Format for an IUC Extended Concept note

Call Institutional University Cooperation (IUC) 2022

GENERAL INFORMATION

Max. 1.5 pages

Programme information	
Country and region of the programme	
Uganda, South Western Uganda	
Programme title (linked to strategic/thematic focus area)	
University as a Facilitator for Community Based Sustainable Solutions to Demographic Challenges in South Western Uganda (UCoBS)	
Programme Summary (Focus of proposed strategic area(s) and institutional strengthening activity)	
The programme hereafter referred to as UCoBS, focuses on strengthening the Mbarara University of Science and Technology (MUST) flagship Community Based Education, Research and Service. This focus will be achieved through a reciprocal model using a participatory, innovative, multidisciplinary, multi-stakeholder and gender-based approach blended with information communication and technology to achieve improved and sustainable household livelihoods in South Western Uganda. These approaches aim at contributing to the redress of demographic challenges that have become a topical issue on the national and international agenda. The programme is premised on institutional capacity gaps and six community-oriented thematic areas targeting most at risk populations. These thematic areas are (i) improved environment conservation practices and natural resources management and governance by indigenous people; (ii) improved mechanisms for climate change adaptation for sustainable food production for small-scale farmers; (iii) improved access and utilisation of affordable energy technologies among the female-headed households and the urban poor; (iv) improved sexual and reproductive health and rights of women, children and adolescents of the local population and refugees; (v) increased youth employability through skilling, innovations, experiential learning and technology transfer and; (vi) improved institutional and community ICT capacity to access and utilise information. The programme's thematic areas resonate with the VLIR-UOS main objectives that include; conservation of eco-systems, resilience to climate change, ensuring healthy lives, equitable and quality education, improved research, innovation and entrepreneurship. The programme will strengthen institutional research and innovation capacity, inclusive knowledge creation and community dividends. To achieve the programme outcomes, the university will leverage on the existing partnerships and work closely with her Flemish partners.	
Applying partner university (institution and proposed local coordinator)	
Full name of the institution (+ abbreviation)	Mbarara University of Science and Technology (MUST)
Name of the local IUC coordinator	Assoc. Prof. Charles Tushabomwe-Kazooba
Name of the authority of the local university (Rector, Vice-Chancellor, President,...)	Prof. Celestino Obua (Vice Chancellor)
Applying Flemish university (institution and proposed Flemish coordinator	
Full name of the institution (+ abbreviation)	Vrije Universiteit Brussels (VUB)
Name of Flemish IUC coordinator	Prof. Gily Coene
Signature of the authority of the local university (Rector, Vice-Chancellor, President,...)	
Signature of the coordinators (Flemish and local IUC coordinator)	

PROGRAMME DESCRIPTION

1. Background & context

Max. 4 pages

How was this extended concept note developed? How did you take into account the comments of the selection commission (selection stage 1 – concept Note South)?

The Extended Concept Note (ECN) is an improved version of the earlier submission and, is premised on previous institutional and community-oriented research that fits into the long term vision and mission of MUST as a community-based university with a mandate to link its training and research to community development. In accordance with MUST's vision and mission, consultative meetings with relevant community stakeholders such as chairpersons of indigenous communities settlements, conservation managers, district farmers associations, Local Council leaders, social services committees, community health committees and workers, leaders of Civil Society Organisations, religious leaders and students were conducted to inform and validate the identification of thematic areas The university Community Based Education, Research and Services (COBERS) annual reports were equally reviewed to identify gaps that further informed the ECN development process. In addition to the initial staff representing all academic and research units of MUST, more social and behavioral scientists have been included on the UCoBS programme team to beef up the participatory and social research methodological approaches that would scale up community benefits. Sections of the initial concept note have been improved on the basis of comments of the VLIR selection commission and the institutional assessment debriefing. To address a gender gap in the initial writing team composition, three more female staff were incorporated. As a way of building synergies between MUST and Flemish partners, an institutional visit of five staff from MUST was undertaken from February 29 to March 08, 2020 at VUB. This visit yielded several outputs especially the review and alignment of themes and subthemes towards advancing the ECN. Fourteen interested experts from VUB, Royal Museum of Central Africa (RMCA) and KU-Leuven met to discuss the details of the ECN. The agreed action plan informed the follow-up information sharing mini-workshop with the writing team and subsequent meetings. Nine more virtual meetings between MUST and VUB teams were held. The ECN development process has entailed 15 meetings and 42 session working groups chaired by the Local Coordinator Associate Prof. Charles Tushabomwe-Kazooba. The meetings generated an in-depth programme approach analysis, an interdisciplinary, multi-disciplinary and inter-faculty/institute methodology in the ECN. Inter-institutional dialogues with implementing partners including VUB, Local Governments, Reproductive Health Uganda, Uganda Wildlife Authority and the National Environmental Management Authority were held. The engagement built more focused ideas to enrich the final writing output and acceptability of the programme.

Provide a local context analysis, highlighting key development problems, their context, importance and underlying causes. Take into account the transversal themes gender and environment in this analysis. Update the local context analysis. If no important changes took place, you may leave this section unchanged.

This programme will be implemented in South Western Uganda (SWU) that greatly bears demographic challenges especially among the Most at Risk Populations (MARPs). The targeted nine districts as informed by the previous research studies (Tushabomwe-Kazooba *et al.,* 2020; Nakazibwe, Wangalwa & Kagoro-Rugunda, 2019; Twinamatsiko *et al.,* 2014) and the Uganda Census, 2016 are; Kasese, Rubirizi, Mbarara, Buhweju, Isingiro, Rubanda, Kisoro, Kiruhura and Kanungu **(ref. attached map of UCoBS targeted districts).** The most pressing demographic challenges in SWU include poor conservation practices of environment and natural resources attributed to minimal involvement of indigenous people in governance processes and the climate change that has resulted into food insecurity. Other gaps are the limited access to affordable clean energy technologies at household level, gender inequality and inequity (Newman, 2014; UBOS, 2019), unmet needs for reproductive health care, maternal and infant mortality, and morbidity, glaring youth unemployment and employability (UBOS 2018), limited access to utilisable vital information and research outputs.

MUST being situated in one of the most densely populated regions of Uganda, the prioritisation for programme thematic areas is based on the dramatic increase in population from about 24 million people at the end of the 20th century to over 41 million in 2019, the majority of who are youth (UBOS, 2017; NDP III, 2020). It is projected that by 2050, Uganda will have 120 million people (UBOS, 2015). The region is endowed with natural resources that make it an agriculture, tourism and biodiversity key hotspot (Tushabomwe-Kazooba *et al.,* 2020) although with a poor populace. With such demographic changes, challenges such as limited utilisation of resources, poor environmental and natural resource governance systems and practices, low yields in agriculture sector and food insecurity, climate change and inadequate reproductive health call for innovative sustainable solutions. As a public university, MUST's institutional strategy fits into the national agenda through improved knowledge transfer and skills development for socio economic transformation as stipulated in the National Development Plan III and Vision 2040 (NDPII, 2017; NDPIII, 2020). Addressing these challenges is on top of the country development agenda (NDPII, NDPIII, Vision 2040 & Kasaija, 2019). The research focus (see the six thematic areas discussed below) also touches upon several sustainable development goals including: no poverty (1), zero hunger (3), good health and well-being (3), gender equality (5), clean water and sanitation

(6), affordable and clean energy (7), decent work and economic growth (8), climate action (13) life on land (15) and partnerships for the goals (17) or increasing international cooperation that is vital in achieving all the above goals. In addition, integration of both ICT (SGD 9) and gender (SDG 5) is an enabler in achievement of all the sustainable development goals.

Poor conservation practices have contributed to environmental hazards with highly severe impacts (e.g. landslides, floods, drought, hailstorms, epidemics, pests and diseases) which have become frequent in Uganda and its South Western region (Tushabomwe-Kazooba & Kemeza, 2008; Jacobs *et al.,* 2017; Kervyn *et al.,* 2015; Jacobs, Dewitte *et al.,* 2016). Hazards greatly impact on people, the economy, the environment, and the long term development of the country. Poor communities and other MARPs in various districts and settlements have become more vulnerable, there is evidence of loss of vegetation cover (UNDP, 2017), encroachment of river banks and wetlands for agriculture, and increased soil erosion and flooding due to mainly poor agricultural farming practices. As land available for agriculture is limited, pressure on the remaining land has led to fragmentation of family plots and invasion on the dwindling forests, river banks and an encroachment on Protected Areas. This has increased poaching of key endemic plants and animal species (Harrison *et al.,* 2015).

There are marked adverse effects of climatic pattern changes (UNDP, 2017) resulting from poor conservation and agricultural practices. The Intergovernmental Panel on Climate Change predicts that during the next decades changes in rainfall patterns will contribute to severe water shortages/droughts or flooding and landslides. Rising temperatures and changing rainfall patterns will cause shifts in crop growing seasons significantly impacting on the rainfall-fed agricultural sector. The current rate of climate change is likely to modify the known variability patterns to the extent that farmers, who survive on subsistence farming with minimal contribution to household income, will be confronted with situations they are not equipped to handle. They must be shielded against the possibility of food-shortage through appropriate use of resources and climate smart agricultural practices in order to preserve resilient livelihoods. Ultimately, the growing populations are at risk of decreased food production (UN report, 2019; Yikii, 2017; Watuleke, 2015) and quality food consumption (Tamale & Kagoro-Rugunda, 2019). Since 1990 the slight increase in food productivity in Uganda has been attributed to expansion of cultivated land rather than improvement in productivity per unit area of land (World Bank, 2008) and disregarded of under-utilised indigenous species (Nakazibwe, Wangalwa, Olet, & Kagoro-Rugunda, 2019). Nabbumba and Bahiigwa (2003) observed that expansion of cultivated land is becoming unsustainable since access to land is increasingly constrained by high population growth. Novel technologies and ways of simultaneously tackling agricultural and environmental problems such as integrated aquaculture-agriculture systems which allow activities to shift in response to changes in the suitability of land and availability of water to produce food are therefore required. The university is located in the region known to be the food basket of the country which puts her in a position to respond to the efforts geared at addressing the faced demographic challenges.

Most households in the region use traditional rudimentary sources of energy (fuel wood and charcoal). This puts pressure on forests and vegetation. On a daily basis 5 out of 10 trucks from Lake Mburo National Park and Queen Elizabeth National Park carry firewood and charcoal for commercial purposes (Nyamukuru *et al.,* 2019). The total current biomass as a source of fuel wood stand at 90% where firewood is 78.6%, charcoal is 5.6% and crop residues is 4.7% (Fashina *et al.,* 2018). Due to population pressure and land fragmentation, fuel wood sources have continued to dwindle. Women greatly participate in collecting firewood, shoulder most household chores and bear the highest risks such as health hazards (back pain, spinal fracture, dislocation, respiratory infections and degenerative changes in the cervical spine), rape and snake bites (Agea *et al.,* 2010). This economic and social burden is one of the contributing factors to sexual and gender based violence (Asasira, 2014). New and innovative sources of energy are crucial for rural and urban livelihoods and climate change mitigation. Innovations include transformation of wastes into commercialisable renewable energy and development of less costly solar, biogas and geo-thermal energy technologies.

In line with inefficient sexual and reproductive health care systems, unequal gender relations at household level are conceived as a key barrier, placing women in a disadvantaged position to seek, access and utilise health care services. As outlined in the 3-delay model by Thaddeus and Maine (1994), women often experience the following delays: (i) delay in decision to seek care; (ii) delay in reaching care; and (iii) delay in receiving adequate health care. Failure to make timely informed decisions results into maternal and infant mortality. Unequal gender relations at household level may result into Gender Based Violence (GBV) which negatively affects the uptake of health care among women (including adolescents). Adolescent pregnancy is associated with a higher than normal risk of poor pregnancy and birth outcomes. The prevalence of adolescent deliveries at Mbarara Regional Referral Hospital (MRRH) is 23.4% (Masembe & Ngonzi, 2016; UDHS, 2016). Adolescent pregnancies entail a high risk of morbidity. The Uganda Demographic and Health Survey (UDHS) of 2011 and 2016 indicate that over 60% of women aged between 15 and 49 years have experienced physical violence at some point in life; 28% of women in the same age group have experienced sexual violence as compared to 9% of men. The current sexual and reproductive health interventions miss out social and behavioral approaches that require a multidisciplinary and interdisciplinary approach for improved community engagement and better health outcomes. It is therefore important to strengthen the already existing emergency obstetric neo-natal care and referral processes in the Faculty of Medicine, as well as the department of human development and relational sciences and the gender focal office which will ensure that gender is mainstreamed better in SRH interventions through implementation, periodic monitoring, evaluations and reporting.

With escalating youth unemployment currently at 83% (UBOS, 2018) and skills gap, there is a considerable number of school drop-outs impacting negatively on the implementation of universal education programs. Also,

there has been a drastic increase in the number of tertiary institutions in Uganda that produce graduates with limited employability skills. Reports show that 87% of the graduates from tertiary institutions cannot find jobs (NCHE, 2017). There is still unreachable skilling target on the required practical skills and experience in the Uganda. Only about 27% of students in Uganda in institutions of higher learning are in science and technology training against the recommended 40% (BTVET Strategic Plan, 2011-2020; NCHE, 2017). The percentage of girls enrolled in science and technology courses stand at 30% which shows a great gender imbalance (NCHE, 2017). The university also needs to operationalise its gender policy to address this gap.

The university recognises the need to realize Uganda's socio-economic transformation and Vision 2040. In recognition of the strategic role in science, technology and innovation can play at community and national level, MUST has positioned herself to facilitate human capital development, research, innovation and technology transfer. However at MUST, institutional management has not strongly grasped ICT and its applications in decision making. Development of relevant applications to disseminate community based interventions has not sufficiently been done and is required to achieve meaningful outcomes. Coupled with limited and unreliable ICT infrastructure the delivery of these interventions remains a huge challenge that the proposed IUC programme will tackle. These challenges have particularly affected the most at risk populations. The identified MARPs include the indigenous people (the Batwa, Basongora and the Bahima) bordering conservation areas, small-scale farmers, female-headed households, urban poor, mothers, children and adolescents of local and refugee population, and the youth. The indigenous people continue to suffer socio-economic and political exclusion in decision making yet they bear most conservation costs (Twinamatsiko *et al.,* 2014; Twinamatsiko *et al.,* 2015). The impact of environmental degradation coupled with climate change effects, has made small scale farmers more vulnerable to hazards and disasters that have worsened food insecurity and welfare (Maes *et al.,* 2018). Women shoulder energy household chores that come with risks and health complications (Agea *et al.,* 2010) and play a significant role of collecting firewood and herbal medicine. They carry the burden of subsistence farming and engage in risky behavior in urban areas for the survival of all members of their households. This social and financial burden greatly exposes them to risks and vulnerabilities thus affecting their reproductive health and rights. The rural poor continue to flock to urban and peri-urban areas for better livelihood opportunities which put pressure on the existing amenities such as water and energy, worsen urban poverty and increases dependence on bio-mass as a source of fuel wood and charcoal production (Fashina *et al.,* 2018). These actions are detrimental to their health and the environment conservation efforts. Despite the numerous interventions aimed at improving sexual and reproductive health, women, children and adolescents continue to suffer high mortality, morbidity and early pregnancies respectively (Masembe *et al.,* 2016; UDHS, 2016). Early pregnancies have exacerbated the level of single and young mothers that continue to need reproductive health services (Nabugoomu *et al.,* 2018). The unemployment question in Uganda (UBOS 2018), has greatly affected the youth aged 18-35 who form 70% of Uganda population (UBOS, 2017; NDP, 2020). Most innovations and ICT initiatives have generally not targeted the MARPs. This justifies the focus and a need to strengthen the university flagship COBERS and make it more relevant, transformative and impactful.

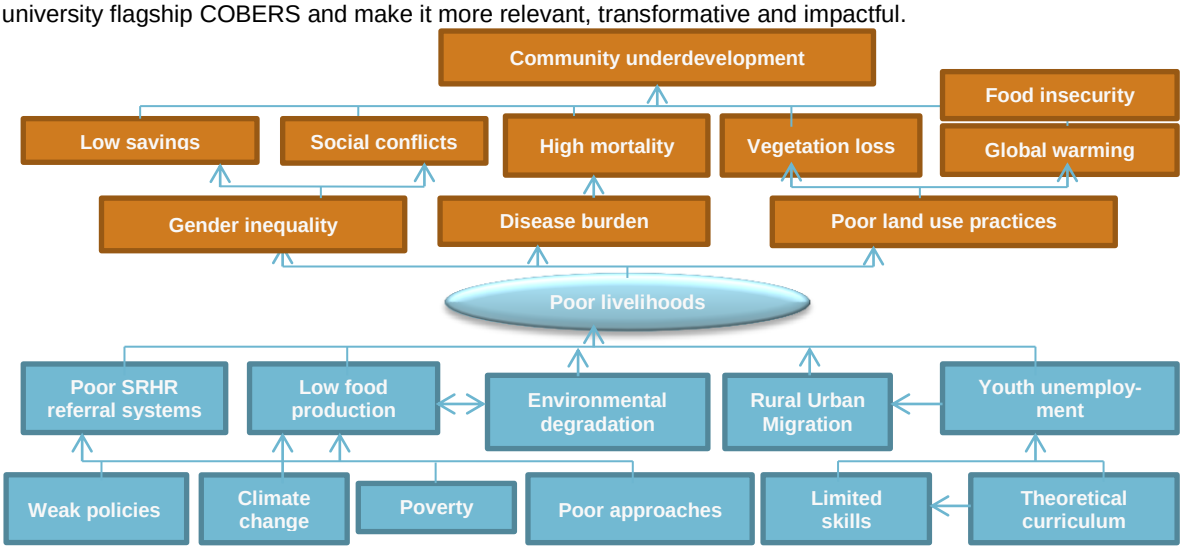

Figure I above indicates the problem tree analysis for the identified challenges and their effects. The figure illustrates the cause and effects relationship of the demographic burden in SWU. Gender and ICT are crosscutting issues to the achievement of the demographic targets under this programme. It is vital to note that sustainable development is built on the foundation of equality, inclusiveness and universal enjoyment of rights (SDG 5 and 10). In Uganda, gender equality is considered a cross-cutting enabler for socio-economic transformation (Vision 2040). According to the Global Gender Gap (GGG, 2020), Uganda ranks 64 out of 153 countries. Gender inequality remains salient including gender disparities in access and control of productive resources, limited participation in household and community decision making.

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.

The capacity and knowledge gap in the field of science and technology, and the required professionals to address the country's challenges led to the establishment of MUST by the Act of Uganda Parliament in 1989. From inception, the university has had a component of engaging with the community on their unmet needs in areas of environmental conservation, food security, clean energy, maternal and child health, innovations and ICT and, knowledge generation and teaching. This has been maintained under the COBERS programme, which is aimed at fostering community engagements. MUST has a number of community outreach programmes that have had some impact in SWU. During the implementation of these, main institutional capacity gaps have been identified that ought to be addressed under UCoBS. These include limited alignment between the COBERS curricula and community needs, limited institutionalisation due to single faculty-based activities, limited enrolment of female students in science and technology that exacerbate gender inequalities, lack of strong sustainability and continuity of COBERS, and limited linkage to policy and governance. The current funding for research and innovations at MUST is still inadequate (below 5% of the total annual budget) to generate substantial transformative outputs in the community. Although the funding of MUST has grown over the years enabling the university to pursue community-led initiatives through offering short courses, professional training, Masters and PhDs in different disciplines, most previous grants have not sufficiently emphasized intervention-focused research, were fragmentally in nature, short-term and rarely mid-term focused; less apportioned to community interventions thus yielding less community impact. There is therefore a need for interventions that will be sustained and relevant to improved household livelihood.

In spite of the footprint created so far, the university has a number of capacity challenges in its bid to improve its relevancy to the community of SWU. Basing on the staff development policy, there are still training and mentorship gaps that are less gender-balanced and need to be filled through Masters and PhD training in all the proposed thematic areas. Currently, there are 19 (28%) female staff with PhDs out of 68 PhD holders. Further to this, the enrolment of female students in Science and Technology programmes at MUST is still low at 36.2% (MUST Annual Report, 2019). The given statistics explain the few females leading projects under this proposed IUC programme thus justifying the need to build the capacity of more female staff. The training and mentorship activities will also integrate skilling of the community and enhance university programmes. The programme strategy will enrich the existing community outreach model, develop research-based solutions to address community challenges, strengthen policy formulation and implementation for demographic solutions leading to improved household livelihoods of MARPs.

Though the university has the departments of Biology, and Environment and Livelihoods Support Systems, the current facilities ought to be strengthened in order to effectively contribute to environmental research and its integrity. The two departments have incorporated climate change into the existing curricula but there is still limited linkage with community risk assessment and GIS mapping. Though the department runs a Bachelor of Science in Agriculture Livelihoods and Farm Production, there are still limited practical applications and innovations that link the university to the community with a focus on climate smart agriculture. New innovations in renewable energy such as biogas, solar and energy saving stoves which would address some of the current environmental and community health challenges, have not been undertaken by MUST to make them locally affordable and adaptable at household level. Though MUST is strongly rooted in health sciences, the sexual and reproductive health referral system is still inadequate with limited scientific research and innovations targeting mothers, newborns and adolescents. In its attempt to embrace the current information and knowledge sharing era, the university faces huge inadequacies in its ICT backbone infrastructure, application platforms and management of the deployed infrastructure and services so as to improve communication and exchange of knowledge, skills and content. The access to ICT equipment for both staff and students is still inadequate; the wired and the wireless coverage and reliability of the university's Local Area Network is limited including the provision of a more reliable and scalable wireless internet service at the university's campuses. Relatedly, the University continues to struggle in maintaining the cost of an internet bandwidth allocation that matches the ever-increasing number of internet users at the university and adaptation of the learning platform. It is important that existing technologies are enhanced with ICT applications to ensure timely exchange of information and eliminate knowledge gaps to positively enhance community engagement. There is need for the improvement of the university's data and network hosting capabilities to allow for storage and access to digital information. With the existence of the ICT and IP policies and the draft ODeL policy, adoption of ICT remains a challenge. The adoption would help the university library and other platforms to digitally refine, store and disseminate knowledge generated through research and community outreach activities at institutional, national and global levels. The university faces challenges in its capacity to optimally utilise ICT to promote its core functions of teaching, research and community engagement. Staff, students and community also require skills to gainfully make use of ICT to innovate and generate e-solutions to address demographic challenges. This will be achieved in line with the university's research, ICT, Intellectual Property, gender policies and Centre for Innovations and Technology Transfer (CITT) manual to generate innovative solutions and aid its relevant stakeholders. For the last 15 years, MUST has held Annual Research Dissemination Conferences (ARDCs). These conferences are a platform to share and disseminate research findings to various stakeholders. The storage, access and uptake of the information shared at ARDCs remains limited. Community participation in the ARDCs has also been relatively low. This limitation is premised on the availability of funding and the cost involved in holding dissemination conferences in the community. The proposed programme envisages increased community participation through dissemination sessions and debriefs organised within the communities. This will enable communities to share their lived experiences to inform and develop the research and community engagement agenda. Despite the achievement of the university community outreach programme and the lessons learned, there are still institutional capacity and community gaps.

2. Strategy of the institution

Max. 1 page

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 no important changes took place, you may leave this section unchanged.

The flagship philosophy of MUST is the community based education (CBE) model. This is enshrined in her ten-year strategic plan, vision (***To be a Centre of academic and professional excellence in Science and Technology)*** and mission (T***o provide quality and relevant education at national and international level with particular emphasis in science and technology and its application to community development)***. The Institution has particularly pioneered and spearheaded the COBERS with the community in a reciprocal manner. This philosophy is achieved through consolidating, enhancing, integrating, skilling and upgrading the community-based research and outreach to address community challenges. All Faculties (6), Institutes (2) and an innovation Centre (1) are engaged in innovations, community oriented outreach and development programmes which also involve international players. Adopting such approach has enabled the university to establish training sites, innovation hubs, micro-research and funding towards wellbeing. The institution also focuses on conservation of natural resources and environment through the Department of Biology, Environment and Livelihood support systems. The Institute of Tropical Forest Conservation (ITFC) in Bwindi supports ecological and sociological research aiming at biodiversity conservation and sustainable management of natural resources. Other community engagement initiatives exist in engineering and ICT applications with skilling through its innovation arm of the Consortium for Affordable Medical Technologies (CAMTech) in partnership with other organisations (cfr. section 4). The institution through her Gender Policy (2019) supports equal participation and fair distribution of benefits in all teaching, training, research, staffing and student enrollment programs in response to gender needs. The university has a gender focal person under the department of Dean of students and churns out graduates through her training programme in gender and applied women health. Currently, MUST is reviewing her five-year strategic plan and in the review, key considerations have been placed on the linkage between MUST and the community, gender-based planning and budgeting of which demographic challenges are at the epicentre. To enhance her corporate image and visibility in science, technology and community development, MUST is committed in her strategic plan to foster the undersigned support areas by; (i) engaging in excellent research-oriented teaching; (ii) strengthening and integrating ICT infrastructure and support services; (iii) enhancing financial resource mobilisation and management systems; (iv) enhancing public trust which attracts and retains academic and administrative staff of the highest caliber, and (v) strengthening the internationalisation agenda. The university is further committed to executing activities to enroll and produce graduates who are well equipped with theoretical knowledge and practical skills that will address gender discrimination, inequalities and inequities. To operationalise this commitment, the Institution has in place a number of functional policies - gender, research, intellectual property, ICT, special needs, sexual harassment, human resource and the grants management manual. Also, there is a functional and independent grants office with adequate human resource capacity. The Centre for Innovations and Technology Transfer established in 2018 coordinates innovative efforts of staff, students and the community. Through UCoBS programme, MUST will generate an inventory of existing, and build additional capacities to deliver community-oriented innovative practical experience and skills to promote national and international collaborations to generate policy relevant information about demographic challenges and solutions. The university working together with the MARPs communities through teaching, research, innovations and collaborations will contribute towards addressing demographic challenges. The current interventions have focused on reducing maternal, neonatal and infant mortality. Interventions on sexual and reproductive health have targeted the refugees and adolescent health programme under Maternal Newborn and Child Health Institute although they are not sustainable due to limited institutional capacity and funding.

Elaborate on the capacity of the university to network with external actors: Governments, private sector, communities, civil society organisations, external funders, etc. If no important changes took place, you may leave this section unchanged.

Currently, over 125 active international partnerships and collaborations exist in the areas of teaching, research, community outreach and institutional development spread across all continents. The University capacity to network has led to the number of active international research projects to grow from 27 in 2011 to 89 in 2019. Specifically, from 2016-2018 MUST was a coordinating Centre for the VLIR-UOS insecurity platform in Uganda and the proposed UCoBS Local Coordinator was the Platform Coordinator. The proposed programme will further lead to internationalisation of programmes in the university. This process will be supported by the already established functional International Relations Office (IRO) that promotes exchange programmes, coordinates international students, and visiting scholars. The University has a good track record of successfully implementing international projects including several VLIR-UOS projects. Being a public Institution, MUST works closely with other Ministries, Departments and Agencies (MDAs). The university has also established strong industrial partnerships with the private sector on industrial training, commercialisation of prototypes and collaborative research (cfr. section 4). The university has established functional community based coordination units at Faculty level to conduct COBERS activities where even two institutes of MUST are community based. To effectively manage the growing internal and external funding, MUST has in place a functional Grants Office (MGO) and a strong financial management systems that are annually internally and externally audited.

3. Updated programme strategy

Max. 5 pages

Long term desired change(s): Explain how the proposed IUC programme will contribute to the strategy of the institution. How does this fit with the objectives of institutional university cooperation? What are the ambition(s)/dream(s) of the proposed IUC programme? If there are no important changes compared to the earlier concept note South, you may indicate this and leave this section unchanged.

As shown in Figure 2, the long-term objective of this IUC programme is to improve the household livelihoods of the MARPs in SWU by **addressing demographic challenges** whereby the interventions of the programme have an **intersectional awareness** and target all members of the household depending on their contextual vulnerability. The interventions prioritise the marginalised and most at risk populations such as (i) indigenous people specifically the Batwa, Basongora and Bahima affected by conservation interventions, (ii) small-scale farmers, (iii) female-headed households, (iv) urban and peri-urban poor, (v) women, children and adolescents of the local and refugees population, and (vi) youth.

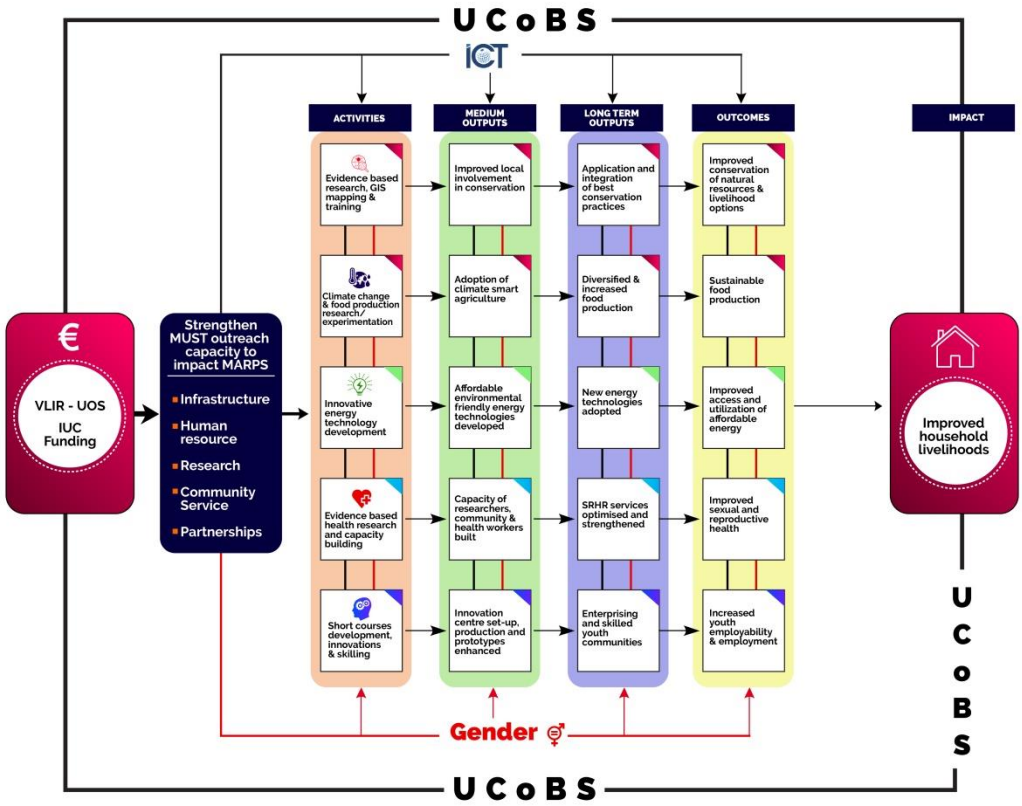

Figure 2: Domains of Change for Strengthening MUST Outreach Capacity under UCoBS

Table 1 gives an overview of the identified demographic challenges that curtailed livelihood options hence affecting the well-being of MARPs. These demographic challenges are identified based on community needs, the gaps identified in the reviewed MUST 10-year strategic plan and, link to VLIR-UOS main themes of environment and water, food security and agriculture, economic, health and social development. Each of these demographic challenges has been translated into a specific project (cfr. supra).

Table 1: *Linkage of UCoBS desired changes to the Institutional strategy and IUC/VLIR-UOS objectives*

Theme/Project	Long-term desired changes	Linkages to the Institutional Strategy (MUST policy documents)	Linkage to IUC/ VLIR-UOS objectives to Uganda
Conservation practices in natural resource and environmental conservation (NREC)	Good governance principles integrated into NREC	Environmental and socio-ecological research for improved conservation of endemic species for people's livelihoods	Ensure the conservation, restoration and sustainable management of strategic ecosystems
	Restoration of degraded rivers catchments determined		
	Integration of indigenous people enhanced		

Mechanisms for climate change/variability adaptation for sustainable food production	Climatic related hazards, risks and vulnerabilities documented to inform policy interventions	Incorporate climate change and its impacts across graduate training programmes	Increase resilience to climate change and livelihoods Increased entrepreneurship for livelihoods improvement
	Climate smart agricultural practices up-scaled to increase and diversify food production	Enhancing agricultural production and livelihoods support systems	
	Laboratory analytical capacity in soil physico-chemical analysis, crop propagation and nutrient profiling for quality food production strengthened and optimised	Optimisation of analytical laboratories to strengthen research excellence	
	Farmer-led crop and climate monitoring system for informed production developed		
Access and utilisation of affordable energy technologies	Affordable and environmental friendly energy technologies developed and up-scaled	Applying knowledge, skills and research for affordable and environmental friendly energy technologies	Increase resilience to climate change and livelihoods of the beneficiaries especially women and youth
	New low cost input and affordable energy technologies transferred and adopted		
Sexual and reproductive health and rights of women, children and adolescents	Gender integrated into SRHR	Improving Maternal Newborn and Child health	Ensure healthy lives and promote well-being for all in an inclusive way
	Strengthened quality improvement initiatives to optimise care and prevent maternal, new born and child related complications		
	Sexual and reproductive health care services for adolescents optimised	New mechanisms to improve sexual and reproductive health	
Youth employability through skilling, innovations, experiential learning and technology transfer	A multidisciplinary ecosystem established to support youth entrepreneurship	Create a multidisciplinary ecosystem to inspire, nurture and promote the conversion of innovative ideas into commercially products and businesses Produce quality and high skilled graduates in Science and Technology	Pursue inclusive and equitable quality education, promote life-long learning and cultural opportunities for all Improve research and stimulate innovation
	Youth trained in entrepreneurial and innovation skills		
	Youth entrepreneurs and innovators supported through experiential learning and technology transfer		
	Business incubation at MUST strengthened		
Institutional and community ICT capacity to access and utilise information	Expansion of ICT infrastructure training and research	Quality teaching, research and innovation infrastructure Internationalisation and mobility	Improve research and stimulate innovation
	Provision of ICT methodologies, approaches and tools		
	Optimised ICT support for internal communication and internationalisation		

In order to drive to the above long-term changes, gender and ICT will be enabling factors and integrated across all programme activities. Ultimately, the anticipated achievement is in line with VLIR-UOS strategy for Uganda that focuses on pursuing inclusive and equitable quality education, promote life-long learning and cultural opportunities for all, improve research and stimulate innovation.

Domains of change: What are the key challenges (cf. context/institutional analysis and strategy) the programme wants to tackle (can be both internal and external to the institution)? How to translate them into desired changes (i.e. "domains of change")? How does this contribute to the long term objective(s)? If there are no important changes compared to the earlier concept note South, you may indicate this and leave this section unchanged.

As stated above, the overarching goal of UCoBS is to address key demographic challenges that have been identified while engaging with communities over the last years. Despite the university's previous effort to contribute to the redress of the MARPs challenges, there are still key institutional challenges within COBERS that ought

to be addressed mainly (i) poor alignment of COBERS activities with community needs, (iv) lack of a strong sustainability and continuity of COBERS implementation plan, (ii) minimal institution collective action due to single faculty-based activities, (iii) low enrolment of women that exacerbate gender inequalities in science and technology professionals, (v) ill equipped training and research infrastructure, (vi) inadequate ICT infrastructure, and (vii) poor linkages to policy and governance. Through the IUC programme, the university will acquire human resource, research, community service, partnerships and infrastructure capacity to efficiently execute its mandate to tackle the identified challenges in section 1. The university's ability to efficiently manage the information/knowledge flow amongst its different stakeholders for purposes of teaching, research and community engagement will change. Students, staff and community partners shall have adequate access to ICT devices, infrastructure, internet and web access services. This will be strengthened by an enabling policy framework as well as skilling technical and academic staff to ensure the sustainability of this effort and its fruits. Figure 2 illustrates different pathways in achieving the desired changes. It shows various domains of change that are instrumental for programme success.

Programme strategy: Describe how the programme will approach these different challenges or 'domains of change'. Describe how the programme will achieve its objectives through different projects. **This strategy needs to build further on the first programme strategy already developed in the Concept Note South. In addition to a narrative, including a first descriptive overview of projects, also include a visual representation of the Theory of Change at programme level.**

The university will implement the proposed programme through research, training, and evaluation actions using inclusive and participatory community approaches (for more details on the inclusion of community members cfr infra). **Gender is central** in the proposed programme approach focusing on inclusiveness in institutional research capacity building, household relations and community development. Gender has been mainstreamed across the programme design, methodology, implementation and evaluation. The design of UCoBS takes into consideration the current gender gaps, socio-cultural contexts and complexities at both institutional and community levels. These gaps and contexts inform the suggested participatory methodologies and interventions that will benefit both women and men. A gender analysis approach will be adopted, where, gender specific disaggregated data will be collected, analysed and disseminated to inform policy interventions (cfr. infra gender as transversal theme). More broadly, social inclusion of marginalised groups will be taken into consideration in order to address the exclusions and vulnerabilities that exist in the community. An equity framework that integrates distributive, procedural and recognitive aspects of equity will be adopted during implementation.

As stated before 6 projects were identified that tackle demographic challenges. The details of these projects can be found in Section 7. Here follows a short overview: For improved conservation practices (**project 1**), the programme aims at creating an inventory and scientifically evaluating the current environmental and natural resources' management practices and governance. A specific attention will be given to the spatial dimension of land degradation and restoration practices, through GIS analysis, and in the role of indigenous communities in resource management. Mismanagement of natural resources together with climatic changes leads to low food production. **Project 2** focuses on adaptation mechanisms to climate change for improved food production. To achieve this, farmer-led citizen-science networks will be develop and laboratory capacities will be developed to monitor soil fertility and identify climate-resilient food species, and providing agro-meteorological data to farmers to optimise climate smart agricultural practices for improved food production. **Project 3** aims to increase access and utilisation of clean and affordable energy. This will entail assessment of community energy challenges and demands, performing cost benefit evaluation of existing technologies, developing desired innovations to up-scale and enhance usage**. Project 4** focuses on the improved sexual and reproductive health and rights of women, children and adolescents. The programme proposes several strategies to increase demand, access to and utilization of quality HIV- and STI prevention services among the native population and refugees. To minimise unemployment associated risks, **project 5** focuses on increasing youth employability through skilling innovations, experiential learning and technology transfer. Targeted beneficiaries include unemployed graduates and school dropouts in equal proportions of male and females. **Project 6** aims to contribute to the previously mentioned projects by the development of stronger ICT. This will be achieved through the following specific three objectives; (i) to expand ICT infrastructure for data storage, exchange and support for training and research; (ii) to provide ICT methodologies, approaches and tools of the five projects for adoption within communities, and (iii) to optimise ICT support for internal communication and internationalisation.

In order to achieve the above pathways under various projects, the programme envisages putting in place appropriate methods and tools of measuring progress and involvement of relevant stakeholders. A Monitoring, Evaluation and Learning framework will be developed as a precondition to assess how the programme meets the set goals and objectives. Stakeholder engagement is fundamental to building lasting relations and partnerships for sustainability. An inception meeting will be conducted to engage key local stakeholders that would influence programme design and implementation. The university will establish district Local Community Steering Committees that give grass root advice to programme implementation. There are a number of Civil Society Organisations (CSOs) doing community work in SWU that will work closely with MUST in the implementation of the proposed activities. Periodic meetings with the implementing partners will be conducted to consistently keep track of the programme progress and success as per specific projects. Willingness of community actors to work with the university is already registered and will contribute towards programme success.

How will the programme realise organisational and institutional change? How will the programme approach this?

An **institutional-community engagement committee (ICEC)** with at least 1/3 women that brings all Facul-

ties/Institutes together will be established and operationalised. The committee will be coordinated by UCoBS in the ten years of the programme implementation after which it will be integrated into the university structures. The committee will have representation from university top management, Faculty/Institutes' coordinators, Local Government and the community. At the community level, each district will have a Local Community Steering Committee (LCSC) which reports to ICEC. The programme presents an opportunity for MUST to develop and operationalise **a community engagement policy and align various faculty activities to create a well unified inter-faculty community engagement programme**, leading to more solid and sustainable impact in the community.

Policies on data sharing and management, innovation and internationalisation will be developed and influence how decisions are currently made at the university at various levels. The position of the Local Coordinator has been appointed by the Vice Chancellor which makes him sit within various decision-making bodies such as university top management, senate and council. This **enables the programme to progress well and influence the current management systems to strongly mainstream gender and ICT in planning and budgeting as well as aligning the current curricula needs with community needs and priorities.**

Increased tailored research capacity at MUST through MSc, MA, PhD, postdoc and short courses' training of over 50 members, pre- and in-service academic and technical staff in thematics relevant to address the demographic challenges of SW Uganda will enhance **staff and human resource development.** Basing on the human resource gaps, the targeted personnel to train will be those who are already employed by the university and will facilitate capacity growth upon career development. In order to ensure retention, the trained programme beneficiaries are to be bonded in line with the university human resource manual. A few beneficiaries outside MUST will be bonded and retained as teaching assistants during their training duration with the current Faculty/Institute funding support.

To be known as a centre for reliable scientific analyses for other researchers and collaborating institutions, the university will build capacity through scientific training, strengthening lab facilities and training of the technical staff. The university will put in place a **central inventory and policy to support shared access of laboratory and fieldwork equipment** across Faculties/Institutes. This will provide a central procedure for providing expertise to external providers to facilitate interactions between laboratories within the university and, between university laboratories and external partners. Using the existing university ICT policy on data sharing and privacy, an enhanced central data repository, hosting and storage infrastructure will be created to increase capacity to reliably and securely host e-Learning and e-Library applications for use by staff, students and community stakeholders. The improved data storage will enable analysis and usage of ICT to produce complex modelling and forecasting.

The programme will contribute to a **strong internationalisation agenda** of MUST. This will be achieved through various staff and students exchange benchmarking visits to Flemish Institutions to build capacity in conducting research and the development of the internationalisation policy. The International relations office will be strengthened to efficiently manage agreements and partnerships, and become more responsive to the needs of international students and visitors by establishing a resource centre. MoUs will be signed on joint degree awards, joint supervision and short research stays for early career researchers.

Explain how the programme will create the conditions for the uptake of new knowledge, applications and services outside the Higher Education context.

UCoBS will yield a more streamlined community engagement programme at MUST to make the university more responsive to addressing community challenges. The community will be put at the centre of the programme design. The conditions for uptake of research-based interventions will be further facilitated through the institutional-community engagement committee and existing satellite centres, contacts and synergies with the existing actors such as Community Based Organisations (CBOs), NGOs, religious institutions, health centres, policy makers and implementers at local and national levels. **Communities will be involved in all stages of programme implementation from the design to the evaluation phase.** As a way of engaging communities on knowledge uptake, community based approaches such as citizen science and use of community-based facilitators have been adopted. Community members will be represented in the **Programme Implementation Committee (PIC)**, 30% of who will be women. This will be a channel to transmit information and feedback to and from the targeted MARPs. This strategy will guarantee that communities are kept informed and can meaningfully contribute to the research process. The programme aims at continued demonstration of the relevance and effectiveness of this approach and to provide educational platforms and tools that could enhance the process of knowledge uptake, application and service delivery. Information sharing events will be conducted annually at MUST and in the MARPs communities where open active dialogue will be done. These fora will include the MARPs, community leaders, technocrats, policy makers and implementers. These events will be planned and organised with the community residents and local leaders to increase ownership and sustainability of information utilisation. In addition, community members will be invited to participate in the programme inception and evaluation **workshops. Community engagement coordinators** will be nominated by their fellow MARPs and mobilised to keep in contact with the targeted groups as well as the PIC. The coordinators will make and share timely reports to the PIC for proper monitoring of the utilisation of the implemented interventions. **Digital applications** will be developed to aid quicker access to information by community members.

Explain how the programme will integrate the transversal theme of **gender**? Explain how the programme will take the actual gender situation (in the institution and broader context) into account in its strategy and explain the potential impact of the programme strategy on the actual gender situation (in the institution and broader context).

Gender is central in all processes of UCoBS programme. The centrality of gender is premised on the

assertions of the sustainable development built on the foundation of equality, inclusiveness and universal enjoyment of rights (SDG 5 and 10). In Uganda, gender equality is considered a cross-cutting enabler for socio-economic transformation (Vision 2040). Gender inequality, however, remains salient including gender disparities in access and control of productive resources, limited participation in household and community decision making, and sexual and reproductive health. In line with the National and MUST Gender Policy, in the implementation of the proposed programme, gender based knowledge will be generated through research and stakeholder dialogue to provide data for decision making at district and national levels regarding the access to labour markets, education, reproductive health services and ensure equal gender opportunities. **Gender will be integrated at the programme design, methodology and implementation levels.** The design of the programme and the approaches of implementation, are taking into consideration the socio-cultural contexts and complexities of the MARPs. Having realised that currently only 35% females hold University management positions, 37% of enrolled students are women and of the UCoBS programme project leaders only 1 person is female, the programme will create an enabling ground to increase the number of females benefiting from the interventions both at MUST. During the selection of participants for the academic programmes and committee composition, attention will be put on **affirmative action** to increase the number of women. Furthermore, the institution will ensure that female and male students will equally enroll and train for MSc, PhD and Post doctorate research training. A **gender analysis tool** will be developed as a checklist to generate gender disaggregated data to know the number of men and women recruited at the beginning of the programme, and the number of women and men actually benefiting from the programme.

Females will at least compose 30% of the committee composition right from the PIC, and Local Community Steering Committees (LCSC). During **community stakeholder dialogues**, some specific separate meetings for women and men will be conducted. This will enable the proper voicing of concerns of either gender in the context of cultural rigidities that may hinder expression of views in general meetings. The programme will also create enabling ground for both men and women to participate such as starting meetings at a time when women are free from household chores and provision of sanitary services for women during training. In the programme recruitment process, affirmative action will be given to females to undertake PhD and MScs/MAs. Active dialogue meetings involving both men and women will scale up the interventions that specifically target women. This involvement will boost inclusive institutional outcomes and development. The programme will conduct **gender inclusive and responsive trainings**. This has already been embarked on by the engagement MUST has with the Forum for African Women Educationalists, a project implemented by MUST where in anticipation of greater gender activism, a team of 5 staff that include amongst others the local coordinator for the proposed programme attended a trainer of trainers workshop on gender responsive pedagogy in November/December, 2020. Gained knowledge will be applied to develop gender responsive teaching and learning materials, undertake gender responsive planning and budgeting as well as gender responsive and learner centred pedagogy.

Explain how the programme will integrate the transversal theme of **environment**? Explain how the programme will take the actual environmental situation (in the institution and broader context) into account in its strategy and explain the potential impact of the programme strategy on the environment.

The programme **focuses on the environment** for instance, local conservation practices will be improved; environmental changes and degradation due to climate changes will be investigated, climate smart agricultural practices will be adopted as a mechanism to climate change adaptation and clean and environmental friendly technologies will be up-scaled for example alternative energy technologies to decrease utilisation of fuel wood hence reduce deforestation. For the 5th theme of *Increased youth employability through skilling, innovations, experiential learning and technology transfer*; environmental matters will be integrated by way of ensuring that the avenues of skilling and innovation are not against the environment protection rubrics. The youths will also be motivated into innovations that could reverse the impacts of environmental degradation like making briquettes from the water hyacinth, using waste to generate energy.The programme will implement environmentally friendly interventions by ensuring **environmental and social safeguards**. There will be a focus on the following safeguards: limited activities to be conducted in protected areas, environmental impact assessment for infrastructure installations and putting into consideration the social cultural contexts of those participating, will be emphasised before, during and after programme implementation. The implementation of programme activities will bear in mind **environmental integrity and sustainability**. These activities will include sustainable investments, favourable use of local products, and establishment of accommodation of researchers within the targeted communities to limit local mobility and use of efficient digital communication tools to limit international travels. The involvement of **indigenous** peoples in the conservation and management of natural resources is important to sustainable conservation. On a daily basis, women especially in MARPs communities relate with nature and therefore interventions that target improved livelihoods of such population create a reciprocal effect on the environment they live in. Particularly the collection of firewood, food and medicine from nature as well as their participation in agriculture make women a key target for development policy interventions. The programme framework will include **environmental concerns in the planned advocacies and trainings**. For example, graduate students will be required to include environmental aspects in their proposals and, training packages for in-service health centre administrators will include environment protection activities and facilities at the individual health units.

4. Updated stakeholder analysis

Max. 2,5 pages

In order for a programme to have impact, a thorough understanding of the key stakeholders is essential. Please update the previous stakeholder analysis and focus on stakeholders that are deemed crucial for creating effective uptake of results outside the university and the stakeholders deemed crucial to achieve genuine institutional change.		
Stakeholder	**Analysis**	**Engagement strategy**
Internal stakeholders		
MUST Council, Senate & Management	**Secondary stakeholders -** responsible for administration and with a high level of interest in academic, research, innovation and human resource development	Discussion and approval of UCoBS activities and progress
MUST Staff	**Academic and non–academic - primary role** with a high level of interest in developing academic programmes and policies, participate in trainings, undertake research, advise on academic standards, conduct effective teaching, ensure quality assurance, share relevant learning experiences, supervise, mentor students and facilitates students admission	Planning, meetings (formal and informal), curricula development, evaluations, workshops, research seminars, training, web-based UCoBS information sharing
Students	**Primary stakeholders** with high level of interest since they will be trained, and twinned with the community for research, apprenticeship, hands-on skills enhancement and exposure to real-life experience	Learning, research, training, meetings, twinning, supervision and mentorship
Mbarara Regional Referral Hospital	**Plays a secondary role** with a high level of interest. The hospital is central to the health professional teaching, training, clinical supervision and research	Identification of focal persons to the UCoBS, requests for site administrative research approvals, research implementation
MUST affiliated institutions/centres	**Plays a tertiary role** with a moderate interest, involved in teaching, training, supervision and research	Consultations, dialoguing, requests for research approvals, research implementation
4.2 External stakeholders		
Local community	**A primary stakeholder** with a high level of interest in the demographic challenges and solutions. MUST implements a holistic community outreach programme with faculties/institutes involvement (cfr. section 6).	Placements, demonstrations, supervision, citizen science based data collection and information sharing
Local Government	**A secondary stakeholder** with high level of interest in community entry and engagement. Have always participated in the MUST Annual Research Dissemination Conferences for the last 15 years. Meetings and workshops are always conducted between MUST and its stakeholders to share and generate experiences that inform the next course of action.	Strategic stakeholder meetings, workshops, conferences, involvement of relevant district officers and departments
Line Ministries in the Government of Uganda	**MUST works with various ministries -** Water and Environment, Health, Information and Communications Technology and National Guidance, Agriculture, Animal Industry and Fisheries, Gender Labour and Social Development, Disaster Preparedness and Refugees **- Secondary stakeholders** with a moderate level of interest. The Ministries are responsible for policy development, political guidance and have operational mandate. There are a number of interventions under UCoBS that link to various ministerial policy papers and actions.	Policy advocacy meetings, strategic workshops, consultative engagement and trainings
Government ICT supporting Agencies	E.g Uganda Communications Commission and National information and Technology Authority-Uganda - **Secondary stakeholders** with moderate level of interest. Relevant in capacity building and awareness creation; information security and development of the information technology enabled services/business process outsourcing industry	Consultative meetings and workshops
Government Agencies in Natural	These are Uganda Wildlife Authority, National Environment and Management Authority, National Water and Security Corporation, Uganda National Meteorological Authority, Rural	Consultative meetings and workshops

Resources and Environment	Electrification Agency – These are **secondary stakeholders** with moderate level of interest. They are relevant in policy advocacy, capacity building and awareness creation	
Civil Society Organisations	**Secondary stakeholders with a moderate interest** in programme implementation. Relevant in programme implementation since some CBOs will be sub-granted to reach out to programme beneficiaries.	Community mapping, community- based training, meetings, workshops, certifications and information sharing events
Other universities and institutions	National, regional/great lakes and global universities/institutes- **Are tertiary stakeholders with a moderate interest.** They have been involved in research conduct and dissemination, students' research supervisions, trainings and workshops, co-publications and capacity building.	Research training, supervision and dissemination
Vrije Universiteit Brussels (VUB)	**Primary stakeholder** with a high level of interest. Major Flemish partner and coordinating institution that has collaborated with MUST in the joint development of the UCoBS ECN. Have also been involved in joint research projects and student supervision, staff and students exchange, and capacity building of the MUST International Relations Office.	Identification and engagement of focal persons to the UCoBS, joint implementation of UCoBS strategy and coordination of Flemish partners.
VLIR-UOS	**A primary stakeholder with a high level of interest.** Has funded MUST in various projects ranging from South Initiative, TEAM and MUST was VLIR-UOS platform coordinator. Has funded & supported a number of MUST staff on short research and academic trainings and scholarships in Belgium. It is the major funder and overseer of UCoBS	Monitoring, evaluation and learning, offer guidance, consultations, meetings, sharing and availing reports
Belgium Development Actors	**Secondary stakeholders** with high level of interest. They support projects in Uganda and some operate in SWU.	Generating inventories and participate in programme workshops/dialogues

Synergy and/or complementarity with Belgian development actors: Highlight complementarity or synergy with the actions of other **Belgian organisations** funded by the Belgian development cooperation (*see call: Background documents per country*).

The extended concept note is leveraging on the previous and current links between researchers at MUST and the Belgium Development Actors. The university has been involved in a wide range of collaborations with universities and institutions in Belgium, ranging from research project work, students and staff exchange and institutional capacity building. For the last 12 years, MUST has had sound collaborations under the VLIR-UOS platform and other key programmes under the Belgium Technical Cooperation. Over 10 staff members have benefited from BTC scholarships and this has brought in strengthened capacity in conducting research, innovations and research uptake. Before this programme, MUST faculty has made collaborative links with Universities and individual researchers from the Flemish Universities such as VUB, IOB, University of Antwerp, KU- Leuven and Ghent University. The Belgium embassy and Belgium organisations working in Uganda have already been contacted to work with MUST in the implementation of UCoBS. These include the Belgium Development Agency (ENABEL), Broederlijik Delen, Iles de Paix, VVOB and BOS+. These organisations work within or near the programme geographic scope such as Fort Portal, Isingiro, Rwenzori and Albertine region, in areas of agriculture, food security, health, youth skilling and employment, and education. The Iles de Paix has already shown interest to work with MUST and will provide internship placements, exchange or sharing of methods and results of Participatory Action Research.

Synergy and/or complementarity with other actors: Highlight complementarity and/or synergy with initiatives taken in the same domain by other organisations (local, regional, etc.).

The MUST long term vision and vast experience of community engagement in most areas in Uganda is a good catalyst for programme success. MUST has created a community network of outreach programmes in 40 districts of Uganda which implement cross cutting livelihoods programmes. The networks have increased MUST visibility and community trust as a premier community driven institution. The university location is a connection point to more than 20 districts in SWU in which it has partnered with Local Government, Civil Society Organisations, Government bodies and parastatals to deliver its mandate. This programme will therefore strengthen the already existing networks. Local community members have trust in the university's strategic activities and this will be a basis for programme success. The Government line ministries are willing to cooperate with MUST under the Public Private Partnership during programme implementation. Private sector is willing to support MUST achieve its proposed interventions. The University already has links with industry and is in pipeline of developing a cottage industry under the Centre for Innovations and Technology Transfer. The willingness by the industry to twin MUST students for apprenticeship is paramount in promoting the employability approach. Information and Communication Technology, implemented as a cross-cutting issue, will facilitate information management systems and information exchange with governmental and industrial partners.

Synergy and/or complementarity with other VLIR-UOS activities: Highlight complementarity and/or synergy with other VLIR-UOS funded activities (TEAM projects, Global Minds, ICP's, etc.).
The university has and continues to be involved in a wide range of collaborations with various Flemish Higher Education Institutions (HEIs). Working with Flemish HEIs, the university has been able to attract funding from VLIR-UOS to implement 13 TEAM and South Initiative projects that provide a strong foundation for the proposed institutional programme. The specific collaborations include, among others, projects with the VUB, Royal Museum of Central Africa (RMCA), University of Antwerp, KU-Leuven and Ghent University. These projects focused on topics related to some of the areas of the UCoBS programme, including environmental conservation, monitoring of natural hazards and resilient agricultural practices using a citizen-science approach, sexual and reproductive health. During the implementation of Health Environment and Food Security (HEFS) VLIR-UOS programme, Assoc. Prof. Charles Tushabomwe- Kazooba (the ECN Local Coordinator) worked closely with a number of Flemish University faculty including Prof. Jean-Pierre Van Geertruyden from the University of Antwerp as the Local Coordinator. The HEFS platform coordinated different projects, organised annual dissemination conferences and supported short research stays for eight Uganda universities in areas of HEFS and Governance supported by the Belgium Development Cooperation. As part of capacity building, a total of 10 MUST staff members have benefited from Flemish scholarships and has strengthened capacity in conducting research and innovations. Three of the programme concept team members (Dr. Medard Twinamatsiko, Dr. Joseph Ngonzi and Dr. Tom Ogwang) are VLIR-UOS fellows. To further strengthen the collaborations between MUST and VUB, a number of engagements have been under taken. In April 2018, Prof. Dr. Caroline Pauwels, VUB Rector, Prof. Dr. Sonja Snacken, Vice Rector for international policy, and representatives of the VUB international service visited MUST. As part of follow-up, in December 2018 and 2019 Mr. Motmans (VUB ICOS) took part in two workshops with the MUST faculty in anticipation of developing the IUC programme. In October 2017, VUB hosted the MUST International Relations Officer- Ms. Sheila Niinye Olivia on strengthening inter-university Collaboration. Also, the university hosted VUB students for a medical elective course. Most of the beneficiaries of the collaborations stated above are core team members of the development, management and implementation of the ECN. Thus, the links, engagements and collaborations with the Flemish HEIs is a firm ground for the proposed IUC programme to strengthen the university capacity to deliver community outreach programme for sustainable demographic dividends in SWU communities.

5. Risk analysis

Max. 2 pages

Risks + potential impact	**Probability (1-4)**	**Potential impact (1-5)**	**Response**
5.1 Internal Risks			
5.1.1 Strategic risks			
Elite capture that may affect acceptability and uptake of programme interventions	2	3	Good links already exist. More in-depth stakeholder analysis and strategic engagement will be done
Integration of UCoBS into the university structure. This may delay decision making and necessitate review of some existing university processes	1	2	Institution leadership has been involved in the development of the ECN and some key personnel will be involved throughout UCoBS implementation
Fear of change in terms of institutionalisation of UCoBS, adoption of new technologies and practices likely to delay implementation	2	2	Relevant stakeholders have been part of the formulation of UCoBS and regular gender based engagement will continue through meetings, workshops, recruitment of students, monitoring and evaluation of the programme
Programme staff turn-over during the 10-years may delay UCoBS work plan implementation	1	2	Programme will put in place human resource plans in the implementation manual
5.1.2 Operational risks			
Decreasing interest of participating communities which may retard targeted deliverables	1	3	Involvement of Community Based Organisations through the already established links, conducting periodic evaluation meetings, information sharing and giving timely feedback
Enrolment of suitable graduate students within MUST may lead to partial redress of human resource capacity gaps at MUST	2	2	A few potential trainees already exist but there are still continuous engagements with the government to lift the recruitment ban
Failure to get the targeted PhD students	2	2	Affirmative action to encourage young

especially females			female career beneficiaries and increased publicity
5.1.3 Financial risks			
Lengthy procurement process of goods and services may affect targeted deliverables and reporting	2	2	Having a procurement plan, timely submission and follow-up of procurement requests and compliance with the PPDA act and alignment to conditions set by VLIR-UOS. Also purchasing some major equipment from Europe
Price fluctuations of goods and services may affect the anticipated budget provisions	1	2	Engage VLIR-UOS on adjustments; and engagement with the vendors
5.1.4 Sustainability			
Decreasing interest of participating communities which may retard targeted deliverables	1	3	Involvement of the Community Based Organisations through the already established links, conducting periodic evaluation meetings, information sharing and giving timely feedback
Vandalisation and theft of established infrastructure by community that may lead to loss of properties and disorganize implementation of the program	2	2	Soliciting in-kind local contributions through community development officers for ownership
PhD students not finishing in the first phase of implementation	2	3	Periodic progress seminars and reducing administrative and teaching load
5.1.5 Compliance risks			
Inability to meet set targets and deadlines in submission of progress reports, financial accountabilities and evaluation reports may delay work plan implementation	1	3	Conducting periodic evaluation meetings, information sharing and timely reporting
5.2 External Risks			
5.2.1 Strategic risks			
Diplomatic relationship between Uganda, Flanders and other partners may affect programme funding and implementation	1	4	Engage the relevant ministries, departments and consulates
Change of leadership of the VUB-UCoBS team may affect programme implementation	1	1	Engaging the leadership of VUB on the continuity of the program
Insecurity and political instability may affect implementation of the programme in terms of policy changes, community field work and achieving set targets	1	3	Continued monitoring of the situation and change in the implementation strategy
5.2.2 **Operational risks**			
Legal liability through injuries and accidents that may lead to litigation challenges and compensations	1	2	Engagement through signing of MoUs and consent that can help during arbitration and mechanisms for dispute resolutions
Pandemics and epidemics could affect the operation, design and work plans of the programme	2	4	Change in program operations through alternative engagement
5.2.3 Financial risks			
Foreign Exchange fluctuations may negatively or positively affect programme budgets and financial accountability	2	1	Engage VLIR-UOS on foreign exchange fluctuations
Price fluctuations of goods and services may affect the anticipated budget provisions	1	2	Engage VLIR-UOS on adjustments; and engagement with the vendors
5.2.4 Sustainability risks			
Insecurity and political instability may affect implementation of the programme in terms of policy changes, community field work and achieving set targets	1	3	Continued monitoring of the situation and change in the implementation strategy
5.2.5 Compliance risks			
Getting qualified audit and assurance reports that may affect Phase II of VLIR-	1	2	Adherence to the programme deliverables according to IUC partner pro-

UOS funding			gramme for Universities entering Phase I&II, other contract obligations and provisions of the IUC-UCoBS Management Manual
Unfavourable evaluation reports performed by External Audits of VLIR-UOS that may affect Phase II funding and the progress of programme projects	1	4	Adherence to the programme deliverables, contract obligations and provisions of the IUC-UCoBS Management Manual

6. Institutional embeddedness

Max. 1,5 pages

Link with university management: explain how the programme will assure a continuous link with and involvement of the university management.

MUST has a clear management system governed by the university Council guided by the Universities and Other Institutions Act (UOTIA) of 2001 (as amended 2006) informed by the university senate and top management. The local coordinator of UCoBS is endorsed by the Vice Chancellor and sits on some management committees, and will be required to submit quarterly reports to the top management for subsequent recommendations to Council for evaluation and approval. The programme will be implemented with interdisciplinary, multi-disciplinary and inter-faculty based approaches. To operationalise this, the Programme Implementation Committee (PIC) and institutional-community engagement committee will have representatives from each faculty/institute and with varying disciplines. At the start, the thematic areas were generated from all faculties/institutes to yield the overall theme of this concept note. The university student training programme components are going to be aligned to the identified thematic areas in order to give students hand-on knowledge and skills in addressing the current community demographic burden. Under different faculties, the university implements an internship programme, community based health and research services, community student twinning project, industrial training psycho-social clinics and school practice. Community based initiatives will be aligned to programme activities through scheduled quarterly information sharing and evaluation meetings. This will further enrich the proposed ideas of strengthening the MUST community outreach programme. MUST has a tested track record in the establishment of systems that have resulted into significant contributions to Science, Technology and Innovation through initiatives such as the Consortium for Affordable Medical Technologies, business clinics and innovation ecosystem among others. The proposed programme is entrenched in the existing university establishments and structures it will leverage to facilitate its success. The management of Programme Support Unit (PSU) will work closely with the already established MUST Grants Office unit under the Directorate of Research and Graduate Training (DRGT). The unit is mandated to oversee and guide the effective implementation of the programme. Working with the PSU structure, the university Council and its committees, Senate and top management committee will be involved in space allocation, programme compliance, financial planning, management and accountability, admission of students, recruitment of staff, signing of MoU, approval of policies, curricula development, certificate awarding, quality assurance and information dissemination.

The UCoBS Local Coordinator in collaboration with the Vice Chancellor will provide the overall leadership of the programme. Based on the Public Finance Management Act 2015, Section 43, the university Secretary who is the accounting officer will ensure financial compliance, approvals, spur accountability through the audit office and ensure efficient procurement processes using the Procurement Unit. The DRGT Director working closely with the PSU-M will approve requisitions before they are endorsed for payments. The unit will further ensure that all accountability and human resource requirements are achieved. In line with the University Charter, 2019, the UCoBS Local Coordinator will submit quarterly financial and non-financial reports to MUST and VUB. In terms of admission of programme beneficiaries, the programme is structured to work closely with the DRGT Board, Faculty/Institute and Departmental committees in the selection and recruitment of student beneficiaries. Priorities will be given to students and staff that are already studying or working at MUST in order to enhance institutional capacity. The selection process will be guided by the internal university policies and the NCHE quality assurance framework of 2014. The DRGT and Faculty/Institute boards in collaboration with the UCoBS Flemish partners will forward the prospective beneficiaries to the university admissions committee and Academic Registrar for final admission. The beneficiary selection and admission process will put into consideration the inclusion of both gender and people with special needs to ensure equality and equity at all levels. The selection of beneficiaries will also be informed by the priority needs identified through community preference ranking and mapping. The community will be at the epicentre of identifying priority areas of research. The inclusion of the existing Faculty/Institute boards and structures in academic programme design, development and implementation creates a ground for risk mitigation and sustainability beyond UCoBS scope. In the implementation of the academic programmes, Faculty Deans, Heads of Departments (HoDs), faculty staff will be involved to ensure deeper understanding and continuity of these programmes for the University wider benefits. The space allocated to and ICT infrastructure developed by UCoBS will further strengthen the entire training arrangement for MUST beyond ten years. Compliance and integrity ensures ultimate achievement of the programme objectives and outcomes. UCoBS policies and manuals will follow the University standard operating guidelines and will be integrated in the university management operations. The developed MoUs will further

fasten collaborations and partnerships for MUST, VUB, other collaborating institutions and the community.

Flemish support: explain the programme's vision/approach on creating broad Flemish support (inter-institutional cooperation) at the level of the Flemish universities and university colleges.

The UCoBS programme envisions a broader collaboration between MUST and Flemish HEIs that will facilitate a multidisciplinary institutional change as well as specific scientific contributions to make MUST even more relevant to the community. This vision premises on the trajectory of VLIR-UOS initiatives at MUST so far characterised by short term projects and limited scope. There is a growing need for broader staff and student exchange, institutional and community scientific contribution, increased education capacity through innovative curriculum development, experiential learning and, application of ICT, gender and environment as transversal themes for optimal wellbeing. The university will build on the past and present collaborations where MUST staff are already connected with several academics in the Flemish HEIs. These collaborations are a precursor to increase the connections with new academics with relevant expertise and disciplines. This engagement started during the March 2020 visit of 5 MUST staff where the first contacts were established with Flemish academics with interest in ICT, bio-engineering, law, gender and demography. Through more formal match-making events, and under guidance from our established contacts, new expertise available in Flanders will be brought on board to strengthen the programme. Since the university has jointly implemented TEAM and South Initiative projects, more joint research supervision and publications will be attained to increase the capacity of students and staff at MUST and Flemish partners. MUST envisions involving Flemish universities and colleges to share technical expertise in curricula development and students/staff exchange. These engagements require tapping the expertise, knowledge and experiences of the Flemish partners and MUST to build more capacity. There are already various project cooperation agreements with Flemish universities - Ghent University, KU-Leuven, University of Antwerp and VUB which will be enhanced to more institutional Memoranda of Understanding.

Positioning of Programme Support Unit (PSU): explain how (where in the organisation) the PSU will be organised and any particular focus areas / accents regarding the PSU the programme wants to realise.

The UCoBS will have an independent administrative structure led by the Local Coordinator that will work closely with the university administrative establishment. The UCoBS will have a Programme Implementation Committee (PIC) whose membership will be comprised of Local and Flemish coordinators, project leaders, programme manager and a representative of university management. The committee will play an oversight advisory role and guide the entire management and implementation. The PIC will report to the Vice Chancellor who will subsequently report to the University Council. The PIC will supervise 6 project committees that will do the monitoring and evaluation, community outreach, external collaboration liaison and training. There will be an institutional-community engagement committee and Local Community Steering Committees in the nine districts with a representation of 30% women. These committees will give periodic reports to the PIC. The PSU will have a full-fledged secretariat and office managed by the Programme Manager, two Finance Officers, 1 Training Coordinator and 6 Faculty coordinators. Through the university space allocation committee, the PSU will be allocated operational space that accommodates staff, students and visiting partners. The space shall include meeting rooms, office, students' seminar room, wash rooms, a recreation area and a video conference room.

7. Project identification

Max. 1,5 / 2 pages per project.

7.1 Project 1: Improved conservation practices of the environment and natural resources

Objectives: State the objectives of the project. What do you want to realise through the project (medium-term (5 year) objectives)? To what long term objectives will the project contribute (can be both internal and external to the university)

The objectives of this project are; (i) to integrate governance principles into natural resource and environmental conservation; (ii) to determine the socio-ecological drivers and extent of degradation of five river systems to inform their restoration; (iii) enhance the integration of Indigenous People in the management & conservation of natural resources. The objectives are framed under three domains (capacity building, knowledge generation and community impact).

Objective i: To integrate governance principles into natural resource and environmental conservation
Expected results: The project envisages integration of governance principles in the current conservation practices by the communities and natural resource managers in Kisoro, Kanungu, Kasese, Kiruhura and Isingiro districts. The governance principles of focus are; participation in natural resource management, fairness in the distribution and sharing of natural resource benefits, accountability and dispute resolution mechanisms for human-wildlife conflicts. Academic and research capacities will be strengthened by assessing the critical governance needs. The capacity building will yield into new knowledge through quality research publications, policy briefs and strengthened capacity of MUST staff and the community in undertaking evidence-based participatory action research on the existing shortfalls in natural resource governance. In collaboration with Local Governments, a regional multi-stakeholder natural resource forum and natural resource management

committees will be constituted. The forum and committees will sit after every six months to periodically discuss and generate actions for improved conservation and resilient livelihoods. In the long term, this objective will contribute to improved equitable natural resource benefit distribution and utilisation, community-park relations and reduction of unauthorised resource use in communities bordering protected areas.

Objective ii: To determine the socio-ecological drivers and extent of degradation of five river systems to inform their restoration

Expected results: In the medium term, as part of capacity building for MUST and the community, postgraduate students will be recruited and trained to establish spatial and temporal distribution of degradation patterns and hydrological dynamics. Quality research will be attained through mapping the degradation related land use practices and review of legal aspects. Research outputs such as best practices for catchment restoration, GIS maps on river degradation, academic manuals on best practices for river catchment restoration and policy briefs will be shared with the relevant stakeholders. Gender-inclusive knowledge, attitudes, best practices and dynamics of riparian communities will be documented and disseminated. In the long term, the results will contribute to the interventions aimed at restoring the degraded rivers of Rwizi, Nyamwamba, Nyamugasani, Lhubiriha and Ruhezamyenda that cross through major national parks of Lake Mburo in Kiruhura, Queen Elizabeth in Kasese and Bwindi in Kisoro.

Objective iii: To enhance the integration of indigenous people (Batwa, Basongora and Bahima) in the management & conservation of natural resources

Expected results: The project will strengthen research, academic and community capacity in understanding the integration of indigenous knowledge into conservation of natural resources. The current use of natural resources by indigenous people, and their indigenous knowledge and practices related to natural resources will be documented and shared with relevant stakeholders. This will help to focus the current interventions by government and natural resource/conservation managers. Action research in determining alternative methods to integrate indigenous people in natural resource management and conservation will be conducted. Through dialogue and engagement with natural resource managers and government, indigenous knowledge and cultural values will be integrated into conservation practices. Indigenous people will form conservation scout associations that will monitor and report unauthorised resource use. In the long term, indigenous people will be recognised as co-managers, involved in decision making and management plans. The involvement will reduce poaching and anti-conservation practices. There will be mind-set change manifested in increased participation in conservation activities and uptake of other government programmes including sexual and reproductive health care, reduction of gender based violence and alternative sources of food access and production.

Explain the link with the context analysis, the programme objectives and the other projects. Detail the context analysis if needed (e.g. the specific theme, specific challenges of the departments involved, the local/sectoral context, etc.).

This project focuses on improved conservation practices, environmental restoration and natural resource governance which are central in stimulating sustainable demographic dividends in SWU. Currently, there are poor conservation practices that have accelerated the rate of environmental hazards, loss of lives and property, and food shortages. There is evidence of degradation of major rivers of Nyamwamba, Lhubiriha, Nyamugasani, Rwizi, Ruhezamyenda and their catchments thus compromising local livelihoods. There is an immediate need for restoration and redress of governance shortfalls (Twinamatsiko *et al.,* 2015). The indigenous people like the Batwa who are the primary stakeholders of Protected Areas (PAs) continue to be left out due to historical injustices, with limited livelihood options. The highlighted issues relate with the overall programme needs of integrating best practices into conservation and management of natural resources. Much as the university staff has done research in this area, the outputs remain faculty and individual-based with minimal multidisciplinary, participatory and institutional approaches. Failure to address the stated challenges has a multiplier effect on climate change adaptation, affordable energy utilisation, appropriate cash crop production for improved household income and food security. This project addresses National Development Plan (NDP) III objectives 1 and 4, strategies 4, 7, 16 and 18, and programmes 4,5,13 and 16. The project further feeds into SDG 6, 12, 13 and 15(http://envalert/org/wp-content/uploads/2020/06/NDP-3-Finale.pdf).

Describe the strategy of the project: how will it reach its objective(s)?

Multi-stakeholder engagement and policy arrangements approaches such as key informant interviews and stakeholder dialogues will be used to analyse governance principles for objective i. Innovative research using participatory mapping method to engage local people in data collection and reporting on degraded areas under objective ii. Socio-ecological drivers of degradation will be determined using in-depth interviews and vegetation and land use change mapping, soil sediment fluxes and water resources assessment. These approaches will be undertaken by trained community members and selected postgraduate students. Participatory approaches such as narrative inquiries will be undertaken to document the indigenous knowledge and cultural values under objective iii. Dialogues and negotiations between indigenous people and conservation managers will be facilitated to inform the integration of cultural values and indigenous knowledge in the management and conservation of natural resources. Micro-workshops, seminars and information sharing dialogues between MUST and her stakeholders will be undertaken to link scientific research to policy. Key interventions premised on restoration of river systems will be implemented in participatory and gender inclusive approaches supported by spatial-temporal analysis.

Analysis of end-users / final beneficiaries: identity the end-users of the project results and describe the uptake strategy of the project (incl. structural barriers for end-users).	
The primary final beneficiaries are local community members especially IP bordering PAs and river catchments. Other beneficiaries are the University community, PA managers (UWA and NEMA), MTWA and MWE. The beneficiaries will utilise the research outputs and infrastructure set-up to boost governance and management effectiveness of ENRs. Increased benefits to local people will build a sense of ownership and protection of NRs. Policy briefs generated will inform decision making at all levels. As a result, the teaching and research capacity of MUST, and the management capacity of conservation authorities, Local Governments and integration of IP bordering PAs and river catchments will be strengthened.	
Presentation of the project team: present the project team, the available expertise and the expertise sought for.	
Proposed local project leader	Dr. Medard Twinamatsiko, PhD
Local project team *(Other involved staff: professors, assistants, (administrative) collaborators, etc,). Also mention involved departments/faculties/universities.*	Dr. Ronald Twongyirwe, PhD; Department of Environment and Livelihood Support Systems Dr. Cleophas Karooma, PhD; Dr. Tom Ogwang, PhD Department of Planning and Governance, Faculty of Interdisciplinary Studies; Assoc. Prof. Grace Kagoro Rugunda, PhD; Sr. Jane Yatuha, PhD, Department of Biology, Faculty of Science
Overview of available domains of expertise in the project team	Natural resource governance and policy management, environmental conservation, natural resource management, hydro-biology, geography and livelihoods analysis, social psychology, gender analysis, indigenous people rights and refugee and displacement studies.
Comments on the expertise sought for at level of the Flemish HEIs	Natural hazards assessment, legal and ethical aspects of natural resource governance, social psychology, land degradation, catchment hydrological modelling and catchment restoration and environmental conservation

7.2 Project 2: Mechanisms for Climate Change Adaptation for Sustainable Food Production

Objectives: State the objectives of the project. What do you want to realise through the project (medium-term (5 year) objectives). To what long term objectives will the project contribute (can be both internal and external to the university)
Objectives are to (i) establish climatic related hazards, risks and vulnerabilities in farmer communities of five districts to inform policy interventions; (ii) optimise climate smart agricultural practices for adoption to upscale and diversify food production; (iii) optimise spatially collected data and analytical capacities in soil and food profiling and plant micro-propagation of MUST and; (iv) develop farmer-led crop and climate monitoring systems for informed food production. **Objective i:To establish climatic related hazards, risks and vulnerabilities in farmer communities of five districts to inform research and policy interventions** **Expected results:** The project will establish a citizen science network to document climate change and degradation-related environmental disasters in the unstudied Albertine rift districts of Kanungu, Kabale, Kisoro and Rubirizi, and the drier districts of Kasese and Isingiro. This will extend the existing network of geo-observers already started thanks to RMCA and VLIR-UOS funding. To link the environmental hazard data to climate, a network of weather stations will be installed and generate data will help develop climate e-kiosks in the first project phase providing agro-meteorological monitoring data accessible to the districts' agricultural extension services. Data produced will generate hazard risk assessment maps to inform policy at each district and national level. The project will produce a large and reliable data to track climate driven environmental change and adaptation of communities to cope with their impacts. The specific role of gender on the vulnerability to climatic change related hazards from farmer communities will be researched to inform policy interventions and strategies that can be applied to promote resilience. The capacity of MUST will be enhanced through curricula development, students and staff training and new methodological approaches for increased community impact. **Objective ii: To determine climate smart agricultural practices for adoption to diversify and increase food production in climatic disaster-prone areas** **Expected results:** The project seeks to optimise, upscale and diversify food production through favouring adoption of climate smart agricultural practices adapted to climate and degradation-related hazards by the farmer communities. As climate change exacerbates the challenge and cost of agriculture, the project will intervene to reduce unnecessary loss and waste of the increasingly valuable harvest and the resources (land, labour, water and agricultural inputs) used for production. Climate tolerant and underutilised crops will be evaluated and encouraged. In the medium term, the project will determine the extent to which climate variability has altered food production: the affected food crops, and the tolerant ones, will be documented. The underutilized crops and the climate resilient food species will be characterized and their catalogue developed. Climate

and eco-physiological growth requirements for production of climate resilient species will be profiled. Soil physico-chemical parameters will be determined and fertility prediction algorithms developed. Suitable crops will be identified per zone at the end of the five years and soil, climate & geomorphology suitability maps developed. Environmental friendly and cost effective soil conservation practices relating to the fertility prediction algorithms will also be established for recommended adoption. In the second phase, technical skills and capacities in crop propagation will be strengthened through training technical and academic staff, half of which must be females. Field and in-vitro crop propagation avenues will be set up to pilot propagation of the indigenous underutilized climate resilient food species. This will reduce the vulnerability of small-scale farmers to famine and drought, increase food productivity and household income.

Objective iii: To optimise laboratory infrastructure for analytical capacities in soil, food profiling and plant micro-propagation at MUST
Expected results: Initiatives to increase food production take into consideration the quality of food. In the medium term, additional GPSs, soil and food analytical equipment will be procured and installed to improve the existing inadequately equipped biology and bio-chemistry lab of MUST. Technical staff, half of which must be females, will be trained on how to use the equipment, perform food nutrient and soil quality profiling and maintenance of the equipment leading to climate hazard validation, continued food nutrient and soil quality profiling hence facilitating research in all Faculties/Institutes. In the long term, the university laboratory analytical capacity for research will be built. Together with GIS, this profiling will lead to the production of crop-soil suitability maps to define eco-physiological requirements and nutrient profiles of climate resilient and underutilised indigenous food species for better health especially for maternal and new-born at household level.

Objective iv: To develop farmer-led crop and climate monitoring systems for informed food production
Expected results: Indigenous practices in crop production monitoring will be documented, evaluated together with the farmers and appropriate options adopted. A digital citizen science network of farmers will be established and trained to use a mobile Application to champion this improved crop production inputs and outputs recording and monitoring. This encourages farmers to keep records of inputs such as weather, seed, labour and fertilizer and be able to examine the productivity of improved inputs. Baseline information of the agro-climatological knowledge will be generated and a farmer-friendly record keeping methodology developed for use in crop agricultural extension training and services. Increased monitoring and evaluation at farm level will enhance competence and reduce risks in crop production especially for women that constitute the majority of small scale farmers. PhD and MSc researchers will be trained to generate knowledge in form of crop based yield models, crop production manuals and policy briefs. This increased knowledge will lead to better practices for crop production, increased crop yields, and an informed agricultural extension network in a changing climate.

Explain the link with the context analysis, the programme objectives and the other projects. Detail the context analysis if needed (e.g. the specific theme, specific challenges of the departments involved, the local/sectoral context, etc.).

This project focuses on mitigating climatic change impacts and declining soil fertility leading to reduced food production and encroachment of fragile ecosystems. Climate change has increased distribution of disease vectors, shortened growing seasons due to erratic rainfall and reduced arable land due to the resulting hazards and disasters, leading to increasing risk of food shortage. The effects of climatic change and anthropogenic factors mutually reinforce risks and vulnerabilities in SWU hazard-prone areas. The poor farming practices accelerate landslides, floods and other disasters (Maes et al., 2018); this relates to interventions under project one. Agricultural production in Uganda operates at less than 40% of its attainable potential for key staple crops (Kraybill, et al. 2012) yet has a potential to employ a large number of population including the youth (project 5). With increased human population growth, access to land is increasingly constrained. Climate smart agricultural inputs can increase yields, but adoption rates are low, leaving small scale farmers vulnerable to adverse climatic conditions. Household agricultural activities are women dominated who have no formal training; do not evaluate their agricultural inputs and outputs thus incurring poor crop yields adversely affecting cash flows and the motivation for continued food production. Active involvement of women in climate smart agricultural practices and farm record keeping is paramount in production that stimulates income at household level. Similarly, the university has limited analytical laboratory and trained staff to support evidence-based decisions on climate tolerant nutritious species, or crop-soil suitability evaluation for improved agricultural household outputs. This project addresses Uganda NDP III objectives 1, 2 and 4, strategies 1, 2, and 16, and programmes 1, 5 and 8. The project feeds into SDG 2, 6 and 13 (http://envalert/org/wp-content/uploads/2020/06/NDP-3-Finale.pdf).

Describe the strategy of the project: how will it reach its objective(s)?

A citizen science approach blended with ICT will be used to map climatic hazards under objective 1. In this approach, a citizen scientists' network will be set up, participants trained and inducted to digitally collect climatic related hazards data. Weather stations will be installed and the resulting agro-metrological data will be used in the climatic e-kiosks. GIS hazard and disaster risk mapping will be done to inform planning and policy decisions. Gender inclusiveness will be considered in selecting postgraduate students to undertake research and innovations. Objective 2 will be addressed using multi-disciplinary participatory approaches that involve district agricultural extension staff, psychologists and farmer community platforms for multi actor dialogues. Objective 3 and 4 will be addressed using physical and chemical analyses on soil and food samples from a selection of farms in the different agro-ecological zones. ICT applications will be developed for digital soil fertility prediction algorithms. Also a farmer led citizen science will be set up to record agricultural input versus

outputs in a bid to valorize farmers to monitor their agricultural production and learn how to keep farm records. An activity and knowledge analysis based on second order cybernetics which allows transforming experience of farmers combined with reconstruction interviews; record monitoring and socio-economic analysis will be employed to further address objective 4. Collaborations with other partner institutions such as NARO will be strengthened to boost the agriculture research capacity of MUST and the community. VUB and other Flemish Institutions will provide technical support to MUST for transformative communities. Digital information dissemination will be undertaken.
Analysis of end-users / final beneficiaries: identity the end-users of the project results and describe the uptake strategy of the project (incl. structural barriers for end-users).
District Disaster committees, office of the prime minister, farmers, agricultural extension officers and local communities are the primary final end-users. They will learn smart agricultural practices, gain improved food production and increased household income. Other end-users are MUST community, VUB & other Flemish partners who will access equipped labs and utilise climate ICT enabled data, infrastructure, upgraded library services with an operational repository and e-catalogues. Laboratory infrastructure will spur MUST inter-Faculty research competencies in hazard risk assessment, soil and nutrient profiling thus becoming a regional hub to offer services closer to the farmers.
Presentation of the project team: present the project team, the available expertise and the expertise sought for.

Proposed local project leader	Assoc. Prof. Grace Kagoro Rugunda, PhD
Local project team *(Other involved staff: professors, assistants, (administrative) collaborators, etc,). Also mention involved departments/faculties/universities.*	Dr. Imelda Kemeza, PhD- Department of Educational Foundations & Psychology; Sr. Dr. Jane Yatuha, PhD; Assoc. Prof. Julius Bunny Lejju, PhD-Department of Biology, Faculty of Science; Dr. Ronald Twongyirwe, PhD; Department of Environment &Livelihood Support Systems; Richard Kimera, MSc.IT-Department of Computing
Overview of available domains of expertise in the project team	Ecology, natural resource management, social and educational psychology, aquatic and soil science
Comments on the expertise sought for at level of the Flemish HEIs	Citizen Science, climate smart agriculture, soil conservation, hazard and risk assessment

7.3 Project 3: Increased access and utilization of affordable energy technologies

Objectives: State the objectives of the project. What do you want to realise through the project (medium-term (5 year) objectives). To what long term objectives will the project contribute (can be both internal and external to the university)

The project specific objectives are to; (i) develop and adapt affordable and environmental friendly energy technologies for gender responsive outcomes; and (ii) transfer and up-scale new low-cost input and affordable energy technologies.

Objective i: To develop and adapt affordable and environmental friendly energy technologies
Expected results: The project seeks to adapt and optimise renewable energy technologies (solar energy, biogas and briquettes) for use in rural and peri-urban communities. Solar energy will be promoted mostly for lighting, water heating, powering of simple machines and electrical appliances, and clean drying of agricultural produce. Biogas will be developed for farmer communities and homesteads with animals to be used for cooking. Biomass will be used for making briquettes with targeted use in peri-urban areas and concentrated settlements such as refugees and small towns. Through collaborations with organisations such as solar Uganda and Stichting Nederlandse Vrijwilligers (SNV), the project will assess the socio-economic, ecological and technical aspects of the current technologies in order to optimise them for uptake by female-headed households and the peri-urban poor. A renewable energy research laboratory will be established and equipped to test and evaluate the energy content of the available energy sources and the energy conversion efficiency of the different energy technologies. Based on these findings, affordable and environmental friendly innovative energy conversion technologies will be adapted and optimised to the local context. Capacity at MUST will be developed through training of PhD and masters students and staff in areas of renewable energies of which high quality publications and policy briefs will be shared and disseminated.

Objective ii: To transfer and up-scale new low-cost input and affordable energy technologies for gender responsive outcomes
Expected results: This objective focuses on up-scaling and improving the uptake of the energy technologies developed and optimized from objective i. Research will be conducted by PhD and Masters students to understand human behavior so as to reduce the barriers to new energy technology uptake. Women and youth will be trained on home-based briquette making techniques and biogas digester designs and maintenance. Off-grid solar systems will also be designed for concentrated communities and institutions. The generated knowledge will help in developing mechanisms to improve and encourage energy technology uptake Dissemination of findings

through exhibitions and demonstration workshops will scale up the adoption. After the dissemination, a network of community champions will be commissioned in selected locations to enhance uptake and influencing mind-set and attitude change from the use of biomass which is not environmentally friendly, labour intensive and time consuming. Evidence based quality research will inform policy decisions at local and national levels to address societal energy problems. Community members, especially women, will be trained in the development and use of these technologies since they are the ones mostly affected by poor energy access.

Explain the link with the context analysis, the programme objectives and the other projects. Detail the context analysis if needed (e.g. the specific theme, specific challenges of the departments involved, the local/sectoral context, etc.).

Access to affordable and environmentally friendly sources of energy still remain a major challenge in SWU. The proposed interventions under this project fit into SDG 7 that emphasizes reliable, affordable and sustainable energy for community wellbeing and socio-economic transformation. The existing energy technologies such as solar and hydro-power being promoted in communities remain costly and therefore not well adopted. Biomass (fuel wood, charcoal, crop residue) remain the main energy source for rural households, putting pressure on the environment and human well-being. This puts pressure on the environment and compromises human wellbeing. There are limited innovations to generate less costly energy options such as local, environmental friendly and affordable biodigester systems to lessen the financial cost, time and risks associated with collection of firewood. Women greatly participate in the collection of firewood, shoulder most household chores and bear the highest risks such as health hazards , rape and snake bites (Agea et al., 2010;). In search of fuel wood, communities bordering protected areas are always at conflict with environmental conservation (Akampurira et al., 2019) which require alternative energy sources. MUST has not adequately embarked on renewable energy research and innovations that involve community consumption due to limited infrastructure and staff capacity. The proposed interventions are a pathway to achieve the MUST vision of community engagement. The cost effective energy technologies will spur improved household incomes and community development. Addressing challenges of affordable energy access and utilization will conserve the environment, free up time for communities especially women to engage in other productive activities and provide better ways of food production and preservation. The income of women and youth will increase through self-employment and business start-ups. This project addresses NDP III objectives 2 and 3, strategies 10 and 12, and programmes 10,12,13,14 and 17. The project fits into the proposed conservation initiatives under project 1 and 2 as well as innovative skilling in project 5.

Describe the strategy of the project: how will it reach its objective(s)?

Multi-stakeholder dialogues and baseline surveys coupled with human behavioral studies will be conducted to establish the existing energy technologies and their use. Evaluation of strengths and weaknesses of these technologies will be done to identify gaps and limitations to inform the development process of new and affordable energy technologies. The project will equip the renewable energy research lab with modern equipment to analyse the efficiency of solar cells, identify and track the maximum power output from solar arrays and test local materials for fabrication of solar panels. The equipment will also be needed to test composition of biogas, the energy per unit of biomass and evaluate the impurities. Students, staff and community members will be trained to develop technologies that will be tested and deployed in selected communities. By engaging industry and community stakeholders, mini-grid and off-grid energy sources will be established in concentrated urban poor communities and monitored using a web portal. The availability of the energy will also enhance the capacity for affordable and efficient drying and heating processes required for facilitating business start-ups such as value addition in farmer communities and youth as articulated in project 5. Information dissemination with relevant stakeholders will be undertaken at both medium and long term levels. In order to strengthen the home health improvement campaigns to reduce indoor pollution and to multiply adoption of the developed and optimized clean energy technologies, community model energy champions will be trained and supported.

Analysis of end-users / final beneficiaries: identity the end-users of the project results and describe the uptake strategy of the project (incl. structural barriers for end-users).

The primary final beneficiaries are rural and peri-urban households. Other end users will include concentrated community settlements, farmer groups, institutions, municipalities and cities. MUST and other Institutions of Learning will benefit from the energy laboratory infrastructure and energy usage. The community energy model champions will also act as training resource for MUST students and the community. The beneficiaries will use available natural resources in a better and sustainable manner, increase incomes and livelihoods.

Presentation of the project team: present the project team, the available expertise and the expertise sought for.

Proposed local project leader	Dr. Johnes Obungoloch, PhD- Department of Biomedical Engineering, Faculty of Applied Sciences and Technology
Local project team *(Other involved staff: professors, assistants, (administrative) collaborators, etc,). Also mention involved departments/faculties/universities.*	Ms. Penlope Yaguma, MSc- Department of Electrical and Electronics Engineering, Faculty-Applied Sciences and Technology; Dr. David Okot Kilama,PhD, Department of Physics, FOS; Dr. Cleophas Karooma, PhD; Department of Planning and Governance;Dr. Imelda Kemeza, PhD-Department of Education Psychology and Foundational Studies; Sr. Dr. Jane Yatuha, Ph.D, Department of

	Biology, Faculty of Science, Moses Ntaro, MPH, Department of Community Health; Mr. Rogers Mwavu, MSc. IS- Department of Information Technology
Overview of available domains of expertise in the project team	Renewable energy, engineering and innovation, environmental management and energy conservation, environmental health, Social Sciences
Comments on the expertise sought for at level of the Flemish HEIs	Renewable and clean energy, innovation cycle and technology transfer

7.4 Project 4: Improved sexual and reproductive health and rights of women, children and adolescents

Objectives: State the objectives of the project. What do you want to realise through the project (medium-term (5 year) objectives). To what long term objectives will the project contribute (can be both internal and external to the university)

Specific objectives are; (i) to mainstream gender in reproductive health care promotion for MARPs to reduce GBV; (ii) to optimise sexual reproductive health care services and rights for adolescents and; (iii) to strengthen quality improvement initiatives to optimise care and prevent maternal, new born and child related complications

Objective i: To mainstream gender in reproductive health care promotion for MARPs to reduce GBV
Expected results: Enhanced institutional academic and research capacity in SGBV health promotion framework for gender will be realised to leverage the existing initiatives under VLIR-UOS South Initiative funding. There will be increased awareness in GBV and SGBV prevention and gender sensitive life skills integrated in reproductive healthcare promotion and service delivery. In the medium term, the capacity of post-doctoral, PhD, Masters students, in-service and pre-service healthcare and social work personnel that is gender responsive will be strengthened. Policy briefs, SGBV manual, a documentary and publications in relevant methodologies of integrating gender in SGBV health care promotion and service delivery will be developed and disseminated. In the long term, community members will be empowered through awareness raising and grass root training among the local and refugees populations, resulting into community health champions that will facilitate mind-set change for gender responsiveness. Increased outreaches and community health champions in the refugee camps, schools and safe homes will result into reduction of GBV and SGBV cases. In the long term, gender will be integrated into future comprehensive health promotion strategies.

Objective ii: To optimise sexual reproductive health care services and rights for adolescents
Expected results: There will be enhanced institutional capacity in conducting quality research and training of post-doctoral, PhD, masters students in medicine, nursing, biomedical sciences and social sciences as well as in-service and pre-service health care personnel. Geo-spatial mapping will be done to determine access to sexual reproductive health services and referral service pathways that apply to both boys and girls. Communities and Civil Society Organisation leaders, Health Unit Management Committees (HUMCs) and adolescents (both in and out school) will also be trained and supported in SRHR. This will be done through engaging the existing peer educators and village health teams using a trainer of trainees approach, role plays, animations and songs for adolescents training. The training needs and priorities of both girls and boys will be taken into consideration for gender responsive outcomes. ICT will aid automation of health data and integrated in SRHR service delivery for adolescent utilisation. Training and counselling adolescent centres will be equipped with adolescent-friendly services and operationalised to address the unmet family planning needs for both boys and girls, engage SRHR peer groups and facilitate an interactive digital forum. Knowledge generated will be disseminated through publications, policy briefs, tailored e-training manual, SRHR Apps, documentaries, adolescent SRHR book and posters. Adolescent-friendly digital media campaigns will be conducted to enhance awareness and prevention. In the long term, the interventions will result into increased access and utilisation of SRHR services by adolescents, strengthened involvement of communities in taking responsibility of their own health, cumulative reduction in pregnancies among young girls, service utilisation against HIV/sexually transmitted infections, reduced disease burden and improved health. This practice fits into the Ministry of Health national adolescent health policy and will be incorporated into the implementation initiatives at Mbarara Regional Referral Hospital for sustainability.

Objective iii: To strengthen quality improvement initiatives to optimise care and prevent maternal, new born and child related complications
Expected results: There will be strengthened institutional academic and research capacity in maternal, newborn and child health through training of post-doctoral, PhD, masters and COBERS students. The capacity of in-service and pre-service healthcare personnel, Health Unit Management Committees and MNCH outreach centres will be built for improved health care service delivery. Operational service manuals in the most prevalent complications will be generated and used by health care workers in lower facilities. An antenatal care appointments mobile App and sms reminder developed and piloted to link mothers at household to village health teams, nearby health facilities and the referral centres to monitor and prevent complications. Video clips, animations, documentaries will be developed in local language to increase awareness and prevention of

MNCH complications. Policy briefs will be developed to increase inform decision making at local and national levels. In the long term, the capacity of MNCH healthcare workers and PhD students will be built in areas of emergency obstetric and neonatal care. Also, there will be increased access and utilisation of antenatal care services, reduction in new-born deaths and complications. A clinical skill lab and model high risk maternity birth centre will be built, and equipped and a grant in MNCH written and awarded. A model UCoBS maternity birth centre will be set-up. Consequently, there will be strengthened university community health outreaches such as medical camps and health education which results into health promotion, awareness, increased access and utilisation of MNCH services, and reduction in MNCH morbidities and deaths.

Explain the link with the context analysis, the programme objectives and the other projects. Detail the context analysis if needed (e.g. the specific theme, specific challenges of the departments involved, the local/sectoral context, etc.).

Improving sexual and reproductive health of the MARPs is a fundamental demographic issue in SWU communities. Currently, there are gaps and challenges among the MARPs pertaining mainstreaming gender in reproductive health care for young people and refugees to reduce SGBV. Health indicators pertaining sexual and reproductive health for Ugandans are worrying. Adolescent pregnancy rate in SWU is 27% compared to the national rate of 25%. Teenage pregnancy rate is at 25% and adolescents contribute to over 20% of maternal mortality. In addition, fifty-two per cent (52%) of the people living with HIV/AIDS are young people (UDHS, 2016). GBV rate is 13%, the total demand for family planning among married women in Uganda is 67% yet the total fertility rate for Uganda is high at 5.4 (UDHS, 2016). Maternal mortality ratio for Uganda is 336 deaths per 100,000 live births; 1 in every 16 Ugandan children does not survive to their fifth birthday; the total demand for family planning among married women in Uganda is 67% yet the total fertility rate for Uganda is high at 5.4. HIV/AIDS remains prevalent among the youth aged 15-24years accounting for 52% with young women disproportionately affected by the epidemic. The unmet need for family planning among married women is higher in rural (30%) than urban (23%) areas (UDHS, 2016). Despite reports by the Government of Uganda in the budget strategy 2020/2021 on some strides in reduction of maternal and under-five mortality rates from 435 to 336 and 137 to 64 respectively, this reduction is still below the attainment of the Sustainable Development Goal (SDG) 3; target 3.1 and 3.2 (SDG, 2015). About 60% of all maternal deaths are estimated to be potentially preventable (Geller SE *et.al.* 2014). The reduction is also generic and lacks contextual realities of SWU. The highlighted areas of concern relate with the one of the UCoBS focus of improving sexual and reproductive health and rights of the MARPs. MUST staff have done research in adolescent health, maternal new-born and refugees' health (Masembe *et.al.* 2006) and (Ngonzi *et.al.* 2020). The outputs, however, remain largely departmental and individual-based without significant multidisciplinary and institutional approaches. To address the stated challenges above requires interdisciplinary and inter-faculty/institute interventions, adaptation and utilisation of innovative community outreach strategies to attain optimum health outcomes. This project addresses National Development Plan (NDP) III objective 4, strategies 12, 16 and 18, and programmes 12 and 13. The project further feeds into SDG 3, 5 and 10. Failure to achieve optimal wellbeing of MARPs will undermine the interventional efforts on climate change, energy utilisation, food production, youth employability and skilling, gender relations, poor health outcomes and inadequate information access and usage. In this redress, universities with their interdisciplinary knowledge and expertise are facets to address reproductive health challenges by providing health systems and communities with the necessary knowledge which can be disseminated and utilized.

Describe the strategy of the project: how will it reach its objective(s)?

Stakeholder analysis involving CSOs, collaborative partners in SRHR, MNCH women and men will be adopted. Interdisciplinary health promotion through sensitisation and training of adolescents in sexual and reproductive health, mothers, teachers, peer educators, pre- and in-service healthcare professionals, policy makers, and community members in SRHR, MNCH and GBV; will optimize adolescent health, MNCH outcomes and reduce GBV. Digital applications and interdisciplinary approach to SRHR, MNCH and GBV will be done to improve information access and utilisation. Basic infrastructure such as friendly adolescent youth centres, birthing model centres and clinical skills laboratories to improve service delivery will be established. Ambulance services will also be used to access timely emergency obstetrical care. Operational research will be conducted with an aim of finding solutions for better health outcomes of the MARPs. Innovative approaches that generate solutions to the existing SRHR challenges will be undertaken.

Analysis of end-users / final beneficiaries: identity the end-users of the project results and describe the uptake strategy of the project (incl. structural barriers for end-users).

The primary end users will be adolescents, mothers, new-borns, victims of GBV and people living with HIV/AIDS. Other end-users are marginalised persons in SWU. The uptake strategy will be based on phased training and utilization of new technological approaches, dissemination of best practices, coaching, apprenticeship, mentoring, supervision and feedback for MARPs and other stakeholders. Community champions will be identified in areas of intervention. These strategies will be available in locally customised ways. The barriers include perceived negative attitude towards some services and inadequate infrastructure which will be addressed by the interdisciplinary approach that includes social scientists and infrastructure set-up.

Presentation of the project team: present the project team, the available expertise and the expertise sought for.

Proposed local project leader	Dr. Joseph Ngonzi, PhD- Department of Obstetrics & Gynaecology

Local project team *(Other involved staff: professors, assistants, (administrative) collaborators, etc,). Also mention involved departments/faculties/universities.*	Dr. Grace Nambozi, PhD - Nursing; Dr. Cleophas Karooma, PhD-Planning and Governance; Mr. Moses Ntaro, MSc; Dr. Gad Ruzaaza, PhD - Community Health; Prof. Jerome Kabakyenga, PhD- MNCHI, Faculty of Medicine; Dr. Imelda Kemeza, PhD - Educational Foundation and Psychology; Mr. Rogers Mwavu, MSc. IS- Information Technology; Dr. William Waswa, PhD-Biomedical Engineering; Mr. Fredrick Bulondo, BSc-Biomedical Engineering
Overview of available domains of expertise in the project team	Maternal New Born and Child Health, Reproductive health and nursing; Community Based Education & Social Psychology, Biomedical Engineering
Comments on the expertise sought for at level of the Flemish HEIs	Sexual and Reproductive Health and Rights, community obstetrics and midwifery, social and medical anthropology, health systems and sociologists

7.5 Project 5: Increased youth employability through skilling, innovations, experiential learning and technology transfer

Objectives: State the objectives of the project. What do you want to realise through the project (medium-term (5 year) objectives). To what long term objectives will the project contribute (can be both internal and external to the university)

The specific objectives of this project are: (i) to develop a multidisciplinary ecosystem of various internal and external stakeholders in support of youth innovation and entrepreneurship; (ii) to develop training for youth that strengthens their entrepreneurial and innovation skills; (iii) support youth entrepreneurs through experiential learning and technology transfer and, (iv) to strengthen business incubation.

Objective (i): To develop a multidisciplinary ecosystem of various internal and external stakeholders in support of youth entrepreneurship
Expected results: A multidisciplinary ecosystem will be developed in support of female and male youth entrepreneurship for the three target groups – youth entrepreneurs, internal university stakeholders, and network partners. Youth entrepreneurship could be seen as a tool to come out of unemployment and poverty. Unfortunately, the youth is lacking basic skills, funding and resources to develop their enterprise. The development of a solid supportive ecosystem can help youth entrepreneurs to overcome these challenges. We will start to develop this ecosystem from the internal university stakeholders. This implies engagement of students, university professors, university staff members, as well as university centres related to (i) social entrepreneurship, (ii) community service learning, (iii) entrepreneurship, (iv) innovation and (v) technology transfer. We will further extend the ecosystem with network partners, i.e. a large group of heterogeneous external stakeholders to the university. It is composed of various organisations dedicated to supporting youth entrepreneurs. This target group constitutes government agencies, incubators, accelerators, industry, non-profit organisations, financial institutions, impact investors, foundations, philanthropists, and businesses and a variety of advisory services. The creation of a multidisciplinary ecosystem in support of youth entrepreneurs is a valuable tool to enhance the success of their venture creation and growth.

Objective (ii): To develop training for youth that strengthens their entrepreneurial and innovation skills
Expected results: The university will develop a curriculum and training manuals of vocational short courses to strengthen the skills of female and male youth entrepreneurs in entrepreneurship and innovation. The course development will use alternative methodologies to the classical university education, since the target group of female and male youth entrepreneurs is living in poverty and lacking solid education. In this context, the course development will be based on game exercises, and involve as much experiential learning as possible. Moreover, the university will host hackathons, entrepreneurship and innovation workshops that will provide hands-on training to youth entrepreneurs. These events will involve internal and external stakeholders from the ecosystem (cf. objective i above), who can provide hands-on support to the beneficiaries of this project and strengthen their entrepreneurial skills.

Objective (iii): To support youth entrepreneurs through experiential learning and technology transfer
Expected results: A centralised innovation and technology transfer centre will be expanded and equipped to strengthen the capacity of the university to host and coordinate entrepreneurship and innovation initiatives. This centre will channel the support towards youth entrepreneurs in two ways. First, the centre will channel technology transfer in support of youth entrepreneurs (with a focus on female youth). We will use the technology transfer systems to channel knowledge transfer towards youth entrepreneurs. Secondly, the centre will channel students involved in experiential learning (or community service learning) to support youth entrepreneurs. After all, this centre should stimulate student and academic entrepreneurship, as well as innovation processes of existing industry.
Objective (iv): To strengthen business incubation
Expected results: Entrepreneurship skills will be gained by the female and male youth to transform them for gainful employment and employability. The above mentioned Centre for Entrepreneurship and Innovation will serve in the medium term also as a business incubator for ventures created by youth entrepreneurs, students, faculty, and staff of the university. The trainings (objective ii) and the multidisciplinary ecosystem (objective i) will play an important role in the incubation process. In addition, we will look for funding opportunities and internation-

al support to the ventures in the incubation, in order to strengthen their rates of success.

Explain the link with the context analysis, the programme objectives and the other projects. Detail the context analysis if needed (e.g. the specific theme, specific challenges of the departments involved, the local/sectoral context, etc.).
The youth constitute over 70% of the total population in Uganda, of which the majority are female (UBOS, 2017). Youth unemployment and employability is a topical issue on the national development agenda (NDP, 2020). According to National Planning Authority (NPA, 2017), 700,000 youth join the job market every year regardless of qualification but only 90,000 get employment. The current student uptake in science and technology in higher institutions of learning stands at 27% against 40% as recommended in the STI policy of 2011 (UBOS, 2015). Therefore, the central demographic challenges this project addresses are youth unemployment and under employability. Innovation, experiential learning, entrepreneurship and technology transfer will be pathways for addressing the identified challenges. This project provides an opportunity to develop a multidisciplinary ecosystem to inspire, nurture and promote the conversion of entrepreneurial innovative ideas into commercially viable and sustainable products as well as to strengthen the skills of youths through experiential learning for employability. Much as MUST has institutionalised innovations (cf section 1), the innovation ecosystem, the Centre of Innovations and Technology Transfer and Business Incubation Clinic are ill equipped to generate and up-scale environmental friendly affordable innovations. This requires a strong infrastructural base to host and skill both female and male youths. The project therefore focuses on producing skilled, competent and entrepreneurial youth with the capacity to make a contribution towards solving the demographic challenges. Hence empowering the youth to become job-creators rather than job-seekers. Additionally, the project addresses NDP III objectives 1, 2 and 4, strategies 1, 2, 7,10,14, 16 and 18, and programmes1, 6, 8, 10, 12, 13 and 14. The project further feeds into SDG 1, 4, 8 and 9. Addressing the entrepreneurship, innovations and technology transfer challenges will have an effect on energy utilisation, environmental conservation, food production, youth employability and skilling, gender relations, health outcomes and household livelihoods. The expected results contribute towards Uganda Vision 2040 of promoting business and technical education, ICT-led enterprises and abundant labour force.
Describe the strategy of the project: how will it reach its objective(s)?
The overall objective is to strengthen the capacity of youth entrepreneurs. We will reach them through the university or through organizations specialized on youth and youth unemployment. Project five will strengthen the capacity of the university through the development of training on entrepreneurship and through the strengthening the Centre of Innovations and Technology Transfer. A see, think, do and care model will be employed to link training, research, innovations and production. Innovative teaching and experiential learning in short vocational entrepreneurship courses will include hands-on skills, coaching, mentorship, feedback, follow-up and twinning with industry/artisans to benefit the youth for gainful employment. Industrial training will be undertaken through partnership with selected innovation centres, agencies and industry. Annual hack-a-thons that engage all categories of youth will be run and prototypes developed for commercialisation to respond to pressing demographic challenges. Datathons will also be run to bring together participants to use their creativity and data science skills to build, test and explore solutions. A PhD student will be attached to the project to avail datasets for the Datathons and assess their success. This will inform the best applicable models that can be used to effectively skill the youth. The project will equip the Centre for Innovations and Technology Transfer and setup satellite innovations and skilling centres. Female and male youths will be equitably selected and supported with ICT to build teams, self-esteem and pull resources for their business start-ups until apprenticeship maturity. The skilled youth champions will be supported to reach out to other youth as a multiplier effect. Exhibitions, demonstrations, commercialisation of ideas and an annual youth skilling week will be conducted for technology transfer. Such a capacity building will systematically benefit the university stakeholders (students, alumni, faculty and staff) and other youth entrepreneurs in the region to develop their ventures. Surrounded with a multidisciplinary supportive ecosystem, the rate of success of youth entrepreneurs can dramatically increase.
Analysis of end-users / final beneficiaries: identity the end-users of the project results and describe the uptake strategy of the project (incl. structural barriers for end-users).
Youth are the primary final end-users. The target youth groups comprise of male and female graduates, out-of-school youths, less-skilled persons, employees in formal sector, self-employed workers, artisans and small-scale farmers. Other end-users include; MUST and the prospective employers who will benefit from infrastructural setup and uptake of the skilled youths, respectively. Structural barriers likely to affect end-users include individual, social, economic and environmental factors which will be addressed by awareness raising, mentorship, coaching and training.

Presentation of the project team: present the project team, the available expertise and the expertise sought for.	
Proposed local project leader	Dr. Manasseh Tumuhimbise, PhD-Department of Accounting & Finance
Local project team *(Other involved staff: professors, assistants, (administrative) collaborators, etc,). Also mention involved departments/faculties/universities.*	Dr. Imelda Kemeza, PhD- Department of Educational Foundations & Psychology; Mr. Asaph Katarangi, MBA-Department of Human Resource; Dr. Medard Twinamatsiko, PhD- Centre for Innovations and Technology Transfer: Mr. Alex Twinomuhwezi, MBA-Department of Marketing & Procurement, Faculty of Business and Management Sciences; Mr. Mwavu Rogers, Department of Information Technology

	and Dr. ir. Fred Kaggwa, Department of Computer Science, Faculty of Computing and Informatics
Overview of available domains of expertise in the project team	Financial accounting; business management and entrepreneurship, innovation, socio-economics, educational psychology
Comments on the expertise sought for at level of the Flemish HEIs	Software engineering, innovation and technology transfer, marketing, social sciences and intellectual property, supportive ecosystem development, youth entrepreneurship and social entrepreneurship

7.6 Project 6: Improved Institutional and Community ICT Capacity to Access and Utilise Information

Objectives: State the objectives of the project. What do you want to realise through the project (medium-term (5 year) objectives). To what long term objectives will the project contribute (can be both internal and external to the university)
Project 6 'improved institutional and community ICT capacity to access and utilise information' aims to contribute to the previously mentioned projects by the development of stronger ICT. This will be achieved through the following specific three objectives; (i) To expand ICT infrastructure for data storage, exchange and support for training and research; (ii) To provide ICT methodologies, approaches and tools of the five projects for adoption within communities, and (iii) To optimise ICT support for internal communication and internationalisation. **Objective i: To expand ICT infrastructure for data storage, exchange and support for training and research** **Expected results:** Reliable ICT hard and soft infrastructure will be enhanced at MUST. This will result into building physical and human capacities to support research, training and innovations during the implementation of the 5 thematic projects. UCoBS web page on the MUST website and a centralised data repository will be developed for the information generated to enhance exchange. A secured modern coordination and training hub will be established and operationalised to benefit PSU and the entire university community. Performance of servers and network systems will be improved to enhance the Open and Distance Electronic Learning and online graduate thesis oral defence. A GIS lab that has already been partially supported by VLIR funding-TEAM project will be optimised to become a GIS Centre to benefit projects and subsequently build the already demanded GIS capacity by staff and students. Staff and students will be trained in emerging technologies and improved digital information access and utilisation in long term and short term courses. Coordination and training hubs, solar-powered digital communication drums and digital kiosks set up at MUST community based satellite centres will be supportive arms for the programme in mapping degradation risks, agro-meteorological and risks and hazards monitoring and inform the district natural resource, disaster committees and agriculture extension services (under project 1 & 2). Staff, students and community will attain timely information access and feedback. The blendness of ICT in the projects will strengthen MUST capacity to deliver community outreach programme for sustainable demographic dividends. In the long term, ICT-based development of human capacity in training and research will be increased. **Objective ii: To provide ICT methodologies and tools to the five thematic projects for adoption within communities** **Expected results:** In the medium term, digital citizen science, GIS mapping, innovation hackathons will be adopted and up-scaled. Digital and media tools – including mobile and web applications, E-kiosks, soil fertility algorithms, digital weather stations and bio-organic technology - will be developed to collect quick and detailed data. Media radio talk shows will be conducted to support ICT dissemination. Skills will be acquired by staff and students to optimise the uptake of the methodologies and tools, and upscale the applications with community members. Methodologies/tools will support the 5 projects under UCoBS programme. The acquired skills will result into new approaches of conducting quality research in the areas under UCoBS projects and inform upcoming research in areas of environment, climate smart agriculture, renewable energy, SRHR and youth skilling. The uptake of the digital methodologies and tools by the communities (citizen scientists, community champions) will aid data generation, analysis, reduced cost in data collection, improved records management, timely responses to emergencies and service delivery, and improved information access and utilisation. **Objective iii: To optimise ICT capacity for communication and internationalisation** **Expected results:** Human resource capacity will be built to manage the expanded ICT infrastructure and services**.** This will enhance communication and internationalisation. A video conferencing facility for coordination of all projects and online international collaborations will be established to enhance networking among stakeholders. UCoBS resource centre for international students and visitors will be established to strengthen international mobility and exchange. Internationalisation policy and guidelines to facilitate partnerships and collaborations that link to all the projects will be developed. In order to link international students and visitors of the UCoBS programme to the community, English-Runyankole guide and an orientation manual will be developed. A digital academic interaction platform will be set up to strengthen project inter-disciplinary and multi-disciplinary linkages, share progress and outputs. ICT will enable holding physical and virtual dissemination conferences and hackathons. ICT will support production of interactive audio and visual communication materials such as video clips, digital newsletters, digital visual illustrative manuals, documentaries and digital stories for internal and external stakeholders. External communication will also include conducting radio talks to adapt to the limited access to electricity and internet network coverage in several communities of SWU. Annual exhibitions that involve all MUST stakeholders will be conducted to show-case the innovations and research

outputs. Information technology and services are integrated in all projects to achieve interdisciplinary research and capacity building. With ICT enabling display of programme activities and progress on the UCoBS web page; national, regional and international expertise will be attracted. In the long term, ICT systems will increase the institutional visibility, community linkages, awareness and responsiveness and, adaptation of new methods of addressing demographic challenges.

Explain the link with the context analysis, the programme objectives and the other projects. Detail the context analysis if needed (e.g. the specific theme, specific challenges of the departments involved, the local/sectoral context, etc.).

Maintaining an informed society can significantly impact development in communities (Getman *et al.,* 2020). **This project is framed to enable the successful implementation of the 5 thematic projects and coordination within the PSU.** The use of ICTs in all projects provides a new framework and enormous opportunities for facilitating multi-disciplinary and inter-Faculty project interactions and improving community information access and utilisation. The ICT infrastructure at MUST is inadequately equipped to fully support eLearning, eLibrary services, the CITT and international relations office. The computer to student ratio at MUST stands at 1:15, way below the ideal 1:5 by the National Council for Higher Education (NCHE, 2014). The current bandwidth at MUST stands at 145 Mbps compared to the expected standard of 27,000 Mbps required by the current university students and staff population (MUST unit report, 2020). The university lacks a centralised data repository for research and data management. There is limited technical expertise in existing ICTs to collect, analyse and disseminate data. The MUST satellite centres lack timely access to information and related services. Several demographic challenges exist in the rural communities, and because of lack of streamlined data access means, there is information poverty. There is limited expertise in the integration of environmental observations, digital spatial databases or energy use information which would enable rapid transfer of information and production of analytical reports to stakeholders and the community. The healthcare system has not fully embraced ICT applications. ICTs are needed to support youth skilling, innovations, business incubation, and business outsourcing initiatives. The international relations office lacks adequate ICT facilities for international students and visitors. There are no central digital meeting and resource rooms for international mobility short research stays. The project fits into NDP III objectives 1 and 4, strategies 2, 7, 12, 14 and 15, and programmes1, 8, 13 and 14 and feeds into SDG 8 & 9. This transversal project strongly links with UCoBS objectives to bridge the gap of information poverty and digital divide by improving information access/utilisation through building capacity in data management and utilisation of community-generated information.

Describe the strategy of the project: how will it reach its objective(s)?

ICT infrastructure will be upgraded and extended at MUST and the community satellite outreach centres to support long term sustainable data management, storage, analysis, information access and utilisation. Innovative digital tools will be designed to support effective community engagement in the different thematic projects. This will be achieved through efficient digital data management and information access within MUST, and the use of digital technologies for interactions with communities (citizen scientists, climatic and environmental monitors, village health teams, youth innovators) and external partners. A centralised data repository will be set up to manage data from all the five projects. Data analysis, monitoring, evaluation and dissemination of all project outputs will be supported by the ICT at the PSU. A GIS laboratory will be set-up to support students and staff skilling in collecting spatial-temporal data. Digital citizen science network will adopt the smart phone technology to collect data on climate change related hazards. A mobile digital application will be developed to aid the farmer-led citizen scientists to enhance record keeping. ICT Applications will be developed to support the energy research lab, health care information access and service delivery and the development of bio-organic prototypes for commercialisation and technology transfer. ICT-based soft technologies will be provided in the infrastructure to aid access and continued usage. In the implementation of UCoBS, ICT will be strengthened to facilitate internal and external communication. Digital interactions and information exchange between and among project leaders and the Local Coordinator, UCoBS programme and university management, MUST and Flemish partners will achieve timely monitoring, evaluation and reporting. Policies for data format, storage and sharing will be developed to guide programme implementation and the broader institutional growth.

Analysis of end-users / final beneficiaries: identity the end-users of the project results and describe the uptake strategy of the project (incl. structural barriers for end-users).

The primary final end-user is MUST, satellite outreach centres and the nine districts where the projects are to be implemented. Other end-users are international students and visitors. The project has a key cross-cutting role to play in all other UCoBS projects selected themes and the PSU. This is in line with capacity building, knowledge generation and community transformation in businesses, gender, environment, health, climate change adaptation and natural resources management. Development of ICT capacity will be essential for achieving the goal of transforming SWU selected communities into a knowledge-based economy.

Presentation of the project team: present the project team, the available expertise and the expertise sought for.

Proposed local project leader	Dr. ir. Fred Kaggwa, PhD Department of Computer Science, Faculty of Computing and Informatics
Local project team *(Other involved staff: professors, assistants,*	Mr. Rogers Mwavu, MSc. IS- Department of Information Technology; Mr. Amos Baryashaba, MSc. HIT, MBA- Head Computing Services Unit; Mr.

(administrative) collaborators, etc,). Also mention involved departments/faculties/universities.	Richard Kimera, MSc. ICT- Department of Information Technology, Faculty of Computing and Informatics; Ms. Sheila Niinye Olivia, MIRD, PGDPPM- International Relations Officer, International Relations Office
Overview of available domains of expertise in the project team	Computer and network security, web and mobile application development, ICT infrastructure set-up, systems administration and configuration, information systems management
Comments on the expertise sought for at level of the Flemish HEIs	Data science, data centre design, software engineering, system administration, network administration and security

8. Budget indications

Total annual budget[1] applied for during Phase 1 IUC Cooperation:

Indicative project budget repartition[2]:

Title of project	Type[3]	Indicative % of project budget
Project 1: Improved conservation practices of the environment and natural resources	Academic theme-based	13.4
Project 2: Mechanisms for climate change adaptation for sustainable food production	Academic theme-based	14.3
Project 3: Increased access and utilisation of affordable energy technologies	Academic theme-based	12.0
Project 4: Improved sexual and reproductive health and rights of women, children and adolescents	Academic theme-based	14.0
Project 5: Increased youth employability through skilling, innovations, experiential learning and technology transfer	Academic theme-based	13.3
Project 6: Improved institutional and community ICT capacity to access and utilise information	Transversal Institutional Strengthening Projects	14.5
Programme Support Unit- Local and Flemish coordination, administration, fulltime wage for Local Programme Manager and Flemish Project Leader	Transversal Institutional Strengthening Projects	18.5
Total		**100.0**

DOCUMENTS TO BE SUBMITTED

Annex 2: CVs potential project leaders	*The format is included and to be followed, except if indications are included that own data formats can be added*

[1] See budget section in the call document. Annual IUC budget in Phase 1 is a fixed amount.

[2] A part of the programme budget will be needed for the PSU. In this section we only want to see the relative weight of the different projects.

[3] 2 types of projects: academic theme-based projects or Transversal Institutional Strengthening Projects (TISP)