services, policy development, etc) after VLIR-UOS funding.

Opportunities and challenges

a. Develop short-term courses
The programme will develop on deman short courses which will generate income.
b. Institutional and/or program international accreditation
The current relevant courses on offer at JOOUST are accredited by the CUE. The partnership with Flemish Universities will offer an oppotunity for international accreditation of JOOUST programmes to be able to attrack internation and regional students and faculty from which the University will generate income through tutions and other fees scharged.
c. Joint researches and equipment sharing
Through the programme the University will acquire state-of-the art facilities will be used by other research and academic institutons at a fee.
Challenges
a. Human resource capacity
Although the university has qualified academic staff members currently involved in teaching, research and outreach activities, the current student:staff ratio is high relative to international standards. In addition, there is inadequacy in innovative pedagogical skills with the current approach being more lecturer centered than student centered.
b.Low number of regionally accredited programmes
The current academic programmes are only accredited locally reducing their appeal and acceptance to regional and international students. This will be addressed through review and accreditation of existing programmes and development of new ones. The accreditation will be done early to ensure student enrollment at the project inception.
c.Partnerships and industrial linkages

The existing partnerships and linkages lack elaborate partnership engagement policies, operational procedures, have poor communication networks and funding agreements between the University and the partnering institutions. IUB will develop policy guidelines which will involve acquisition of an MIS platform for efficient and effective communication, exchange of ideas, implementation matrix and tracking of project implementation.

d.Dissemination of technologies and skill transfer:

There is currently a lack of technology and business incubation hub which hinders commercialization of research outputs and business ideas. IUB will establish a hub to nature technology and enterprises.

e.Infrastructure for teaching, research and outreach

There is inadequate teaching, research and outreach infrastructure which is the basis of strong graduate training. JOOUST will establish a state of art teaching and research infrastructure that will attract high number of regional and international faculty and high student enrollment. This will be achieved through: physical infrastructure (equipping of laboratories, developing a framework for sharing laboratories with partner institutions, providing working space and requisite equipment/material; financial management; development of research policy, enactment of grant management system, establishment of small grant system for graduate student researchers, establishment of research ethics committee. Outcome is improved research infrastructure.

6. Background of the proposal

Please explain how this concept note was developed (process, who was involved?).

The concept was developed through a participatory process involving University faculty/researchers, management, students and potential industrial partners. In addition, the University hopes to identify a collaborative partner from the Flemish Higher Education Institutes (HEIs) to develop a full proposal.

Please explain earlier or current links with Flemish Higher Education Institutions (if any):

- earlier collaborations with Flemish Higher Education Institutes (HEIs)
- specific links with Flemish HEIs and/or individuals?
- their role in the development of this concept note?
- how do you see their involvement in the proposed programme?

The University has had previous contacts with VLIR-IUC during the scoping mission by the local VLIR-IUC office in Nairobi in 2016. During the visit, the team interacted with the chief officers of the University who included the Vice Chancellor and Deputy Vice Chancellor in charge of research, innovation and outreach and who was also a local Component Leader of the Reproductive Health Component of the VLIR-IUC-UON Program.

Based on the previous experience, the project has proposed the Deputy Vice Chancellor research, innovation and outreach as the Kenyan Coordinator of the VLIR-IUC-JOOUST project. He was the Project Leader /Promoter of the Reproductive Health component of the VLIR–IUC–University of Nairobi project between1999 – 2008. During that time, he worked with both Kenyan and Belgian Coordinators (Prof. Kenneth Mavuti and Prof. Georges Eisendrath respectively) and his Belgian counterpart Prof. Marleen Temmerman of the University of Ghent where the component was based. He has maintained links with the persons named in addition to having contacts with Prof. Bernard Manderick of VUB. None of these individuals have had a role in developing this proposal.

In case your university has applied for IUC funding earlier, please summarize the main reasons for non-selection by VLIR-UOS at that time, and what measures you have taken to remedy since then.

Not applicable

DOCUMENTSTO BE SUBMITTED

Annex 1:Format for a Concept Note South	*Main narrative document. This format is to be followed when drafting the proposal and to be submitted (with the signature of the rector enclosed).*
Annex 2:Institutional Fact Sheet	*The format is included and to be followed, except if indications are included that own data formats can be added*
Annex 3:Format for the application of a local coordinator (including a CV)	*The format is included and should in principle be followed. The CV of the proposed local coordinator is to be included in free format(relevant info for this mandate), however, with a maximum of 2 pages)*
Annex 4:Mission statement and latest strategic plan	*Free format*
Annex 5:Confirmation letter by the local rector	*Free format, The project proposal has to contain a confirmation letter (e.g. e-mail) of the rector of the university proposing itself for an IUC cooperation and supporting the proposed local coordinator*