JARAMOGI OGINGA ODINGA
UNIVERSITY OF SCIENCE AND TECHNOLOGY

DIVISION OF RESEARCH INNOVATION AND OUTREACH

AFRICA CENTRE OF EXCELLENCE IN SUSTAINABLE USE OF INSECTS AS FOOD AND FEEDS (INSEFOODS)

STRATEGIC PLAN 2017 – 2022

June 2017

Foreword by the Vice-Chancellor

Prof. Stephen G. Agong', PhD, FAAS

Kenya's long-term vision is to become globally competitive and prosperous with a high quality of life by the year 2030. This aspiration of Kenyans is elucidated in Vision 2030, the long-term development blue print that is being implemented through five-year medium-term plans (MTP) together with the three-year cycle Medium-Term Expenditure Frameworks (MTEF). The Government recognizes the central role of Science, Technology and Innovation (STI) in building and maintaining competitiveness in the global economy, addressing global challenges and for realizing sustainable development.

Within the framework of Vision 2030 and other supplementary development instruments, the Government has proposed to intensify the development and application of STI for the creation of wealth and building of the requisite human capital to raise productivity and efficiency levels across the three pillars of national development. To support this, the Government has created the necessary policies, legal and institutional framework for the identification, generation, acquisition, transfer and application of the relevant STI knowledge in all sectors of the economy.

Food and nutrition insecurity remain a major challenge in Kenya and to a large extend sub-Saharan Africa. On average forty percent of children under the age of five years in Africa are stunted. These grow into adults who cannot perform to their full potential. The outcome is a terrible loss of capacity for high productivity, innovation and intellectual decision making.

Protein is often the most expensive ingredient in human food and animal feeds and insects have been identified to be an inexpensive alternative source of animal proteins. However, the development of insect technology for food and feed is hampered by limited capacity in research, outreach and technology development.

JOOUST has established the *Africa Centre of Excellence in Sustainable Use of Insects as Food and Feeds (INSEFOODS)*. The goal of INSEFOODS is to contribute to the long-term food and nutritional security in Africa by using insects as a cost-effective, reliable and sustainable source of protein and other nutrients. To achieve this, INSEFOODS' strategy is to develop and offer high quality research and training in food security using insects as food and feeds. Our programs will involve teaching, research, product development, business incubation and commercialization.

The University Strategic Plan embodies a roadmap towards achieving this noble goal in the short, medium and long-term strategic orientation and the INSEFOODS Strategic Plan mirrors that of the University from where it is cascaded. I take this opportunity to thank all those who have contributed towards the development of this Strategic Plan. The long journey towards transforming JOOUST into a world-class university is on course.

PROF. STEPHEN G. AGONG', PHD, FAAS
Vice-Chancellor

Message from the Deputy Vice Chancellor, RIO

Prof. Benson B.A. Estambale,

Jaramogi Oginga Odinga University of Science and Technology recognizes the need to strengthen research through the Division of Research, Innovation and Outreach (RIO) which has the mandate to generate and promote research outputs that contribute to improvement of livelihoods. The establishment of INSEFOODS complements the University's mission statement of providing quality university education that nurtures creativity and innovation through integrated training, research and community outreach. INSEFOODS addresses three goals in the University strategic plan. These are Goal 2 which advocates for provision of quality university education and training; Goal 3 which advocates for conducting innovative research and consultancy and Goal 4 which provides for initiating and participating in community outreach and collaborations. Through Goal 3 INSEFOODS intends to promote new research frontiers in insect science as a solution to food security and alleviation of malnutrition among vulnerable populations; while in Goal 4 INSEFOODS will promote collaborations, linkage and community outreach through formation of multidisciplinary teams of researchers and development of training modules that will enhance knowledge generation and sharing at all levels.

The Centre's activities are in line with Kenya's Agriculture sector development Strategy 2009-2020 whose vision is "food secure and a prosperous nation". The Centre will work towards utilizing the less understood information on insects that can be used for food or feeds to improve food security. Value addition to newly developed products will be core in the Centre's activities in line with Agricultural Sector Development Strategy (ASDS) 2009-2020.

Article 43 (section 1 c) of the Constitution of Kenya on Economic, Social and Cultural Rights states that "Every person has the right to be free from hunger, and to have adequate food of acceptable quality". The global food security strategic plan 2011-2016 identifies sustainable production and capacity as key pillars to global food security. INSEFOODS through its objectives proposes a sustainable production model for the insects as food and feeds and building of capacity through training.

This Strategic Plan has, therefore, been developed through a consultative process and provides the road map for the first five years of INSEFOODS' establishment. During the plan period, the Centre has proposed to achieve a number of clear and verifiable milestones through various activities aimed at raising the profile of the University. The detailed activities, work plans and budgets will be prepared annually and submitted for approval within the established University system for budgeting and financial management framework.

PROF. BENSON B.A. ESTAMBALE, MBCHB, PHD
Deputy Vice-Chancellor (Research, Innovation and Outreach)

Table of Contents

LIST OF ABBREVIATIONS

ACE	Africa Centre of Excellence
ASDS	Agricultural Sector Development Strategy
CD	The Centre Director
CUE	Commission for University Education
DVC, RIO	Deputy Vice Chancellor, Research, Innovation and Outreach
EA	East Africa
GoK	Government of Kenya
INSEFOODS	Africa Center of Excellence in Sustainable Use of Insects as Food and Feeds
ICIPE	International Centre for Insect Physiology and Ecology
ISO	International Standards Organization
JOOUST	Jaramogi Oginga Odinga University of Science and Technology
JKUAT	Jomo Kenyatta University of Agriculture and Technology
KeBS	Kenya Bureau of Standards
MTEF	Medium Term Expenditure Framework
MTP2	2nd Medium Term Plan
MoUs	Memorandum of Understanding
MIS	Management Information System
NACOSTI	National Commission for Science, Technology and Innovation
NMK	National Museum of Kenya
PESTEL	Political, Economic, Social, Technological, Environmental and Legal
PhD	Doctor of Philosophy
PI	Principal Investigator
QMS	Quality Management System
SCOT	Strength, Challenges, Opportunities and Threats
SDGs	Sustainable Development Goals
STI	Science, Technology and Innovation
VC	Vice-Chancellor

1.0 INTRODUCTION

Kenya's vision is to become "a globally competitive and prosperous country with a high quality of life by the year 2030." The aspirations of Kenyans is articulated in Vision 2030, the long-term development blue print that is being implemented using five-year medium-term plans (MTP) together with the three-year cycle Medium-Term Expenditure Framework (MTEF). The Government recognizes the central role of science, technology and innovation (STI) in building and maintaining national competitiveness in the global economy, addressing global challenges, realizing sustainable development and boosting its endeavours in achieving the desired socioeconomic status.

The Government in Vision 2030 and other supplementary development instruments has thus proposed to intensify the development and application of STI for creation of wealth and, building of the requisite human capital to raise productivity and efficiency levels across the three pillars of national development. To support this, the Government has also endeavoured to create the necessary policy, legal and institutional framework for the identification, acquisition, transfer, diffusion and application of relevant STI knowledge in all sectors of the economy.

Jaramogi Oginga Odinga University of Science and Technology (JOOUST), derives its mandate of teaching, learning, research and community outreach from the Universities Act 2012 and its charter. JOOUST is a designated STI institution and Centre of Excellence in training, research, innovation and community outreach offering practical and market oriented programmes for steering socio-economic development. The University focuses on the development of Kenya's rich cultural heritage and the utilization of the vast natural resources for academic advancement and research purposes premised on improving the socio-economic status of communities. To spearhead its STI mandate and agenda, the University has created the Africa Centre of Excellence in Sustainable Use of Insects as Food and Feeds (INSEFOODS) within the Division of Research, Innovation and Outreach (RIO) which is responsible for coordinating research, innovation, outreach and income generating activities. It is envisaged that through INSEFOODS, the division will play a leading role in the generation of new and/or expand existing knowledge in modern research, innovation and technology to enable the University contribute to the country's Short-Term, Medium Term Plans, Vision 2030 and to the overall national development.

This Strategic Plan has been formulated to guide the first development phase for INSEFOODS for the next five (5) years and mirrors that of the University from where it has been cascaded. The plan not only benchmarks the academic, research and community outreach programmes, but also outlines the spectrum for human capacity as well as the physical infrastructure required to realize our vision. It is envisaged that INSEFOODS will play a leading role in the generation of new and/or expand existing knowledge in modern edible insect research and technology to enable the University contribute to the country's Medium Term Plans, Vision 2030 and to the overall national, regional and global development.

1.1 The Mandate of INSEFOODS

The University mandate is to achieve sustainable growth and development, through provision of quality education, innovative research and community outreach. In support of the University's mandate, INSEFOODS shall:

1. Build human resource and infrastructural capacity for research, training and technology development and transfer on insects as food and feeds.
2. Build sustainable local, regional and international partnerships and networks for research, development and training on insects as food and feeds.

3. Develop a biodiversity repository of insects for food and feeds in the Eastern and Southern Africa region.
4. Develop insect technology incubation and skills transfer hub for teaching and research.

1.2 Vision and Mission

The **Vision** of University is: "*the beacon in training, research and sustainable development"*, and the **Mission** is "*to provide quality university education that nurtures creativity and innovation through integrated training, research and community outreach"*. INSEFOODS' **Vision** and **Mission** are by extension aligned to the University's vision and mission.

1.2.1 Vision

A centre of excellence in edible insect research, training, innovation and technology for sustainable development.

1.2.2 Mission

To train high level human capacity, conduct research and innovation, and commercialize products, services and solutions that enhance the livelihoods of communities through outreach and extension programmes.

1.3 Core Values

i) Fairness
ii) Professionalism
iii) Transparency and Accountability
iv) Integrity
v) Meritocracy
vi) Gender Equity
vii) Sustainability

1.4 Strategic Plan Development Process

The Strategic Plan was developed through a highly participatory and consultative process that ensured the inclusion and involvement of a wide spectrum of internal and external stakeholders.

2.0 SITUATION ANALYSIS

This Strategic Plan is set against the existing operating environment as well as reality within which INSEFOODS must operate and respond to achieve its objectives. The stages of analysis include: analysis of external environment using the Political, Economic, Social, Technological, Environmental and Legal (PESTEL); Institutional analysis; and a INSEFOODS internal SWOT analysis.

2.1 Environmental Scan

Science, Technology and Innovation (STI) play a pivotal role in industrialization, economic growth and sustainable development of the country. Therefore, the effective management of STI is now widely recognized as a determinant of competiveness for corporate entities, countries and regions. In a knowledge-based economy, the capacity to compete in the global market is highly dependent on the ability to innovate and apply the relevant technologies to industries and productive sectors. Investment in STI and its integration into the social, economic and governance policies can increase global market competiveness, create employment and increase productivity, which are key components for achieving the Kenya Vision 2030. It is against this national background that the University has established INSEFOODS.

To enable INSEFOODS chart a pathway for the future, a critical evaluation of the operating environment is necessary. The critical political, economic, social, technological, environmental and legal (PESTEL) variables that may affect the operations of INSEFOODS are summarized below. PESTEL analysis enables INSEFOODS to identify, understand and appreciate factors that could affect the implementation of this Strategic Plan.

Table 2.1: Findings from PESTEL Analysis

Political	The Constitution of Kenya (2010	The Constitution of Kenya (2010) provides a framework for national governance with which the INSEFOODS is expected to operate.
	Kenya Vision 2030 and MTP	There is the national requirement that all local level strategic plans be aligned to the Kenya Vision 2030.
	Good governance	Embracing Public Sector Performance Improvement Measures: Public institutions are required under the current political order to align activities to requirements on Performance Contracting and Quality Management System (ISO 9001: 2008).
	Devolution	The devolved governance system has facilitated people participation as well as increased participation of Universities in regional and national development.
	Risks	There could be a likelihood of interference with the positive provisions in the above documents by the political / ruling class.
Economical	Stability in the national economy and MTEF	Government ability to finance higher education, research, innovation and outreach is dependent on the general national economic growth. This growth is impacted on by several national and global trends. Such factors include: the levels of inflation, Gross Domestic Product, development trends of imports and exports, development partner participation, climate change, the rapid population growth rates, political stability and the general global economic trends.
	Public-Private Partnership	Fostering partnerships under the public-private partnership arrangement is a worthy route towards enhancing synergies for growth and development for INSEFOODS.
	Risks	Events and factors that result in negative impacts to the Kenyan or Regional economy are likely to relegate funding of science, technology and innovation activities.
Social	Rich cultural heritage	The University is located within an environment with a rich cultural heritage which offers immense opportunity for mutual understanding among existing communities and people of varying ethnicities and religious affiliations.
	Population and demographic characteristics	There exists high and increasing population within the region. There is increasing interest by youth to get training in different aspects of research and technology development, and a quest by mature persons to pursue higher education. This gives an impetus for the INSEFOODS to explore many different training and mentorship programmes. However this may put strain on available resources.
	Infectious diseases	The University is located in a region characterized by high prevalence of infectious diseases such as HIV/AIDS, Tuberculosis and Malaria. The social and cultural context is characterized by these infectious disease and other health issues. INSEFOODS has opportunities to spearhead efforts through research, innovation and technology development to provide solutions that have relevance and direct impact on society.

	Risks	Population pressure, infectious diseases, increasing levels of poverty and other social factors have and may impact negatively on human resource productivity. Issues such as gender disparities and national cohesion will have to be addressed.
Technological	Use of technology	There is an increase in use of ICT and other technological advances. INSEFOODS will have to invest in the appropriate technologies in the conduct of research, training and consultancy services. INSEFOODS has opportunities to use these technological advances to leap-frog in development and contribute to more relevant solutions to the society. INSEFOODS will have to address issues of investments in emerging technologies including ICT, information security and research equipment and infrastructure to remain relevant and concurrent.
	Risks	Technological obsolescence and associated costs of cutting-edge technologies are major threat to many research, innovation and technology development organizations. Inability to invest in requisite technologies will constrain INSEFOODS in efforts to achieve its objectives.
Environmental	Increased attention on environmental issues	There are several ecological factors which affect the operations and effectiveness of INSEFOODS including climate change, natural resource management and waste management. INSEFOODS has opportunities to participate in and contribute to green development as well as preservation of the rich eco-system around the Lake Victoria Basin.
	Challenges	INSEFOODS as a nascent organization has to build the requisite competence and networks to participate in the 'green' revolution to reduce adverse environmental impact
Legal	Compliance with legal requirements	INSEFOODS is expected to operate within the provisions of The Constitution of Kenya (2010), The Universities Act (2012), Commission for University Education (CUE) requirements, Universities Standards and Guidelines 2014 and other Legal provisions within Kenya. This could present challenges as the regulations may be overlapping and conflicting.
	Risks	Working within the state corporations' legal framework pose challenges when dealing with the private sector in terms of procurement, timely delivery of services, environmental compliance and intellectual property rights.

2.2 The SWOT Analysis

To enable INSEFOODS chart a pathway for the future, a critical evaluation of the factors that would influence the achievements of its objectives has been done through (SWOT) analysis.

2.2.1 Strengths

i) Capacity to attract resources from external sources with support of the Government, Council and Management

INSEFOODS is one of the 24 competitively selected centers at universities in eastern and southern Africa region under the World Bank's *Eastern and Southern Africa Higher Education Centers of Excellence Project II (ACE II)*. The INSEFOODS' budget for World Bank funding is USD 6 million over a five year period. The World Bank's funding will act as a catalyst for INSEFOODS to mobilize additional funding to support its activities during and after the ACE II Project period for its sustainability.

ii) Available policies to guide functions of the University in a consistent and transparent manner
JOOUST has several policies that guide it functions in a consistent and transparent way. These policies include financial policy, Intellectual and Property Rights, Research and Development, Income Generation, and ICT policy. The policies are posted on the University website for ready accessibility.

iii) Existing physical and ICT infrastructure with skilled personnel
JOOUST has the basic physical and ICT infrastructure to enable INSEFOODS to establish the necessary infrastructure and access the necessary ICT services to enhance research, training, technology development and transfer.

iv) Existing School of Agricultural and Food Science (SAFS) with a curriculum in Food Security
The existence of the SAFS at JOOUST provides INSEFOODS with a foundation upon which to build its masters and doctoral programs. In addition, apart from its own core staff, INSEFOODS will draw expertise from the academic and research staff of SAFS and indeed from other schools. These are highly qualified and complement staff and represent one of the highest concentrations of multidisciplinary researchers and trainers in the region. Most of the academic and research staff are specialists in their fields and many of them are internationally recognized.

v) Application of public sector performance improvement initiatives
To be in unison with the public sector performance improvement initiatives, the University uses international ISO certified standards based on ISO-9001-2008. All the functional units in the university are obliged to use set guideline of Quality Management System for consistency. The QMS is regularly internally audited with scheduled external auditing by KeBS

vi) Established financial management systems and software
There is a functional financial management system and software Enterprise Resource Planning (ERP) at JOOUST that help the finance department to efficiently manage the financial resources of the institution, and all the departments abide by the financial rules and regulations spelled out in the system.

vii) Strong collaboration and linkages
The University has established a large number of collaborations and signed memoranda of understanding (MoUs) with many local and international organizations that have greatly enhanced its research output.

viii) The location of the University
The location of JOOUST in a tropical setting has an advantage of attracting scholars and researchers from the international community who are interested in innovative research and technology transfer in sub-Saharan Africa. INSEFOODS will improve the quality of research and training through pooling of expertise in several areas including basic and applied sciences, health, agriculture, biodiversity, environment and social sciences.

2.2.2 Weaknesses

i) Inadequate funding from Government to support development, academic and research
The INSEFOODS' budget for World Bank funding is USD 6 million over a five year period. The World Bank funding will cover activities such as the development and offering of curricular for masters, doctoral and short courses programs in food and nutrition security, rehabilitation and upgrading of teaching and learning facilities, rehabilitation and equipping of research laboratories, provision of limited research grants and scholarships, support for student and staff exchanges, support for regional and international partnerships and collaboration, and support for administrative and coordination activities.

ii) Inability to attract and retain staff and researchers

JOOUST is a young university established by public charter only in 2013 and is located in a rural setting far from a nearest city (Kisumu) which is 60 kilometers away. Its physical facilities for students and staff are very limited. To attract regional students and staff, INSEFOODS needs not only well established and equipped laboratories and lecture halls but also comfortable and safe graduate student and staff study and hostel facilities.

iii) Inadequate infrastructure for teaching and learning

As a young institution, JOOUST has limited infrastructure for teaching and learning. A key feature of INSEFOODS is that it will be regional and gender responsive in nature in student admissions and staff exchanges for teaching, research and outreach. However, while the World Bank funding has provision for research laboratories and lecture halls, there is no provision for student hostel, study, seminar/conference facilities and staff offices. The Center is expected to mobilize and generate additional resources to cover additional needs and sustain its activities.

iv) Relatively a young institution compared to others

As a young institution existing among older and better established and known Universities, JOOUST and INSEFOODS have low visibility, and will face a stiff competition in attracting and recruiting staff and postgraduate students especially at the regional level. INSEFOODS would have to build and offer modernized physical structures and facilities.to compete with these institutes.

v) Limited research facilities and resources

Being among the youngest institutions of higher learning, JOOUST does not have all the necessary basic research facilities. However, in the recent years, a lot of efforts have been put in place and through the development partners, the institution has seen growth in selected equipment and tools being put in place. More efforts will be put to encourage research and development proposals to see more development in the area. The award of the World Bank ACE II will encourage development partners to work with JOOUST towards improving research facilities and resources.

vi) Inadequate competencies in core facilities

ICT is a key driver for research, innovation, technology development and transfer. The current ICT infrastructure at JOOUST is not adequate to support the growing demands for its services.

vii) Inadequate competencies in core functions

The current procurement procedures have proved to be bureaucratic and tedious resulting in delays in meeting set targets, deadlines and opportunities. This greatly impairs efficiency and undermines collaborative activities.

2.2.3 Opportunities

i) Strengthening regional economic cooperation

A lot of efforts are being made toward soliciting for regional cooperation with all the East African Community and beyond. The University has already applied for membership to the IUCEA which will be an opportunity to cooperate with the individual countries making the community. This will foster cooperation for academic and research to strengthen economic output from research and development.

ii) Encourage Public Private Partnership for development

The University, through the INSEFOODS, needs to enhance collaboration with the national and county governments, communities, civil society organizations, industries, international organizations, peer institutions and other stakeholders to enhance innovative research, technology development and transfer.

iii) Increasing demand for continuing and professional education

The demand for postgraduate education in the country has been on the increase. Since INSEFOODS intends to offer specialized postgraduate programmes, it shall seize upon this opportunity to enhance student enrollment, their uptake and participation in innovative research, technology development and transfer.

iv) Paradigm shift in higher education sector characterized by focusing more on research and development

There is increased awareness on the role of STI in sustainable development. In the recent past, the government has recognized the important role of STI in sustainable national development. To this end, it has not only increased the number of STI institutions but also increased funding for STI activities. INSEFOODS will take advantage of this opportunity to mobilize additional resources for its development and activities.

v) Existence of research facilities in peer universities, research institutions and industries

JOOUST has cordial relationships with peer institutions most of which are senior in existence in the region. The university may borrow facilities as needs arise. Student and staff exchange is also encouraged whenever specialized supervision of student or facilities are needed. Since our programs are industry oriented, the University has developed healthy relationships with relevant industries, and others are encouraged to be open for consultation and collaboration as necessary.

vi) Preference by funders to work with institutions

Research in the area of insects for food and feeds being a new and fast developing area of innovations, several research and institutions of higher learning are interested in collaborating with like minds such as JOOUST. The direction to move with development is multidisciplinary research. Therefore this is a good opportunity for JOOUST to develop fundable research proposals. Several faculty members have taken this opportunity seriously, and are developing research project proposals that are attractive to international development partners.

2.2.4 Threats

i) Effects of global economic turbulence and high inflation

Unstable global macroeconomic environment impacts negatively on the national economy as the country is highly dependent upon global markets for imports and exports.

ii) Reliance on the limited state funds

Various effects in the national scene such as droughts, floods, social and economic instability have resulted in reduced government funding and at times the already allocated funds for development and recurrent expenditures is further reduced. Given that INSEFOODS will require additional funding through the University beyond the World Bank funds to achieve sustainability, this is considered as a threat to the development of INSEFOODS.

iii) Rigidity and inconsistencies in the political, legal and economic environment

The government tends to focus on more serious national challenges such as security, health, food as well as nutrition security and this could affect funding for research and training activities in the country.

iv) Effects of climate change on food security

The climate change has had a severe negative impact on food security in most parts of the world, Kenya not being spared. This has seen less food production and unprecedented several incidences of famine, hunger and malnutrition in many areas in the country. Households are vulnerable to any additional threat to agricultural production. Researchers in the INSEFFODS project are encouraged to be alert while working with the households to identify potential signs of threat and impact this may have on the insects that have been identified as potential for food or feeds.

v) Emergence of incidences of insecurity including to academic institutions

Universities in the country have been characterized by sporadic occurrences of unrest and violent attacks. The insecurity has sometimes resulted into loss of life which may lead to loss of skills required by industry. These occurrences of insecurity have proved to be a major threat to learning, research and development activities in these institutions. The University works very closely with the national security system to monitor movements of any suspicious elements in the vicinity of the institution. There are increased number of security agents in the University to keep vigil. This may prove expensive but it is a short-term measure to deal with the emergence of insecurity.

2.3 Stakeholder Analysis and Engagement

2.3.1 Stakeholder Analysis

The stakeholder analysis includes stakeholder characteristics such as knowledge of research/innovation, policy, related interests, position for or against, potential alliances with other stakeholders, and ability to affect the process (through power and/or leadership). INSEFOODS stakeholders are grouped into categories which include: international development partners (donors/collaborators), national political leaders (legislators, governors), public agencies (ministries/state departments), commercial/private for-profit institutions, non-profit organizations (non-governmental organizations [NGOs], foundations), civil society, users/consumers and suppliers.

2.3.2 Stakeholder Engagement

Stakeholder engagement is key to the strategic planning and implementation process and the preparation of this strategic plan involved consultations with the various categories of stakeholders at various stages of development. It is envisaged that future evaluations of the plan and programmes will also involve consultations with the various categories of stakeholders.

2.4 Determination of the Strategic Options for INSEFOODS

Having carried out a SWOT analysis, further analysis was done to develop the strategic options and to ultimately identify high leverage strategies. Threats, opportunities, weaknesses and strengths (TOWS) were considered in a more systematic way than in the typical SWOT analysis. The TOWS analysis helped in focusing on leveraging strengths, avoiding weaknesses, making the most of opportunities and managing threats. Thus:

1) How can INSEFOODS employ its **strengths** to take advantage of the available **opportunities**?
2) How can INSEFOODS use its **strengths** to overcome identified **threats**?
3) How can INSEFOODS use the available **opportunities** to overcome the **weaknesses**?
4) How will INSEFOODS minimize its **weaknesses** to avoid the identified **threats**?

Table 2.2 below provides a summary of the analysis and the available strategic options.

Table 2.2: TOWS Matrix

		STRENGTHS	WEAKNESSES
	TOWS ANALYSIS	**i.** Capacity to attract resources from external sources with support of the Government, Council and Management.	i. Inadequate funding from Government to support development, academic and research
		ii. Available policies to guide functions of the University in a consistent and transparent manner	ii. Inability to attract and retain staff and researchers
		iii. Existing physical and ICT infrastructure with skilled personnel	iii. Inadequate infrastructure for teaching and learning
		iv. Existing School of Agricultural and Food Science with a curriculum in Food Security	iv. Relatively a young institution compared to others
		v. Application of public sector performance improvement initiatives.	v. Limited research facilities and resources
		vi. Established financial management systems and software	vi. Inadequate competencies in core facilities
		vii. Strong collaboration and linkages	vii. Inadequate competencies in core functions
		viii. The location of the university	
OPPORTUNITIES		**Strategies to Maximize on Strengths and Opportunities**	**Strategies to Use Strengths to overcome Weaknesses**
	i. Strengthening regional economic cooperation	1) Capitalize on the opportunities to strengthen linkages and partnerships to develop and implement joint programmes.	1) Strengthen resource mobilization capacity and Intensify resource mobilization activities to fund programmes
	ii. Encourage Public Private Partnership for development	2) Strengthen linkages and partnerships with private sector to invest in viable programmes	2) Develop dynamic and attractive regional and national programmes
	iii. Increasing demand for, continuing and professional education,	3) Develop and promote/market professional courses, research and innovation areas through training and mentorship	3) Continuously improve quality of programmes and facilities Use both local and international experts / facilities to implement the training
	iv. Paradigm shift in higher education sector characterized by focusing more on research and development	4) Develop dynamic and attractive national, regional and international programmes that industry oriented and can be translated into products	4) Promote/market the programmes
	v. Existence of research facilities in peer and research institutions and industries	5) Strengthen linkages and partnerships with peer and research institutions and industry	5) Improve efficiencies of service delivery
	vi. Preference by funders to work with institutions	6) Maximize use of existing tangible / intangible assets	6) Strengthen collaborations with partners for benchmarking
THREATS		**Strategies to Use Strengths to Reduce Threats**	**Strategies to Minimize Weaknesses and Threats**
	i. Effects of global economic turbulence and high inflation	1) Develop joint medium and long-term dynamic priority areas of research	1) Increase involvement with multi-disciplinary development partners
	ii. Reliance on the limited state funds	2) Scout for angel funders for activities / facilities	2) Provide a conducive environment for teaching, research and innovation
	iii. Rigidity and inconsistencies in the political, legal and economic environment	3) Attract and retain top talents to increase quantity and quality of proposals and research outputs	
	iv. Effects of climate change on food security	4) Sensitize and train the public for climate smart agricultural strategies	3) Promote policies and programs ideal for mitigation of climate change
	v. Emergence of incidences of insecurity including to academic institutions	5) Promote safety and security awareness amongst stakeholders	4) Strengthen collaboration with the security systems to ensure safety and security of all

3.0 STRATEGIC GOALS AND OBJECTIVES

Focusing on its vision as a centre of excellence in edible insect research, training, innovation and technology for sustainable development INSEFOODS will seek to achieve specified strategic long-, medium- and short-term objectives. This will be done through the undertaking of activities that optimize on the use of the available resources. INSEFOODS has taken participatory approach by involving all stakeholders who share the vision and undertakings of the centre, and the commitments to the goals and programme activities. Consequently, INSEFOODS has identified four strategic goals and a set of strategic objectives to fulfill its mandate (Table 3).

3.1 Strategic Goals

3.1.1 Goal 1
Build human resource and infrastructural capacity for research, training and technology development and transfer in insect science.

3.1.2 Goal 2
Build sustainable local, regional and international partnerships and networks for research, development and training.

3.1.3 Goal 3
Develop a biodiversity repository of insects for food and feed in the region.

3.1.4 Goal 4
Develop insect technology incubation and skills transfer hub for teaching and research.

3.2 Strategic Objectives

The above strategic goals will be achieved through the following Strategic Objectives:

3.2.1 Objective 1
Strengthen education capacity excellence and development impact

This will involve the development of masters and doctoral programmes in food security and sustainable agriculture and related fields for national, regional and international accreditation, and recruitment of students for the programmes across Africa and beyond. In addition teaching facilities will be enhanced for high quality teaching.

3.2.2 Objective 2
Strengthen research capacity excellence

This will entail conducting research and technology development through student thesis and faculty research, publication of articles in high impact journals, and the development of modern research facilities to support the research.

3.2.3 Objective 3
Attract regional faculty and students

The regional and internationally accredited masters and doctoral programmes as well as modern teaching and research facilities will attract student enrollment and faculty exchange regionally and internationally. In addition, collaborative postgraduate programmes and scholarships to needy students will be developed.

3.2.4 Objective 4

Plan for national, regional and international academic partners and collaborations

National, regional and international partnerships and collaborations will be promoted through MoUs for teaching, research, technology development and transfer activities with stakeholders in public, private and civil society sectors. Furthermore, collaborative postgraduate, postdoctoral studies and fellowship programmes will be established.

3.2.5 Objective 5

Develop a biodiversity repository of insects for food and feed in the region

An edible insect conservatory will be established to ensure conservation of edible insects for future generations.

3.2.6 Objective 6

Develop insect technology incubation and skills transfer hub

An insect technology incubation and skills transfer hub will be developed for short term training of stakeholders in edible insect production and enterprise development.

3.3 Strategic Framework

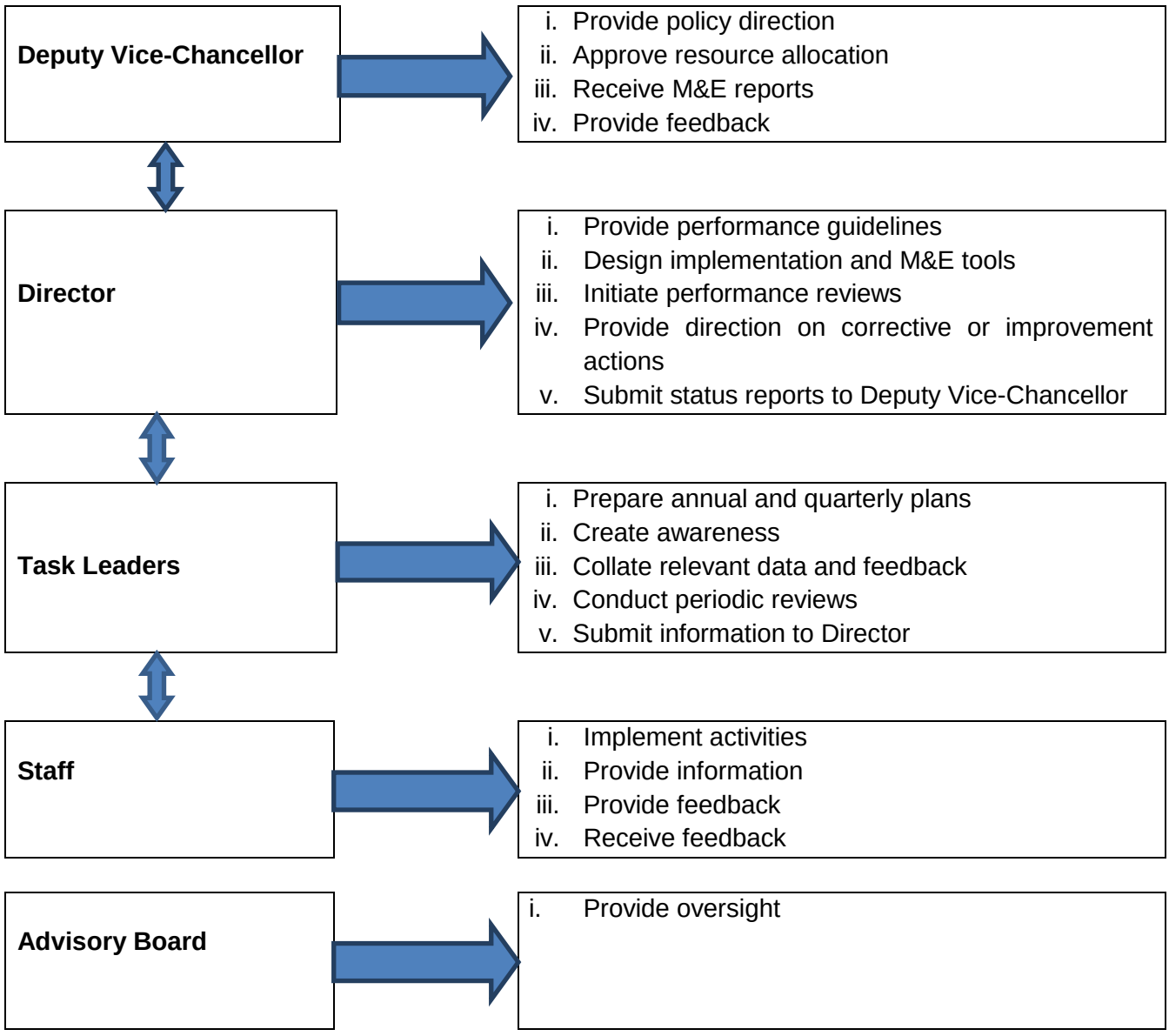
GOAL 1	STRATEGIC OBJECTIVES	STRATEGIES
Build human resource and infrastructural capacity for research, training and technology development and transfer in insect science.	1. Strengthen education capacity (excellence) and development impact	1. Develop new relevant multidisciplinary MSc and PhD food security curricula and regular reviews
		2. Benchmark and obtain accreditation for MSc and PhD food security curriculum
		3. Rehabilitate and upgrade teaching and learning facilities
		4. Set up a grants management scheme and allocate research funds
		5. Strengthen ICT infrastructure for teaching and learning
		6. Advertise and admit students into MSc and PhD programmes
		7. Offer required taught courses to MSc and PhD students
		8. Initiate and implement regional student exchanges to broaden learning experience
		9. Develop and offer relevant short courses for special groups
		10. Develop content and convert for delivery by e-learning platform
		11. Expand the existing library resources including e-resources relevant to the ACE
		12. Broaden students' knowledge and skills through internship at advanced research institutions and industries
		13. Provide appropriate tools for people with disabilities to access learning and research
	2. Strengthen research capacity (excellence)	1. Scale up MSc and PhD research in key areas in insect science and food security
		2. Expand regional and international collaborations and joint research programmes
		3. Equip and rehabilitate research laboratories for upscaling insect rearing, processing and analysis
		4. Enhance faculty research capacity through staff development , exchange programmes and visits
		5. Recruit qualified technical and support staff
		6. Conduct training workshops and seminars to broaden students' learning experience
		7. Develop and sign MoUs with partner institutions
		8. Attract, retain and retool faculty in areas relevant to the ACE
		9. Publish in peer reviewed journals
		10. Support scientific conference presentations
	3. Attract regional faculty and students	1. Set up collaborative postgraduate programmes with other Institutions
		2. Set up structures for student and staff support
		3. Establish staff/student regional mentorship programme and regional working groups
		4. Develop partnerships with industry, research organization for staff and equipment sharing

GOAL 2		
Build sustainable local, regional and international partnerships and networks for research, development and training.	1. Plan for national, regional and international academic partners and collaborations	1. Inception meeting and workshops to form strategic working groups for collaborative teaching and research
		2. Institutionalize faculty exchange programmes
		3. Establish and publish a high impact peer reviewed journal in insects as food and feeds
		4. Set up collaborative postgraduate, postdoctoral studies and fellowship programmes
		5. Schedule a launching and inception workshop with partners
		6. Participation in two (2) joint regional ACEII Meetings
GOAL 3		
Develop a biodiversity repository of insects for food and feed in the region	Develop a biodiversity repository of insects for food and feed in the region	Carry out a regional survey of edible insects
		Establish an edible insect conservatory
GOAL 4		
Develop insect technology incubation and skills transfer hub for teaching and research	Develop insect technology incubation and skills transfer hub	Carry out an implementation survey and impact assessments through participatory community outreach activities
		Write proposal and acquire funds to develop insect technology incubation and skills transfer hub

4.0 IMPLEMENTATION, MONITORING AND EVALUATION

In view of the many interests (current and/or potential), the management system is required to adequately respond to the needs and complex interests as well as provide a sensitive central linking / coordinating structure. The administrative structure therefore provides clear links and authority, paying particular attention to the relationship between the various research and training activities and their management.

4.1 Implementation Structure



4.2 Implementation Approaches

INSEFOODS will need to be recognized not only as a highly skilled program delivery partner, but also as an acknowledged innovator and leader in the design and delivery of successful, sustainable programmes. In this regard, there will be need for:

(a) Allocating to INSEFOODS, the resources to achieve the goals and strategies of the Strategic Plan;
(b) Acquiring the necessary infrastructure for research, training, consultancy and business incubation services;
(c) Attracting and retaining the requisite top talent human resource capacity for the activities of the Centre
(d) Engaging the private sector to support technology uptake
(e) Adopting a comprehensive and aggressive communications and marketing programme to enhance the visibility and influence of INSEFOODS;
(f) Marketing, writing grant proposals and expanding external funding of INSEFOODS to support the implementation of the Strategic Plan;
(g) Monitoring and regularly reporting on the INSEFOODS progress in implementing the Strategic Plan;
(h) Preparing quarterly and annual work plans to operationalize the Strategic Plan;
(i) Periodically reviewing implementation of the Strategic Plan.
(j) Working together to consult, coordinate, collaborate and communicate.

4.3 Implementation Matrix Five Years

Strategic Objectives	Strategies	Indicators of Success	Budget-USD	Timeframe: 2017-2022	Responsibility
1. Strengthen education capacity (excellence) and development impact	1. Develop new relevant multidisciplinary MSc and PhD food security curricula and regular reviews	Number of new relevant multidisciplinary MSc and PhD curricular developed and regularly reviewed	1,157,600	Continuous	Centre Director/Deputy Director
	2. Benchmark and obtain accreditation for MSc and PhD food security curriculum	Number of MSc and PhD programs accredited		Continuous	Centre Director/Deputy Director
	3. Rehabilitate and upgrade teaching and learning facilities	Number of teaching and learning facilities upgraded		Continuous	Centre Director/Deputy Director
	4. Set up a grants management scheme and allocate research funds	A grants management scheme established and functional		Continuous	Centre Director/Deputy Director
	5. Strengthen ICT infrastructure for teaching and learning	ICT infrastructure for teaching and learning strengthened		Continuous	Centre Director/Deputy Director
	6. Advertise and admit students into MSc and PhD programmes	Number of MSc and PhD students admitted		Continuous	Centre Director/Deputy Director
	7. Offer required taught courses to MSc and PhD students	Number of courses offered to MSc and PhD students		Continuous	Task Leader - Training
	8. Initiate and implement regional student exchanges to broaden learning experience	Number of students involved in regional student exchanges		Continuous	Task Leader – Collaborations/Partnerships
	9. Develop and offer relevant short courses for special groups	•Number of short courses developed and offered to special groups •Number of beneficiaries trained in the short courses		Continuous	Task Leader - Training
	10. Develop content and convert for delivery by e-learning platform	•Number of courses delivered by e-learning platform •A functional e-learning platform		Continuous	Task Leader - Training
	11. Expand the existing library resources including e-resources relevant to the ACE	Number of new library resources including e-resources relevant to the ACE provided		Continuous	Task Leader - Training
	12. Broaden students' knowledge and skills through internship at advanced research institutions and industries	Number of students participated in internship at advanced institutions and industries		Continuous	Task Leader – Collaborations/Partnerships
	13. Provide appropriate tools for people with disabilities to access learning and research	Number of appropriate tools provided for people with disabilities to access learning and research		Continuous	Task Leader - Training
	1. Scale up MSc and PhD research	•Number of additional MSc and PhD	2,712,481	Continuous	Deputy Director/PI

Strategic Objectives	Strategies	Indicators of Success	Budget-USD	Timeframe: 2017-2022	Responsibility
2. Strengthen research capacity (excellence)	in key areas in insect science and food security	programs developed and offered •Number of MSc and PhD students trained			
	2. Expand regional and international collaborations and joint research programmes	Number of MoUs signed with regional partners		Continuous	Task Leader – Collaborations/Partnerships
	3. Equip and rehabilitate research laboratories for upscaling insect rearing, processing and analysis	•Number of research laboratories rehabilitated •Number of equipment procured		Continuous	Task Leader – Research & Technology
	4. Enhance faculty research capacity through staff development , exchange programmes and visits	Number of staff involved in staff exchange programmes		Continuous	Task Leader – Research & Technology
	5. Recruit qualified technical and support staff	Number of qualified technical and support staff recruited		Continuous	Centre Director
	6. Conduct training workshops and seminars to broaden students' learning experience	•Number of training workshops conducted •Number of students trained in the training workshops		Continuous	Task Leader – Training & Mentoring
	7. Develop and sign MoUs with partner institutions	Number of MoUs signed with partner institutions		Continuous	Task Leader – Collaborations/Partnerships
	8. Attract, retain and retool faculty in areas relevant to the ACE	Number of faculty recruited, retained and retooled		Continuous	Task Leader – Training & Mentoring
	9. Publish in peer reviewed journals	Number of publications in peer reviewed journals		Continuous	Deputy Director/PI
	10. Support scientific conference presentations	Number of papers supported for conference presentations		Continuous	Centre Director
3. Attract regional faculty and students	1. Set up collaborative postgraduate programmes with other Institutions	Number of collaborative postgraduate programmes with other institutions developed	616,000	Continuous	Task Leader – Training & Mentoring
	2. Set up structures for student and staff support	Number of structures for student and staff support developed		Continuous	Centre Director
	3. Establish staff/student regional mentorship programme and regional working groups	•A staff/student regional mentorship programme established •Number of regional working groups established		Continuous	Task Leader – Training & Mentoring
	4. Develop partnerships with industry, research organization for staff and equipment sharing	Number of partnerships with industry & research organizations for staff and equipment sharing developed		Continuous	Task Leader – Collaborations/Partnerships
4. Plan for national,	1. Inception meeting and workshops to form strategic working groups for	•Inception meeting & workshop held •Number of working groups for	107,000	Continuous	Centre Director / Deputy Director-PI

Strategic Objectives	Strategies	Indicators of Success	Budget-USD	Timeframe: 2017-2022	Responsibility
regional and international academic partners and collaborations	collaborative teaching and research	collaborative teaching & research formed			
	2. Institutionalize faculty exchange programmes	Number of faculty exchange programmes institutionalized		Continuous	Task Leader – Training & Mentoring
	3. Establish and publish a high impact peer reviewed journal in insects as food and feeds	A high impact peer reviewed journal in insects as food and feeds established		Continuous	Deputy Director/PI
	4. Set up collaborative postgraduate, postdoctoral studies and fellowship programmes	Number of collaborative postgraduate, postdoctoral studies and fellowship programmes established		Continuous	Task Leader – Collaborations/Partnerships
	5. Schedule a launching and inception workshop with partners	A launching and inception workshop held		Continuous	Deputy Director/PI
	6. Participation in two (2) joint regional ACEII Meetings	Number of ACE staff participated in two regional ACE II Meetings		Continuous	Centre Director
5. Develop a biodiversity repository of insects for food and feed in the region	Develop a biodiversity repository of insects for food and feed in the region	A regional biodiversity repository of insects for food and feeds developed		Continuous	Task Leader – Research & Technology
6. Develop insect technology incubation and skills transfer hub	Carry out an implementation survey and impact assessments through participatory community outreach activities	A report of a survey and impact assessment through participatory community outreach activities available		Continuous	Task Leader – M&E
	Write proposal and acquire funds to develop insect technology incubation and skills transfer hub	An insect technology incubation and skills transfer hub established		Continuous	Task Leader – Business incubation & Outreach

4.4 Monitoring and Evaluation

4.4.1 Develop a Monitoring and Evaluation framework for INSEFOODS

INSEFOODS will develop an M&E framework to ensure consistency, accuracy and timely reporting of the activities of the Centre.

4.4.2 Continual data collection and analysis

INSEFOODS will conduct continual data collection, analyze the output and compare against targets and indicators of success. Reports shall be submitted to the Management for decision-making.

4.4.3 Performance supervision

The Director shall supervise performance of all functions to ensure that the Strategic Plan is implemented.

4.4.4 Review Mmeetings

INSEFOODS shall hold regular performance review meetings to assess the status of the Strategic Plan.

4.4.5 Quarterly Status Rreviews

INSEFOODS shall conduct quarterly reviews, compile quarterly reports and submit the same to management.

4.4.6 Annual Strategic Plan performance audits

INSEFOODS shall conduct an annual performance audit to evaluate performance progress, impact and relevance.

4.4.7 Policy rreviews

Based on the results of the M&E reports, INSEFOODS shall review policies, strategies and activities with a view to improving performance.

4.5 Assumptions and Risks

Implementation of this Strategic Plan is premised on the assumptions and risks listed below.

4.5.1 Assumptions

(a) That the University will continue allocating sufficient resources for operations of the INSEFOODS;
(b) That partners and stakeholders will continue supporting endeavours of INSEFOODS;
(c) That our offerings match the stakeholders expectations.

4.5.2 Risks

(a) Social, Environmental, Political and Legal;
(b) Delays in disbursement of resources;
(c) Delays in facilitating procurement of materials;
(d) Availability of adequate expertise;
(e) Professional Risks.

5.0 ADMINISTRATIVE STRUCTURE

INSEFOODS will operate under the Division of Research Innovation and Outreach. The Director will oversee the day-to-day running of the Centre. The Centre will be governed by a board to be constituted by the DVC, RIO. INSEFOODS will be expected to take up the challenge of responding adequately to national, regional and international needs. It must have relative autonomy and legitimacy as a centre of excellence for reputable and innovative research and training in order to attract national, regional and international attention and support.

The Centre requires a basic administrative structure of its own for it to effectively manage the various activities and satisfy the various interests in research, training and community outreach. To this end, the following structure needs to be considered and be in place in the next five years.

Figure 5.1 below is the organogram for the Centre.

INSEFFODS ORGANOGRAM

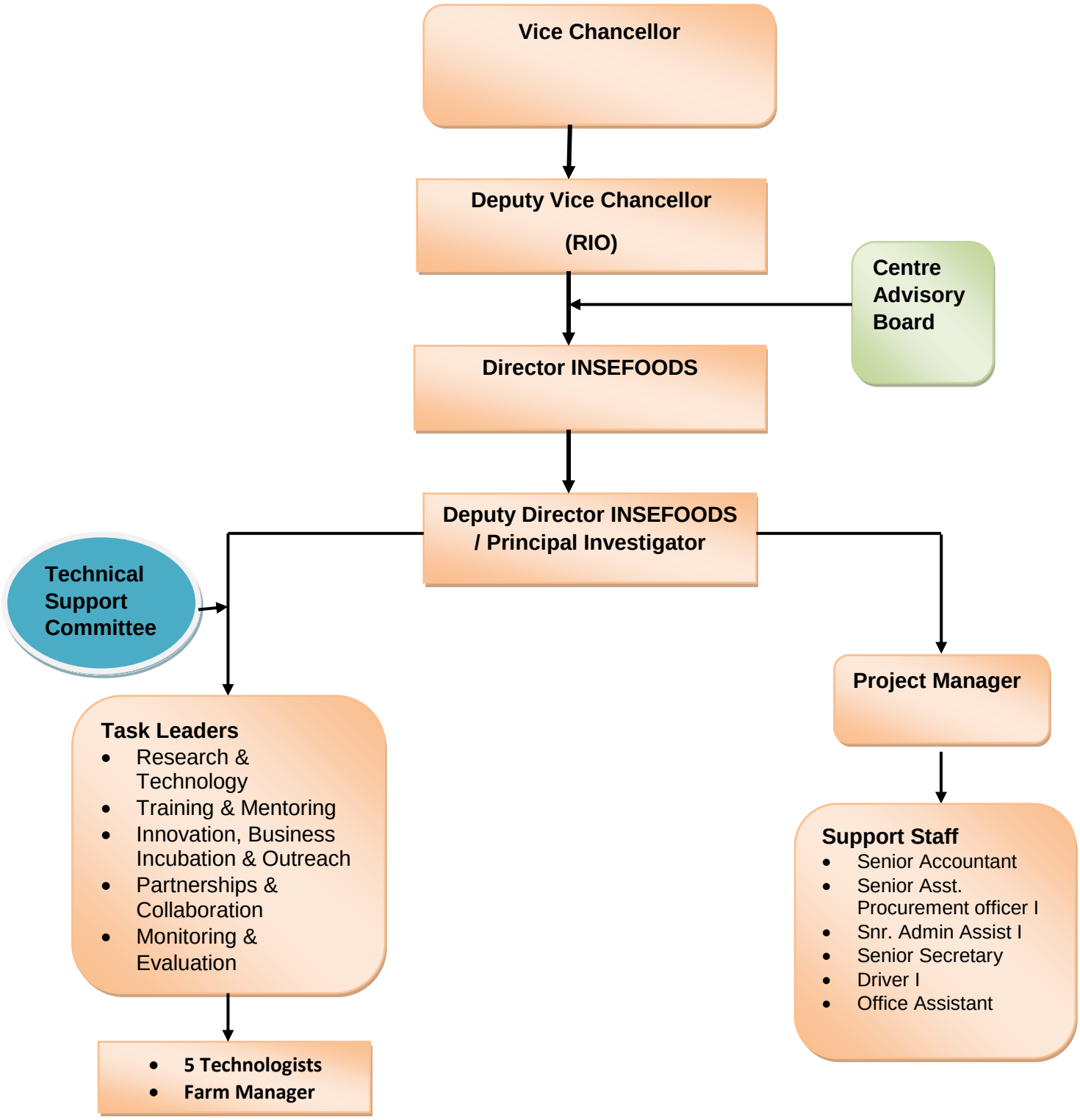


Fig 5.1: The Organogram showing INSEFOODS Administrative Structure

Annex 1
List of Selected Partners/Stakeholders

The following are selected partner/stakeholder institutions for the Centre and the roles they will play:

Category/type of partnership/Stakeholder	Key Partner	Partner	Associate Partner
JOOUST	• Staff (academic & support) • Postgraduate students		
Advanced Knowledge Institution	ICIPE, *Research and Development*	*Internship/Industrial attachment*	Kenya Agricultural and Livestock Research Organization (KALRO) *On-farm trial*
Private Sector – National	SANERGY *Research and Development*	UNGA Feeds *Industrial Processing and commercialization*	
Private Sector: International	COCHRANE Centre (SA) *Research & Development Benchmarking*	AGRO Protein (SA) *Internship & Industrial attachment*	MAMAH (UG) ECOFARM (UG) *On-farm trials Demonstrations*
Peer Universities National	JKUAT *Instrumentation and bench work*	MMUST *Ecological comparison Student placement Benchmarking*	*Dissemination*
Peer Universities: Regional	Makarere Universities (Uganda) *Ecological comparison. Curriculum development and review, Training*		
Peer Universities: International	University of Copenhagen Wageningen Netherlands, University of Copenhagen *Student & staff exchange programmes. R&D.*		
Research Institutions: National	National Museums of Kenya *Research and Development*	KALRO, KEMRI, National Bee Keeping Station *On-farm trial. Industrial attachment and postdoctoral training*	KALRO National Bee Keeping Station *Dissemination*
Research Institutions: Regional	ICIPE (African Insect Science for Food and Health)		
Research Institutions International	ILRI, ICIPE *Research and Development*		
Others		Retail Outlets *Distribution* *KeBS- Regulation* *LVBC, LVEMP*	County Governments CBOs, SBOs Promotions, civic education