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BASELINE REPORT ON INCUBATORS AND TECHNOLOGY TRANSFER

Nine university case studies from East and Southern Africa

Universities Promoting Linkages for Impactful Training, Innovation and Technology Transfer in Agriculture (UPLIFT-Ag)

Erasmus-EDU-2023-CBHE PROJECT No. 101129421

UPLIFT-AG WP4 BASELINE REPORT

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This report is part of Work Package 4 of the UPLIFT-Ag project. The objectives of the work package are: a) to develop the capacity of existing and new incubation centers to manage and commercialise university intellectual property; b) to develop operational guidelines and sustainable business models for diUerent types and scales of incubators; and c) to develop a framework for supporting and incubating green agri-innovations, business ideas and start-ups in HEIs.

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The UPLIFT-Ag project is a collaboration between Kenyatta University (KU), Kenya, Chuka University (CU), Kenya, Taita Taveta University (TTU), Kenya, University of Rwanda (UR), Rwanda, University of Lay of Adventists of Kigali (UNILAK), Rwanda, Université de Ngozi (UniNGOZI), Burundi, Universite Du Burundi (UB), Burundi, Chinhoyi University Of Technology (CUT), Zimbabwe, Zimbabwe Open University, Zimbabwe, Hochschulen fur Angewandte Wissenschaften Neu-Ulm, Germany, Universita Politecnica delle Marche (UNIVPM), Italy, and University of Copenhagen (UCPH), Denmark.

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Summary

This report serves as a baseline study for the Erasmus+ Research Capacity Building in Higher Education project UPLIFT-Ag, which is implemented by nine African and three European projects from 2023 to 2026. The UPLIFT-Ag project supports a multilateral partnership to implement actions that will improve the relevance, quality, modernisation and responsiveness of agricultural higher education in Kenya, Rwanda, Burundi and Zimbabwe. This baseline study is conducted as part of Work Package 4: Innovation and entrepreneurial capacity strengthening. Work Package 4 aims to develop the capacity of existing and new incubation centres to manage and commercialise university intellectual property; develop operational guidelines and sustainable business models for diUerent types and scales of incubators; and develop frameworks to support and incubate green agri-innovations, business ideas, and start-ups in HEIs. The specific aim of the baseline study is to provide a starting point for these eUorts.

In Chapter 2, the report provides a general overview of key concepts related to university incubators and innovation hubs, as well as technology transfer in the university context. The purpose of this chapter is to establish a common terminology and attention to central aspects of these functions. This includes an overview of the types of organisations that are established within universities to support enterprising behaviour and innovation among students and staU. Moreover, income streams, business models, and the entrepreneurial ecosystem are briefly introduced.

Chapter 3 provides a brief overview of the methodology and the data sources used in the study. Chapters 7 and 8 present the data collection tools used in the study.

Chapter 4 gives a high-level overview of the nine universities and the status of their incubation and technology transfer activities. In Chapter 5, nine case studies are presented, one for each African UPLIF-Ag partners university. Although the cases are quite diverse, they all aim to establish a baseline for the university's developmental stage. The cases describe the history and background, organisational structure and governance, staU'ing and budget issues, service provision and internal and external relations. Each incubator or technology transfer oU'ice is asked to identify its own strengths and weaknesses, what it perceives to be its development needs, and in which areas it believes it can contribute its experience to help reach UPLIFT-Ag's objectives. If possible, the universities have also provided performance data. However, this is not relevant for all universities, as some are yet to establish incubators or technology transfer units.

Chapter 6 summarises the identified development needs across the nine cases. These topics are intended to be the focal points for the development of the training and organisational support delivered by UPLIFT-Ag to achieve the project's objectives.

For readers interested in how incubators and technology transfer operations are being established in resource-scarce environments, we encourage readers to take a deep dive into the qualitative case studies to understand the nature of these challenges. Thus, the report can be used beyond the UPLIFT-Ag context as an insight into the multiple dimensions that university decision makers need to consider when building entrepreneurship and start-up support and professionally managing the intellectual property rights associated with the innovation emerging from their organisations.

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Preface

This baseline report is an updated version of the 2024 tentative baseline publication. The aim of the baseline study was initially to provide an overview of the developmental stage of incubation and technology transfer activities at the nine universities that constitute the African partners in the UPLIFT-Ag project.

Moreover, a central aim was to identify key areas where the UPLIFT-Ag project could support universities in learning from one another and from best practices, enabling them to advance their incubation and technology transfer activities jointly. These objectives were already reached in the first version of the report, finalised in the fall of 2024.

The insights from the initial baseline study have been used to develop an online training manual for incubator and technology transfer activities. This online resource is used for project-internal training and is publicly available. The manual can be accessed at https://sites.google.com/view/incubator-and-tto-training-man/home.

However, during this initial work, the core team behind the report encountered many valuable insights that we also wanted to share with a broader audience. Hence, in this second version, the initial report has been extended to include nine case-study sub-chapters (5.1-5.9) that narrate the experiences of the nine partner universities.

We thank all the colleagues at the UPLIFT-Ag universities who have contributed to the elaboration of the report.

We hope you, the reader, find the report as engaging and thought-provoking as it has been to compile.

The author team

1 Introduction

1.1 The Uplift-Ag project

The UPLIFT-Ag project seeks to improve the eU̓ectiveness of higher education institutions (HEIs) in Kenya, Rwanda, Burundi, and Zimbabwe by fostering strong partnerships with the agriculture industry.

The primary goal is to improve the quality of agricultural education through innovative teaching methods, industry collaboration, and curriculum reform. The project seeks to equip graduates with employability and entrepreneurial skills, thereby addressing challenges in food security, unemployment, and economic development.

By establishing and strengthening innovation incubation centres and technology transfer oU̓ices, UPLIFT-Ag aspires to drive impactful research and technology commercialisation in the agricultural sector.

The UPLIFT-Ag project is organised into five work packages, each led by a specific partner institution, ensuring a collaborative and structured approach. The project's activities include baseline analyses,

capacity building, support for incubation and technology transfer functions, and the development of innovative curricula and teaching methods.

By integrating industry roles in teaching and establishing incubation centres, the project aims to enhance the relevance and quality of agricultural education, fostering employability and entrepreneurship among graduates. This approach directly addresses the identified gaps and aligns with the project's development rationale.

1.2 Objectives of the incubator and TTO baseline study

The aim of the baseline study was to establish a solid basis for the activities in the UPLIFT-Ag project, supporting the development of new incubation centres and TTO functions at the partner universities by providing an overview of the current situation and development level of these organisational units.

Moreover, the baseline provides a detailed overview of the training needs experienced by the UPLIFT-Ag project partner universities, enabling the project to develop the most relevant training materials and online training activities. Moreover, the baseline study highlights opportunities for South-South collaboration and knowledge exchange. Finally, the baseline study includes eight case studies that provide insights into how incubation and technology transfer have been addressed across very diU erent organisational and institutional contexts in Africa.

2 Background [1]

In this chapter, we provide a brief overview of the key concepts and basic knowledge required to understand the subsequent elaboration of UPLIFT-Ag project partners' experiences with incubation and technology transfer oU ice establishments. In particular, we aim to identify the role universities can play as important actors in entrepreneurial ecosystems through incubation and technology transfer activities.

2.1 University incubators and innovation hubs

Entrepreneurship education is widely implemented at African universities, often with a focus on theoretical introductions across all disciplines and more specialised, hands-on courses in programmes such as business management, agribusiness, agriculture, and engineering. Many universities have or are developing entrepreneurship support functions such as business incubators, business parks, or innovation centres. While supporting internal beneficiaries, i.e., students and staU, these support units may also support external actors and maintain links to the entrepreneurial ecosystem surrounding the universities.

2.1.1 Entrepreneurship education

Universities oU er courses and programs focused on entrepreneurship, covering topics such as business planning, venture creation, and innovation management. These programs often include both theoretical and practical components to equip students with the necessary skills.

[1] We used AI tools to elaborate input for this chapter, however all texts are critically reviewed and supplemented with insights from our own research and experiences within the UPLIFT-Ag consortium.

Entrepreneurship education equips individuals with the skills, knowledge, and mindset to identify opportunities and create successful ventures. Here are some key aspects.

- **Skill development**: Entrepreneurship education emphasises critical thinking, problemsolving, creativity, and leadership. These skills are essential for navigating the challenges of starting and running a business.
- **Practical experience**: Many programs incorporate hands-on learning through projects, internships, and simulations. This practical approach helps students apply theoretical knowledge to real-world scenarios.
- **Interdisciplinary learning**: Entrepreneurship education often integrates concepts from various fields such as business, engineering, and social sciences. This interdisciplinary approach fosters a holistic understanding of how diUerent aspects of a business interact.
- **Networking opportunities**: Programs frequently provide access to a network of entrepreneurs, investors, and mentors. These connections can be invaluable for gaining insights, advice, and potential funding.
- **Innovation and creativity**: Encouraging innovative thinking and creative problem-solving is a core component. Students learn to develop unique solutions and business models that can disrupt existing markets.

- **Global perspective**: Many entrepreneurship programs emphasise a global outlook, preparing students to operate in diverse and international markets. This includes understanding global trends and cultural diUerences.
- **Support systems**: Universities often oUer resources such as incubators, accelerators, and funding opportunities to support entrepreneurial ventures. These resources help reduce the risk and increase the chances of success for new startups.

Entrepreneurship education aims to inspire and prepare the next generation of entrepreneurs to drive economic growth and innovation. If you have any specific questions or need more details, feel free to ask!

2.1.2 Incubators and accelerators

Universities play a crucial role in fostering entrepreneurship among students and staU through a range of initiatives and resources. Here are some of the main ways they provide support [2,3]:

- **Incubators and accelerators**: Many universities have established incubators and accelerators that provide startups with oUice space, mentorship, and access to funding. These programs help early-stage companies develop their business models and scale their operations.
- **Mentorship and networking**: Universities connect students and staU with experienced entrepreneurs, industry experts, and alumni through mentorship programs and networking events. This support helps budding entrepreneurs gain valuable insights and build professional relationships.

- **Competitions and grants**: Business plan competitions, pitch contests, and grant programs are common at universities. These initiatives encourage innovation and provide financial support to promising entrepreneurial projects.
- **Makerspaces and labs**: Universities often provide access to makerspaces, labs, and other facilities where students and staU can develop prototypes and test their ideas. These resources are essential for hands-on learning and innovation.
- **Interdisciplinary collaboration**: By promoting collaboration across diUerent faculties and departments, universities encourage the exchange of ideas and foster a multidisciplinary approach to problem-solving and entrepreneurship.
- **Intellectual property support**: Universities oUer guidance on intellectual property rights, helping entrepreneurs protect their innovations and navigate the complexities of patent and trademark law.

These initiatives collectively create a supportive ecosystem that nurtures entrepreneurial talent and drives innovation, contributing to economic growth and societal advancement.

[2] Universities should support more student entrepreneurs. Here's why – and how. World Economic Forum, Oct 2020. [Accessed at: https://www.weforum.org/stories/2020/10/universities-should-supportmore-student-entrepreneurs/].

[3] Schimperna, F., Nappo, F., & Marsigalia, B. (2022). Student Entrepreneurship in Universities: The State-of-the-Art. *Administrative Sciences*, *12*(1), 5. https://doi.org/10.3390/admsci12010005.

2.1.3 Entrepreneurial ecosystems

An **entrepreneurial ecosystem** refers to the interconnected network of institutions, organisations, and individuals that collectively support and drive entrepreneurial activity within a region. This ecosystem includes universities, incubators, investors, government policies, and cultural attitudes towards entrepreneurship. In the African context, the entrepreneurial ecosystem is characterised by unique challenges and opportunities [4]. Key components include access to finance, market access, governance, support systems, infrastructure, and human capital [5]. African entrepreneurial ecosystems often emphasise the importance of community engagement and local solutions to address socio-economic issues. Despite facing hurdles such as limited funding and infrastructural constraints, these ecosystems are vibrant and dynamic, fostering innovation and resilience. They play a crucial role in job creation, economic diversification, and sustainable development, contributing significantly to the continent's growth and stability [6,7].

2.1.4 Business incubator business models

Business incubators come in various models, each designed to support startups in diUerent ways. Here are some common types [8,9]:

1. **University-based incubators**: These are aUiliated with universities and provide resources like oUice space, mentorship, and access to research facilities. They often focus on tech and innovation-driven startups.

2. **Corporate incubators**: Run by large corporations, these incubators aim to foster innovation within the company. They provide startups with funding, mentorship, and market insights, often in exchange for equity or strategic partnerships.
3. **Non-profit and government-sponsored incubators**: These are funded by government entities or non-profit organisations. They focus on economic development and supporting startups that can create jobs and drive local innovation.
4. **Virtual incubators**: These provide support remotely, oUering resources like mentorship, training, and networking opportunities online. This model is flexible and can support startups regardless of their location.

[4] Hernández-Chea, R., Mahdad, M., Minh, T. T., & Hjortsø, C. N. (2021). Moving beyond intermediation: How intermediary organizations shape collaboration dynamics in entrepreneurial ecosystems. *Technovation*, *108*, 102332. Doi: https://doi.org/10.1016/j.technovation.2021.102332.

[5] The Africa Entrepreneurial Ecosystem Index [Accessed at: https://africa.ecosystem.build/]. [6] Danquah, J.K., Mensah, M.S.B., Yamoah, W., Mahmud, Q.M. (2023). Understanding the Impact of the Entrepreneurial Ecosystem on Sustainability in Africa. In: Adomako, S., Danso, A., Boateng, A. (eds) Corporate Sustainability in Africa. Palgrave Studies in African Leadership. Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-031-29273-6_11.

[7] Alhaji Abdulai & N. Raja Hussain (2024) Dynamics of Entrepreneurial Ecosystem and Entrepreneurship Development: Evidence from Africa, Cogent Business & Management, 11:1, 2292315, DOI: 10.1080/23311975.2023.2292315.

[8] A Comprehensive Guide to the Startup Incubator Business Model [Accessed at: https://www.advisorycloud.com/blog/a-comprehensive-guide-to-the-startup-incubator-businessmodel].

[9] 8 Types of Business Incubators Every Entrepreneur Should Know [Accessed at: https://cheddarden.com/types-of-business-incubators/].

5. **Industry-specific incubators**: These focus on startups within a particular industry, such as biotech, healthcare, or food. They provide specialised resources and mentorship tailored to the unique challenges of that industry.
6. **Social/Public incubators**: These incubators support social enterprises that aim to address social or environmental issues. They provide resources to help these startups scale their impact.

Each model has its own strengths and is suited to diUerent types of startups and goals.

2.1.5 Incubator income streams

Business incubators can generate income from a variety of sources. Here are some common income streams [10,11]:

- **Equity stakes**: Many incubators take an equity stake in the startups they support. This means they own a percentage of the company and can profit when the startup succeeds, either through an acquisition, IPO, or other liquidity events.
- **Membership or service fees**: Incubators often charge startups fees for membership or for specific services such as oUice space, mentorship, and access to resources.

- **Government or private funding**: Non-profit incubators, in particular, may receive funding from government grants, academic institutions, or private donations. This funding helps cover operational costs and support services.
- **Event and program revenue**: Hosting events, workshops, and training programs can also be a source of income. These events can attract sponsorships and participation fees.
- **Consulting and advisory services**: Some incubators oU̓er consulting services to startups and other businesses, generating revenue through fees for these services.
- **Rental income**: Incubators that provide physical oU̓ice space can earn rental income from startups using their facilities.
- **Royalties from IP commercialisation:** In some cases, incubators may earn royalties from the commercialisation or licensing of intellectual property developed by the startups they support.

These diverse income streams help incubators sustain their operations and continue to support new startups.

2.1.6 Collaboration with local communities and industries

Business incubators at African universities collaborate with local communities and industries in several impactful ways:

[10] How Do Startup Incubators Make Money? A Look At The Business Model [Accessed at: https://realwealthbusiness.com/startup-incubators-make-money]. [11] How Do Startup Incubators Make Money? A Basic Guide [Accessed at: https://www.angelschool.vc/blog/how-do-startup-incubators-make-money].

- **Partnerships with local businesses**: Incubators often form strategic partnerships with local businesses to provide startups with market access and supply chain opportunities. These partnerships help startups integrate into the local economy and benefit from established business networks.
- **Community engagement**: Incubators engage with local communities through outreach programs, workshops, and events. These activities raise awareness about entrepreneurship and provide community members with opportunities to participate in and benefit from entrepreneurial initiatives [12].
- **Industry collaboration**: By collaborating with various industries, incubators can oU̓er specialised mentorship and resources tailored to specific sectors. This collaboration helps startups gain industry-specific insights and accelerates their growth.
- **Access to funding**: Incubators often work with local investors and financial institutions to secure funding for startups. This support is crucial for early-stage companies that need capital to develop their products and services [13].

- **Knowledge transfer**: Universities and incubators facilitate the transfer of knowledge and technology from academic research to practical applications in the industry. This process helps commercialise innovations and drives economic development [14].
- **Skill development**: Incubators provide training and development programs that enhance the skills of entrepreneurs and the local workforce. These programs often include business management, technical skills, and soft skills training [15].
- **Networking opportunities**: By hosting networking events and creating platforms for interaction, incubators help entrepreneurs connect with potential partners, customers, and mentors from the local community and industry [16].

These collaborations create a supportive ecosystem that not only helps startups thrive but also contributes to the region's economic and social development.

2.2 Technology transfer oU̓ices

Technology transfer oU̓ices (TTOs) at universities operate as intermediaries to facilitate the commercialisation of academic research. Their business model encompasses strategic and operational activities, including intellectual property management, licensing, and the creation of spin-oU̓ companies. TTOs aim to bridge the gap between academia and industry by fostering collaborations, securing patents, and negotiating licensing agreements. Key success factors include a supportive commercialisation culture, eU̓ective resource allocation, and robust evaluation metrics.

Technology transfer oU̓ices can play diU̓erent roles in the regional economy. The following typology of TTO roles is based on [17]:

- **TTO as catalyst**: The few universities that emerged as catalysts and global (regional) players in the university-industry collaboration to develop disruptive innovations.
- **TTO as '*smart bazaar*'**: universities that intend to generate and openly disseminate science at large; they perceive their responsibility to respond to human needs, and in general to engage society.
- **TTO as '*traditional shops*'**: TT as a process to drive research outputs that already exist into the marketplace through patents.

[12] Hjortsø, C.N., Romanova, G., Abdulkader, B. *et al.* Community engagement in African agricultural universities: challenges to the institutionalisation of engaged scholarship. *High Educ* (2025). https://doi.org/10.1007/s10734-025-01538-5.

[13] Lose, T. (2021). Institutionalised business incubation: A frontier for accelerating entrepreneurship in African countries. *Academy of Entrepreneurship Journal*, *27*, 1-10.

[14] Hassan, N. A. (2024), University business incubators as a tool for accelerating entrepreneurship: theoretical perspective. *Review of Economics and Political Science*, Vol. 9 No. 5 pp. 434–453, doi: https://doi.org/10.1108/REPS-10-2019-0142.

[15] Lose, T. (2021). Institutionalised business incubation: A frontier for accelerating entrepreneurship in African countries. *Academy of Entrepreneurship Journal*, *27*, 1-10.

[16] How Business Incubators Are Helping Entrepreneurs In Africa. Africa.com [Accessed at: [https://africa.com/how-business-incubators-are-helping-entrepreneurs-in-africa/].

- **TTO as orchestrator**: recognise the relevance of exploiting new scientific and technological opportunities to boost local economic development, in addition to teaching and research.

2.2.1 Technology transfer

Technology transfer, in the context of university Technology Transfer OUices (TTOs), refers to the process of transferring discoveries and innovations developed through academic research to the commercial sector. This involves managing intellectual property, securing patents, and facilitating licensing agreements or spin-oU company creation. The goal is to translate scientific research into marketable products or services, thus fostering innovation and contributing to economic development.

2.2.2 The TTO's income-generating activities

Ideally, a university-based technology transfer oUice (TTO) can engage in several incomegenerating activities to improve sustainability and ensure a funding source for the university. Here are some key ones [18,19,20]:

- **Licensing agreements**: Licensing university-owned patents and technologies to companies can generate significant revenue. This includes exclusive and non-exclusive licenses.
- **Spin-oU companies**: Establishing start-ups based on university research can provide equity stakes and future income from successful ventures.

[17] Baglieri, D., Baldi, F., & Tucci, C. L. (2018). University technology transfer oUice business models: One size does not fit all. *Technovation*, *76*, 51-63. doi: https://doi.org/10.1016/j.technovation.2018.05.003.

[18] Siegel, D. S., Veugelers, R., & Wright, M. (2007). Technology transfer oUices and commercialisation of university intellectual property: performance and policy implications. *Oxford Review of Economic Policy*, *23*(4), 640–660. http://www.jstor.org/stable/23606751.

[19] Building a technology transfer oUice – starting out. Science Business [Accessed at: https://sciencebusiness.net/news/69049/Building-a-technology-transfer-oUice-%e2%80%93-startingout].

[20] Hockaday, T. (2009). What is the Best Structure for a University Technology Transfer OUice? Oxford University Innovation [Accessed at: https://innovation.ox.ac.uk/wp-content/uploads/2015/01/BestStructure-for-a-University-Technology-Transfer-OUice.pdf].

- **Patent management**: Filing and maintaining patents for university inventions and then licensing these patents to industry partners.
- **Consulting services**: OUering expert consulting services by university researchers to industry partners.
- **Material sales**: Selling research materials, such as biological samples or specialized chemicals, developed within the university.
- **Managing seed funds**: Investing in early-stage technologies and start-ups through seed funds managed by the TTO.
- **Collaborative research**: Partnering with industry for collaborative research projects, which can include funding and shared resources.

These activities not only generate income but also foster innovation and strengthen the university's ties with industry.

3 Methodology

The baseline study draws on qualitative and quantitative information collected from the UPLIFTAg partner universities through interviews and surveys. Based on this information, we identify the existing development stages, used practices and business models applied. We also identify perceived capacity gaps in incubation centres and technology transfer oUices as preparation for the development of a training program. The methodology is expected to capture partners' previous experiences (in cases where incubation and technology transfer have been pursued) and identify diUerences in, for example, institutional setting, organisational culture, and organisational arrangements among the project's partners. We expect that understanding this variation and complexity will provide an excellent basis for developing relevant contextualised training content.

The first step was to identify the key informants, as they were not necessarily involved in the project from its inception. This was particularly relevant because some universities may not have full-time staU dedicated to incubator and technology-transfer activities, as these are handled by other oUices. Key informants included staU of existing or emerging incubators, innovation hubs, maker spaces or similar organisational units. Similarly, we identified staU members responsible for technology transfer activities at each university.

Once the key informants were identified, they were asked to complete a questionnaire developed to identify business models, practices, and gaps in management, resource allocation, and strategy for incubators and TTOs. The questionnaire is found in Appendix A.

Subsequently, the key informants were interviewed online via Zoom using a semi-structured interview approach. The aim was to obtain supplementary and clarifying information or to fill the gaps in the storyline emerging from the survey responses. The interview guide for the in-depth interviews included the same questions as the survey (see Appendix A). This phase was critical because many concepts and terms related to incubation and technology transfer were new to the informants, as universities, in some cases, did not have separate units or oUices responsible for incubators and TTOs.

After the interviews, the two main authors began elaborating on the case study descriptions in Chapter 5 using the two templates in Appendix B. However, it proved to be diUicult to reach the intended level of detail due to a lack of specific information points. Therefore, a second data collection was initiated, during which the initial draft case study description was sent to the respective key informants, who were asked to provide further information to address some gaps in the storyline. In addition, this step enabled the key informant to collect specific information on topics raised during the interview, which they needed to verify by consulting documents or colleagues. Moreover, some interviews were aUected by a poor internet connection, and oUering the option to provide information in a written document would facilitate comprehension, minimising the risk of misunderstandings. Finally, the key informants obtained an opportunity to verify the initial interpretations made by the two main authors.

The initial data collection provided the information needed to fulfil the main goal of the baseline study, i.e., to reach conclusions regarding the development status and training needs. An overview of the development status is provided in Chapter 4. The conclusions regarding the challenges experienced and the resulting training needs are presented in Chapter 6. These challenges constitute a set of issues common to multiple universities and provide the basis for the training material developed in the UPLIFT-Ag Work Package 4, i.e., an online tool and a platform to support universities

in making strategic decisions about establishing and managing in-house business incubators and technology transfer oU̓ices or functions.

3.1 Data collection

An initial interview round was conducted via Zoom in May and June 2024, resulting in 14 semistructured interviews. Surveys requesting additional case study information were sent to key informants in September 2024, and responses were obtained during the next 4-5 months. The second interview round was conducted in February 2025 to supplement the evolving case descriptions. This round resulted in four additional interviews. A list of the data collection through Zoom interviews is shown in Table 1.

Table 1. Key informant interviews conducted for the baseline study.

Name of University	Theme	Key informant	Function of the key informant	Format	Date
Kenyatta University	Incubator and TTO	Prof. Maina Mwangi	Director of the Directorate of Innovation, Incubation and Industry Linkages	Zoom interview: 2 hours, 5 minutes	4 May 2024
Chuka University	Incubator and TTO	Dr. Zipporah Muthui	Lead Chuka University Technology and Innovation Transfer and Commercialisation Hub	Zoom interview: 1 hour, 18 minutes	26 February 2025
Taita Taveta University	TTO	Mr. Lucas Mwangala	Project OU̓icer, Programme and Planning, Academic Research and Outreach Division	Zoom interview: 1 hour, 1 minute	10 June 2024
	Incubator	Prof. Mwagandi Shadrack Mwakio	Head of Department of Economics, Entrepreneurship, and Social Sciences	Zoom interview: 1 hour, 13 minutes	11 June 2024
University of Rwanda	Incubator	Prof. Theophile Niyonzima	Professor aU̓iliated with the Centre for Innovation and Entrepreneurship (CIE) and the Centre for Environment, Entrepreneurship and Sustainable Development (CEESD)	Zoom interview: 56 minutes	10 June 2024
	TTO	Dr. Jeanine Niyonkomezi	Product development manager of Grid Innovation and Incubation Hub	Zoom interview: 42 minutes	10 June 2024
UNILAK	TTO	Dr. Nsanzumukiza Martin Vincent	Director of the Directorate of Research and Consultancy	Zoom interview: 56 minutes	10 June 2024
	Incubator	Dr. Innocent Ndikumana	Senior lecturer in Entrepreneurship	Zoom interview: 38 minutes	10 June 2024

	Incubator	Dr. Innocent Ndikumana	Senior lecturer in Entrepreneurship	Zoom interview: 3 hours, 3 minutes	21 February 2025
University of Ngozi	TTO	Mr. Nyandwi Siméon		Zoom interview: 1	7 Juni 2024
Name of University	Theme	Key informant	Function of the key informant	Format	Date
				hour, 9 minutes	
	Incubator	Amidou Nshimirimana	Technical coordinator of Incubator	Zoom interview: 41 minutes	7 June 2024
University of Burundi	Incubator and TTO	Prof. Richard Ndayishimiye	Dean of UB Business School	Zoom interview: 1 hour, 14 minutes	7 Juni 2024
	Incubator	Prof. Richard Ndayishimiye	Dean of UB Business School	Zoom interview: 51 minutes	26 February 2025
	TTO	Prof. Richard Ndayishimiye	Dean of UB Business School	Zoom interview: 1 hour, 14 minutes	20 February 2025
Chinhoyi University of Technology	Incubator	Lecturer Patridge Mlambo	Technical Manager Innovation, Research Innovation & Business Incubation Hub	Zoom interview: 48 minutes	7 Juni 2024
Zimbabwe Open University	Incubator and TTO	Prof T. Mapolisa	Director of Research, Innovation and Technology Transfer and Full Professor of Education	Zoom interview: 41 minutes	10 Juni 2024
	Incubator and TTO	Prof T. Mapolisa	Director of Research, Innovation and Technology Transfer and Full Professor of Education	Zoom interview: 1 hour, 12 minutes	28 February 2025
	Incubator	Senior Lecturer Trust Mutero	Head of Innovation Hub and Senior Lecturer in the Faculty of Technology	Zoom interview: 52 minutes	10 Juni 2024

3.2 Use of the baseline report for other deliverables

Based on the baseline study and additional information, a sub-working group was tasked with establishing the foundation for each university to develop ideal, scalable incubator and TTO (business) models that can focus local development eU̓orts.

Many Standard Operating Procedures (SOPs) and similar documents exist for incubation centres. See Table 2 for some examples. Still, they are often unfit for the UPLIFT-Ag project's purpose, as they are often very generic, overly organisational and management-oriented, overly complex, and not aligned

with the realities of African institutions [21]. For this reason, in the UPLIFT-Ag project, we have aimed to elaborate simpler guidelines that focus primarily on the strategy level of the

[21] Hjortsø, C. N. P., Alexander, I. K., & Hernandez Chea, R. R. (2017). Experiences and Lessons Learned from the UniBRAIN Agribusiness Incubation Programme. Frederiksberg: Department of Food and Resource Economics, University of Copenhagen. IFRO Report, No. 266 [Accessed at: https://www.researchgate.net/profile/Carsten-Hjortso/publication/322404331_Experiences_and_Lessons_Learned_from_the_UniBRAIN_Agribusiness_Incubation_Programme/links/5a579af3aca2726376b66746/Experiences-and-Lessons-Learned-fromthe-UniBRAIN-Agribusiness-Incubation-Programme.pdf].

incubation and technology transfer function development processes and can serve as a guide for identifying training needs based on organisations' developmental levels [22]. We aim to develop a scalable training program that enables training on diUerent levels (basic, intermediate, and advanced). We aim to establish a competence-based curriculum for this training and to design it to meet the needs of diUerent stakeholder groups (i.e., management, incubation/TTO professionals, students, teachers, and researchers). The main idea is to develop local training capacity to ensure post-project sustainability across all partner countries and to establish a regional knowledge-sharing community of practice [23].

Table 2. Examples of management guidelines for incubator operations.

- Business incubation – from startup to scaleup: A Policy Brief from the Policy Learning Platform for a Smarter Europe (Interreg Europe Policy Learning Platform).
- Guidelines and Standard Operating (SOP) for Incubation Support to Startups Procedure as per Arunachal Pradesh Startup Policy 2021.
- Managing the Incubator (infoDev and World Bank).
- A comprehensive Handbook for Incubators and Accelerators (Golf Organization for Industrial Consulting).
- Guidelines on Business Incubator Establishment (Stritih Sustainable Development).
- Policy Brief on Incubators and Accelerators that Support Inclusive Entrepreneurship (Organisation for Economic Co-operation and Development).
- TRAINING MANUAL FOR INCUBATORS: Business incubators to support entrepreneurship and MSME creation in Somalia (UNIDO).
- PROCEDURE MANUAL FOR INCUBATION CENTERS MANAGEMENT (Rwanda TVET Board).
- Development GUIDELINES FOR TECHNOLOGY BUSINESS INCUBATORS (Capacity Building International gGmbH).
- Business Incubators for Sustainable Development in the SPECA Sub-region (United

[22] This output will address Milestone 12 in the UPLIFT-Ag project document.

[23] The knowledge sharing community is associated with Milestone 11 in the UPLIFT-Ag project document.

4 Baseline status 2024

One of the primary purposes of the baseline study was to establish knowledge of the development stage the universities in the UPLIFT-Ag have reached regarding incubation and technology transfer activities. Table 3 provides an overview of the status of the incubation activities, and Table 4 provides information about the development stage of technology transfer activities. In Chapter 5, the findings from each university are presented, and the conclusions across the nine cases are presented in Chapter 6.

Table 3. Overview of incubator functions at UPLIFT-Ag partner universities as of May 2024.

Name of University	Incubator name	Established	State of development
Kenyatta University	Chandaria Business Innovation and Incubation Centre	2011	Fully operational, admitting innovators and entrepreneurs with regular intakes about once every 2 months
Chuka University	CU holds the Technology and Innovation Support Centre Eastern Region oU'ice CU Science Park is under construction	Starting phase/ early development phase	Physical location is under construction, but the staU' and incubatees have access to oU'ice space
Taita Taveta University	-	-	Still at the concept stage
University of Rwanda	Grid Innovation and Incubation Hub (GIIH)	2020	The incubator (GIIH) at UR is still in early development. However, over 125 young innovators were trained in three diU'erent cohorts and fifteen (15) startups registered in diU'erent sectors. A maker space has been established with gadgets and laboratory materials
UNILAK	Agribusiness Incubation and Innovation Hub (AIIH) - UNILAK KIGALI HUB	2022	The incubation (AIIH) at UNILAK is still in early development
University of Ngozi	-	-	Still at concept stage
University of Burundi	CUNAUB, UNIPOD		CINAUB is under establishment. UNDP has recently committed to building the UNIPOD
Chinhoyi University of Technology	Chinhoyi University of Technology Innovation Hub & Agro-Industrial Park	2019	Physical Infrastructure and manpower all in place and the units are operational

Zimbabwe Open University	Technovation Hub	2021	The Technovation Hub is in early development

Table 4. Overview of the technology transfer functions in UPLIFT-Ag partner universities as of May 2024.

Name of University	Name of the responsible organisational unit	Established	State of development (in 2024)
Kenyatta University	Technology Transfer OU'ice, Kenyatta University	2019	Operational, main activity is to support IP protection
Chuka University	Supported by the Technology & Innovation Support Centre Eastern Region, which is integrated at CU		
Taita Taveta University	Responsibility of the Research OU'ice	2017	
University of Rwanda	Centre for Promotion of Students' Innovation and Entrepreneurship (CPSIE)	2017	Starting phase/ early development phase
UNILAK	Responsibility of the Directorate of Research and Consultancy	2012	Under development and improvement
University of Ngozi	No dedicated function	-	-
University of Burundi	Responsibility of the Directorate of Research	-	-
Chinhoyi University of Technology	The CUT Innovation Hub is the overall technology transfer	2021	Unit operates with physical facilities
Zimbabwe Open University	Responsibility of the Directorate of Research, Innovation and Technology Transfer	2021	Early development

5 UPLIFT-Ag partner case descriptions

5.1 Kenya - Kenyatta University Innovation Centre

5.1.1 Introduction

At Kenyatta University, the incubation centre and technology transfer oU'ice are organised as part of the Directorate of Innovation, Incubation and Industry Linkages, which deals with incubation, IP management and industry linkages. The Chandaria Business Innovation and Incubation Centre (CBIIC) is the facility within the Directorate where incubation activities are undertaken. The TTO is a section in the Directorate. Figure 1 shows the organisation of the Directorate. The main sections in the Directorate are structured to provide incubation services, IP management services, and industry linkages. Each section is headed by a senior administrator, typically a master's degree holder. The administrators are drawn from a pool of administrative staU' working in diU'erent university sections. They are not required to have any specific relevant experience before being deployed to the incubation; they can also be transferred to any other oU'ice at any time without reference to any skills or training they have undertaken to improve their eU'ectiveness in their current roles. However, some administrators have been deployed at the Incubation Centre for nearly 10 years. The Directorate is administratively placed within the Division of Research, Innovation and Outreach (RIO). Until now, the director has been appointed by the vice chancellor among the academic staU' and reported through the deputy vicechancellor, RIO. In the future, there is a proposal to appoint a director/senior manager for the incubator centre whose sole duty will be to manage the centre without academic responsibilities. The proposed manager is expected to have professional training and background experience in innovation and IP management, technology transfer, commercialisation, investor engagement and entrepreneurship.

5.1.2 The Chandaria Business Innovation and Incubation Centre

History and background

The Chandaria Business Innovation and Incubation Centre was established in 2011 as a publicprivate partnership between Kenyatta University and the Chandaria Foundation and is supported by the Kenyan Ministry of Education. Kenyatta University initiated the vision and provided part of the financing; Chandaria Foundation financed a significant cost of construction and seed capital for innovators; by endorsing the initiative, the Government of Kenya created the impetus for other government agencies to invest resources and direct support to the centre, for example, the Kenya National Innovation Agency, the Youth Enterprise Development Fund, the National Research Fund, National Commission for Science, Technology and Innovation, among others. The driving force behind the establishment of the incubation centre was the then Vice-Chancellor, who wanted to create a mechanism for supporting university students in starting their own businesses.

The Vice-Chancellor benchmarked with other universities around the world to be inspired on how to organise the incubation centre, and the incubator started out small-scale to test the feasibility of the idea. The initial funding from Chandaria Foundation was mostly for construction, and Kenyatta University has been providing the operational budget for running the centre. In addition to the funding from the Chandaria Foundation for establishing the centre (KSh. 25 million), the university also contributed significant resources (KSh. 25 million) to the construction of the oncampus

incubation centre facility. The initial years from 2011 to 2015 witnessed a significant increase in partners and the number of entrepreneurs who wanted to join the centre. During the founding years (2011-2016), the Kenyan Government, through the National Innovation Agency, provided funding to support the innovator and, in some cases, gave direct funding to startups enrolled in the incubator. In the same period, Kenyatta University was able to invest capital in the Chandaria BIIC using income streams unrelated to the incubator.

Since 2011, the university has had three Vice-Chancellors, each with their own perspective on what should be the role or mandate of the Chandaria BIIC. This reflects that there has been an ongoing discussion regarding the role of the incubator. For example, some actors see the incubator's 'money-making' potential for the university as central, whereas others see the educational aspect of enhancing students' entrepreneurship skills as the primary objective. University actors appreciate the incubation concept and acknowledge that Kenyatta University has pioneered student entrepreneurship support, benefiting the university's visibility. However, some of the key university actors are not familiar with the actual operation and activities of an incubator, which, for example, translates into a lack of understanding of the kind of resources that are needed to run such an organisation. As a result, in the current situation, there is a lack of agreement on the scale of investment the university should make to scale up or enhance the incubation services, which seems to be a prerequisite for meeting the increasing demand for services and local competition.

Since 2011, the number of incubators in the broader entrepreneurial ecosystem of the greater Nairobi and generally in Kenya has increased, resulting in significant competition for attracting and retaining entrepreneurs with promising innovations. This has heightened the startup's expectations for service level and the benefits incubators provide.

Target group

Incubatees' admission to the incubator is based on an application process. The Chandaria BIIC enrolment policy reserves 70% of the incubator slots for Kenyatta University students and staU' and 30% for entrepreneurs from outside the university. There is usually high demand for the 30% external seats but less competition for the 70% reserved for Kenyatta University students. Since its foundation in 2011, approximately 300 entrepreneurs or teams have been enrolled in Chandaria BIIC, and nearly 60 startups have been successfully established.

Organisation and institutional framework

Initially, the Chandaria BIIC was an independent unit with its own systems and structures to support the running of the centre. In 2018, the centre was merged with the oU'ice dealing with IP management to form the Directorate for Innovation Incubation and Industry Linkages. The merger was part of the re-organisation of the university to rationalise operations and reduce expenditure. The merger was seen as a progressive move, bringing together oU'ices oU'ering related services. The Chandaria BIIC is currently managed by the Director, reporting to the Vice Chancellor through the Deputy Vice Chancellor. Figure 1 shows the present organisation.

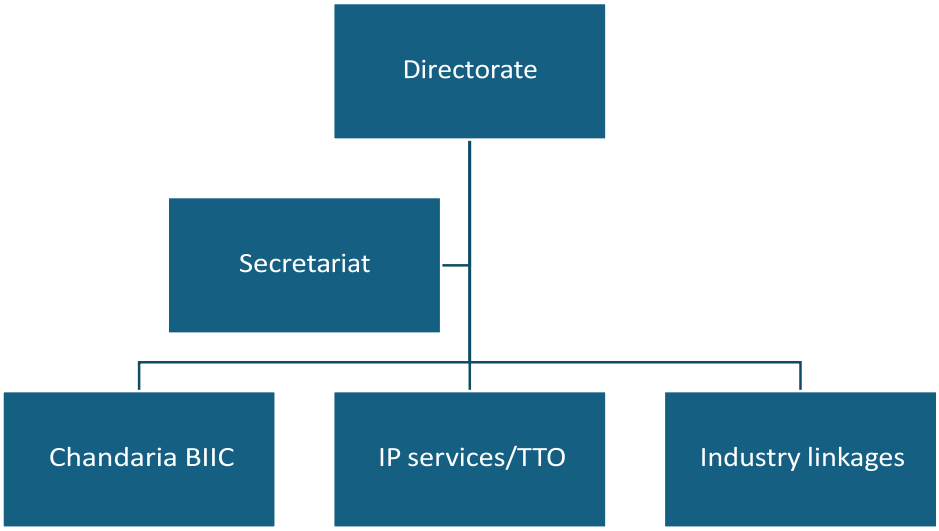

Figure 1. Organisational structure of the Directorate of Innovation, Incubation, and Industry Linkages at Kenyatta University.

From the beginning, Chandaria BIIC has operated with a board of directors (BoD) appointed by the Vice-Chancellor from among the university staU to support day-to-day management. Because incubatees want to interact with successful entrepreneurs, in 2023 a proposal was initiated by the DIIIL director for the BoD to be reconstituted and to include alumni with a successful startup record and private sector representatives. The change in the BoD's constitution is in process.

The Chandaria BIIC operations are guided by the Incubation Policy (2013-2017, not yet updated), the university's IP Policy (published in 2010 and revised recently to IP and Commercialisation Policy, still under review by the University management) and the University Research Policy. The centre's incubation policy has evolved in response to challenges and conflicts encountered over time, as well as through learning from other incubators. Previously, Chandaria BIIC's strategy (2019) aligned with the university's corporate strategy, which stipulates that Kenyatta University should be an eUective provider of incubation and entrepreneurship capacity development services. The Chandaria BIIC strategy needs to be updated to align with the newly launched Kenyatta University strategy 2023 – 2027.

Chandaria BIIC reports quarterly to the university management, but a specific monitoring & evaluation (M&E) system does not exist.

The embeddedness within the university bureaucracy is perceived to negatively impact the flexibility and agility necessary to run the incubator eUiciently. The (legitimate) bureaucratic nature of public governance conflicts with the logic and pace of the business environment where speed is necessary to take advantage of emerging opportunities.

StaUing

The Chandaria BIIC day-to-day management consists of the Director of Directorate of Innovation Incubation and Industry Linkages (an academic staU member appointed for a 2-year term, renewable) working part-time. The internal appointment means that the Director may not be trained in entrepreneurship but must learn on the job. In addition to the Director, the Chandaria BIIC has a clerk and a secretary for front oUice management. The directors' team consists of four full-time

professionals, including an IP management specialist, an incubation service expert, an industry linkages expert and an IT support person.

From 2011 to 2016, the Chandaria BIIC had a resident trainer with an entrepreneurship background. The resident trainer position was dropped during a restructuring exercise carried out in the university to reduce operational expenses. Since 2011, the centre has operated with a setup that includes eight 'technical' mentors who are experts in diverse scientific fields and are recruited from among the academic staU of Kenyatta University. Initially, the mentors were purposively nominated by the Director based on their expertise, experience and interest and recommended for appointment by the Vice Chancellor. However, since 2016, the recruitment of mentors was taken over by the University HR OUice, interested persons were required to apply for consideration, with a mandatory requirement for them to have participated in an Applied Entrepreneurship short course that was facilitated through a collaborative project with the Hochschule Neu Ulm, Germany. The mentors were appointed on six-month-long renewable contracts; the last renewal was in quarter 1 of 2021. Since then, the mentors oUered services on a voluntary basis, though some have since abandoned this role. These mentors have undergone various additional trainings, for example, in lean startup, marketing, and design thinking, when opportunities for such upgrading have been available, for example, through project collaborations with other university partners.

The mentors were compensated hourly according to the time they spent serving incubates. This training and supervision model is considered expensive. Each mentor is paid for a maximum of 3 hours per week at Ksh 2300 per hour; most mentors utilise the hours fully, taking the cost to about Ksh 2.8 million per year. The return on investment is low or uncertain because not all incubated entrepreneurs end up starting a company. The university management sees this as a wasted eUort and argues that new, more cost-eUective and sustainable ways of training incubators are needed. In the future, a cohort-based moderating of admitting innovators is proposed, whereby a group is taken through training and mentorship together, and hence, one trainer/mentor serves many people at once. A set of topics is proposed for each cohort to go through within a specified period. There is also a proposal to digitise some of the training and make it self-service to reduce human interaction during incubation.

One of the challenges that Chandaria BIIC faces is ensuring that the centre is adequately staUed. A challenge is that Chandaria BIIC staU members can be reallocated to a diUerent function by Kenyatta University's Human Resource OUice at any time. This is a particular challenge because of the resulting knowledge drain as internal staU members knowledgeable of entrepreneurship training and incubation are very limited. Moreover, long-term staUing is required to ensure sustained internal and external networking and capacity building of the allocated staU.

Operating budget

In principle, Chandaria BIIC is allocated an annual amount in the university's operating budget, but in recent years, the funding has been inadequate to meet the needs. Additional funds are mobilised through grants and projects. However, the necessary fundraising skills to mobilise resources through grants and other sources have not been suUiciently developed and are currently not present. Examples of grants are the Technology Transfer and Commercialisation of University IP funded by DAAD (75,000 Euro, 2021-2024); Coalition for Climate Entrepreneurship project funded by US Department of State (50,000 USD, 2024-2025); UPLIFT-Ag project funded by EU has component supporting the Chandaria BIIC; Industry Meets Talent project funded by Mastercard Foundation

(40,000 USD, 2023-2024); KU-Louisiana State University Innovation Capacity Strengthening Project by US Dept. of State (75,000 USD, 2024-2025).

Business model

The Chandaria BIIC is an 'early-stage' incubator. Many incubatees who join the centre have a very initial idea. Chandaria BIIC does not charge incubatees for the services provided by the centre, but the university acquires ownership of a 10% equity holding in a start-up if the involved IP is owned fully by the incubator. The model is problematic for various reasons. First, it is complicated or even impossible to maintain control of the ownership share when startups graduate and move outside. In practice, no mechanism exists to claim any return on the 10% ownership. Second, whereas the first batches of incubatees could obtain cash support of 1,000-3,000 USD from the incubator, this support is no longer possible, which reduces the legitimacy of the 10% ownership share. Third, the limited level of incubation services oUered also makes the incubatees question if the benefits they receive justify a 10% university co-ownership. Finally, notably in the 30% external incubatees, more and more are coming with established prototypes, and their primary purpose of enrolling is to aUiliate with the brand value of Kenyatta University, and they are typically not willing to give 10% but only 2-5% at most.

The current co-ownership-based business model seems to be challenging to implement in practice. In addition, the university's leadership is unwilling to accept a departure from the 10% shareholding requirement. This creates a problem for Chandaria BIIC, which struggles to align stakeholder expectations to the balance between service provision and benefit sharing.

Although Kenyatta University is research-intensive, the experience has been that very few university staU members disclose their inventions. The explanation is complex, but it is assumed that the lack of agile business development capacity at Chandaria BIIC may cause researchers to question the value of bringing their inventions from the lab to the incubator. It is evident that the university is losing significant university-based IP. This is an argument for reconfiguring the Chandaria BIIC business model to focus more on research-based IP and internal incubatees. On the other hand, such a strategy is complicated by Kenya's university legislation specifying that IP developed through publicly funded universities belongs to the university. A strategy to circumvent this barrier is hinged on the reality that most of the IP is developed through external (largely nonstate) research grants which creates room to modify IP ownership arrangements. There is also a need to explicitly integrate funding for innovation and commercialisation in project applications.

Services oUered by the incubator

The aim is to provide a well-equipped facility for prototyping, product development and the necessary support for market entry. Chandaria BIIC provides mentorship and coaching in entrepreneurship, oUice space and access to the Internet and computers, a 3-D printing lab, support to access prototyping services in other university departments' labs, economic support for startups in the magnitude of 500-1,000 USD (but not in all cases) and drafting and filing services for IPR. Chandaria BIIC organises events for incubatees to engage with potential investors and supports startups to participate in exhibitions to market their products.

Chandaria BIIC has been strategising to obtain funding for a prototyping facility. Due to the physical location and Kenyatta University's brand, such a facility is considered to have good commercial potential and can thus constitute an income-generation activity which can co-fund other incubation

activities. The total cost is estimated to be approx. 1 mill. USD. This magnitude of funding is not easily accessible, and an incremental approach where the facility is slowly equipped over time is considered. In 2024, several labs were established in the engineering and other departments that significantly increased the capacity for prototyping in the university: Cezeri Lab (donated by the Turkish Embassy); Biomedical Devices lab by Lemelson Foundation; AfriBioHub for biotech-related innovations through the US government funding. What is needed is a mechanism to enable access to these facilities for innovators under incubation.

University-internal linkages

Targeting the academic staU, Chandaria BIIC has aimed to establish stronger linkages with the academic departments and position the Centre as part of the university's research ecosystem. This has been challenging, and limited IP is finding its way into the incubation centre from the research conducted at the university. There is a need to do more to motivate university staU and students to do research oriented at creating IP and to disclose it for protection and commercialisation.

Concerning the university's educational mission, much eUort has been made to raise awareness about entrepreneurship. Kenyatta University initially planned to implement a common entrepreneurship course that all students should take at some stage during their education. The entrepreneurship course, intended to be implemented by all departments, was developed together with external partners in 2017 (Wadhwani Foundation). The initiative was not as widely embraced as planned, and currently, only students in business and economics education take the course. However, many discipline-based teachers across the university acknowledge the value of integrating an element of entrepreneurship into their classes, but how to do it is challenging due to the congestion of the curriculum and a lack of entrepreneurship and entrepreneurship teaching knowledge.

Relationship with the surrounding entrepreneurial ecosystem

As start-ups graduate and set up their operations in the region, the incubator itself is becoming increasingly integrated with the local economy. However, there are a few strong connections to local companies. One major mechanism for creating an integration is the reservation of 30% of the slots for incubation at Chandaria BIIC for the local non-university community. This opportunity is very popular and creates a positive image for the university as incubatees create local enterprises and jobs. In addition, some student-driven startups enrolled in the incubation centre set up their businesses adjacent to the university, directly contributing to the local economy.

The external ecosystem also provides opportunities for Chandaria BIIC. Training incubator staU in entrepreneurship and business development is an activity that has been supported by funding and training opportunities provided by external actors. The future development of prototyping labs also depends on utilising connections to government and private sector actors.

One of the challenges that Chandaria BIIC faces is a lack of data on key metrics (businesses started, jobs created, financial contribution to the economy, etc) to demonstrate significant results that can convince potential private sector supporters about the usefulness and impact of the incubator.

Performance

Table 5 shows the Chandaria Business Innovation and Incubation Centre's results from 2020 to 2024.

Table 5. Key metrics for the Chandaria Business Innovation and Incubation Centre.

Average annual number of startups enrolled in the incubator since 2020	Average annual number of startups graduated from the incubator since 2020	Estimated number of jobs created since January 2020	The amount of capital raised (equity, debt, and grants) secured by the startups since 2020	Average annual number of mentorship hours used by incubatees since 2020
Approx. 20 per year	Approx. 5 per year	Exact number unknown. Each of the five companies graduating per year has, on average, five jobs. In four years, at least 100 jobs.	Total amount unknown. Some companies have attracted milliondollar investments.	8 mentors have been engaged at the centre annually, each allocated a maximum of 3 hours per week to work with diUerent innovators. Total = 1200+ hours.
Incubatee capacity of the incubator	Annual average internal operational budget of the incubator	Annual average external funding obtained by the incubator	M&E system in place (including incubatee satisfaction survey)	Average annual number of new products or services launched by incubated startups
80-100 incubatees, depending on the size of the innovators' team.	50,000 USD (in principle, but in practice not always available in full).	The amount and sources vary. For example, in 2024, total grants of $250,000 are ongoing.	No. There is a system to keep track of the progress of incubated, but it is very basic.	This is the same as the number of startups (average 5).

Strengths and weaknesses of the incubator

Table 6 summarises the strengths and weaknesses identified by the incubator manager.

Table 6. Strengths and weaknesses of the incubator from the manager's perspective.

Theme	Strengths	Weaknesses
Location (physical location of the incubator)	• Location within an institution with a vibrant research environment, diverse fields of expertise and innovation domains. • Location in an area with economic activity and close to good infrastructure and service providers (banks, insurance, logistics, etc) for entrepreneurial activities. • Association with the strong brand name of Kenyatta University.	• High competition from incubators and accelerators established in the same region. • Cost for start-ups exiting is high in the Nairobi region; more start-ups are needed.
Strategy (plan for change and implementation)	• University management is conscious of the need to change; the incubator has been factored as a point of delivery	• The reduced financial resources have not been countered with a review of the operational model to ensure intakes can be

Theme	Strengths	Weaknesses
	and performance measurement in developing the university's strategic plan for 2023 – 2027.	eUectively supported without compromising the quality of services.
StaU (size of workforce, recruitment, motivation)	• The university has budgeted for deploying several staU (quantity) for the proper administration of the centre.	• The method used to deploy staU is not favourable for sustainability. • Short-term director appointment is not favourable for long-term partnerships and networking. • StaU trained on relevant skills are not ring-fenced and can be moved to any other oUice at any time.
Skills (employees' skill level, training programmes)	• StaU have been trained on several skills through diUerent projects, e.g. IP management, technology transfer, etc • Some staU have been deployed since inception and hence have deep knowledge of how the incubator operates	• Lack of fundraising competencies. • Lack of some expertise among the staU, e.g. IP valuation and commercialisation, and a grant writing expert. • Lack of M&E system and capacity.
Business model (create, capture, configure value)	• The business model has enabled many innovators to come to the centre. • Enables the incubator to gain visibility in the surrounding communities.	• The current business model (not charging for services) is unsustainable. • Funding is inadequate to support the needs of the entrepreneurs.
Facilities	• A dedicated, well-established facility where incubation services are provided.	• Prototyping capacity has been lacking, but this is now being (partly) resolved as new labs have been set up.
Values (the values governing stakeholders' behaviour)	• Several policies have been developed to guide centre operations	• University management's understanding of the incubation centre and how to operate it eUectively needs strengthening.
Style (the management style and how it influences employees' productivity and satisfaction)	• There is provision for a Board of Directors with alumni and industry representatives. • Performance-based systems with target setting and periodic reporting are in place annually.	• Management of the centre through Directors from academic departments is short-term and disruptive. • The university applies a hierarchical bureaucratic management structure with lengthy approvals for all things. • Some staU deployed on a short contract basis can aUect productivity.
Structure (chain of command, accountability)	• Has a well-defined organisational structure with a clear reporting pathway.	• Board constitution and appointment delayed. • Appointment to the Director of the Centre has no defined criteria and is at the sole discretion of the Vice Chancellor

Systems (SOP, routines, workflow)	• Policies on incubation and IP management are in place.	• Embedding an incubator in the university bureaucracy stifles
Theme	Strengths	Weaknesses
	• Quality management system ISO 9001 was applied at the university and in the incubator in 2015.	agility and speedy response to opportunities.
Internal relations	• Working with technical mentors from various departments has created good connections. • The incubation centre is connected to the academic departments through research coordinators appointed by the university. • The incubation centre has established good relations with various labs and departments that support mentorship and prototyping. • The incubation centre has supported the training of many staU from diUerent departments at Kenyatta University.	• The incubation centre does not have adequate visibility internally. • High turnover of academic staU and leaders who have been trained to support incubation services located in diUerent departments erodes capacity.
External relations	• Good partnerships and collaborations locally and internationally. • Successful alumni create external visibility and goodwill for the centre. • The incubation centre hosts many university delegations benchmarking with Kenyatta University as they establish their own incubation centres.	• Slow progress and sometimes inability to follow through with agreements with industry partners aUect the image. • Bureaucracy aUects the ability to respond rapidly to external opportunities. • Some partners come with high expectations that are not fulfilled. • Bad publicity when dissatisfied innovators leave the centre to seek support elsewhere.

Future development needs for the incubator

The incubator management identified the following development needs:

- Developing a sustainable business model.
- Creating mechanisms to link the academic departments to the incubation centre so that more of the IP created within the university can be commercialised.
- Developing a M&E system.
- Increasing visibility of the incubator's services, activities and achievements. This involves understanding how to package diUerent information for diUerent audiences. The university's external communication traditionally targets students and their parents and focuses on the academic perspective. Targeting the industry and private sector requires diUerent ways of thinking about visibility.

- Establishing HR capacity for grant writing/resource mobilisation, IP valuation and commercialisation.

Suggestions or recommendations for other universities aiming to establish incubators In the following, we present the recommendations provided by the Chandaria BIIC management on what other universities should consider when engaging in the establishment of universitybased incubators:

Business model

- Study which oUerings exist already in your area and find a niche. Being a general incubator makes it challenging to specialise your competencies and services. Moreover, it can be confusing for investors and challenging to develop the necessary high-quality networks.
- To promote sustainability, a mechanism should generate income/revenue from the services oUered. Free services will be a challenge to sustain.
- Relationships with the rest of the university must be well defined so that the incubator can be flexible and responsive to emerging opportunities while simultaneously benefiting from the relationship with the university.

Management

- The incubator manager should have expertise in innovation management and entrepreneurship.
- To ensure consistent relationship building with external and internal partnerships and to be able to benefit from existing networks, the manager should have a longer-term tenure. • Make sure that you have the right expertise attached or employed.
- Shield your employees from the university human resource unit to avoid (presumably arbitrary) redeployment of staU with specific capacities developed over time.

Service

- The training and mentorship plan should be designed to benefit from the expertise already available in the organisation, if possible, and aUordably and sustainably.
- It is important to have the necessary basic prototyping capacity in-house.

Funding

- Aim to create a mechanism to connect the startups to sources of capital or investors to grow their businesses. Do not expect to be able to rely on the university's internal budget in the long run.
- Ensure in-house capacity for grant writing to facilitate continuous access to capital.

Intellectual property

- There is a need for a mechanism to ensure that IP generated from research done in the university is identified, protected and commercialised.
- Create an incentive structure for university staU and students to bring their IP to the incubator.
- Find a way of assuring the support for the commercialisation of staU and students' innovations.

Key reference documents for Kenyatta University

The documents will be made available for project participants on the shared Teams platform.

- Incubation policy
- IP policy
- Research policy
- Chandaria BIIC strategy
- Kenyatta University corporate strategy
- Admission policy/procedure
- Contract for admission

5.1.3 Technology transfer section

Key performance metrics

Table 7 shows the performance of the Kenyatta University Technology Transfer OU'ice from 2021 to 2024.

Table 7. Average annual key metrics for technology transfer activities at Kenyatta University (during 2021-2024)

Average number of patents registered per year	Average number of utility models registered per year	Average number of trademarks registered per year	Average number of copyrights registered per year	Current number of innovation-related MoUs with external partners
3	4	10	10	None, but some may exist outside of the TTOs purview
Average annual number of invention disclosures received	Average annual number of new licence agreements with external partners	Average annual revenue from universityowned IPRs	Average annual startups formed based on universitybased technologies	Average case processing time
5 –10 for patents and UTMs	An average of 3 start-ups per year attract investors	Not yet generating returns	Average 6 startups/year, but more are not from university-owned IP	Not sure what case processing time is.

History and background

The TTO at Kenyatta University was established in 2006 following collaboration with the World Intellectual Property Organisation (WIPO).

With the foundation of Chandaria BIIC, it was realised that technology transfer and business incubation were closely related, which led to their placement within the new Directorate of Innovation Incubation and University-Industry Linkages (IIUIL).

In October 2019, a person with a business background was employed to manage the TTO. This person further developed their expertise in the field through training in the US and Germany. Equipped with these new skills, in 2022, the person left for another job within a project in the university and

eventually left the university for greener pastures in 2024. Expertise in technology transfer and IP management is limited in East Africa, and demand for such expertise is high.
Another person was deployed in early 2024 (a fresh graduate on a casual appointment basis), but without much field experience.

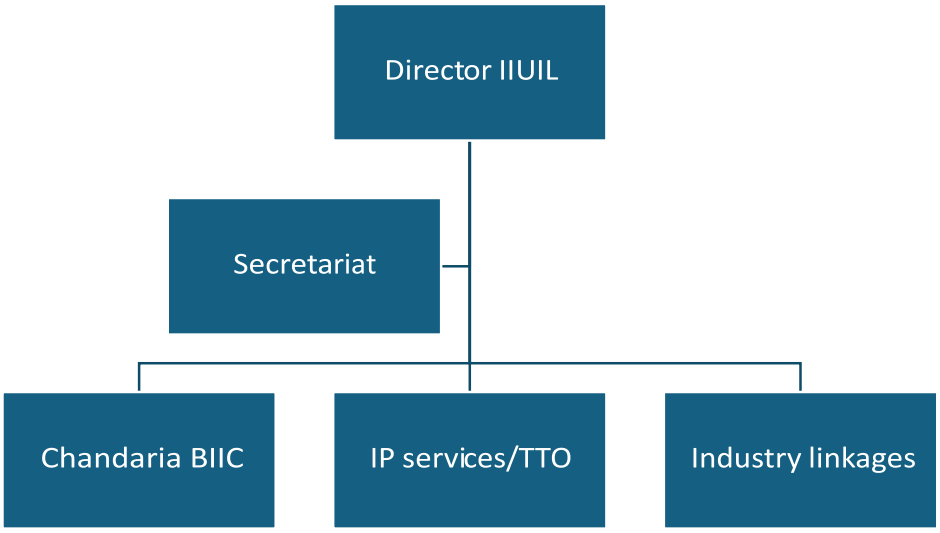

Figure 2. Organisational structure of the Directorate of Innovation, Incubation, and University-Industry Linkages at Kenyatta University.

Organisation and institutional framework

The structural organisation of the TTO is shown in Figure 2. The proximity to Chandaria BIIC is considered important given the overlap between the two units' missions and activities. The industry linkages unit serves as the point of interphase between external partners and the university community for various services, including research collaborations, training, technology demonstrations, and access to financial or other resources the university needs. The TTO is expected to connect to industry and facilitate negotiations that may lead to the licensing of IP developed from research.

The embedding of the TTO within the traditional university bureaucracy has certain limitations. The TTO needs to be able to act with agility and speed, both by actively pursuing emerging opportunities but also by reaching out to the business community to create opportunities based on their knowledge of internal IPR. Acting dynamically is difficult within the established university context, where the mindset is one of 'questioning rather than facilitating'. The impression is that university administrators see themselves as gatekeepers who are more attuned to asking what can go wrong rather than finding solutions. This slows down activities and, in cases involving external stakeholders, negatively impacts the university's reputation due to prolonged processing times.

The main performance metric used currently is that the university, as part of performance reporting to the government, sets targets for annual achievement. These targets are used as a monitoring mechanism. The main metrics are the number of patents filed and the number of start-ups. Aligned

to the current strategic plan (2023 – 2027), the target number distinguishes between different IPR types. Most of the registered IPRs are in the copyright and trademark categories. In contrast, the number of patents and utility models is still relatively few despite efforts to create awareness and increase disclosure.

Staffing

As indicated above, the staffing of the TTO is a challenging issue. Recruiting and retaining qualified staff is difficult. IPR experts are in high demand, and the university has difficulties competing with the private sector. The staff who had been recruited and trained for this purpose has recently left the university to the private sector. Currently, IP management is done by an internally trained staff member who has gained substantial experience. Unfortunately, this expert only partly supports IP management as the person is also allocated other responsibilities in the Directorate, and this reduces the technology transfer engagement. The most urgent need seems to be to recruit expertise in IP valuation and commercial negotiations. However, employing additional expertise is currently not possible due to an employment stop imposed by the government. Moreover, the innovation centre may not obtain priority when competing with the academic departments for new positions.

Intellectual property management

The Kenyatta University TTO conducts routine IP management activities, including drafting and filing patent, utility model, and trademark applications. The TTO has gained a good level of experience with these activities. The university pays for patents and patent renewals. Students, staff, and external incubatees at Chandaria BIIC are supported in protecting their IP. The clients include a few staff members, students and innovators from outside the university community. All IP created by staff and students fall under the national IP legislation, which grants the university IPRs. Still, an increasing number of researchers are becoming aware of opportunities to protect their innovations within or outside the university system.

It is a challenge for IP management that very few researchers, academic staff, and students disclose IP. This may be attributed to different aspects. First, a culture of innovation seems to be lacking within the research community at Kenyatta University; second, the national IPR legislation does not incentivise innovation because discoveries made at the university belong to the university. The result is that many researchers do not want to put in all the effort and see the university reap the benefits. One consequence is that some staff members have bypassed the TTO and filed for IPRs privately.

Business model

The technology transfer business model used by Kenyatta University follows Kenya’s national IPR legislation, which stipulates that the university should obtain 100% ownership of IPR developed with public resources, i.e., by staff and postgraduate students in their regular positions. The problem associated with this model is that academic staff have no incentive to disclose inventions, and the number of disclosures is very low. In practice, this means that no income is generated from university-owned IP and no commercialisation is undertaken. There has, however, been a recent effort to revise the university's IP policy to enable co-ownership of innovations.

For IPR, which is owned by startups incubated at Chandaria BIIC, the university requests 10% ownership of the startup's shares, independent of IPR ownership. The problem with this model is that, in practice, the university is unable to collect the money when startups graduate and move outside the incubator. Moreover, this type of investment is long-term, as startups typically need to

reinvest their revenue into growth. In practice, this business model currently generates no income for the university.

There is a need for rethinking the technology transfer business model. One possibility is to establish a service-fee-based model in which the university's expertise is also used to provide services to external actors.

Operating budget

There is no separate specific budget set aside for TTO activities. A general budget of about 50,000 USD annually is allocated to the Chandaria BIIC, and funds from this budget can be used to pay for patent filing and maintenance costs. Additional funds are obtained through grants, especially to support training in IP management, raise awareness, and engage researchers at the university.

Commercialisation

The valuation and assessment of the market potential of innovations constitute a challenge for the TTO due to a lack of expertise in this area. Moreover, the TTO lacks expertise in commercialisation and negotiation. Even though the TTO is expected to broker the negotiation, this is a very delicate and complex task that requires expertise that does not currently exist in the organisation. An additional challenge is that most researchers who obtain patents are satisfied with simply noting this on their CVs and do not take any active steps to commercialise their IP.

Legal and regulatory compliance

A significant challenge arises from the fact that the university's IP policy is modelled on the government's IP law. All universities in Kenya must comply with the same standard legislation, which grants all IPR arising from publicly funded research to the universities where the research was conducted. To counter the lack of incentives that this creates, Kenyatta University has recently elaborated a new IP policy that makes it more attractive for researchers to innovate. This new policy, which is not yet approved, aims to create incentives for university-based innovation by proposing joint IPR ownership between staff inventors and the university, and it provides a benefit-sharing ratio for potential commercialisation outcomes. It is expected that the new policy will be questioned by the government, but the university can make its case by noting that more than 90% of its research funding comes from external, non-public grants; the existing policy is therefore based on wrong assumptions and needs to be changed to foster greater innovation.

Funding and investment

It has been a challenge to identify and attract investors to support innovations incubated at the Chandaria BIIC. Moreover, experience shows that some investors are interested in opportunities requiring significant investment (million-dollar projects). In contrast, most startups at the Chandaria BIIC are seeking investments of 10,000–100,000 USD. Thus, a mismatch exists between investors' expectations and actual opportunities, and smaller-scale investors are difficult to identify.

Internal relationship management

There has been considerable effort in creating awareness about TTO and the services offered to university researchers (staff and students). However, the TTO and its mandate are still not well understood among the researchers. There is a proposal to devolve IP services and awareness creation to the department level, working with research coordinators appointed by the university.

Another proposal has been to implement policy changes requiring researchers to commit to IP disclosure at the commencement of research.

External relationship management

The director of IIUIL argues that the university's reputation in the external environment suffers because of administrative red tape and delays. External stakeholders lack an understanding of the university's processing time, which creates the impression that the university is too slow to respond to opportunities through external collaborations.

Marketing and outreach

The director of IIUIL recognises that the university needs to enhance its awareness-raising activities for staff and postgraduate students who may contribute to technology transfer and commercialisation. Kenyatta University has many success stories to showcase. Over the years, 40-50 startups have commercialised their IP, the majority of which is not university-owned. To increase the university-owned IPR share, the TTO must engage more actively in outreach activities and improve the incentive structure for researchers by allowing co-ownership of IPRs. Notably, the university caters for the full cost of filing IP for protection.

Education and Training

The university offers periodic training to improve knowledge of IP, commercialisation and entrepreneurship. The trainings have been organised mainly under different externally funded projects and primarily focused on schools/faculties with high potential for innovation and IP development, e.g. engineering, agriculture, pure and applied sciences, and health sciences. The TTO provides tailor-made support and guidance to researchers and innovators on all IP-related matters.

Strengths and weaknesses of the TTO

Table 8 summarises the strengths and weaknesses identified by the TTO manager.

Table 8. Strengths and weaknesses from the perspective of the technology transfer responsible at Kenyatta University.

Theme	Strengths	Weaknesses
Location (physical location of the TTO)	• Suitably located with adequate space and accessibility	• Location within the Chandaria BIIC building masks TTO's distinct identity
Strategy (plan for development and implementation)	• Strategy for the Chandaria BIIC developed	• TTO does not have its own specific strategy
StaU (size of workforce, recruitment, motivation)	• Adequate number of staU deployed at TTO	• Qualifications of staU in the post do not match the needs of the TTO. • Challenging to retain expert staU.
Skills (employees' skill level, training programmes)	• StaU in the post have attended various IP management trainings.	• Lacks commercialisation expertise. • Lacks IP valuation expertise.

Business model (create, capture, configure value)		• Current legislation does not incentivise researchers to disclose inventions or engage in commercialisation.
Facilities	• Adequate facilities available for IP administration services.	• IT systems may have vulnerabilities that could present the risk of IP loss.
Values (the values governing the management's behaviour)	• IP ownership is respected, especially for the nonuniversity community seeking TTO services.	• University management does not fully understand the startups' need to invest in their growth.
Style (the management style and how it influences employees' productivity and satisfaction)	• University leadership is open to collaboration, continuous learning, capacity building, etc.	• Lack of agility in the university system. • Risk-averse attitude of questioning rather than facilitating. • Too much dependence on external support to carry out TTO work.
Structure and organisation (chain of command, accountability)	• There is a clear organisational structure and reporting pathway.	• Hierarchical decision-making procedures slow down processing time.
Systems (SOP, routines, workflow)	• The procedures are well established and documented as per ISO9001:2015.	• Work instructions on IP have not been updated for several years.
Internal relations	• TTO is recognised at the highest levels of management in the university, schools and departments.	• Recognition of TTO and its services is higher in some schools/faculties than in others.
External relations	• Numerous partnerships and collaborations have been established. • Good brand name of the university eases networking.	• Reputation is not good. We often promise much more than we can deliver in the end.

Future development needs for the TTO

The TTO management identified the following development needs:

- StaU'ing with experts in IP valuation, licensing and commercialisation.
- More robust mechanism for identifying university IP for commercialisation.
- Financial and operational autonomy to enhance eU'iciency in operations

Suggestions or recommendations for other universities aiming to establish a TTO

In the following, we present the recommendations provided by the Director of IIUIL on what other universities should consider when engaging in the establishment of a technology transfer office function:

Business model

- Aim to increase IP flow from university research, i.e., promote the university's own IP.
- Focus on the IP you are co-owning from which you can profit.
- Identify a service portfolio that can provide a basis for a revenue stream.

Management

- Free the TTO from the administrative regime in the traditional university structure to enable the TTO to be more agile and aligned with external stakeholders' work culture.
- Ensure that top management understands the dynamics of the business sector, i.e., startups' typical development challenges and investor behaviour and how this influenced the management and organisation of the TTO.

Service provision

- Provide services that support and attract innovators, such as a prototype facility.
- Create control points. For example, when approving a new grant project, the university should ask researchers how they have considered IP and commercialisation issues, i.e., how they are integrated into the funding and project implementation.

Funding

- A proportion of the revenue generated from IP commercialisation should be invested in the TTO.
- IP services in cases where the university does not own the IP should be at cost.

Intellectual property management

- Develop incentives to get staU and postgraduate students to disclose their innovations.
- Institute control points along the research review, approval and reporting process where researchers declare if any IP has been produced and how it has been handled.

Key reference documents at Kenyatta University:

- IP policy
- Research policy
- University corporate strategy

5.2 Kenya - Chuka University

5.2.1 Introduction

Chuka University became the 9th fully chartered University 11 years ago, having been a constituent college of Egerton University. It has grown to about 20,000 students and is still on an upward trajectory in infrastructure, including the construction of a Science & Research Park, which is underway. The description of the CU incubation and technology transfer activities is included in this section due to their novelty and scale.

5.2.2 Incubator and technology transfer

Description of Chuka University (CU) Incubation Centre

The Chuka University Technology & Innovation Transfer and Commercialisation Hub's (CU-TITCH) [24] mission is to support innovators in transforming their knowledge resources into socioeconomic opportunities, with a view to oUering simple solutions to societal challenges through the identification, incubation, and commercialisation of local and external innovations. The Technology and Innovation Support Centre (TISC) was launched in 2019 as a focal point for the Eastern Kenya region through the Kenya Industrial Property Institute (KIPI), the governmentdesignated focal point for establishing and coordinating the Kenyan TISC Network, to encourage innovation, technology transfer, and IP commercialisation-related services. Later, CU-TITCH was established to specifically spearhead the identification, incubation and commercialisation of local and external innovations. Currently, intellectual property (IP) management remains a function performed by the TISC section under CU-TITCH.

CU-TITCH has been allocated space in the Science & Research Park building. CU-TITCH is involved in all processes that entail the commercialisation of IP, including protection, incubation, business planning, mentorship, sourcing funders, piloting production/testing, marketing strategies, and upscaling/improvements/ diversification of the product.

The CU Incubation Hub is relatively new and is currently incubating its first innovation: a 'safe banana fibre sanitary pad'. The innovation was first registered as an innovation patent before the process of commercialisation was commenced. The first incubatee is currently sharing the resources with the TISC oUice and has space for prototype development at the Science & Research Park allocated to CU-TITCH. There are other innovators whose IPs are currently being assessed for protection and may soon be candidates for incubation at the HUB.

Organisation infrastructure and institutional framework

TITCH promotes support, idea development and innovation, technology transfer, and commercialisation through four sections:

- Technology and Innovation Support Centre (TISC)
- Technology and Innovation Creation and Incubation (TICI)
- Technology and Innovation Transfer (TIT)
- Technology and Innovation Commercialisation (TIC)

[24] CU-TITCH homepage: http://cu-titch.chuka.ac.ke/.

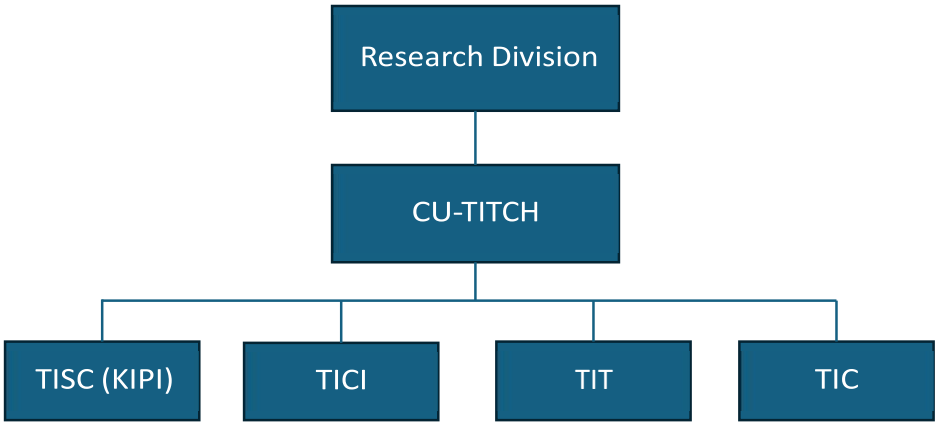

Figure 3. Organisational structure of the Chuka University Technology & Innovation Transfer and Commercialisation Hub.

Figure 3 shows the organisational structure of the CU-TITCH. CU-TITCH has not been established as an independent entity within the institutional structure. It works in liaison with the Directorate of Research, and the Deputy Vice Chancellor, in charge of academics and research, supervises its activities.

Currently, the available resources include a TISC oU'ice with two desks and chairs, a cabinet, a shelf, a drawer, and one computer. The Research Division OU'ice supports TITCH for printing. Moreover, TISC has access to prototype development at the Science & Research Park.

M&E is conducted in accordance with the key indicators outlined in a performance contract signed by CU and the Kenyan Government. Reporting on TITCH activities and other university activities is done to the Commission for University Education, the Ministry of Education and the National Council for Science, Technology and Innovation. The latter is done regularly, while the first two are done upon request.

The recognition of TISC by KIPI has given TISC staU' access to WIPO and KIPI training, such as IP management, which has enabled TISC to serve the eastern region.

Legal and regulatory compliance

Intellectual Property in Kenya is regulated by several laws, including the Copyright Act, Trademarks Act, Intellectual Property Act, and international treaties. Key government agencies involved in Kenya's intellectual property rights landscape include the Kenya Industrial Property Institute (KIPI), the Copyright Board of Kenya (KECOBO), the Kenya Health Plant Inspectorate Services, and the Anti-Counterfeit Agency (ACA). These laws and regulators are in line with the Trade-Related Aspects of Intellectual Property Rights (TRIPS) agreement.

StaU'ing

The Vice Chancellor appointed the Innovation OU'icer from among the academic staU'. The Innovation OU'icer coordinating TITCH's activities has a background in Physics. The Innovation OU'icer has the necessary competencies and is undergoing training in IP management through

distance learning provided by WIPO. The innovation oU'icer is paid an allowance. Currently, other needs of the Innovation Hub are managed by university employees assigned to perform these functions.

Operating budget

The incubation centre is financed by the university. TITCH obtains budgetary support from the university to support the prototype development. However, the plan is to seek external funding, and grant applications are also being pursued to support the activities of the HUB, from technical capacity building to start-up setup and other needs.

Business model

Chuka University TITCH oU'ice focuses on the aspects of transfer and commercialisation of technology & innovations, which are pertinent and current focus areas in the innovation landscape. However, TITCH does not have a specific sector focus. Innovations across all sectors, generally represented by academic disciplines, are encouraged for technology transfer and commercialisation. The target groups for incubation and technology transfer include individual inventors, small and medium enterprises (SMEs), industry, researchers in technology centres and universities, academia (ranging from schools to universities), IP professionals, etc. Current or potential future revenue-generating activities handled by CU-TITCH/TISC include:

- Collaboration with industries to create new products to drive businesses forward
- Horizontal transfer across diU'erent areas or vertically by moving technologies to other research and development teams for upscaling
- Joint ventures
- Licensing agreements
- Partnerships to share the risks and benefits
- Raising of venture capital

TITCH hopes to raise funds from investors and partners to support the HUB's activities, including technical capacity building, start-up setup, and other needs. A case in point is the current innovation under incubation that attracted the attention of an industrialist, who pledged to support its commercialisation with a KSh 1.3 million donation.

Services oU'ered by the incubator and technology transfer section (TISC)

Some of the envisaged activities include provision of oU'ice space, internet facilities, entrepreneurial training, business development and linking with industry and funders. CU-TITCH is involved in all processes related to the commercialisation of IP, including protection, incubation, business planning, mentorship, sourcing funders, piloting production/testing, marketing strategies, and upscaling, improvements, and diversification of products.

CU-TITCH ensures continuous improvement of staU' on IP issues through a) workshops (providing training on IP, commercialisation, and entrepreneurship) and b) mentorship (oU'ering guidance and support to researchers and startups. In addition, the following services are provided on demand:

- Access to online patent database systems and science and technology resources
- Access to industrial property-related publications
- Assistance in searching and retrieving technology information

- Training in database search
- On-demand searches (novelty, state-of-the-art, and infringement)
- Technology and competitor monitoring
- Basic information on industrial property laws and management and strategy
- Basic information on technology commercialisation and marketing

University-internal linkages

CU-TITCH collaborates with other functions, such as the University-Industry OUice, in order to create synergies within the university system. This is part of the policy outlined in the CU Strategic Plan 2023-2027.

Prototype development capacity is provided at the Science & Research Park.

Relationship with the surrounding entrepreneurial ecosystem

CU-TITCH has established Industry linkages for 1) training and 2) research and tech transfer. Training is conducted at least once per academic year as a one-day workshop. External facilitators from KIPI and venture capital managers, as well as internal trainers comprised of TISC staU, are involved in the training.

Key performance metrics

Table 9 shows the University Technology & Innovation Transfer and Commercialisation Hub's results from 2020 to 2024, and Table 10 shows the technology transfer-related performance from 2019 to 2024.

Table 9. Key metrics for the University Technology & Innovation Transfer and Commercialisation Hub.

Average annual number of startups enrolled in the incubator since 2020	Average annual number of startups graduated from the incubator since 2020	Estimated number of jobs created since January 2020	The amount of capital raised (equity, debt, and grants) secured by the startups since 2020	Number of new products or services launched to the market by incubated startups since 2020
1	0	1	1.9m (KSh)	0
Incubatee capacity of the incubator	Number of incubatees currently housed by the incubator			
2	1			
Annual average internal operational budget of the incubator	Annual average external funding obtained for the incubator operations	Average annual number of mentorship hours used by incubatees since 2020		M&E system in place (including incubatee satisfaction survey)

Not documented (However, approx. KES 200,000 was	0	Not documented (however, 7 academic staU'		None so far
spent in various IP registration activities and commencement of commercialisation of the innovation of the incubate)		have been assigned to TISC, though none exclusively, and have been involved in mentoring of the incubatee on aspects such as product development and business set-up)		

Table 10. Key metrics for the Technology and Innovation Support Centre (TISC) at Chuka University (during 2019 -2024).

Average number of patents registered per year	Average number of utility models registered per year	Average number of trademarks registered per year	Average number of copyrights registered per year	Current number of innovation-related MoUs with external partners
0	2 (and 2 underway)	1 (underway)	0	1 (underway)
Average annual number of invention disclosures received since 2020	Average annual number of new licence agreements with external partners	Average annual revenue from university-owned IPR	Average annual startups formed based on universitydeveloped technologies	Average case processing time since 2020
7	0	0	1	1 year
Is a M&E system in place for technology transfer				
No				

Strengths and weaknesses of the incubator and technology transfer sections

Table 11 summarises the strengths and weaknesses identified by the CU staU' in relation to incubator and technology transfer activities.

Table 11: Strengths and weaknesses of the incubator from the manager's perspective

Theme	Strengths	Weaknesses
Location (physical location of the incubator)	• Adequate space at the Science and Research Park	• Science and research park still under construction, limiting accessibility to an extent.

Strategy (plan for change and implementation)	• Enjoys management support and, therefore, is likely to be established within the institutional structure soon.	• It's a fairly new concept in universities, so its establishment is a bit slow, without ideal similar institutions to benchmark from.

StaU (size of workforce, recruitment, motivation)	• An appointment is a mark of confidence from management and therefore may serve to motivate the staU to go an extra mile without necessarily being adequately compensated.	• StaU are academic staU with full. Loads and therefore not able to dedicate the time and mental resources required for such an undertaking
Skills (employees' skill level, training programmes)	• Training opportunities provided by government agencies such as KIPI and international ones such as WIPO.	• Since it is not yet established within the institutional framework, available training opportunities from agencies such as the Kenya Innovation Agency (KENIA) may go unexploited by the staU undertaking the functions.
Business model (create, capture, configure value)	• Incubatees are not charged. The activities are funded directly by the university. Additionally, grants from government and private investors are targeted to support the innovators.	• The unpredictability of funds acquisition makes the timely planning and execution of activities a challenge
ilities	• Space at the Science and Research Park is available	• Minimal facilities and resources.
Values (the values governing stakeholders' behaviour)	• The visibility after acquisition of IP protection and subsequent commercialization support of the current incubatee has caused an upsurge in innovators seeking the services of the incubator, signalling an appreciation of IP development and support. The full support that these activities receive from the management has greatly contributed to this.	• The enthusiasm of the innovators is not being matched by the availability and expertise of the human and physical resources, leaving the staU feeling overwhelmed and innovators feeling frustrated.
Style (the management style and how it influences employees' productivity and satisfaction)	• The employees enjoy full support from the management, who oUer the required support as per the available facilities and resources.	• Being a fairly new concept, inclusion into the organisational structure is still underway, consequently limiting the optimal operations under the circumstances.
Structure and organisation (chain of command, accountability)	• At present, the incubation activities are supervised by the Deputy Vice Chancellor in charge of Research, Academics & Student AUairs (DVC- ARSA) and work in liaison with the Directorate of	• The structure is still in the formative stages, and some functions may overlap, inhibiting optimal operations.

c

	Research, Extension & Publications (DREP).	
Systems (SOP, routines, workflow)	• These are not formalised but are being developed as the activities are being undertaken.	• Unclear and non-uniform treatment of innovators, which can lead to disappointment and frustration.
Internal relations	• Visibility and engagement with the hub are improving, as more innovators become aware of the available services.	• As the organisational structure is still underway, eU'ective horizontal relationships and support may be aU'ected, which may limit the eU'ectiveness of the hub in its current state.
External relations	• The hub has penetrated the entrepreneurial ecosystem, with the current incubatee managing to finish as the first runner-up for the Presidential Innovation Award, organised by the Kenya Innovation Agency (KeNIA). Additionally, the innovator has participated in numerous exhibitions and pitching events and has secured financial support from a private industrialist. In the future, innovators from the surrounding community will be eligible for admission.	• As mandates are not yet fully clarified, the capabilities are not being fully exploited.

Future development needs for the incubator and technology transfer section The

Incubation OU'icer identified the following development needs:

- Access to meeting rooms for client meetings can facilitate the eU'icient running of the HUB.
- OU'ice furniture, high-speed internet and computers, printing facilities
- Availability of funds for prototype development
- Training and funds for incubatees and start-ups
- Specialised labs and workshops for research and development, prototyping, and testing to support science and technology-based startups
- Funds to train trainers for purposes of coaching and mentorship
- Networking opportunities such as conferences and workshops involving innovators, partners, investors and customers

Suggestions or recommendations for other universities aiming to establish incubators and technology transfer oU'ices

In the following, we present the recommendations provided by the TITCH management on what other universities should consider when engaging in the establishment of university-based incubators:

Management and organisation

- Begin by entrenching the incubator independently with clear mandates to avoid a slow start, derailment, and distractions.

Service

- Clearly identify and communicate the services oU̓ered to academic staU̓/research department – demonstrate what the TTO is and what value they can have from it.
- The TTO needs to have the capacity to connect to commercialisation pathways, i.e., the skills and expertise to bring innovations to the market.

Funding

- Identify suitable grant opportunities and begin to make grant applications. Have staU̓ specifically dealing with this function.

Intellectual property

- Sensitise the university community through regular workshops and training on IP creation and benefits. Identify staU̓ to undergo training and incentivise them. Relieve them of some of the workload to increase IP productivity.

Internal and external linkages

- Foster linkages with industry to get support for the innovators.
- Clearly separate functions to avoid ambiguity and ineU̓iciency. However, ensure that synergies between related functions are developed.
- Commercialisation requires collaboration with investors and industry.

Key reference documents at Chuka University:

- Research and IP policy
- Strategic plan 2023-2027

5.3 Kenya - Taita Taveta University

5.3.1 Introduction

Taita Taveta University (TTU) was chartered on 7 October 2016, having started as a campus of Jomo Kenyatta University of Agriculture and Technology (JKUAT) on 5th September 2007 and becoming a Constituent College of JKUAT on 18 October 2011 through Legal Notice No. 156. Currently, it comprises five (5) Schools: School of Agriculture, Earth and Environmental Sciences, School of Business, Economics and Social Sciences, School of Mines and Engineering, School of Sciences and Informatics, and the School of Education.

TTU is one of the universities in the UPLIFT-Ag projects, which has joined the project to obtain support for developing an incubator organisation. For this reason, performance metrics are not provided as the incubator was only at its outset at the time of the baseline study.

5.3.2 Incubator

History

In the past, TTU has oU̓ered ad hoc incubator services, such as training and mentoring, to entrepreneurial students at the school or faculty level, or through engagement with external stakeholders. For example, TTU provided entrepreneurship and incubation support for a sustainable agriculture project launched by Taita Taveta County in 2017. In this project, the county government oU̓ered seed funding of 5000 USD to community members to establish agribusiness startups. The funding was competitive, and TTU staU̓ served as judges. TTU also provided technical, management, and entrepreneurship training to community members who won the competition.

During the COVID-19 pandemic, many Kenyan universities launched student-driven innovations. In 2020, TTU established the Nanotech Lab to support its student innovators better. Student innovations from diU̓erent schools that TTU feels have the potential for patenting are supported by the lab. Typically, a student comes up with a concept, and interested staU̓ get on board with the project and help develop the idea; for example, by connecting the student to relevant industry partners. At TTU, there is a long-standing practice of students and staU̓ members collaborating on innovation projects when interests overlap. A prototype is created with the lab's help, which also provides workspace. If the innovation is patentable, the university will help file for a patent, and university staU̓ will also promote the idea by attending conferences with students to find funding and partners for commercialisation. Even though it has been successful, the Nanotech Lab has been operating with limited resources. However, based on these experiences, TTU aims to further scale up support for entrepreneurship and innovation by creating a dedicated incubation centre. This was specified in the 2023-2025 strategic plan for TTU, where “establishing business incubation centres in Mariwenyi and Ngerenyi” is one of the activities aimed at promoting the output of quality innovations addressing the strategic issue of “limited quality research innovations and patents” (TTU Strategic Plan, Appendix 1).

Against this backdrop, in 2023, TTU began the process of establishing a university-based business incubator, the Tsavo Innovation and Incubation Hub (TIIH), with oU̓ices in Mariwenyi (at the main campus) and Ngerenyi (at the agricultural school). A committee was established in 2023 to oversee the incubator's setup. The terms of reference for the committee include, among others,

- defining the incubator name and brand image,
- formulating a vision, mission, objectives, and core values,
- developing a value proposition in line with TTU's academic profile
- defining the location of the hub in the organisational structure of the university
- seeking approval for its registration as an independent structure of the university
- develop an annual programme for the recruitment and selection of promising business ideas, and
- establishing relevant collaborations and partnerships.

In 2024, the committee presented a concept note to the university management, which approved this. In 2024, the branding profile, core statements, and recruitment programme were developed. Furthermore, the School of Business, Economics and Social Sciences has initiated the physical establishment of the incubator. The university management and administration have played a significant role in facilitating the establishment of TIIH.

Support was also provided by the Kenyan German Centre for Mining, Environmental Engineering and Resource Management (CEMEREM) project, in which TTU collaborated with the University of Applied Sciences Dresden and TU Bergakademie Freiberg (2016-2021). One goal of this project was to set up a business incubation centre. As part of the preparation, TTU has been 'benchmarking' with other universities, for example, visits have been made to Kenyatta University and private incubators where experiences have been shared.

Organisation and institutional framework

The establishment of TIIH is explicitly integrated into the TTU 2023-2028 Strategic Plan and is supported by its statutes. The TIIH is envisioned to be headed by a director who answers directly to the TTU management board. Moreover, an advisory board is established to guide and support the director. Discussions about how the incubator should be organisationally structured are ongoing.

It is envisioned establishing an advisory board comprise representatives from the five schools, the students, and attached consultants and industry partners. TIIH has been allocated two incubation oUices by TTU, one in Mariwenyi at the main campus and one in Ngerenyi at the agricultural school.

Currently, no standard operations guidelines or M&E framework have been established.

StaUing

The functions of TIIH are currently run by a committee led by a Chairman, with members representing the various schools/faculties and the administration.

Business model

Regarding specialisation, the hub is envisaged to focus on the following areas aligned with the university's schools: agriculture, mining, tourism, blue economy, and cross-cutting areas, such as business and ICT. The identified target groups include students, university staU, and community members, including individual entrepreneurs, startups, and established small and medium-sized enterprises.

TTU plans to establish a virtual incubator in addition to its physical incubation activities, which, in principle, means there is no limit to the number of incubatees.

Operating budget

No dedicated funding for the project has been allocated. TIIH is planning to seek external funding. No funding was obtained by June 2024.

The establishment of TIIH is provided for in the TTU 2023-2028 Strategic Plan, with a KSh 3 million (~22,000 Euro) budget for 2024-2025.

Obtaining funding for the seed funding of incubatees' ideas is considered a significant challenge.

Services oUered by the incubator

The incubator envisions the development of the following services:

- Shared infrastructure, for example, oUice space, meeting rooms, electricity, phone, internet, lab facilities, etc.
- Ideation and business modelling.

- Business advisory services, for example, help with registration, licenses, accounting, strategy advice, market research, and exporting facilitation.
- Financial services, for example, brokering and/or providing financial services such as equity, credit and guarantees.
- People connectivity, for example, mentoring, coaching and interaction with fellow entrepreneurs (a micro cluster), and market linkages.
- Customised training, for example, technical, business management and personal entrepreneurial skills training.
- Research and development.

In addition to the line organisation staU, external consultants and partners are also envisioned to be engaged in providing services for the target group. The first enrolment round is planned for September 2024, call, proposals, evaluation, admission, mentoring, and expect to graduate incubatees in about a year.

Education and training

In the past, Taita Taveta University (TTU) has oUered ad hoc skills training and mentoring to entrepreneurial students at the school or faculty level or through engagement with external stakeholders. If student or staU innovations were patentable, the university would help file a patent application. With the establishment of the Tsavo Innovation and Incubation Hub (TIIH) in 2024, future training and mentorship engagement will be enhanced.

The main challenges experienced during the initial startup phase have been inadequate facilities and oUice space, and inadequate finances.

University-internal linkages

Within the university, the following are seen as the most important collaborators: students, academic staU, management, schools, the ICT department, and the finance department. All students at the university are required to take an introductory course in entrepreneurship. If students subsequently develop a business idea, they can seek assistance from their lecturers. These then mentor and train the students in business modelling in one-on-one sessions until they can present a pitch. In the future, these activities can be transferred to the incubator, enabling more students to engage.

Relationship with the surrounding entrepreneurial ecosystem

TTU has mapped the entrepreneurship ecosystem with the following result:

Policy level

- Full support by the university management
- Government through organs such as the Kenya National Innovation Agency (KeNIA) and KenInvest

Finance partners

- Commercial banks, for example, Cooperative Bank, Equity Bank and Diamond Trust Bank
- Micro financing, for example, SMEP Bank, Yehu Micro Finance and Rafiki Bank
- Savings and Credit Cooperatives, for example, Qwetu Sacco Culture

- Necessity entrepreneurship
- Education for employment

- Need for inculcation of entrepreneurial mindsets in the community Supports
- Academic institutions, for example, Taita Taveta University, Taita Taveta National Polytechnic
- Absence of innovation and business incubation centres in the County
- Existence of Self-Help Groups and the social service agencies of the Government
- Government support Human Capital
- Relative availability of both skilled and unskilled labour
- Presence of innovative members in the community Media
- Social and mainstream media Markets
- Depends on the product

The incubator will provide capacity-building services and mentoring to nascent and established entrepreneurs from the community and connect them to markets, industry, and financing organisations. Collaborating partners include the business community, industry, trainers/mentors, financiers, academic and research institutions, and the government.

Collaboration with industry is not new to the university. Industry partners help deliver the university mandate; for example, county and national governments, as well as partners in agriculture, contribute through teaching, guest lectures, and attachment opportunities. A good relationship exists with the county government, which has previously used TTU to build entrepreneurship capacity. Another successful example of a market-oriented project is an agricultural partnership with Danida, the Danish International Development Agency, and the Micro-enterprises Support Programme Trust (MESPT) to establish a banana tissue culture laboratory for the propagation of new banana varieties.

Strengths and weaknesses of the incubator

Table 12 summarises the strengths and weaknesses identified by Taita Taveta University staU. The table is not fully filled in because the incubator is in its early stages.

Table 12. Strengths and weaknesses of the incubator from the manager's perspective

Theme	Strengths	Weaknesses
Location (physical location of the incubator)	• Currently, the only incubator in the region	-
Strategy	-	-
StaU	-	-
Skills	-	-
Business model	-	-
ilities	-	-
Values (the values governing stakeholders' behaviour)	• "Seeing people's problems being solved by people themselves"	-
Style	-	-
Structure and organisation	-	-
Systems	-	-
Internal relations	• Strong innovation culture with experience in promoting innovation and student-staU collaboration	-
External relations	• Good connections to the county government	-

c

Future development needs for the incubator

The incubator management identified the following training and development needs:

Training needs for the university management:

- Monitoring, evaluation and reporting system
- Resource mobilisation

Training needs for the incubator management and staU:

- Various physical items for equipping TIIH oU'ices (computers, printers, projectors, desks, chairs
- Development of a strategy for the TIIH
- Development of standard operating procedures
- Blueprint for developing an incubator
- M&E and reporting
- Project planning and management
- Business planning
- Skills of training of trainers (pedagogy)
- Mentoring and coaching skills
- Resource mobilisation
- Finance management
- Stakeholder management
- Incubatee management
- Idea and IPR protection
- Incubator sustainability
- A knowledge exchange visit by key staU to the University of Rwanda Training needs for other stakeholders:
- The benefits of incubation – including the use of examples
- Short courses on entrepreneurial mindset for community members and students

Key reference documents for Taita Taveta University

- Research, Consultancy and Intellectual Property Rights Policy
- 2023-2028 Strategic Plan

5.3.3 Technology Transfer

Organisation and institutional framework

Technology transfer is under the Deputy Vice-Chancellor in charge of Academic Research and Outreach. TTU does not have a dedicated technology transfer oU'ice, but the Section of Planning and Programmes (SPP), under the OU'ice of the Registrar, Academic, Research and Outreach, coordinates IP management with relevant research projects and programmes, with support from the Corporate & Legal AU'airs Department.

Specific technology transfer tasks are managed at the project level. Project staU collaborate with school deans, department heads, and administrative staU on technology transfer. When a project is developed, for example, in collaboration with a local county, the involved staU are responsible for disseminating research outputs, such as improved agricultural practices, through students or field

assistants in contact with communities. Outreach and knowledge dissemination activities, such as workshops and conference presentations, are done through schools but are coordinated and supported by the SPP.

IPR management is an integrated part of the specific project if participants can find funding, for example, by including IPR costs in project budgets and by collaborating on joint patents, with costs covered by other universities.

To ensure clear guidelines for project collaboration with external partners, TTU has issued a Research, Consultancy and Intellectual Property Rights Policy that specifies how projects should be managed, how potential IPR should be secured, and how it should be commercialised with full or joint ownership. The policy is approved by the university council and anchored at the DVC in charge of academic research and outreach. The policy aligns national and TTU research agendas and specifies coordination of research and consultancy. The policy defines the role of the OUice of the Register (Academic, Research and Outreach) as responsible for funding and research grant administration, including funding of IPR management. The policy also specifies the IPR management procedures at TTU in accordance with national regulations and international law, including issues such as IPR ownership and protection, as well as licensing agreements. The policy provides a clear structure for international collaboration.

The SPP coordinates and supports all five schools in research matters for students and staU. The section links the Deans of Schools with research activities and coordinates multidisciplinary and across-school research in the university. Concrete activities include, for example, supporting applications for funding at the National Research Fund (NRF) and research licenses from the National Commission for Science and Technology and Innovation (NACOSTI). The licence is typically granted to a project, and the IP is authorised to approve sub-research studies within the overall project framework. Another role of the SPP is connecting research projects with communities. In addition, the unit also administers TTU's internal research budget.

At TTU, innovations often are based on some form of technology and developed through projects or in collaboration between students and staU members. Typically, a student comes up with a concept, and interested staU get on board with the project and help develop the idea; for example, by connecting the student to relevant industry partners, a prototype is created with the help of the lab, which also provides working space. The lecturer can support you there. If the innovation is patentable, the university will help file for a patent, and university staU will also promote the idea by attending conferences with students to find funding and partners for commercialisation. The SPP can also support the showcasing of research outputs with commercial potential.

When registering a patent, the involved project, student, or staU member, in collaboration with the SPP and with support from the Corporate & Legal AUairs Department, will prepare the necessary forms, which are available on the Kenya Industrial Property Institute's (KIPI) website. These forms are sent to KIPI to obtain registration. Next, the IP holder applies for a patent at the Kenya National Innovation Agency (KeNIA).

StaUing

No explicit technology transfer oUice exists, but the activities related to IP management are distributed among the involved project staU, the Section of Planning and Programmes, and the Corporate & Legal AUairs Department.

Operating budget

The costs associated with IP management are covered by external project funding and, in part, by the university's regular financing of the SPP and the Corporate & Legal AUairs Department.

Business model

The university emphasises that innovation is promoted by developing projects with external partners, including international research and development cooperation organisations. Moreover, the university has established a dedicated revenue-generating unit that conducts activities such as vegetable/chicken production, coordinates research and consultancy services, rents out campus space for meetings, and provides training services implemented by staU members.

Funding and investment

Funding for commercialisation is obtained through external project collaborations.

Marketing and outreach

TTU promotes university-based innovations through participation in conferences and workshops.

5.4 Rwanda - University of Rwanda

5.4.1 Introduction

At the University of Rwanda (UR), multiple incubator-type units exist because this activity is based at the faculty level. In this baseline study, we have mainly focused on one of these units, the Grid Innovation and Incubation Hub, because this unit was actively involved in the UPLIFT-Ag project. The UR has not provided performance data on incubation and technology transfer in accordance with the UPLIFT-Ag reporting format.

5.4.2 Incubator

History

The UR has a very elaborate innovation and entrepreneurship support system comprising many elements. In 2017, the UR created the Centre for Innovation and Entrepreneurship (CIE), which later changed into the Centre for Promotion of Students Innovation and Entrepreneurship (CPSIE), which is under the Vice-Chancellor of Academic AUairs and Research support. At the college level, each college has a Directorate of Research and Innovation, and in addition, UR has several innovation hubs associated with its colleges and Centres of Excellence. In the following, we will provide a brief description of the development of UR's entrepreneurship and business incubation system, including its key elements.

DiUerent projects have contributed to developing the UR's capacity for entrepreneurship and innovation. The contributions have come in the form of funding for innovation projects and hubs, as well as through training in innovation and entrepreneurship.

The University of Rwanda-Sweden Program, which involved Chalmers University, has been an important partner for UR in terms of funding through the Swedish International Development Agency (SIDA). Currently, the UR-Sweden program supports over 40 ongoing entrepreneurship projects, including 26 from research and academia and 14 by students. Of these, five innovations are ready for commercialisation. In addition to providing seed funding for innovation projects, the UR-Sweden Programme has supported the coordination of innovation development and entrepreneurship at the university level, identified and supported innovative ideas among students and staU at the college/school level, and provided training to the UR community. In 2020, Cherunya and Ahlberg published the "Report from scoping of innovation hubs across Africa - Profiling best practices to inform the establishment of an energy innovation hub at the University of Rwanda" [25], commissioned by the UR-Sweden Program. This publication examines Rwanda's innovation ecosystem and concludes that it is growing rapidly, supported by government policies. The report provides a highly useful list of nine 'considerations for successful innovation hub management' (pages 29-33).

In a UNESCO UNITWEEN project, the Korean Handong Global University has partnered with the UR to provide entrepreneurship training to students focusing on the IT-related fields. This project organises training once a year. The Startup Germany-Africa (StArfrica) project (2020-2024) was a

[25] Cherunya, P., & Ahlborg, H. (2020). Report from scoping of innovation hubs across Africa. Profiling best practices to inform establishment of an energy innovation hub at the University of Rwanda. Chalmers

University of Technology. Accessed at:
https://research.chalmers.se/publication/519948/file/519948_Fulltext.pdf
4-year collaboration between the University of Koblenz and UR. This project supported the establishment of an incubator space at the College of Medicine and Health Sciences at the Remera Campus. Its activities consisted of training for startup projects and maturing startups to the level of commercialising innovative products in the German Markets.

In addition to the projects above, various initiatives implemented through the UR's Centres of Excellence (CE) are actively engaged in innovation and business incubation. These CEs are significantly supported by funding from the World Bank channelled through the Inter-University Council for East Africa. The African Centre of Excellence for Energy and Sustainable Development (ACEESD) and the African Centre for Internet of Things (ACEIoT) have both received World Bank funding for innovation hubs.

Two other CEs are the African Centre of Excellence for Data Science (ACEDS) and the African Centre of Excellence in Biomedical Engineering (ACEBE), which support startups operating from their own incubators and generate high numbers of innovation outputs.

Today, UR has several incubation and innovation hubs at the college level, and these include:

- Grid Innovation and Incubation Hub (GIIH)
- University Innovation Pod (UnIPod)
- Data-driven Incubation Hub
- Internet of Things and Artificial Intelligence incubation hub
- Mastercard Innovation hubs

The Grid Innovation and Incubation Hub (GIIH) at the College of Science and Technology aims to transform learning environments into spaces for student-led innovation and entrepreneurship through a living-lab approach to research and teaching. GIIH is open to students from other colleges, and the hub collaborates with the CPSIE, the other UR hubs, and the college career directors. The objective is to build capacity, address the skills gap and obtain innovative solutions that catalyse a more sustainable and inclusive future for Africa. GIIH operates across diUerent innovation systems, connecting a variety of societal actors to catalyse societal change.

GIIH was established in 2020 to provide incubation, acceleration, and commercialisation services for cutting-edge, SDG- and society-relevant research ideas emanating from staU and students at the Africa Centre of Excellence in Energy and Sustainable Development (ACE-ESD). The GIIH was funded by the World Bank through the Inter-University Council for East Africa during 2020-2024. The GIIH is co-allocated with the ACE, which the World Bank also funds.

The University Innovation Pod (UnIPod) is a makerspace located at the College of Science and Technology. Its main aim is to foster a culture of innovation and entrepreneurship, and to nurture talent, creativity, and competence among students and the community by using technology lab approaches in research, teaching, and the creation of innovative business solutions. UnIPOD has ten equipped labs to enable and nurture creativity and hands-on skills development. The pod was inaugurated in November 2023 and is powered by the timbuktoo Africa Innovation Fund [2].

[2] timbuktoo is an initiative of UNDP that aims to mobilise and invest one billion dollars of public and private capital over ten years, to spark the startup revolution in Africa. timbuktoo is the largest initiative supporting Africa's innovation ecosystem. With ten thematic hubs across the continent, timbuktoo provides resources,

Unipod Rwanda was established in collaboration between the University of Rwanda, the Ministry of ICT and Innovation and UNDP Rwanda. UnIPod is based at the University of Rwanda, College of Science and Technology in Kigali.

Organisation and institutional framework

The Centre for Promotion of Students' Innovation and Entrepreneurship (CPSIE). The mandate of the CPSIE is to staU it with a director and a central business incubation oUicer, whose tasks include organising capacity-building activities at the university level, coordinating with collegebased Directorates of Research and Innovation and innovation hubs, coordinating collaborations with external actors, and developing policies and strategies. CPSIE has been a driving force behind the development of UR's innovation policy and Innovation strategy. Each of the six UR colleges has a Directorate of Research and Innovation (DRI). Each college has a business incubation oUicer responsible for supporting college-level activities and coordinating with CPSIE. The formal organisation of the entrepreneurial ecosystem at UR is shown in Figure 5.

expertise, and funding to young entrepreneurs to accelerate their impact. Guided by the Sustainable Development Goals (SDGs), timbuktoo's vision is to empower Africa's youth to lead the next wave of global innovation in sectors such as HealthTech, MineTech, Agritech, Fintech, and more. Accessed at: https://www.undp.org/africa/projects/timbuktoo.

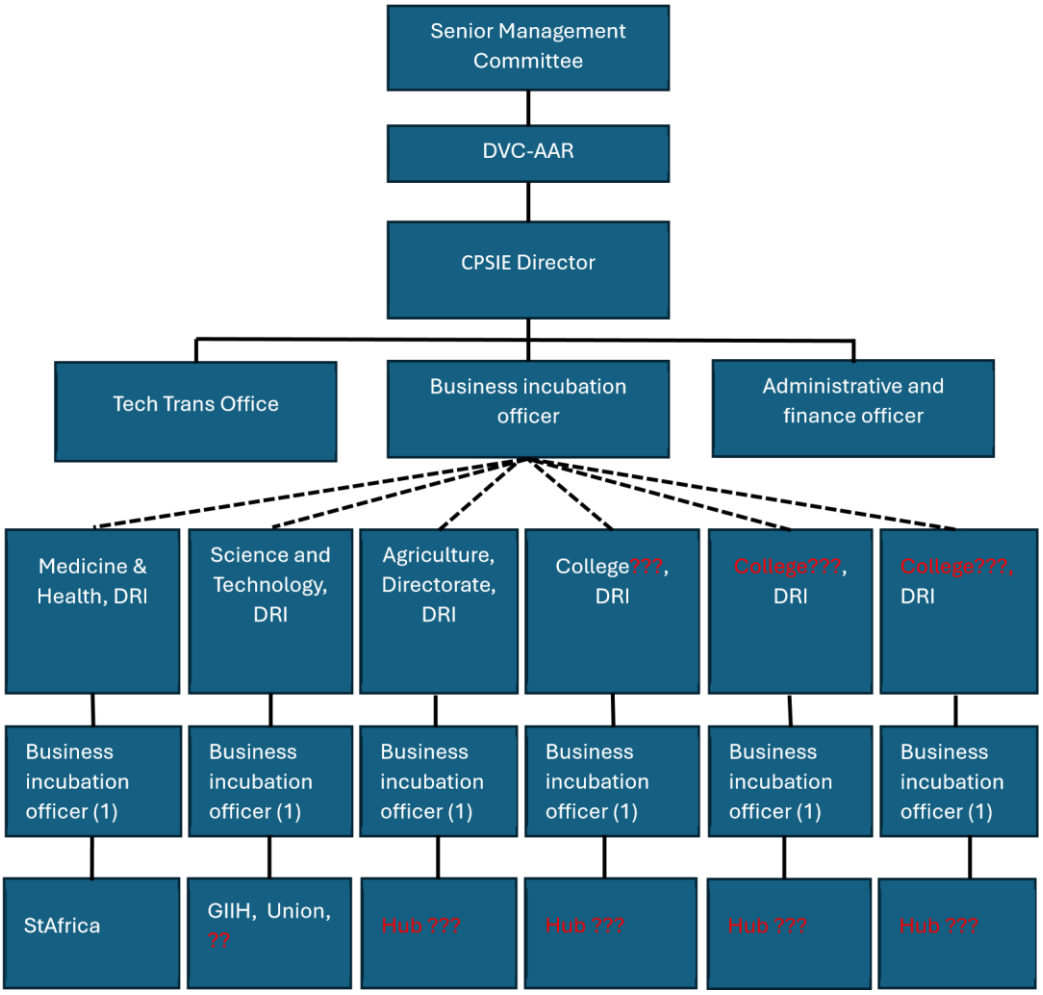

Figure 5. Organisation chart of the entrepreneurial ecosystem at the University of Rwanda.

StaU'ing and training

The director of CPSIE is an academic scholar appointed for a limited term. In addition to the director, the staU' consists of one business incubation oU'icer. Overall, the centre has limited resources to support the colleges.

The staU'ing of the college or ACE-level innovation hubs varies depending on available funding. The currently best-resourced innovation hub is GIIH, which is staU'ed with a full-time product development (PD) manager who functions as the incubator's daily manager. The manager designs and organises training activities, mentors and supports the incubatees, and monitors the incubatees. In designing and implementing the GIIH activities, such as the incubation program and innovation weeks, the PD manager has a background as an entrepreneur who has participated in startup incubation and business competitions. In addition, she has obtained incubation expertise through capacity-building and experience- and knowledge-sharing opportunities funded through external projects, for example, in Kenya (e.g., University of Nairobi), Uganda (e.g., Makerere University), and Sweden (Chalmers University).

UR has identified a need for additional capacity-building to upskill and reskill hub staU' across the university. Currently, the innovation hubs draw on external expertise, for example, in IT and IPM.

Operating budget

The activities of GIIH are funded by the World Bank through the Inter-University Council for East Africa, and UR provides infrastructure and utilities. This funding enables the implementation of the incubation program, including the boot camps, training, mentoring, and startup capital. The funding has also enabled hub staU to participate in capacity building abroad. The World Bank funding runs until 2024.

The UnIPod received funding from UNDP to equip the makerspace technology laboratories. UNDP procured the equipment, and UR is responsible for running the operations.

In general, external funding is considered fundamental for supporting the students and community.

Business model

The current business model is based on external funding for activities and equipment. The World Bank funds GIIH's operations and startup grants, and in-kind funding from UR provides physical space. The UNDP equipped UnIPod's labs, and UR covers UnIPod's operating costs.

In principle, when a startup receives seed funding, the UR takes a 30% equity stake. In practice, this arrangement faces challenges. The initial incubation and startup support provided by UR is provided at the idea development stage and is therefore not expected to generate income for the university. Even when entrepreneurs receive a startup grant, the university does not require equity. According to the GIIH PD manager, it is diUicult to demand equality during the startup phase, especially when external donors provide funding. The GIIH manager argues that if the university continues supporting the entrepreneurs after 2-3 years, when the initial startup phase is passed, UR might consider entering into a venture capital when incubatees want to expand.

The UR students are the main target group. Academic staU members are encouraged to engage in innovation and commercialisation. StaU engagement is especially notable among those engaged in the ACEs. UR has mixed experiences with collaboration between lecturers/researchers and undergraduates in joint startup projects. In general, this is not recommended because the perspectives are very diUerent. One challenge identified at UR is that few female students participate in the innovation and incubation programs.

Services oUered by the incubators/hubs

CPSIE seeks funding for and organises training for startups from diUerent hubs, for example, IP and commercialisation, and for hub staU, for example, on technology transfer.

Regarding business incubation, UnIPod and GIIH provide a supportive environment, collaborative workspace, access to resources and mentorship, and opportunities to connect with potential investors and partners, enabling students to collaborate, learn, and develop their innovative ideas into successful businesses.

GIIH organises a structured 12-month incubation program, which has been implemented three times. The process starts with a call for individuals or teams with an innovative idea. For example, in 2023, 100 teams or individuals applied. The applicants are invited to participate in a one-week boot camp on basic entrepreneurship skills. During the week, the GIIH can also assess the suggested idea and its viability. After the first week, 27 groups were selected for a new boot camp involving design thinking and prototyping. From this batch, 10 groups were selected for incubation. These groups sign a contract, access oUice space, and get assistance from lectures on technical issues. The incubatees

are mentored and supported in market validation by external business experts, typically individuals associated with private-sector incubators in Rwanda. After 3 months, incubatees pitch their startup to an expert audience, and five are selected to receive startup capital. Graduating firms can obtain the necessary certificates, hire employees, and start production.

The incubation program at GIIH was implemented in 2021, 2022, and 2023, resulting in 10, 5, and 10 graduating startups receiving a startup grant, respectively. The startups cover a range of sectors, including education, IT, agriculture, clean cooking, wastewater, mining, and health.

GIIH organises training and mentoring, and UnIPod provides oUice space, infrastructure, internet access, and access to the makerspace, which enables hands-on design and prototyping across ten labs supporting green tech, textile, studio, food tech and agritech, mechanics, and carpentry. External mentors play an essential role as a supplement to the technical expertise available within the university. GIIH has been able to hire external business experts to train on topics such as taxation, IPR, digital marketing, and pitching, with funding from Chalmers University. In the future, UR would like to obtain additional funding to establish mini UnIPod maker spaces in additional colleges, enabling students to create tangible, innovative products and gain handson skills.

University-internal linkages

UR has six colleges located in diUerent places, but all are attached to incubation hubs. This has created awareness about entrepreneurship across the university, and the general staU seems to be becoming more interested in entrepreneurship and commercialisation, not least, because of the success stories that have been emerging during the last few years.

Relationship with the surrounding entrepreneurial ecosystem

Over 20 innovation hubs exist in Rwanda. The majority are private, some are funded by international development agencies, for example, from Germany and Sweden, and some are branches of international networks such as Impact Hub [27]. Overall, Rwanda has a strong entrepreneurial ecosystem. RU works with many of these actors, especially through business mentorship from experts in these hubs, workshops and knowledge sharing.

One means of relationship building used by UR is innovation weeks. UR has conducted several successful Innovation Weeks, increasing visibility and awareness. The first innovation week was held by GIIH in 2022, focusing specifically on innovation in the energy sector and catalysing a range of benefits through the hub. Since then, technological and social innovation across the UR campus has expanded significantly. A second innovation week held in 2023, hosted by GIIH in collaboration with other hubs within the UR, was to catalyse these innovation gains by bringing together a wider range of innovation ecosystem partners in Africa and across all sectors to unpack the central role that the university can play in transformative innovation pathways for African countries as well as in the national strategy for transformation vision 2050.

Another way to engage with the broader international entrepreneurial ecosystem is through association membership. For example, GIIH is a member of Afrilabs [28]. Other activities include exhibitions at the Hanga Pitch Festival, the Youth Connect Africa summit, and Sustainable Energy For ALL, as well as participation in SWEAFUN's (Sweden-East Africa University Network) highlevel strategic and scientific workshop.

Despite these initiatives, the UR hubs still acknowledge that better relations with external partners, such as academic institutions and private and government institutions, are needed to enhance the quadruple innovation model [29,30].

International connections also play an essential role; for example, visiting Chalmers University to learn about managing a maker's space has been a significant opportunity.

UR has also played a role in shaping Rwanda's entrepreneurship policy framework by providing input and commenting on the country's Startup Act, issued by the Ministry of IT and Innovation.

[27] Impact Hub is a global network of locally managed coworking spaces, incubators, and social innovation labs that support entrepreneurs and "impact makers" focused on social and environmental challenges. It provides a community and resources for individuals and organisations to collaborate, innovate, and develop solutions for a more just and sustainable world. The network connects over 500,000 members in more than 120 cities worldwide. See https://impacthub.net/.

[28] AfriLabs is the largest African network of innovation enablers and a dynamic organisation empowering and building a community around innovation hubs and other stakeholders across various African countries since 2011.

[29] The Quadruple Helix innovation model is a collaborative framework involving government, industry, academia, and civil society working together to drive innovation.

[30] Carayannis, E. G., & Campbell, D. F. (2011). Mode 3 knowledge production in quadruple helix innovation systems: Twenty-first-century democracy, innovation, and entrepreneurship for development. In *Mode 3 Knowledge Production in Quadruple Helix Innovation Systems: 21st-Century Democracy, Innovation, and Entrepreneurship for Development* (pp. 1-63). New York, NY: Springer New York.

Key performance metrics

Table 13 shows the performance metrics for the GIIH incubator.

Table 13 shows the GIIH's results from 2020 to 2024.

Total number of startups enrolled in the incubator since 2020	Total number of startups graduated from the incubator since 2020	Total (estimated) number of jobs created since 2020	The amount of capital raised (equity, debt, and grants) secured by the startups since 2020	Number of new products or services launched in the market by incubated startups since 2020
TBA	TBA	TBA	TBA	TBA

Incubatee or start-up capacity of the incubator (how many can be hosted at a given time)	Number of incubatees currently housed by the incubator			
TBA	TBA			
Internal operational budget of the incubator in 2024	Total external funding obtained for the incubator operations in 2024	Estimated number of mentorship hours provided to incubatees per year		Is an M&E system in place (including incubatee satisfaction survey)
TBA	TBA	TBA		TBA

Strengths and weaknesses of the incubator

Table 14 summarises the strengths and weaknesses identified by the incubator manager.

Table 14. Strengths and weaknesses/challenges of the incubator from the managers' perspective

Theme	Strengths	Weaknesses/ Challenges
Location		
Strategy		
StaU (size of workforce, recruitment, motivation)	• StaU are interested but lack the resources to develop initiative	
Skills (employees' skill level, training programmes)		• More capacity building is needed to upskill and reskill hub staU
Business model		
Facilities		
Values (the values governing stakeholders' behaviour)	• Top-level management is supporting • General interest among staU and students in innovation	• Few female students are participating in the innovation and incubation programs
Style (the management style and how it influences employees' productivity and satisfaction)	• Top-level management is supporting	
Structure and organisation		

Systems		
Internal relations		
External relations		• More external partners, such as academic institutions, private and government institutions, are needed to enhance the quadruple innovation model

Future development and training needs for the incubator

The incubator management identified the following development needs:

- Developing a monitoring & evaluation (& learning) system.
- Develop strategies to avoid the incubated startup dying in one or two years after graduation. Identifying ways of supporting their acceleration of growth and market development.
- Finding ways to ensure that the solutions incubatees develop are needed out there in the market.
- Awareness raising about innovation among university staU – starting from the grassroots. How do we make sure that we identify all good innovative ideas? We don't have enough resources to do that. How do we increase the number of interested people?
- Finding ways to ensure that each colleague has a space for discussing innovative ideas?

Suggestions or recommendations for other universities aiming to establish incubators

In the following, we present the recommendations provided by the TITCH management on what other universities should consider when engaging in the establishment of university-based incubators:

- Understand the students and how to be there for them. Organise bootcamps, organise monthly events (for example, Innovation Weeks).

5.4.3 Technology transfer

Key performance metrics

Table 15 shows the University of Rwanda technology transfer results from 2020 to 2024.

Table 15. Key metrics for the University of Rwanda technology transfer.

Total number of patents registered per year since 2020	Total number of utility models registered per year since 2020	Total number of trademarks registered per year since 2020	Total number of copyrights registered per year since 2020	Number of active innovation-related MoUs with external partners
TBA	TBA	TBA	TBA	TBA

The total number of invention disclosures received since 2020	Total number of licence agreements closed since 2020	Total revenue from university-owned IPR since 2020	Number of startups formed based on universitydeveloped technologies since 2020	Average case processing time since 2020
TBA	TBA	TBA	TBA	TBA

Background of the centre

The UR aims to contribute to socio-economic transformation through innovative and impactful programs. The vision for UR is to be a leading university that develops highly enterprising graduates, prepared and dedicated to building a more just and sustainable society, nationally, regionally, and globally, through appropriate innovations that advance quality of life. UR's mission focuses on supporting Rwanda's development by advancing knowledge, maintaining academic excellence, and preparing students for service and leadership to transform communities. UR distinguishes itself by addressing real-world problems, emphasising innovation and commercialising technology and intellectual property. Technology transfer is thus crucial for enhancing the socio-economic status of the region and country.

In 2017, the UR created the Centre for Innovation and Entrepreneurship (CIE), which was later renamed the "Centre for Promotion of Students Innovation and Entrepreneurship (CPSIE)". The creation of this centre was a significant achievement towards building a dynamic environment that fosters innovation and creativity through strong linkages among various partners in the research, innovation and commercialisation ecosystem.

Various projects have contributed to technology transfer at the UR. The contribution comes in the form of funding for innovation projects and training in innovation and entrepreneurship. Below are some projects that actively supported the UR CPSIE.

UR Sweden Program**:** Has been CPSIE's primary funding partner through the Swedish International Development Agency (SIDA). SIDA supports over 40 ongoing innovation projects, including 26 from research and academia and 14 from students. Of these, five innovations are ready for commercialisation. In addition to providing seed funding for innovation projects, the UR Sweden Programme has supported the coordination of innovation development and entrepreneurship at the university level, identified and supported innovation ideas among students and staU at the college/school level, and provided training to the UR community.

UNITWEEN by Handong Global University: This Korean University partnership with the University of Rwanda to provide entrepreneurship training to university students, focusing on IT-related fields. One training is organised each year.

Starfrica: Is a 4-year collaborative project between UR and the University of Koblenz, Germany. This project has supported the establishment of an Incubator space at the College of Medicine and Health Sciences at Remera Campus. Its activities consisted of training for startup projects and preparing startups to reach the level of commercialising innovative products on the German markets. This project closed in April 2024.

In addition to aforementioned projects supporting the CPSIE to boost technology transfer, there are other initiatives implemented through the UR Centres of Excellence notably the African Centre of Excellence for Energy and Sustainable Development (ACEESD), African Centre for Internet of Things (ACEIoT), African Centre of Excellence for Data Science (ACEDS), and the African Centre of Excellence in Biomedical Engineering (ACEBE). These Centres are actively contributing to technology transfer at UR by supporting startups operating from their collegelevel incubator spaces, and they all generate high numbers of innovation outputs from their respective specialisations.

Organisation and institutional framework

Figure 6 shows the organisational structure of CPSIE and its relationship to the UR colleges. UR does not have a dedicated technology transfer oU'ice (TTO), but technology transfer issues are handled by a technology transfer oU'icer under the CPSIE. This oU'icer operates centrally but collaborates closely with the six colleges' business innovation oU'icers on intellectual property and technology transfer matters. These oU'icers are administrative staU'. The technology transfer specialist has the following responsibilities (among others):

- Identifying and evaluating new technologies developed within the institution.
- Securing intellectual property rights for innovations.
- Facilitating the commercialisation of technologies through partnerships, licensing, or startup formation.
- Supporting researchers with guidance on IP protection and commercialisation strategies.
- Ensuring compliance with legal and institutional policies regarding technology transfer.

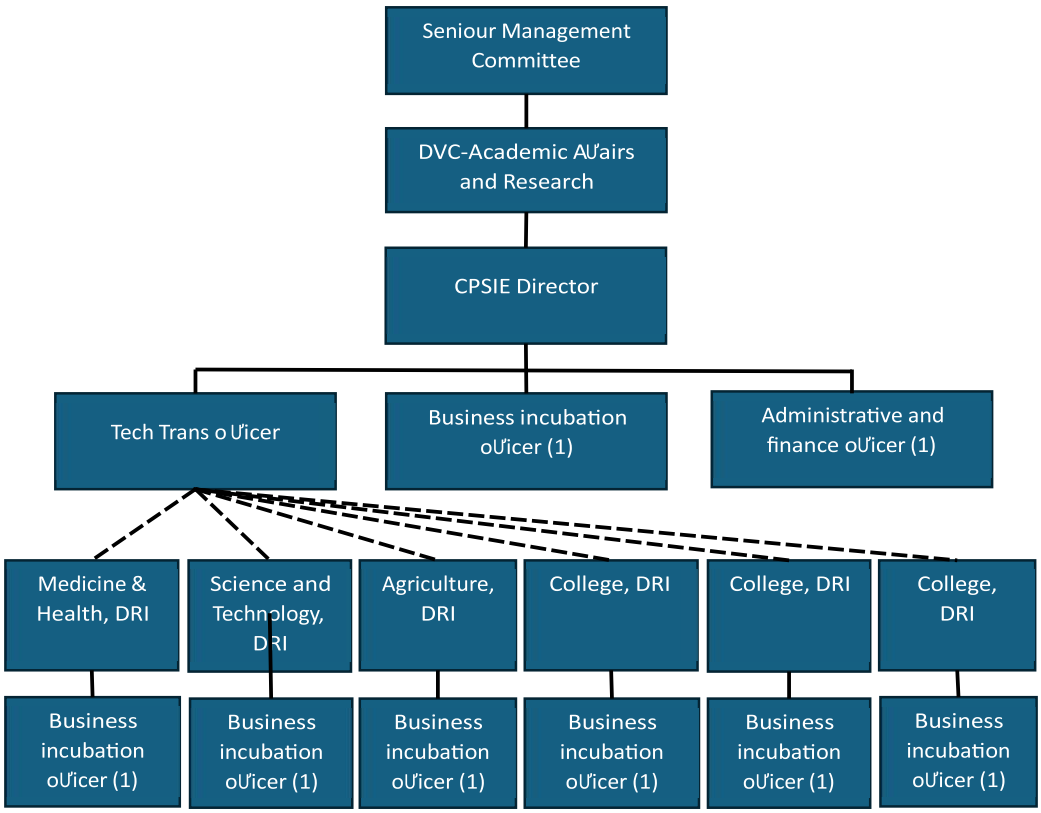

Figure 6. Organisation chart of the Technology Transfer Office at the University of Rwanda.

StaU'ing and training

The central TTO is staU'ed with one technology transfer oU'icer. The limited technology transfer and specialised staU' limit the number of projects and technologies that can be handled.

The allocation of administrative staU' may not always account for the knowledge and skills required for specialised functions such as technology transfer, and the assigned staU' may not be adequately trained for the function. Thus, training is undertaken as on-the-job capacity building when opportunities arise. Once trained, staU' may be reallocated to a diU'erent position on short notice, thereby losing the expertise they have acquired.

Another problem is that when an administrative staU' member takes an extended education leave (e.g., a leave of absence), he/she might be assigned to another position upon returning. CPSIE's technology transfer responsible oU'icer has left for a one-year training at the World Intellectual Property Organisation (WIPO) in the Netherlands. When the person returns, he/she must compete with others for the position and may not obtain the old posting. Another risk is that the capacitated employee may choose to seek other job opportunities. In general, it is a challenge to retain staU' who have been trained.

Intellectual property management

IP identification can happen when a research project results in innovations that become the basis of a startup. This has, for example, been the case in some fintech projects. When an innovator has an invention, they first visit the research oU'ice at their respective college. The staU' there then connect them with CPSIE's technology transfer specialist. The specialist assists the innovator throughout the entire process of registering or commercialising their invention. Typically, a prototype is registered with the Rwanda Development Board.

Managing intellectual property (IP) is complicated and requires special skills and significant time. The CPSEI can advise on IP registration, but is not yet equipped with the expertise and resources to handle the process of securing and maintaining IPRs fully.

The CPSEI director argues that UR do not have an operational technology transfer oU'ice but rather has somebody responsible for technology transfer. One reason is that there has been a limited need in the past. However, this is changing. CPSEI experiences growing demand from staU', students, and graduates. This is a result of the activities in the ACEs and the increasing support for startups provided by, for example, GIIH and UnIPod.

Business model

In principle, the UR aims to generate an income stream from co-owning IPRs on innovations developed at the university. But in practice, this is not possible.

Commercialisation

The CPSIE can support UR innovators until they secure and register an IP at the Rwanda Development Board. UR CPSIE is not ready to manage what follows regarding commercialisation. The commercialisation is beyond UR's mandate. There is a need to engage private companies in collaboration with the UR for commercialisation.

Funding and investment

Finding funding to develop new technologies is challenging, especially for academic inventions that require substantial investment to be market-ready.

Internal relationship management

Getting researchers involved and raising awareness of the TTO's services and the importance of IP protection are also significant challenges.

Strengths and weaknesses of the TTO

The UR technology transfer faces several challenges that aU'ect its ability to manage and commercialise intellectual property eU'ectively. Table 16 summarises some of these challenges.

Table 16. Strengths and weaknesses from the perspective of the technology transfer responsible at the University of Rwanda.

Theme	Strengths	Weaknesses
Location (physical location of the TTO)	-	-
Strategy (plan for development and implementation)	-	-
Theme	**Strengths**	**Weaknesses**
StaU' (size of workforce, recruitment, motivation)	-	• Limited budgets and staU' make it hard to handle many projects and technologies
Skills (employees' skill level, training programmes)	-	• Managing intellectual property (IP) is complicated and requires special skills and a lot of time.
Business model (create, capture, configure value)	-	• Finding money for developing new technologies is tough, especially for academic inventions that need a lot of investment to be ready for the market. • CPSIE is not ready to manage what follows (IPR registration) in terms of commercialisation. In fact, the commercialisation is beyond the UR mandate.
Facilities	-	-
Values (the values governing the management's behaviour)	-	-

Style (the management style and how it influences employees' productivity and satisfaction)	-	-
Structure and organisation (chain of command, accountability)	-	-
Systems (SOP, routines, workflow)	-	-
Internal relations	-	• Getting researchers involved and making them aware of the TTO's services and the importance of IP protection are also significant challenges.
External relations	-	• Building strong relationships with industry partners is important but takes a lot of eUort and resources.

Future development needs for the TTO

The TTO management identified the following development needs:

- The staU at the CPSEI level has lately been trained in commercialisation, but the staU at the college level needs training.
- Revising the innovation policy (in terms of IPR rights and sharing).

Key reference documents for Univesity of Rwanda

- Innovation policy (2022)
- Innovation strategy (2022)

5.5 Rwanda - University of Lay Adventists of Kigali

5.5.1 Introduction

The incubation activities at the University of Lay Adventists of Kigali (UNILAK) are in the establishment phase based on external project collaboration. However, the technology transfer activities at the university are in their initial stage; therefore, no historical performance data are available.

5.5.2 Incubator

History and background

In 2022, UNILAK established the Agri-business Incubation and Innovation Hub (AIIH) in partnership with YEAN (Youth Engagement in Agriculture Network) to involve youth in agribusiness innovation. This initiative was driven by the recognition of agriculture's pivotal role in Rwanda's economic development. To fully harness agriculture's potential, it is essential to empower young entrepreneurs with innovative ideas and skills, thereby catalysing transformation within the industry.

The establishment of AIIH was funded through a 3-year grant (2022-2025) by the AIRTEA [31] project of FARA, ASARECA and EAFF. The AIIH is placed under the Faculty of Environmental Studies. Presently, there are no other incubators at UNILAK. Still, the Faculty of Economic Sciences and Management is in the process of establishing a second one with the help of UPLIFTAg.

It is the vision of AIIH to be a catalyst for ambitious agripreneurs [32], equipped to tackle industry challenges, create jobs, and foster inclusive economic growth. The mission is to empower young agripreneurs with innovative ideas and skills, providing them with the support, resources, and mentorship they need to thrive in the agricultural sector. Through strategic partnerships and a nurturing environment, AIIH aims to cultivate a new generation of leaders who drive sustainable solutions, foster job creation, and contribute significantly to agricultural development and inclusive economic growth.

Being in the startup phase, the first years of the AIIH have been focused on establishing the incubation programme and identifying partners, and the AIIH has selected the first cohort of 18 student incubatees in spring 2024.

Previously to the establishment of AIIH, UNILAK had been involved in mentoring students and developing prototypes for 4 years as part of the African German Entrepreneurship Academy (AGEA) project. In the project, students were sent to national and international competitions. Some students were sent to Germany and Ghana for further training. When returning, these students started their businesses after graduation.

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[31] The Strengthening Agricultural Knowledge and Innovation Ecosystem for Inclusive Rural Transformation and Livelihoods in Eastern Africa AIRTEA project, a transformative initiative aimed at strengthening agricultural knowledge and innovation ecosystems in Kenya, Rwanda, and Uganda. Accessed at: https://faraafrica.org/airtea/.

[32] Agripreneurship refers to the use of business skills and innovation in agricultural and agrifood value chains to improve farming techniques, outputs, products, and logistics, and to tackle sector challenges through innovation.

Organisation and institutional framework

Figure 7 shows the organisational structure of the AIIH at UNILAK, and Table 17 lists the roles and responsibilities associated with the incubator's governance and management.

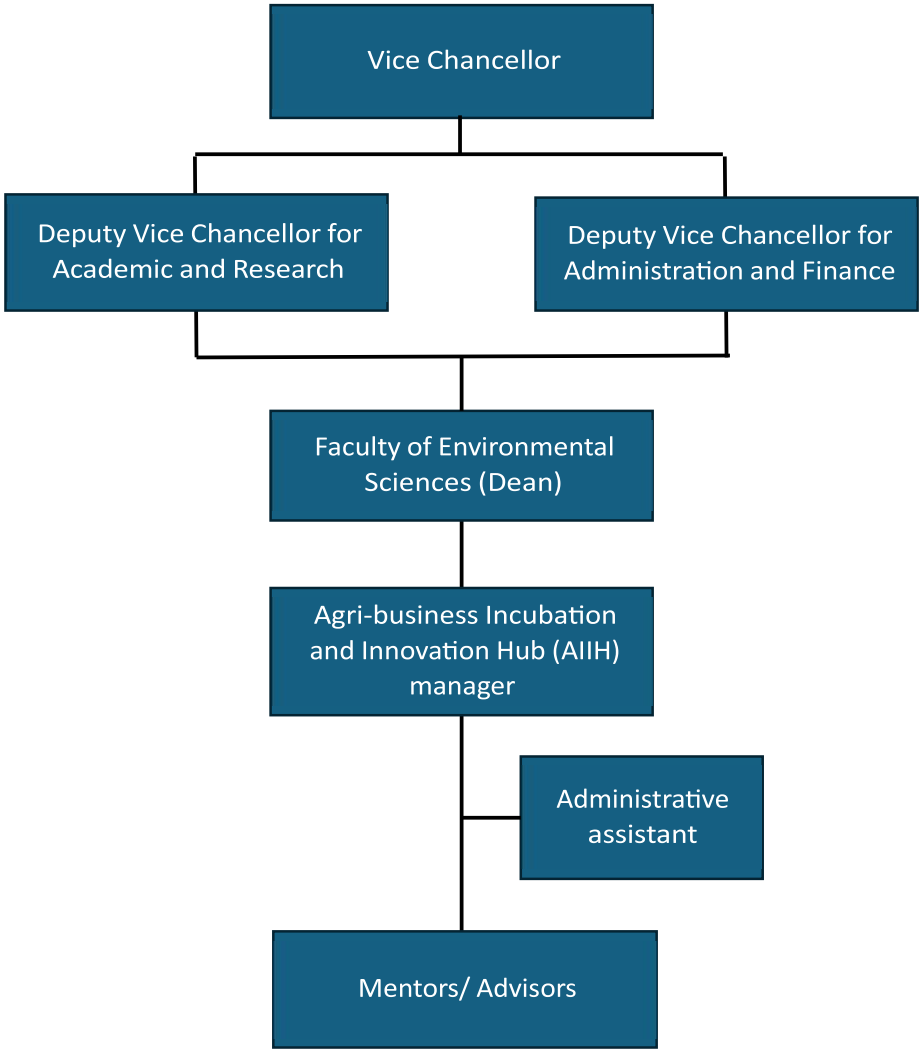

Figure 7. Organisation chart of the Business Incubation and Innovation Hub at UNILAK.

Table 17. Roles and responsibilities associated with governance and management of AIIH.

Position	Roles and Responsibilities
Vice Chancellor	• Oversee overall operations and strategic direction of the incubator. • Engage with external stakeholders, including government agencies, industry partners, and donors, to foster collaborations and support for the incubator's initiatives.
Deputy Vice Chancellor of Academics and Research	• Provide academic and pedagogical support • Oversee the design and implementation of incubation programs Deputy Vice Chancellor for Administration and Finance • Allocate financial resources and infrastructure support to the incubator, ensuring it has the necessary funding, facilities, and equipment to operate eU'ectively • Monitor budget execution to ensure compliance with regulatory requirements and financial reporting standards
Dean of the Faculty of Environmental Studies	• Facilitate collaborations between the incubator and faculty members/students for mentorship, research partnerships, and knowledge exchange • Report on the incubator's outcomes and achievements to university stakeholders, donors, and the broader community.
AIIH manager	• Handle day-to-day administrative tasks and facility management. • Facilitate networking opportunities and investor relations. • Develop marketing strategies to promote the incubator. • Engage with the community and potential entrepreneurs.
AIIH administrative assistant	• Assist the manager in handling day-to-day administrative tasks, including scheduling meetings, handling correspondence, and organising events. • Maintain files, records, including minutes and databases related to incubator operations, ensuring information is accurate and easily accessible. • Provide basic IT support to staU' and incubatees within the incubator.
Mentors and advisors	• OU'er strategic advice and mentorship based on their industry experience and expertise. • Help incubatees develop and refine their business strategies, including market positioning, customer acquisition, and growth planning. • Provide technical advice and support related to agribusiness operations, production processes, technology adoption, and product development. • Facilitate introductions to industry contacts, potential customers, suppliers, and strategic partners. • Serve as advocates for startups within the industry and promote their success stories to enhance visibility and credibility.

An operational plan was developed by YEAN for 2022 to 2025, but AIIH plans to develop additional guidelines and policies to clarify the operational setup. A monitoring plan also exists, but it is not yet very well developed.

Target group

Admission to the AIIH is open to all students, alumni, and aspiring agripreneurs from the surrounding community who possess innovative agribusiness ideas or startups.

StaU'ing

AIIH is staU'ed with a manager and an administrative assistant. The responsibilities of these functions is outlined in Figure 17.

Operating budget

UNILAK provides space for AIIH, but the university oU'ers no internal budget for AIIH activities.

Business model

AIIH's current business model is to provide services funded by external sources. The possibility of generating income from the co-ownership of university-based IPR (developed by researchers or postgraduate students) used in startups, or entering as a co-owner of incubated startups, has been considered but is not a practice engaged in at the moment. This is partly because there is no system for following the startups after incubatees have graduated.

Services and products

The current Incubation program was developed with YEAN. The planned services to be provided by AIIH include agribusiness incubation, co-working space, coaching and mentorship, network and linkages, and knowledge sharing. More specifically, this involves:

- Providing shared oU'ice space, laboratories, research facilities, and specialised equipment for product development and testing.
- Providing access to technology infrastructure and software platforms for data analysis, market research, and digital marketing.
- Developing a structured programs that provide startups with guidance and mentorship, including business plan development, financial planning, budgeting, marketing strategies, value chain management, intellectual property protection, licensing, permits, and compliance with agribusiness regulations.
- Providing assistance in identifying and applying for funding opportunities, grants, loans, and investment capital.
- Matching startups with experienced mentors and advisors who provide industry-specific guidance and expertise.
- Participating in industry events, conferences, competitions and trade shows to showcase startups and enhance visibility.

University-internal linkages

In general, it is a challenge to mobilise agriculture students, as they do not consider agriculture a viable career. The lack of an entrepreneurial mindset among the youth reinforces this. One way to promote entrepreneurship is to encourage the development of youth clusters and collaborative work.

When incubatees graduate, there is no follow-up from AIIH. UNILAK wants change this by establishing a database of incubatees who have graduated to be able to follow up, establish partnerships, and make an MoU with the startups.

Relationship with the surrounding entrepreneurial ecosystem

In general, Rwanda's entrepreneurial ecosystem is well developed, and the university aims to seize these opportunities to build an entrepreneurial culture and mindset among students and staU'. The

Government has initiated support for startups, for example, through the Doing Business in Rwanda program and a tax exemption for the initial two years of a startup.

UNILAK envisions that AIIH will be engaging with the local community, agricultural associations, research institutions, and government agencies to foster collaboration and an entrepreneurial ecosystem. Currently, AIIH has established contacts with diU'erent partners within the industry. These partners help promote entrepreneurship and prototype development and contribute to the mentorship program.

Key performance metrics

Table 18 shows the key performance metrics for the Agri-business Incubation and Innovation Hub since its foundation in 2022.

Table 18. Key performance metrics for the Agri-business Incubation and Innovation Hub at UNILAK from 2022 to 2024.

Total number of startups enrolled in the incubator since 2022	Total number of startups graduated from the incubator since 2022	Total (estimated) number of jobs created since 2022	The amount of capital raised (equity, debt, and grants) secured by the startups since 2022	Number of new products or services launched in the market by incubated startups since 2022
TBA	TBA	TBA	TBA	TBA
Incubatee or start-up capacity of the incubator (how many can be hosted at a given time)	Number of incubatees currently housed by the incubator			
TBA	TBA			
Internal operational budget of the incubator in 2024	Total external funding obtained for the incubator operations in 2024	The estimated number of mentorship hours provided to incubatees per year		Is an M&E system in place (including an incubatee satisfaction survey)
TBA	TBA	TBA		TBA

Future development needs for the incubators

UNILAK emphasises the importance of UPLIFT-Ag in realising the future capacity development plans for further developing AIIH and the second UNILAK incubator, including:

- Developing operational guidelines and sustainable business models for incubation
- Design frameworks for admission, mentorship, graduation and M&E practices
- Support the operationalisation of the incubation processes by
- Training the recruited staU'
- Facilitate staU' to conduct a study visit
- Identify relevant training modules tailored to the cohort's

- Develop training material
- Identify mentors
- Organise campaigns to mobilise the youth (incubatees)
- Identify partners in the ecosystem that can help the incubatees.
- Organise competition to identify incubatees to be awarded (without competition, there will be no motivation) - competition is also a good way to connect them to business partners who are engaged in the competitions
- Establish a mechanism for post-graduation follow-up **Key reference documents**
- YEAN operational plan
- Monitoring and evaluation plan

5.5.3 Technology transfer

Table XX. Key performance metrics for technology transfer at UNILAK.

Total number of patents registered per year since 2020	Total number of utility models registered per year since 2020	Total number of trademarks registered per year since 2020	Total number of copyrights registered per year since 2020	Number of active innovation-related MoUs with external partners
TBA	TBA	TBA	TBA	TBA
The total number of invention disclosures received since 2020	Total number of licence agreements closed since 2020	Total revenue from university-owned IPR since 2020	Number of startups formed based on universitydeveloped technologies since 2020	Average case processing time since 2020
TBA	TBA	TBA	TBA	TBA

History

The TTO at UNILAK is not yet formally established, but the Directorate of Research currently handles its functions. This directorate, which oversees all research activities, was established in 2012 during a period of intensive international collaboration through conferences, training, and student/staU development.

Organisation and institutional framework

The technology transfer processes are managed within the Directorate of Research, but there is no dedicated technology transfer oUice or oUicer. The organisation of the Directorate of Research is shown in Figure 8. The directorate's technology transfer-related responsibilities encompass:

- Strategic leadership by developing a vision and strategy aligned with UNILAK's mission.
- Formulating policies for legal, ethical, and funding compliance.
- Roadmap development, setting out key project milestones and timelines to drive innovation.
- Research management, overseeing projects, allocating resources, project oversight, supervising time management (deadlines).
- Budget management and research quality standards.

- Fostering collaborations with universities, industry experts, and other institutions. By initiating research collaboration, being open to other partners, and marketing the diU'erent faculties and technologies produced by students.
- Facilitating stakeholder engagement and networking.

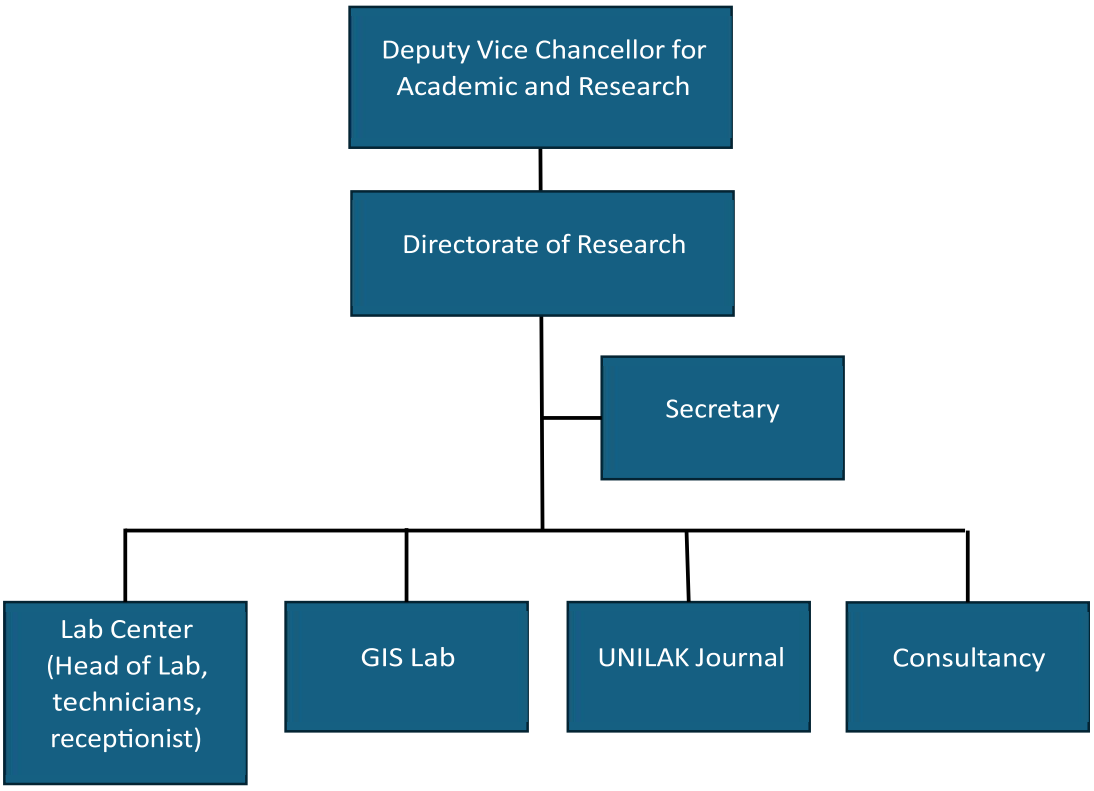

Figure 8. The organisational organogram of the Directorate of Research at UNILAK.

StaU'ing

The Director for Research is responsible for the technology transfer management. The director was recruited from the academic staU' of UNILAK.

Business model

UNILAK is partnering with startups whose activities are supported by the university. The university will continue to support the startups through the Directorate of Research.

Operating budget

There is a limited budget for running the Directorate of Research.

Commercialization

UNILAK needs staU' with skills in commercialising innovations.

Marketing and outreach

The directorate facilitates the transfer of technology to our local community, i.e., by presenting findings that can be applied across diU'erent communities

Education and training

In terms of training, there is a need to improve the quality of the business ideas so they have the potential to be commercialised. Many innovations developed by researchers and students have limited potential to serve as a basis for a successful startup.

Many university researchers have diU'iculties understanding the processes involved in technology transfer and IP management. There is a need to draw on external experts with greater skills and experience from practice. UNILAK have some professors with such skills who work as mentors, but the university still needs to build additional capacity with help from startups and enterprises with successful stories. This may involve raising funds for mentorship, which is challenging.

Services and products

The TTO at UNILAK intends to provide a range of services and products, including.

- Protection and management of IPR
- Promotion of collaborative research between the university and industry
- Encouragement of entrepreneurship and commercialisation
- Business development support
- Networking
- Outreach

Internal relationship management

UNILAK oU'ers courses on entrepreneurship that teach students how to behave outside the university, create jobs, and collaborate with the government. Students who show interest can subsequently be supported to realise their ideas through the AIIH incubator.

YEAP, a youth NGO linked to the Ministry of Agriculture, is an important partner that provides support for education.

Relationship with the surrounding entrepreneurial ecosystem

The technology transfer staU' engages with industry partners, government agencies, universities, and research institutions to foster strong industry linkages and eU'ective intellectual property management. The technology transfer ecosystem includes R&D teams, an innovation incubator, industry partnerships, funding opportunities, and commercialisation support, all within a framework supported by government policies and engagement with educational and research institutions.

The TTO at UNILAK engages a diverse network of members and collaborators, including faculty, students, alumni, and university administration, as well as external partners such as NGOs, academic institutions, and media firms.

Strengths and weaknesses of the incubator

Table 19 provides an overview of strengths and weaknesses identified by the Directorate of Research.

Table 19. Strengths and weaknesses from the TTO manager's perspective.

Theme	Strengths	Weaknesses
Location	-	
Strategy (plan for development and implementation)	-	• The TTO lacks a specific structure, governance framework, dedicated budget or distinct funding sources.
StaU (size of workforce, recruitment, motivation)	-	• Limited staU'ing for intellectual property and commercialisation activities • Needs staU' with skills in how to commercialise prototypes
Skills (employees' skill level, training programmes)	-	• A general challenge is that specific IP management capacity is low. • Support for IPR management is a challenge
Business model	-	•
Facilities and resources	-	• Limited funding opportunities • Resource constraints
Values	-	-
Style	-	-
Structure and organisation	-	-
Systems	-	-
Internal relations	-	• Lack of awareness, understanding of IPR and engagement among staU' and startups
External relations	-	• Limited industry partnerships • Restricted access to global markets

Future development needs for the TTO

The UNILAK Directorate of Research identified the following development needs:

- Knowledge of IP policies and regulations.
- Support on IP strategy development
- TTO managers and staU' require expertise in IP management (patent filing, licensing), funding sources, and skills in technology assessment, negotiation, and project management.
- Training programs should include workshops, mentorship, online courses, networking events, and practical exercises to build these competencies.
- Business development and networking by facilitating connections with industry leaders and potential partners and providing mentorship and coaching to guide startups.

Suggestions or recommendations for other universities aiming to establish a TTO

In the following, we present the recommendations provided by the Directorate of Research, UNILAK, on what other universities should consider when engaging in the establishment of a technology transfer oU'ice function:

Establishment phase

- Have a technology transfer policy which is integrated with the university policy.

Management and organisation

- Training-of-the-trainers (ToT) of the (incubation) mentors so that they can train others (linked with incubation hub).

Funding

- Ensure enough funding for the activity (linked with the incubation hub).

Internal and external linkages

- Active stakeholder collaboration (linked with incubation hub).

Key reference documents

- TBA

5.6 Burundi - University of Ngozi

5.6.1 Introduction

University of Ngozi is in the initial stages of establishing its incubator, and therefore, no performance data are provided. Similarly, although the university has several ongoing research activities, a dedicated technology transfer function is not yet established. Technology transfer is associated with outreach and knowledge-based support, notably to small-scale farmers, for example, through sharing knowledge on management practices and new technologies such as improved seeds.

5.6.2 Incubator

History

The Centre of Incubation, Innovation and Development (CIID) was created in 2023. It is created to foster innovation, research and commercialisation, and to build collaboration between industry and our university. It started with a group of 50 students and the centre manager. However, the centre is still in the process of being created. This is not an easy process as incubation is a relatively new practice in Burundi, with few role models to follow. The university initially provided space for the centre on the main campus and allocated farmland for practical experimentation, but the incubator still needs to develop its training and equipment. In general, CIID finds that university-internal stakeholders (management, staff, and students) have a good understanding of the role of entrepreneurship and an incubator within the university context.

According to the incubator manager, starting an incubator centre is a highly complex process. Overcoming financial constraints, building a strong network of support, and offering relevant services require careful planning and execution.

Organisation and institutional framework

The CIID is located on the university's main campus and is currently working closely with the faculties of Agronomy and Computer Science. CIID does not yet have organisational and governance structures, and its policies, such as a strategy, action plans, budgets, and funding sources, are in the creation phase. The incubator also lacks a set of operational guidelines.

Staffing

The CIID is headed by a part-time manager appointed from the university's academic staff. In addition, some lecturers, students and administrative staff are working as volunteers. None of the staff members has previous incubation experience.

Operating budget

Our incubator is not funded.

Business model

An explicit business model has not been formulated for the CIID.

Services offered by the incubator

The incubator is not yet at the level of offering services. Currently, it is providing hints to students, training, and seminars thanks to a partnership with The Centre for Training and Development of Ex-

Combatants (CEDCA) and the two Spanish NGOs, AsuOng and SPH. CEDCA (Centre of Career Development) aims to develop the essential skills required for the job market. They oU̓er training programs on employability and sustainable entrepreneurship, as well as coaching and professional mentoring.

University-internal linkages

The closest collaborators within the university included department heads and students. CIID and the departments invite each other to workshops and seminars; they share facilities; and professors and students may engage in joint innovation projects. Internal partners are most of the time available to provide help to CIID without payment, as they know the incubator does not have funds.

Relationship with the surrounding entrepreneurial ecosystem

Outside the university, our partners are the local administration, churches and businessmen. As a community university, they keep an eye on university management, fostering its growth.

The entrepreneurial ecosystem in Ngozi is developing quickly, the industries are growing, and local businesses are expanding as people understand the role of cooperativism. The small-scale farmers count on the university to assist them and bring them innovation. They are voicing their issues and concerns, asking for possible solutions from academia. Ngozi location is among the few places in the country where you can grow industrial crops, among them coU̓ee, tea and Hass avocado.

Strengths and weaknesses of the incubator

Strengths

- Access to academic resources and expertise
- Partnership opportunities
- Ample opportunities for collaboration across departments and with external organisations

Weaknesses

- That the bureaucracy can create delays in responding to needs or pursuing opportunities.
- The faculty members may be more interested in research publications or teaching responsibilities than in working with commercial opportunities.
- The university incubators are often dependent on university funding or grants, which is a big problem for poor universities.

Future development needs for the incubators

According to the incubator manager, CIID have identified the following needs:

- We need to learn how to manage and commercialise the talents of students and staU̓ from the university, and how to focus and find new models of agriculture which do not harm lives. This means supporting startups that will find answers to real problems in the local communities.
- We need knowledge of financial management skills and how to secure funding.
- The incubator serves a broad range of startups, and managers may lack deep knowledge in all sectors.
- StaU̓ need to be up to date on the latest technological trends or innovation management practices.
- We lack access to the proper infrastructure for scaling agricultural innovations.

- We lack the simplified bureaucracy and administrative flexibility to avoid slowing down processes of providing resources or support to incubators.
- We need simplified access to university resources to make it easier for innovators to work.
- The competences that are needed are knowledge about incubation models, strategic planning and leadership, grant writing and fundraising, incubation process and stages and entrepreneurial mindset.
- Trainers need their own training to build their capacity to implement good incubator services.
- We seek knowledge on how to access funding and networking opportunities, and how to get appropriate facilities and equipment.

Suggestions and recommendations for other universities aiming to establish incubators The incubator manager's main suggestion is to visit other university incubators and learn from their experiences. This is the only way to know how to build a sustainable incubator.

Key reference documents

- TBA

5.6.3 Technology transfer

The University of Ngozi has been developing research activities in its areas of expertise for several years, often bringing together professors, students and national and international partners. Much of this research is based in the Centre for Research on Agriculture and Rural Development (CERADER), created in 1999. Today, the centre operates in the four most populated and poorest provinces of Burundi, all located in the north of the country: Kirundo, Kayanza, Muyinga and Ngozi. CERADER's action covers three aspects:

- Research and development
- Seed quality control and agri-food product analysis laboratory
- Training and supervision of the population

Research activities are conducted in rice production, vegetable seed production, fruit production and beekeeping. The research is carried out in collaboration with local farmer organisations and international research partners. In terms of IPR, the university aims to develop a seed certification bearing the CERADER label. Technology transfer currently involves training and supervising small-scale farmers in new farming practices and providing seeds. For technology transfer to advance with great momentum, the University of Ngozi must invest more. The current level of research, innovation and technology transfer can be improved.

5.7 Burundi - University of Burundi

5.7.1 Introduction

University of Burundi has advanced significantly on the overall organisational frameworks for establishing both incubation and technology transfer functions. Still, whereas the incubator has gained some experience, the technology transfer oU'ice is still not operationalised.

5.7.2 Incubator and technology transfer

History

The first version of the University of Burundi Incubation and Acceleration Center (CINAUB) was established in 2019 from an incubator project initiated by the Doctoral School of the University of Burundi (UB) after the call for projects and with the support of the Regional Universities Forum for Capacity Building in Agriculture (RUFORUM) [33]. Named at its inception the 'Incubator of the Doctoral School' and founded with RUFORUM funding, this university structure quickly evolved (Rectoral Decision n ° 131 of 01/04/2022) and was transformed into a centre both for the incubation and acceleration of entrepreneurial projects and for the eU'ective integration of innovative practices within the university community using information and communication technologies for education (ICTE). One of the strengths of CINAUB is that it is founded on a legal framework.

CINAUB started working without any knowledge or a general document of shared understanding of entrepreneurship, except that CINAUB began from the observation that all the university faculties organised entrepreneurship courses. This was a springboard for convincing the faculties to enable their students to engage in practical entrepreneurship through an incubator.

From the beginning of 2019, the main idea was to bring together lecturers with research outputs that could be commercialised and entrepreneurial students to create new businesses. The idea was that students could be responsible for managing and organising the startups while being coached by the lecturers. In the initial call (2019), 11 startup candidates received seed funding from RUFORUM and incubation services from UB. 9 ventures were lecturer- and student-based, and 2 were student-based. After some time, challenges were encountered. Some of the initial student incubatees never repaid the seed funding they received, as expected. The startups asked for more money, and in addition, accounting problems regarding the use of grants emerged. Some of the startups died. The incubation of this first batch provided an important learning experience for UB.

In 2022, the university conducted an analysis to determine how to move forward using a learningby-doing approach. The incubator changed its name to CINAUB. At this time, the university had adopted a new vision to transform UB into an entrepreneurial university [34]. The biggest challenge for CINAUB was to launch its activities in a context where entrepreneurship was not a widely known

[33] The Regional Universities Forum for Capacity Building in Agriculture (RUFORUM) is a network of over 160 African universities working to transform agriculture and rural economies by strengthening graduate training, research, and innovation, particularly supporting small-scale farmers through enhanced university-led science and technology for food security and economic growth in Sub-Saharan Africa. Accessed at: https://www.ruforum.org/index.php/.

[34] Abreu, M., Grinevich, V. (2024). The entrepreneurial university: strategies, processes, and competing goals. The Journal of Technology Transfer, 49, 1991–2034. https://doi.org/10.1007/s10961-024-10085-7.

concept at UB. It was necessary to organise training courses to raise awareness among young people about entrepreneurship. Faced with this, it was necessary to find a technical and financial partner.

In 2022, the German Sparkassenstiftung Eastern Africa (DSIK) joined as a new partner and helped transform the original incubator's organisation, training, and intervention approaches. A new call was issued in 2022. 58 students from across the university applied. All applicants received training in topics such as entrepreneurship, business planning, and accountability. DSIK is helping by financing training and coaching activities. The training was focused on elaborating business plans. The cohort was asked to submit their business plans, and 46 draft plans were submitted. A new period of

coaching activity was implemented, and in the second round, 24 submitted complete business plans. The reduced cohort was trained in various subjects, including elevator pitching. Finally, a business plan competition was held, and 5 incubatees got prizes sponsored by DSIK. Following this successful process, RUFORUM returned to UB in 2023 and oUered to organise an additional business plan competition, in which three startups won a prize of 2000 USD.

In 2023, CINAUB implemented entrepreneurship training based on the business games approach introduced by DSIK [35]. Based on an online call, 1,300 students applied and were trained by the program, which involved engaging 30 trainers. This intervention was used to raise awareness and to serve as a basis for recruiting new startups to the incubator.

In general, CINAUB is deeply involved in supporting UB's transformation into an entrepreneurial university. In addition to the incubator, this involves campus-wide training, workshops, the distribution of flyers, and the exposition of achievements. The goal is to change students' attitudes towards entrepreneurship, self-employment, and job creation. This is an ongoing challenge. Even more challenging is promoting this vision among university staU. However, more and more staU members are becoming interested in entrepreneurship at a personal level. Low salaries mean many lecturers must work as consultants to support their families' livelihoods. Thus, engaging in entrepreneurship is increasingly seen as another way to supplement a low salary.

The success stories from CINAUB have sparked a policy shift at UB. In the beginning, CINAUB was intended to be the only business incubator, but recently, the Vice Chancellor has opened it to all faculties to establish their own incubators. To coordinate activities across the diUerent incubators, the Incubation and Technology Transfer Centre at the University of Burundi (CITRATECH) has been established. CITRATECH is introduced in the next section.

Organisation, governance and institutional framework

CINAUB is located on the UB campus, in the doctoral school, with an oUice and a co-working room. We have an oUice organised as shown in Figure 9. The CINAUB is anchored in UB Doctoral School.

[35] See DSIK homepage at: https://sparkassenstiftung-easternafrica.org/projects/activities/default-title-1.

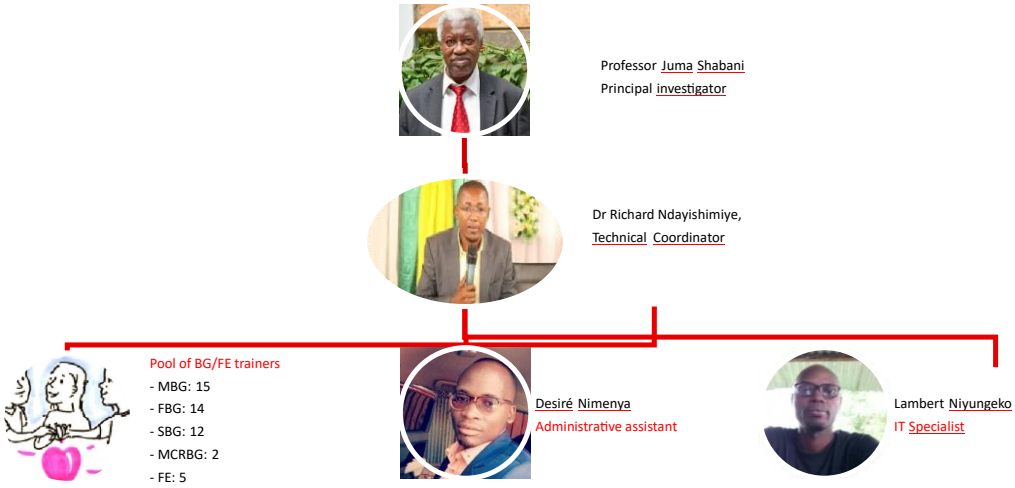

Figure 9. Organisation chart of the Centre d'incubation et d'accélération de l'université du Burundi (CINAUB).

CINAUB has three areas of operation: 1) *Institutional structuring* (planning and administrative governance; coordination of activities, studies and evaluations; mobilisation of partnerships), 2) *research and innovation* (entrepreneurship; transfer of skills; management of organisations), and 3) *Support and acceleration* (face-to-face and online training; support service for young entrepreneurs; support for entrepreneurial projects; coaching and mentoring for access to financing).

In 2024, CINAUB published a detailed 22-page implementation program, "Technical Support Program for Entrepreneurial Innovation within CINAUB" (PRATIC), developed through a collaborative process involving students, lecturers, and management. The document outlines three strategic and seven operational 'axis' of the incubator and stipulates the structure of the incubation program.

CINAUB does not have a monitoring, evaluation and learning (MEL) framework but uses the following four overall categories as key metrics for assessing progress:

- Internal and external collaboration activities
- Training and support
- Intervention at the community level
- Research

CINAUB has no board of directors.

Target group

Students of the UB are the beneficiaries of the CINAUB activities. External actors are currently not included, but the university would like to extend the service to the whole university community and external entrepreneurs

StaU'ing and training

All staU' at CINAUB come from the university community. The staU' includes the following functions:

- Principal Investigator (PI). The PI of the CINAUB is the Director of the Doctoral School. The Director is both internally and externally well-connected and provides a link to the top management.

- Technical coordinator (TC). The TC is appointed among the university staU. The TC is a lecturer of Management Science from the UB Business School. The TC is responsible for the daily operations of the CINAUB and reports to the PI. The TC, also Dean of the Business School. The TC works part-time at the CIBAUB.
- Trainers. The pool of experts includes UB lecturers and external experts with expertise in business games used to promote entrepreneurship among students.
- Administrative assistant: The assistant is also the assistant of the Doctoral School.
- ICT specialist. The IT specialist is also the assistant of the Doctoral School.

The staffing situation is somewhat challenging. The PI and TC have their regular full-time university positions as director and dean, respectively, to attend to, which limits the time available for CINAUB. In practice, it is the AA who runs the daily activities, but also in a part-time position. Currently, a financial management/accountant function is also absent.

Currently, the CINAUB have developed experience in entrepreneurial support and partner mobilisation. According to UB, the skills most needed in the process of developing CINAUB are incubation management and technology transfer project skills.

Operating budget

On the financial side, the operation of CINAUB is ensured by the BU, which provides it with a dedicated team and oU'ice space. CINAUB intends to generate other income through the design and execution of action research projects to contribute eU'ectively to its operation. Aside from this, CINAUB responds to calls for projects in various fields, including entrepreneurship and startup support, but such opportunities are rare.

One significant challenge for the incubator's ability to maintain a consistent level of activities and become sustainable is the instability of resources for facilitating activities, such as staU and student training and buying materials.

At the time of data collection in June 2024, no sponsor was found to replace DSIK, whose project with UB ended in September 2024. Funding is necessary for organising activities. Lecturers and external experts are paid for providing services related to incubation and business game courses. In some cases, students also need to have transportation costs covered.

Business model

CINAUB's business model is based a mix of university subsidies, in terms of in-kind provision of physical space and staU'ing, and external resources for funding of activities. The external funding is sought through establishing partnerships with academic and societal partners. CINAUB relies heavily on internal UB resources to identify, create, and maintain partnership with organisations that are interested in investing in entrepreneurship or can otherwise use the incubator's services. The actual incubation processes and other entrepreneurship related activities are largely funded by these external partners. The terms of collaboration are defined in CINAUB's internal regulations. As part of this model, CINAUB is currently implementing the agreement between the UB and DSIK. It has also engaged in other partnership projects including the one with the Belgian Development Agency (ENABEL).

In terms of income generation, CINAUB have been successful in making available its e-learning platform Moodle for development partners who have training need. This activity involves providing the platform and technical support, as well as training not related to the entrepreneurship field.

Another possible future income stream is to oU̓er business games-based training to a broader customer base outside the university, for example, NGOs that want to train local community groups. Business games have been translated into several local languages, and the expert pool can engage with these communities. The DSIK has licensed UB to use the business games in the future as a means of generating revenue to continue core operations. Currently, CINAUB has no plans to use the incubator business model of acquiring equity shares from startups being incubated.

Services oU̓ered by the incubator

CINAUB promotes and strengthens the entrepreneurial culture in the university community through learning activities focused on entrepreneurship and the transfer of innovative university practices, while paving the way for responsible social projects. More specifically, it contributes to:

- Promote entrepreneurial culture in the community
- Strengthening entrepreneurial capacities and the financial inclusion of members of the university community.
- Supporting the creation of businesses by young entrepreneurs from the university community by providing basic entrepreneurship support and business acceleration.
- Providing members of the university community with a mentoring and networking system.
- Contribute to the mobilisation of partners for development.
- Facilitate the transfer of innovative managerial practices.

In terms of cultural transformation, the incubator aims to influence the student base by oU̓ering access to the business game training across the university. An important entrepreneurial capacity-building approach at UB is the use of business games, which are used to teach students how they do entrepreneurship. The games are five diU̓erent board games played by participants, facilitated by the pool of internal and external experts.

The business incubation process consists of 1) a call, 2) selection of incubatees, 3) initial training, 4) business planning, 5) business plan competition, 6) selection of the winner who receives seed funding, 7) continued incubation, and 8) graduation. The process involves training, coaching, mentoring, networking, etc.

Other services provided by the incubator include selling access to the Moodle e-learning platform. The platform has been used by NGOs to train communities online and by external customers to learn innovative teaching practices.

The best experiences in terms of service provision are associated with digitalised support for young entrepreneurs (e.g., using business simulation games) and organising a business plan competition. Less positive has been the inability to support all students who want to join the incubator program due to budget constraints and limited opportunities to conduct action research in the entrepreneurial field. In terms of aspects of the service delivery that could be improved, CINAUB points to a) entrepreneurial support and b) exchange of experience for the successful transfer of innovative practices.

It should be noted that some of the income-generating activities carried out by CINAUB are not necessarily entrepreneurial in nature but are closely tied to the Graduate School location.

University-internal linkages

The student community is considered the primary stakeholder. The management of faculties and institutes is an important collaborator because they contribute by providing the necessary staU̓ for

CINAUB's operations, particularly as members of the pool of trainers. UB's top management also plays an important role by mobilising stakeholders and partners.

All students at UB receive entrepreneurship training. At the business school, they have a small business incubator that provides entrepreneurship training to business students, such as writing business plans. In the future, it is envisioned that all faculties can have their own incubator. The central innovation and technology transfer unit, CITRATECH, will constitute an important collaborator in this regard.

CINAUB collaborates with UB's research centres and laboratories, as well as the faculties and institutes, for entrepreneurial support activities and the transfer of innovative practices, including digital teaching.

Relationship with the surrounding entrepreneurial ecosystem

How CINAUB is situated in the entrepreneurial ecosystem surrounding UB is described in [3]. This study focused on how CINAUB is integrated into the educational dimension of the ecosystem. CINAUB uses external experts from its partners to teach topics such as business models, accountability, and business plans.

RUFORUM is an important partner for African universities. RUFORUM was the basis for the creation of CINAUB in 2017, when UB responded to a call for incubator projects. Another important external partner is the Belgian development agency Enabel. The German NGO DSIK is another important collaborator. DISK German has supported CINAUB from 2022 to 2024.

An important aspect of CINAUB's external relationship building is its communication strategy. This strategy is important because it strengthens the partnership. It includes transparency in interventions and communication for behavioural change. Based on this strategy, CINAUB organises public debates in which academic and professional actors participate to discuss current issues and identify research topics of importance for society and the local community. Still, UB recognises that CINAUB could have benefited from a better process of knowledge exchange with more experienced external partners.

Strengths and weaknesses of the incubator

Table 20 summarises the strengths and weaknesses identified by the incubator manager.

Table 20. Strengths and weaknesses of the incubator from the manager's perspective.

Theme	Strengths	Weaknesses
Location	-	-
Strategy (plan for change and implementation)	• Technical Support Program for Entrepreneurial Innovation	-

Theme	Strengths	Weaknesses

[3] Ndayishimiye, R. (2024). Ecosystème éducatif entrepreneurial et le rôle des jeux de simulation : vers une relation de type symbiotique. Accessed at : https://www.researchgate.net/profile/RichardNdayishimiye/publication/385473548_Ecosysteme_educatif_entrepreneurial_et_le_role_des_jeux_de_simulation_vers_une_relation_de_type_symbiotique/links/672557632326b47637bfaa8a/Ecosystemeeducatif-entrepreneurial-et-le-role-des-jeux-de-simulation-vers-une-relation-de-type-symbiotique.pdf.

	within CINAUB (PRATIC) outlines a clear strategy	
StaU (size of workforce, recruitment, motivation)	• Committed team	• Few staU and limited work hours available • Little exchange of experience among staU associated with the incubator
Skills (employees' skill level, training programmes)	• Experience in entrepreneurial support • Experience in mobilising partners • Capacity to mobilise funding	-
Business model (create, capture, configure value)	• Services based on the Elearning platform Moodle	• Instability of resources
Facilities	-	-
Values (the values governing stakeholders' behaviour)	-	• Low commitment of the university community
Structure and organisation (chain of command, accountability)	• Existence of a legal framework • Strategic plan exists	-
Systems (SOP, routines, workflow)	• Technical Support Program for Entrepreneurial Innovation within CINAUB (PRATIC)	• Little exchange of experience based on monitoring and evaluation
Internal relations	-	-
External relations	• UB is able to maintain partnerships	• Little exchange of experience with external experts

Future development and training needs for the incubator

The incubator management identified the following development needs:

- The CINAUB has elaborated the PRATIC program, but UB could use input in the process of moving on to in-depth concept development of the various elements in their incubation program.
- Resource mobilisation, grant identification, application and management.
- Enhance incubator management skills.
- Enhance technology transfer management skills.
- Exchange of experience to learn from others, success stories

Suggestions and recommendations for other universities aiming to establish incubators In the following, we present the recommendations provided by the CINAUB manager on what other universities should consider when engaging in the establishment of university-based incubators:

- Establish a clear vision of how the incubator supports the university's strategy and mission, and use this as a selling point towards the top-level management.
- Secure commitment and support from the top-level management of the university.
- Visit other incubators and seek information
- Create strong partnerships based on the identified needs and assigned missions.
- Involve people who are engaged in the domain – they will be innovative, can provide contacts and networks.

Key reference documents for the University of Burundi

- Technical Support Program for Entrepreneurial Innovation within CINAUB (PRATIC)
- University of Burundi Corporate Strategic
- Rectoral Decision n ° 131 of 01/04/2022

5.7.3 Technology Transfer

History

During the last few years, the University of Burundi Incubation and Acceleration Centre (CINAUB) has been involved in technology transfer activities, especially digital teaching practices, and CINAUB has already carried out at least two major projects relating to this with the Belgian development agency ENABEL. These projects relate to technology transfer as outreach or knowledge dissemination.

Recently, the Vice-Chancellor has initiated the establishment of a new technology transferrelated organisation, created under the name Incubation and Technology Transfer Centre (CITRATECH). The legal framework is already in place. What remains is its operationalisation.

CITRATECH's mission is to:

- Help start new innovative businesses by providing premises, multiple services, advice, training, exchanges and contacts.
- Be a support structure for business creation projects. The incubator will be able to provide support in terms of accommodation, advice and financing, during the first stages of the life of the new company.
- Promote scientific and applied research products. The prototypes of products designed, developed, tested, and validated, for which the standards for production and operation are determined, will be transferred to industries and companies for multiplication, mass production, and marketing within the community.
- Rely and build on the results of scientific and applied research and constitute a network, a major springboard to popularise, exploit and market the goods and services resulting from the latter.

CITRATECH's implementation will require great eUort from the stakeholders, who should understand the rationale for establishing CITRATECH in relation to the existing incubator (CINAUB). Another significant challenge is the establishment and staUing of CITRATECH, which is only legally established now. A space has already been reserved for the oUice.
Each faculty can have its own smaller incubator, and CITRATECH is expected to coordinate the activities of these centres.

Organisation and institutional framework

Figure 10 illustrates the ecosystem of CITRATECH, and Figure 11 shows the planned organisational structure of the centre.

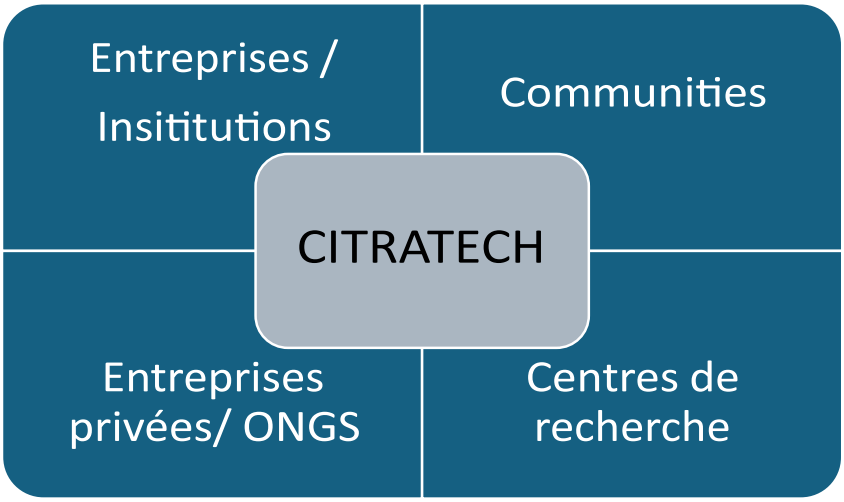

Figure 10. The ecosystem of the Incubation and Technology Transfer Centre at the University of Burundi (CITRATECH).

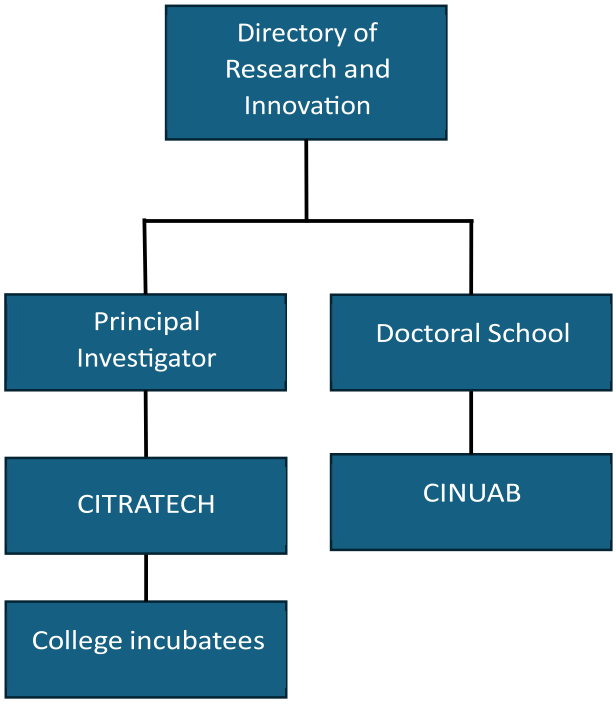

Figure 11. The organisational structure of the Incubation and Technology Transfer Centre at the University of Burundi (CITRATECH)

CITRATECH's legal framework places it under UB's Directory of Research and Innovation, but it has not yet become operational. BU is in the process of establishing the organisation, including developing management and governance systems such as standard operating procedures and MEL (monitoring, evaluation and Learning) frameworks.

StaU'ing

BU is in the process of deciding the organisational design and identifying staU'.

Business model

In its aspect of transfer of technological processes and products, CITRATECH focuses on the following axes:

- Applied sciences
- Food technologies and agribusiness
- Entrepreneurship and project management

The CITRATECH is envisioned to obtain funding through internal subsidies supplemented by external funding.

Operating budget

An operating budget is not yet allocated, except for a limited budget for the creation of CITRATECH. As it is a structure of the university hierarchy, it will undoubtedly benefit from a budget, but it is also envisioned to mobilise external funding.

Commercialisation

Innovations from applied sciences and technologies will be transferred to valorisation and exploitation companies and industries through the following mechanisms:

- Training of actors and other direct and/or indirect stakeholders.
- The creation of new innovative production and marketing businesses and industries.
- The creation and consolidation of mechanisms for perpetuating the processes and technologies put in place by researchers.
- The dissemination of products designed and manufactured for wide adoption by the community.

Internal relationship management

The most important internal collaborators are the laboratories and research centres attached to the Directorate of Research and Innovation.

External relationship management

The most important external collaborators are public and private companies and other universities.

Future development needs for the TTO

The UB management has not yet identified the technology transfer (oU'ice) development needs that UPLIFT-Ag can help to address. But from the obtained material, the following needs have been indicated:

- The establishment of the centre requires experienced people with appropriate motivation.
- Exchange of experience to learn from others' success stories and failures.
- How to mobilise resources for getting established.
- Enhance technology transfer management skills.

Key reference documents for the University of Burundi

- TBA

5.8 Zimbabwe Chinhoyi University of Technology

5.8.1 Introduction

Zimbabwe Chinhyi University of Technology has a well-developed innovation hub, the CUT Innovation Hub, which covers all innovation-related aspects from (technical) idea development, business incubation, IPR management and commercialisation. For this reason, the following presentation integrated the incubator and technology transfer sections.

5.8.2 Incubator and technology transfer

History and background

The Research, Innovation and Business Incubation Hub at Chinhoyi University of Technology (CUT Innovation Hub), serves as a vehicle for ensuring the university supports the innovation and industrialisation agenda of Zimbabwe by producing and supporting business ventures/ideas into viable commercial spin-oU' and start-up companies [37]. The backdrop for this agenda is the National Development Strategy 1, which aims to transform Zimbabwe into an empowered and prosperous upper-middle-income society by 2030 [38]. In addition, for the higher education sector, this agenda is articulated in Zimbabwe's national educational philosophy: Education 5.0 Strategy [39]. The new philosophy aimed to make higher education more experimental and to encourage academics to think outside the box as a driver of social and economic development. Thus, the strategy extends the universities' focus on research, community and teaching also to include the commercialisation and industrialisation of the knowledge produced. Research

[37] See CUT Innovation Hub homepage at https://ihub.cut.ac.zw/.

[38] Accessed at: https://www.veritaszim.net/node/4583.

[39] Zimbabwe's Education 5.0 is a transformative policy shifting its education system from theory-based learning to a practical, heritage-focused model, adding Innovation and Industrialisation to the traditional pillars of Teaching, Research, and Community Service (Education 3.0). Its goal is to solve national problems by developing locally relevant goods and services, fostering an entrepreneurial spirit in graduates, leveraging

indigenous knowledge, and driving Zimbabwe's Vision 2030 towards industrialisation and middle-income status. Accessed at: https://www.zimche.ac.zw/wp-content/uploads/2019/04/TheDoctrine.pdf.

should not be focused solely on publications; it should also generate innovative ideas from teaching and research.

To support its national strategy, the government has tasked all universities to establish an innovation hub, which serves as a combined access point for technology transfer and incubation activities. At CUT, the Innovation Hub serves both technology transfer and business incubation and acceleration purposes. In addition to the Innovation Hub, CUT simultaneously established the CUT Agro-Industrial Park, associated with the Faculty of Agriculture and mandated to lead the government's eUorts to restock the country's national herd.

When Chinhoyi University of Technology (CUT) established its innovation hub, this kind of engagement was a new domain for them. To understand the task and benchmark with existing incubators, the university visited the national innovation hub in South Africa to learn from their experiences. Today, CUT has a fully functional hub; however, it continues to develop with the aim of providing a conducive environment for innovators and fostering an entrepreneurship ecosystem.

The Innovation Hub encourages students and staU to innovate, scouts for ideas among students' and staU's work (innovation disclosure), guides idea and proof-of-concept development, navigates the IPR application process, identifies potential collaborative resources and industry contacts, develops business models, identifies markets, and trains entrepreneurs in how to pitch their venture. Some examples of graduated businesses include a livestock feed company focusing on vitamins and mineral supplements for animal feed, started by two students and a staU member. The firm is now located in the CUT Agro-Industrial Park and is operating independently of the Hub. Another firm producing sanitiser was formed by a team of natural scientists during the COVID-19 pandemic and is also well-established. A third example is a milkprocessing company that adds value to milk by producing yoghurt using locally sourced ingredients.

Potential incumbents are identified through innovation scouting, based on students' projects and business challenge competitions. Incubation candidates are evaluated against a set of criteria, and if they pass, they are enrolled in the incubation program. Currently (2024), six students are under incubation, while two have already graduated.

Target group

The main target group is students who have developed innovative concepts, for example, through their thesis work. These students are supported by the Hub's staU and teamed up with relevant academic staU members from CUT's faculties.

Organisation and institutional framework

Figure 12 shows the organisational structure of the CUT Innovation Hub. It is led by a director and comprises three units: Technical Services, Innovation & Research, and Industry Linkages, each led by a unit head.

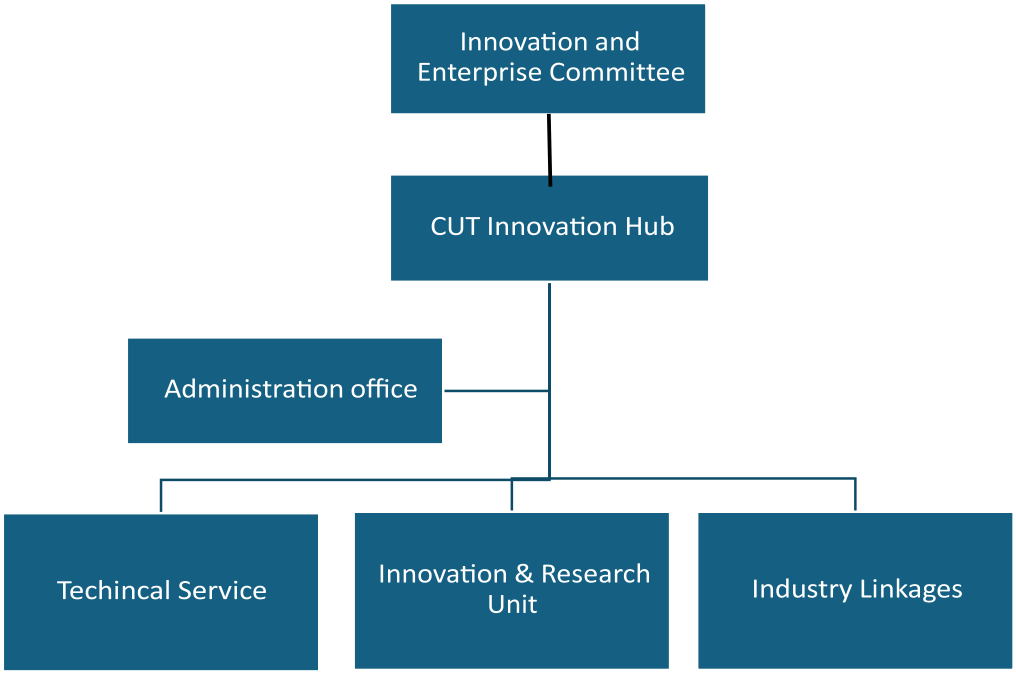

Figure 12. Organisational structure of the Research, Innovation and Business Incubation Hub at Chinhoyi University of Technology.

The Innovation and Enterprise Committee, with representatives from the faculties, serves as the Board for the Innovation Hub, which oversees and guides the Hub's day-to-day operations. Moreover, the Hub management reports to the Innovation, Commercialisation and Industrialisation Committee, which is a committee under the University Council. The committee comprise the Chairman of the Council and other members of the Council. The Hub director serves as the committee's secretary. The CUT Innovation Hub is well-embedded within the university's governance structure.

StaU'ing

The Hub comprises 13 employees. It is led by a director recruited from the academic staU'. In addition to an administrative oU'ice, the hub comprises three units: Technical Services, Innovation & Research, and Industry Linkages, each led by a unit head.

The unit head of Technical Services is an Industrial and Manufacturing Engineer with an MSc in Applied Entrepreneurship and Business Management. The unit employs four technicians. At one point, the Hub had an IP oU'icer. However, because the incentive level was limited, the person found an alternative position.

The Research & Innovation Unit is headed by the R&I Head, who has a background in electric and mechatronics engineering. In addition, the Research and Innovation Unit comprises a R&I manager, a R&I Lead OU'icer and two research assistants. The R&I lead oU'icers provide technological support in fields such as engineering, animal production, and material science.

Finally, the Business Development Unit is headed by a …. with a background in … In addition to the unit head, the unit comprises …..

In general, management functions at the CUT Innovation Hub are staU'ed with academics from within the university. This is a challenge because of the nature of the Hub's activities. Some of the staU' have the required expertise, but CUT has a strategy of developing its own staU' through onthe-job training, and as more and more entrepreneurs graduate, experience is being built. However, some of the employees have also typically gained first-hand experience in technology transfer, innovation, and industry collaboration through consultancies and research project coordination.

Operating budget

The initial establishment and equipping of the Innovation Hub and the Agro-Industrial Park were funded by the Zimbabwean government. The running budget is partly funded by the government and partly by the university's core funding. In addition, supplementary funding for grants is pursued.

Business model

The CUT Innovation Hub is not financially self-sustaining and needs support. One experience is that not all innovations lead to success. Incubation involves providing investments in support and resources that may eventually become sunk costs.

Part of evaluating new ideas for incubation is assessing the technology development level and the level of support (physical, technical) needed to bring an innovation to market. Based on this assessment, the university may opt for equity or revenue sharing under the rules stipulated in the university ordinance. The ordinance limits the university's share to up to 26%. Typically, the share is between 20 and 26% from IP licences or startup revenues. However, this business model is not without challenges due to a lack of understanding of the complexity and requirements of a successful innovation process and a lack of trust among entrepreneurs.

Services oU'ered by the incubator

According to the description on the CUT Incubator Hub's homepage, the three units have the following mandates:

Technical Service Unit:

- Leads full-cycle engineering project execution, including R&D, product development, and rapid prototyping.
- Manages infrastructure and technical assets in line with ISO 55000 standards for asset lifecycle optimisation.
- Implements Lean Six Sigma and continuous improvement methodologies to enhance operational eU'iciency.
- Supports innovation commercialisation through technical assessments, design-formarket strategies, and IP protection.
- Facilitates cross-sector strategic partnerships with academia, government, and industry stakeholders.
- Promotes sustainable engineering practices and localisation of imported technologies through reverse engineering.
- Aligns all technical service functions with the Innovation Hub's vision of driving national innovation and industry linkages.
- Mentors interns and junior engineers and develops capacity-building resources for technical skills transfer.

Innovation & Research Unit:

- Creating a conducive environment for innovation by developing structures and processes to promote innovation.
- Identifying, leading and managing innovative approaches to business challenges and working with teams across the innovation hub to deliver customer-centric products and services that generate revenue and profits for the hub.
- Ensuring that insights and analysis of the environment in which the hub currently operates and may operate in the future are brought into consideration and used eUectively to help respond to societal needs.
- Leading new thinking and nurturing new ideas from concept, through pilot and into mainstream activity.
- Facilitating intellectual property registration for innovators.
- Responsible for the process of innovation, as well as originating new ideas.
- Scout and recognise innovative ideas generated by other people, both within the university and external partners (entrepreneurs, industry, etc).
- To identify strategies, business opportunities, new technologies and then develop new capabilities and architectures with partners and new business models to serve those opportunities.

Business Development OUice:

- Develop and execute a strategy for outreach, hunting, attracting and onboarding deserving and qualified innovative entrepreneurs, and start-ups
- Develop, execute and own an operational and engagement strategy for the entire community, including donors, start-ups, investors, corporates, mentors, advisors, and domain experts.
- Designing and managing Incubation and Acceleration programs.
- Provide high-quality coaching and advisory support to entrepreneurs and start-ups in business development and fundraising activities.
- Qualify and evaluate applicants for creativity, innovation, acceleration and investment stage.
- Manage the day-to-day interaction with the Incubatees
- Provide support to entrepreneurs across ideation, acceleration, investment and scaleup stage.
- Ensure tight management of milestones and progress of entrepreneurs and start-up companies
- Develop and implement new initiatives for incubation service oUerings to entrepreneurs and start-ups.
- Grow the brand equity of the Incubator Forum.
- Assist entrepreneurs in proposal writing, pitch deck, business development, fundraising, as well as relevant linkages to established companies for business opportunities
- Develop and leverage industry, academics, investors and institutional networks for the benefit of the incubation program.
- Develop and manage a network of entrepreneurs, start-ups, mentors, institutions, funding agencies, investors and industries
- Ensure development of appropriate marketing material to promote incubated companies.
- Organise events to facilitate collaborations, technology tie-ups, and business development.

Intellectual property rights management

Since the establishment of the Hub in 2018, an IPR policy has been established. However, access to information on IPR is generally limited. Still, CUT has approached and obtained support from the African Regional Intellectual Property Organisation (ARIPO) and the World Intellectual Property Organisation (WIPO).

Commercialisation

The commercialisation of new technologies owned by the incubated firms is managed by the Hub's Business Development Unit. However, despite having funding to support the innovation's graduation, there may still be challenges on the project management side. For example, knowledge of which tool to use to come up with a proper business case.

University-internal linkages

At the foundation of the Hub, it was challenging to enrol innovations. Even now, it can be challenging to involve academic staff, as there are limited incentives for them to participate in incubation.

However, the Hub is working on awareness-raising to make innovation and engaging in start-up incubation more accepted. Students and staff are becoming more appreciative of the Hub's operation. Thus, today, one challenge is that many university members have ideas and may become impatient because the Hub cannot meet their enrolment expectations.

Education and training

The Hub has realised that not many innovators are forthcoming due to a lack of understanding of the innovation process and a lack of trust. This has led the Hub to initiate awareness campaigns, workshops, and training to foster potential innovation. The Hub also conducts training and awareness-raising to increase understanding of the IP policy, consultancy policy, business incubation policy, startup support policy, and CUT's innovation support framework.

Relationship with the surrounding entrepreneurial ecosystem

In Zimbabwe, industry and academia often work in silos, making collaboration challenging. Some of the companies also lack a positive attitude towards collaboration. However, CUT Innovation Hub is gaining experience in fostering collaboration and is increasingly expanding its external ecosystem. One successful way the Innovation Hub has engaged with the industry and other external stakeholders is by jointly identifying a challenge or problem that CUT can help solve through its research. Based on such a match, a Memorandum of Agreement is signed, under which the company grants financial support for CUT research activity. The research output is subject to IP agreements and may be the basis of a joint venture.

Some external partners, for example, the Youth Alliance for Leadership and Development in Africa (YALDA) [40], supports the Innovation Hub with incubation training and capacity building, for example, on the African Continental Free Trade Area (AfCFTA) protocols, intercountry trade protocols, and other business-sector training.

Performance

Table 21shows the CUT Innovation Hub's results from its founding in 2019 to 2024, and Table 22 shows the technology transfer performance during the same period.

Table 21. Key performance metrics for the CUT Innovation Hub from 2019 to 2024.

Total number of startups enrolled in the incubator since 2022	total number of startups graduated from the incubator since 2022	Total number of jobs created since 2022	The amount of capital raised (equity, debt, and grants) secured by the startups since 2022	Number of new products or services launched in the market by incubated startups since 2022
TBA	TBA	TBA	TBA	TBA
Incubatee capacity of the incubator (how many at a given time can be hosted)	Number of incubatees currently hosted by the incubator			
TBA	TBA			
Internal operational budget of the incubator in 2024	Annual average external funding obtained for the incubator operations	Average annual number of mentorship hours used by incubatees since 2022		M&E system in place (including incubatee satisfaction survey)
TBA	TBA	TBA		TBA

[40] The Youth Alliance for Leadership and Development in Africa (YALDA) is a non-profit, international network connecting African youth with professionals to foster leadership, entrepreneurship, and positive social impact across the continent, operating primarily through university branches to build a strong, resourceful database for mentorship, career development, and implementing youth-led solutions for Africa's challenges.

Table 22. Key metrics for the Chinhoyi University of Technology technology transfer performance from 2019 to 2024.

Total number of patents registered per year since 2019	Total number of utility models registered per year since 2019	Total number of trademarks registered per year since 2019	Total number of copyrights registered per year since 2019	Number of active innovation-related MoUs with external partners
TBA	TBA	TBA	TBA	TBA
The total number of invention disclosures received since 2019	Total number of licence agreements closed since 2019	Total revenue from university-owned IPR since 2019	Number of startups formed based on universitydeveloped technologies since 2019	Average case processing time since 2019

TBA	TBA	TBA	TBA	TBA

Strengths and weaknesses of the incubator

Table 23 shows strengths and weaknesses identified by the Innovation Hub management.

Table 23: Strengths and weaknesses of the incubator from the manager's perspective

Theme	Strengths	Weaknesses
Location (physical location of the incubator)	-	-
Strategy (plan for change and implementation)	-	-
StaU (size of workforce, recruitment, motivation)	• Well-staU'ed organisation	• DiU'icult to obtain IPR expertise
Skills (employees' skill level, training programmes)	-	• Internal recruitment limits entrepreneurship expertise
Business model (create, capture, configure value)	-	• Limited funding for the Innovation Hub
Facilities	• Well-developed technical facilities	-
Values (the values governing stakeholders' behaviour)	-	• Industry may be unwilling to collaborate
Style (the management style and how it influences employees'	-	-
Theme	**Strengths**	**Weaknesses**
productivity and satisfaction)		
Structure and organisation (chain of command, accountability)	• Clear mandate based on national policy • Well-embedded into the university governance structure	• Well-integrated organisation covering incubation, IPR and commercialisation
Systems (SOP, routines, workflow)	-	• The lack of a well-developed performance measurement system (M&E) • Lack of well-developed tools to support business case development.
Internal relations	-	• Limited incentive for university staU' to join the incubator

External relations	• Challenge-based collaboration with industry is a successful approach	• Limited external ecosystem

Future development needs for the incubators

The CUT Incubation Hub managers have identified the following development needs: •
The development of a monitoring and evaluation system.

- Identification of the tool to use to come up with a proper business case.
- The design of a proper incubation process and the development of the material you need for the training.
- Understand how best to incubate and how best to arrive at a sustainable business from whatever idea arrives at the Innovation Hub in the shortest possible time.

Suggestions and recommendations for other universities aiming to establish incubators Based on the experiences gained since the foundation of the Hub in 2018, the management team provides the following recommendations:

Management and organisation

- The context of a developing country is diUerent from others, and we can share experiences on how to manoeuvre in such a context. Service

- -

Funding

- -

Intellectual property

- Like setting up a TTO and experience in policy formulation.

Internal and external linkages

- -

Key reference documents

- TBA

5.9 Zimbabwe - Zimbabwe Open University

5.9.1 Introduction

Zimbabwe Open University (ZOU), like CUT, operates an incubation centre under the Zimbabwe Education 5.0 philosophy, which promotes commercialisation and industrialisation as important outcomes of higher education. On this background, the ZOU operations are comparable. However, since the ZOU description of its technology transfer operations is more detailed, we have chosen to present incubation and technology transfer as separate sections in this subchapter.

5.9.2 Incubator

History and timeline

The ZOU incubation centre, named Technovation Hub, is located on the 6th floor of the ZOU National Centre in Harare. The Technovation Hub was set up in January 2022. Although ZOU is mainly a virtual campus, it now has physically located national centres. Thus, recruiting for the incubator can be from all over the country, and students can work at the regional oU'ices or be accommodated if they need to go to the main campus in Harare.

The Hub is ZOU's collaborative space for technological research and development, commercialisation, and business incubation. Its objective is to contribute to national economic growth by generating new ideas, experimenting, iterating, and fine-tuning them until they are transformed into goods and services integrated into business operations. Therefore, the hub enables active knowledge transfer between researchers and business experts, industry, government and representatives of academia. Opportunities abound for decision-makers to meet with scientists and business experts, brainstorm, and discuss solutions to their complex business challenges.

The focus on the Hub is on the agricultural sector. The Hub identifies student projects that have commercial potential and enrols them in the Hub. Here, they can work with relevant researchers and realise a startup or spin-out company. Since 2022, three students have been enrolled in projects on smart greenhouses, smart fishponds, and mushroom production. For example, the Smart Greenhouses project is one in which researchers and students have developed the prototype design, purchased the components, coded the digital components, etc., with support from the Hub. The result is a fully-functional, automated greenhouse system prototype established at the university farm in Harare. ZOU can now sell the greenhouse system to generate income. Other projects are established at the university's three other experimental farms. These projects include, for example, goat production and horticulture crops. These projects also aim to establish production and become income-generating units within the Hub.

In December 2021, the first two student entrepreneurs were linked to the Hub through a 'student internship'. The Hub plans to develop a competitive process based on an innovation/business idea competition, in which the winners receive access to and support from the Hub to develop their startup companies.

Target group

The main target group of the Technovation Hub is ZOU students who may then collaborate with relevant researchers when enrolled at the Hub.

Organisation and institutional framework

The Technovation Hub is under the Directorate of Research, Innovation and Technology Transfer (RITT), a unit within the Department of Research, Innovation and Enterprise Development (RIED). The researchers report to the Technovation Hub Head, who, in turn, reports to the Manager, Business Development & the Director of RITT, who reports to the Pro-Vice Chancellor for Research, Innovation and Enterprise Development (PVC-RIED). Figure 13 shows the organisational structure of RIED.

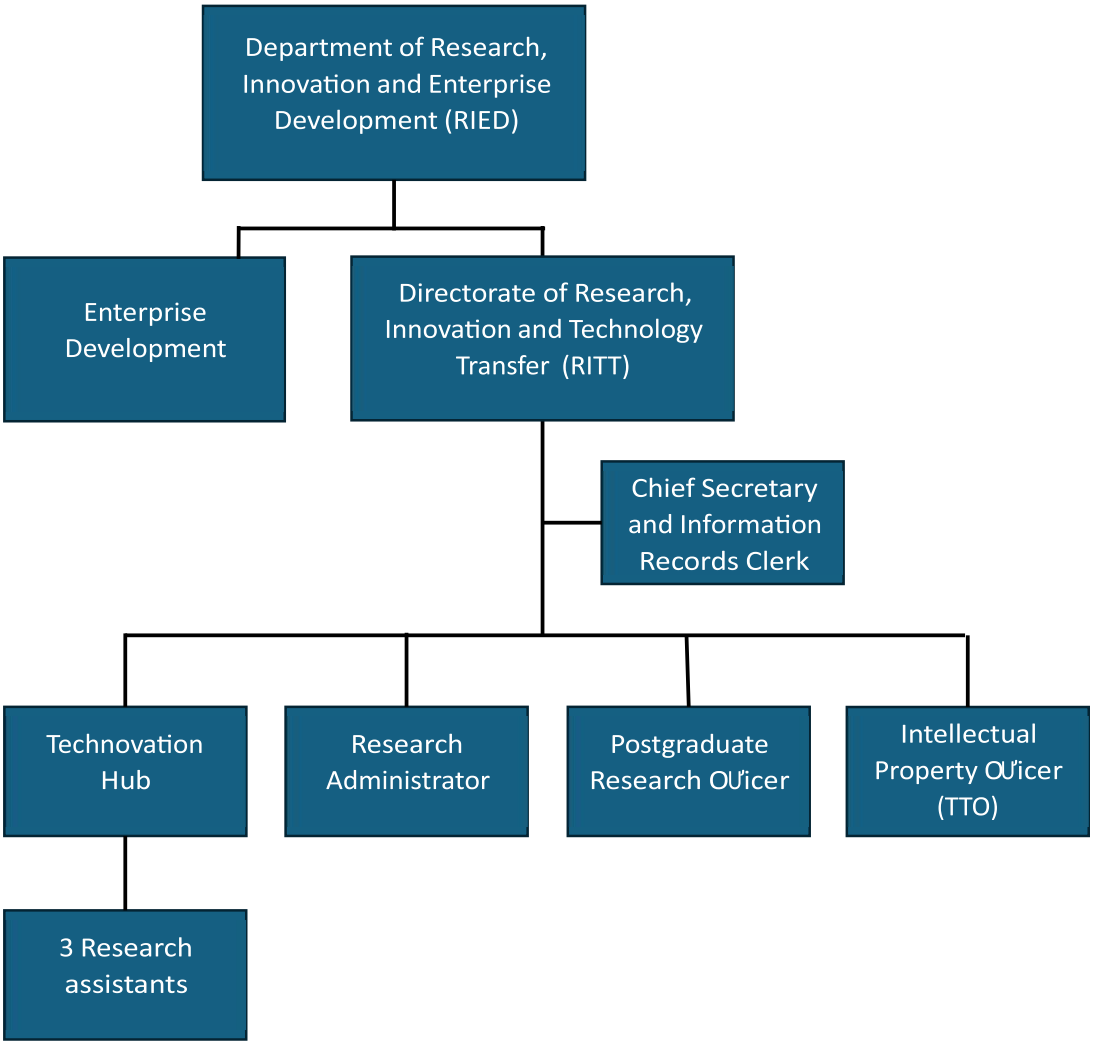

Figure 13. Organisation chart of organisational position of the Technovation Hub at the Zimbabwe Open University.

The innovation and incubation activities are governed according to the university ordinance; however, the incubator has no advisory board. A new building is under construction at the future central campus in Harare.

StaU'ing

The staU' of the Technovation Hub consists of a Hub Head and three teaching assistants. In addition, four researchers are attached to the Hub. The Teaching assistants are students who conduct the day-to-day activities and develop the systems, while learning and earning an MSc degree.

Operating budget

The ZOU funds the staU'ing and operational budget of the Technovation Hub. The requirement to go through the Procurement Department can be challenging because they have a limited understanding of the technical needs. The result is that procurement processes take a long time. The Technovation Hub would like to have an independent budget and accounting function to enable more flexible and agile procurement processes.

Business model

The business model is based on ZOU providing support for incubatees' innovations and business development, and subsequently revenue sharing. Thus, the university invests in innovations that subsequently become income generators for the ZOU.

Services oU'ered by the incubator

The ZOU Technovation Hub coordinates all innovation and industrialisation-related research in the university. Some of its functions include:

- *Facilitate networking and collaboration*: Bring together diverse groups such as students, startups, established companies, universities, government bodies, and investors to collaborate and share ideas. Hence, it encourages the formation of partnerships that can lead to the development of new products, services, or technologies. For example, when a student has a promising idea, the Hub will help identify an external partner interested in the project, draft an MoU, and then help the student develop a business model before actually seeking funding.
- *Provide resources and infrastructure*: OU'er physical and digital spaces equipped with necessary tools and technology for prototyping, testing, and development.
- *Provide support, mentorship and expert guidance*: Provide access to experts, mentors, and advisors who can oU'er guidance and insights to nurture student ideas/prototypes.
- *OU'er educational programs*: Organise workshops, training sessions, and seminars to help innovators develop necessary skills.
- *Encouraging idea generation and innovation*: Host hackathons, competitions, and brainstorming sessions to spur creativity and generate new ideas.
- *Foster an innovation culture*: Cultivate an environment that encourages risk-taking, experimentation, and out-of-the-box thinking.
- *Promoting economic growth and job creation*: Drive job creation by supporting new businesses and expanding existing ones.

Key performance metrics

Table 24 shows the key performance indicators of the Technovation Hub since its foundation in 2022.

Table 24. Key performance metrics for the Technovation Hub at Zimbabwe Open University from 2022 to 2024.

Total number of startups enrolled in the incubator since 2022	total number of startups graduated from the incubator since 2022	Total number of jobs created since 2022	The amount of capital raised (equity, debt, and grants) secured by the startups since 2022	Number of new products or services launched in the market by incubated startups since 2022
TBA	TBA	TBA	TBA	TBA
Incubatee capacity of the incubator (how many at a given time can be hosted)	Number of incubatees currently hosted by the incubator			
TBA	TBA			
Internal operational budget of the incubator in 2024	Annual average external funding obtained for the incubator operations	Average annual number of mentorship hours used by incubatees since 2022		M&E system in place (including incubatee satisfaction survey)
TBA	TBA	TBA		TBA

University-internal linkages

The faculties oUer short courses and microcredentialing courses to support entrepreneurship. These courses are important recruiting spaces for the Technovation Hub.

Lecturers in the departments are mandated to innovate, and the university management is motivating staU to be innovative and encourages them to come up with ideas. ZOU has eight faculties, but only the Faculty of Science and the Faculty of Agriculture and Technology are currently engaged with the Technovation Hub. For other faculties, such as Law and Art, it is more diUicult to imagine what (technological) innovations they can bring, and their engagement in innovation is limited. There is also not much interaction with the Faculty of Commerce. One reason may be that Zimbabwe's Education 5.0 Strategy [41] focuses on science, so some faculties that do not oUer science may feel excluded and may be slow to catch up with the innovation agenda. However, the Hub link up with all the faculties to identify and promote research with high potential done by students and staU members.

Business development for projects in the Hub is handled by the Enterprise Development Unit under DIED. They help commercialise the results of the Hub projects.

[41] Zimbabwe's Education 5.0 is a transformative policy shifting its education system from theory-based learning to a practical, heritage-focused model, adding Innovation and Industrialisation to the traditional pillars of Teaching, Research, and Community Service (Education 3.0). Its goal is to solve national problems by developing locally relevant goods and services, fostering an entrepreneurial spirit in graduates, leveraging indigenous

knowledge, and driving Zimbabwe's Vision 2030 towards industrialisation and middle-income status. Accessed at: https://www.zimche.ac.zw/wp-content/uploads/2019/04/TheDoctrine.pdf.

Another important internal partner is the ZOU Agro-Techno Park, which is under establishment at the ZOU farm in Kadoma, approximately 150 km from Harare, with financial support from the Ministry of Higher and Tertiary Education, Innovation, Science and Technology Development. The Agro-Techno Park embraces salient agricultural practices within the entire value chain of horticultural crops. The Park, under construction, features facilities such as modern teaching laboratories for students and farmers, state-of-the-art greenhouses, cutting-edge drip and Centre-pivot irrigation systems, highly mechanised farming machinery and post-harvest handling facilities that include warehouses, cold rooms, and pack sheds. Hence, it is an expected nexus for researchers, farmers, students, and the business sector, and a prospective home for innovative research, where modern technologies will be disseminated to industry, entrepreneurs, and the public at large. Beyond generating income to support the university, the park plays a critical role in strengthening the competence of relevant management staU, farmers, and students (capacity building) and in facilitating the production of intellectual property (IP).

Relationship with the surrounding entrepreneurial ecosystem

The ZOU Agro-Techno Park is expected to be an important driver for external linkages.

Strengths and weaknesses of the incubator

While the Technovation Hub is applauded for its capacity to produce visible services and tangible products, it is prone to the following challenges:

- Lack of funding, which limits what can and will be done. Currently, the university is the sole funder; hence, the hub cannot meet its intended implementation plans.
- Lack of all the necessary technology gadgets and software limits the quality of research, innovation and industrialisation products in the Hub.
- Acute lack of research, innovation and industrialisation capacity among members of ZOU staU is a huge challenge.
- Inability to recruit a qualified IPR specialist.
- No M&E system in place to track an idea from conception to commercialisation.

Future development needs for the ZOU Technovation Hub

The incubator management identified the following development needs:

- Establishment of an operational M&E system.
- To obtain training for internal staU capacity building in IPR management (diUicult to attract qualified people.
- Establish a functional IPR management system.
- To identify strategies to diversify the Hub's funding sources.
- To form partnerships with well-established technology companies like Econet, NetOne and TelOne, to obtain a supply of requisite technology gadgets and software.
- To plan and conduct capacity building workshops to support staU research, innovation and industrialisation.

Suggestions and recommendations for other universities aiming to establish incubators In light of the foregoing challenges associated with the Technovation Hub, the following recommendations suU'ice:

- ZOU's Technovation Hub needs to dig deep into its strategies to diversify its funding sources.
- ZOU's Technovation Hub needs to form partnerships with well-established technology companies like Econet, Netone and Telone so that they may be supplied with requisite technology gadgets and software.
- Technovation Hub needs to regularly carry out staU' research, innovation and industrialisation needs for it to plan capacity building workshops accordingly.

Key reference documents

- TBA

5.9.3 Technology transfer

Key performance metrics

Table 25 shows the technology transfer performance at the Zimbabwe Open University from the foundation of the Directorate of Research, Innovation and Technology Transfer in 2019 to 2024.

Table 25. Key metrics for the ZOU technology transfer from 2019 to 2024.

Total number of patents registered per year since 2019	Total number of utility models registered per year since 2019	Total number of trademarks registered per year since 2019	Total number of copyrights registered per year since 2019	Number of active innovation-related MoUs with external partners
TBA	TBA	TBA	TBA	TBA
The total number of invention disclosures received since 2019	Total number of licence agreements closed since 2019	Total revenue from university-owned IPR since 2019	Number of startups formed based on universitydeveloped technologies since 2019	Average case processing time since 2019
TBA	TBA	TBA	TBA	TBA

History and background

The Zimbabwe Open University (ZOU) Technology Transfer OU'ice (TTO) is housed in the Directorate of Research, Innovation and Technology Transfer (RITT). The RITT was set up in January 2019 to replace the Institute of Research, Innovation and Technological Solutions (IRITS). The following changes have been made to the way Technology transfer has been organised at ZOU since its foundation:

- Before 2019, technology transfer activities used to be centralised in the Centre for Research and Open and Distance Learning Scholarship (ODLS) and IRITS. All technology transfer activities were handled by ODLS and IRITS based on input from the faculties.
- Technology transfer activities in the Postgraduate Research OU'ice used to be handled by the disbanded Higher Degrees Directorate (HDD).

- With the establishment of RIIT and the formation of the TTO, functions of the former HDD, ODLS and IRITS were decentralised to the faculties in 2019, except the technology transfer functions, which were centralised at RITT. The TTO at ZOU serves students, staU, and society.

Organisation and institutional framework

The dedicated technology transfer oU'icer function is part of the RITT mandate. The RITT has an institutional framework. Its strategy is derived from the ZOU's annual strategic plan, which is in turn drawn from the OU'ice of the President and Cabinet's Integrated Performance Management System.

Since the narrowly defined technology transfer functions, such as innovation disclosure, IPR management and commercialisation of university-based IPR, are related to many other functions of the RITT, we first summarise the directorate's broader task portfolio in relation to the implementation of technology transfer processes. RITT engages in the following tasks:

- Coordinating all research, community engagement, innovation and industrialisation activities in the university.
- Identifying, disclosing, protecting and commercialising innovations in the university.
- Forming strategic partnerships with research institutions, industries, business communities, Non-Governmental Organisations and International Organisations.
- Organising research, community engagement, innovation and industrialisation workshops.
- Leading the compilation and drafting of proposals to apply for funding from external donors.
- Facilitating the drafting processes of the policies, procedures and postgraduate research regulations.
- Coordinating the Postgraduate Research workshops in the faculties for oral proposal, chapter and viva voce defence examinations.
- Organising annual research conferences.
- Coordinating annual innovation exhibitions at the Presidential Innovation Fair, Agricultural Show, Trade Fair and graduation ceremonies.
- Coordinating the Postgraduate Research Programmes in the eight faculties of ZOU.

An M&E system exists for technology transfer at ZOU. It uses policies and procedures, as well as throughput, impact, tracer, and satisfaction surveys to do so. ZOU uses regular quarterly reporting to the Senate and Council to share progress and challenges. These key performance indicators (KPIs) attempt to track the progress and impact. They also try to employ an adaptive management system meant to adjust the transfer process based on lessons learnt.

StaU'ing

The RITT consists of the following staU':

- Director for Research, Innovation and Technology Transfer
- Manager, Enterprise Development
- Research Administrator
- Postgraduate Research OU'icer
- Intellectual Property OU'icer (the post is currently unoccupied)
  Chief Secretary

-
- Information Records Clerk.

The function of Intellectual Property OUicer has been regularly advertised, but was not taken up because the conditions of service were not attractive enough. However, fortunately, it was occupied by June 2024.

To mitigate the challenge of not having an IP specialist, the TTO at ZOU has entered into a Memorandum of Understanding with ARIPO (African Regional Intellectual Property Organisation) to capacitate ZOU in patenting, copyrighting, trademarks, and industrial designs.

Intellectual property management

- Disclosing innovations for the agriculture and transport industries.
- Registering seven copyrights with the Zimbabwe Intellectual Property OUice

Business model

The technology transfer at the university primarily serves a social welfare purpose of disseminating relevant information on innovations from the university to society. This is either done through dissemination, for example, during community engagement activities, or through the maturation of innovations at the Technovation Hub, where new products are developed and marketed under a revenue-sharing model in collaboration with student and staU entrepreneurs. For example, the Enterprise Development unit sells farm produce and paraphernalia in the Alumni and Stakeholder Development Unit.

Commercialization

Within RITT, commercialisation of innovations, notably those developed in the Techovation Hub, is undertaken by the Enterprise Development oUicer.

Funding and investment

ZOU's Research, Innovation and Industrialisation Board has funded 10 applied research projects that engage with communities to solve their problems.

Education and training

The Intellectual Property OUicer and the Business Development OUicer can help shape the university's profile by holding workshops on innovation and intellectual property management with diverse stakeholders. In addition, the university management committee empowers faculties to raise funds for research projects through holding regular short courses.

Marketing and outreach

RITT's dissemination activities are focused on holding international conferences and producing two journals for the Faculty of Commerce in 2022 and the Faculty of Arts, Culture and Heritage Studies.

Internal relationship management

There is a need to expose staU and students to TTO environments to learn technology transfer best practices. Currently, innovation disclosure has been limited to the agriculture and transport industries, but other research areas should also be involved in the future.

-

Within ZOU, TTO is collaboratively delivered by faculties.

External relationship management

It collaborates with farmers, farming organisations and Harare City and Masvingo City Councils.

External relationship management

ZOU is exploring ways to establish herself in the entrepreneurial ecosystem. ZOU has its head oUice in the Harare City Centre. It has ten regional campuses in ten provincial centres of the country. RITT has partnerships within and outside the country. Some of the university partners outside Zimbabwe are the University of Zambia and the University of Chalimbana. Some of the local RITT partners include the Harare City Council, Masvingo City Council, Epworth Local Board, Ministries of Education, and other Government Ministries and Departments.

ZOU is collaborating with several stakeholders to transfer technology and solve their problems. Collaborations include projects with:

- The Chitomborwizi Network of Farmers to improve dairy milk yields.
- The Masvingo City Council on how to use the Internet of Things Transport Management System to improve parking practices.
- The Harare City Council and Zimbabwe Prisons Correctional Services to capacitate staU members so that they obtain higher qualifications in corporate governance.
- The Masvingo City Council uses water hyacinths in the Mucheke River to generate gas (methane) for cooking and other uses. The other benefit is decongesting the Mucheke River by removing the weeds.

Strengths and weaknesses of the TTO

Table 26 summarises the strengths and weaknesses identified by the RITT management in relation to the technology transfer activities.

Table 26. Strengths and weaknesses from the TTO manager's perspective.

Theme	Strengths	Weaknesses
StaU (size of workforce, recruitment, motivation)	-	• Inability to engage the services of an Intellectual Property Specialist is one other big challenge. • Lack of qualified human resources, such as innovation specialists and intellectual property specialists. These posts were regularly advertised but were not taken up because the conditions of service were not attractive enough. Fortunately, they were occupied by June 2024.
Skills (employees' skill level, training programmes)	-	• Acute lack of research, innovation and industrialisation capacity among members of ZOU staU is a huge challenge. • The knowledge and skills gaps in the TT oUicer and staU in past operations were centred on a lack of technology transfer capacity with regards to intellectual Property Protection in line with: a) patent and copyright, where they lack knowledge regarding protection of the technology provider's intellectual property and b) non-disclosure agreements where confidentiality needs to be ensured.

Business model	-	• ZOU's TTO needs to dig deep into its strategies to diversify its funding sources.
Theme	Strengths	Weaknesses
Facilities and resources	-	• Lack of technology gadgets and software limits the quality of research, innovation and industrialisation products in TTO. • The greatest challenge is the lack of funding, which militates against all plans intended for the implementation of TTO.

Future development needs for the ZOU TTO

Considering the foregoing challenges associated with the TTO, the following recommendations suffice:

- ZOU's TTO needs to dig deep into its strategies to diversify its funding sources.
- ZOU's TTO needs to form partnerships with well-established technology companies like Econet, NetOne and TelOne so that they may be supplied with the requisite technology gadgets and software.
- TTO needs to regularly carry out staff research, innovation and industrialisation needs assessments for it to plan capacity building workshops accordingly.

Suggestions and recommendations for other universities aiming to establish a TTO function

The following suggestions are provided by the RITT management to other universities aiming to establish a TTO function.

Establishment phase

- Carry out individual universities' needs assessments to understand the uniqueness of these diverse universities.
- Embrace capacity building in the guidelines (developed by UPLIFT-Ag) to enhance the beneficiary's skills and knowledge to absorb and utilise the technology effectively.
- Encourage sustainability practices in the guidelines (developed by UPLIFT-Ag) to ensure the long-term viability and adaptability of the transferred technology.

Management and organisation • Benchmark their TTO plans with what universities running TTO are doing.

- Send staff to other universities for sabbatical leave, contact leave and staff exchange programmes to expose them to the best TTO practices.
- Explore funding source diversity for TTO.
- Study successful TTO case studies to inform them.

Business model

- Emphasise equity in the guidelines (developed by UPLIFT-Ag) to promote fair access and benefits sharing.

Service provision

- To plan capacity-building workshops, the TTO need to regularly carry out needs assessments for staU' research, innovation, and industrialisation.

Internal and external linkages

- Form partnerships with well-established technology companies so that they can supply the requisite technology gadgets and software.
- Encourage collaboration to get the best shared ownership of the research outputs.
- Conduct needs assessments of their stakeholders.

Key reference documents for Zimbabwe Open University

- The Ministry of Higher and Tertiary Education, Innovation, Science and Technology Development's Heritage-Based Education 5.0 Philosophy.
- Revised Research Policy.
- Consultancy and Professional Works Policy.
- Policy on Dissertations, Theses and Research Projects' Viva Voce, • Artificial Intelligence Policy,
- Anti-plagiarism Policy.
- The Intellectual Property Policy is undergoing compilation.

Key reference documents for Zimbabwe Open University

- TBA

6 Discussion and conclusions

The following chapter details the conclusions from the analysis of the information collected and created for the baseline, identifying the training needs for each point.

Furthermore, the analysis includes specific recommendations, outlining areas for interventions and suggesting the organisation of the training developed in WP4.

6.1 Incubators

In conclusion, the baseline analysis of the consortium's existing incubators highlights several crucial points, some of which can (and will) be addressed in the training material.

1. The baseline study highlights the need for developing sustainable business models and a strategy to support startups in the short, medium, and long term. The activities must be monitored through a robust M&E system to ensure long-term sustainability and to modify the business model as needed, based on verifiable data.

   Training needs: Tools for strategy development and coordination of incubators and TTOs.

2. On the other hand, incubators need to improve the coordination with research activities, both in terms of strategy, recruitment, and training/mentorship.

   Training needs: Creating a mechanism to link academic departments and incubators, with tools and strategies that foster knowledge and skill transfer.

3. There is a demand for improving networking and communication between incubators and the other oU'ices and activities within the university. Communication is critical to increasing the number of staU' and students who can contribute to the incubator's activities and to exchanging innovative ideas among staU'.

   Training needs: The Communication team is expected to provide tools to increase interest across the university stakeholders.

4. Similarly, the visibility of incubators outside the university is often missing or inadequate. To the external audience, incubators' services, activities, and achievements are often unclear, as well as the benefits and innovations produced within the incubators.

   Training needs: The communication should use languages and tools targeted for the diU'erent stakeholders in the external audience (e.g., students, private companies, funding agencies).

5. Mobilising resources (both HR and financial) requires eU'orts from both the incubators' staU' and the management. There is a need to identify and mobilise financial and technical resources for the incubator's activities, as well as for the training of teachers, mentors, and administrative personnel.

   Training needs: The teams (i.e., Facility, Mentorship, and Management teams) should provide tools to identify and mobilise resources for all activities.

6. Besides staU', the incubators need diU'erent kinds of facilities. Laboratories should be designed to support all phases of R&D (e.g., prototyping and testing) and have adequate infrastructure (e.g., a stable internet connection).

   Training needs: Tools to identify all the necessary facilities.

7. With the goal of having, at the same time, an eUective and sustainable incubator, the staU must be selected and trained to ensure the necessary skills and knowledge. All aspects of incubator management must be considered: from planning and management skills to the development of procedures, SOPs, and monitoring programmes, as well as financial and stakeholder management.

Training needs: Tools to navigate the complexity of the incubators' management.

8. The incubators must oUer support for all the phases of developing innovative ideas. To achieve this result, mentors must be selected, trained, and coached to develop the right mindset, which diUers from that of teachers. The goal is to both identify and support the development of ideas and to improve recruitment and increase the quality of ideas.

Training needs: Finding ways to ensure that the solutions developed in the incubator are properly developed and relevant for the market.

9. Incubators and TTOs must work together, oUering services that support both protection and commercialisation of the ideas developed: from the evaluation of the IP potentials, the establishment of IP protection, and support to commercialisation. All such activities require precise skills and training for staU, as well as
10. coordination with the TTOs.

Training needs: Tools for identifying the necessary skills and coordination with TTOs.

6.2 Technology transfer oUices

In conclusion, the baseline analysis of the consortium's existing technology transfer activities highlights several crucial points, some of which will be addressed in the online training material and subsequent training.

1. Missing a clear connection between TTOs and university policies and vision: this is perhaps the most critical weakness, mainly when the IP management strategies are dictated by an institution outside the university (e.g., the government policy about IP in Kenya), or when the TTO activities are linked to externally funded, international projects. The emphasis on innovation is often missing.

Training needs: A unified training manual (for incubators and TTOs) will oUer a guide to align university, incubator, and TTO visions.

2. The identification of functions related to IP management is problematic, as the functions diUer across the partners' experiences. Since most TTOs operate either in connection with the incubators, as part of oUices with a broader scope, or in a separate unit, the classic functions (i.e., identification, protection, and maintenance of intellectual property) might also be connected to others, or even be missing (e.g., with a lack of a strategy for maintaining the IP registered). Hence, at this stage, it is impossible to provide a common definition of the TTOs' functions, narrow enough to cover all cases.

Training needs: It could be useful to establish more uniform terminology regarding technology transfer. However, to capture the rich understanding of the concept in the case settings, this should be based on a more inclusive conceptualisation than is normally used in the TTO literature.

3. Training on how to promote the TTO (marketing) is often missing or inadequate. Most partners lament diU'iculties in engaging internal stakeholders, especially when the link between the TTO and the incubator is not strict. Therefore, the training will provide TTO staU' with specific training to establish a structured connection to the incubator and to market TTO activities among teaching staU' across diU'erent faculties/departments/schools.

Training needs: The tools identified by the communication team will provide the proper training.

4. A coherent roadmap of development, setting milestones and a definite timeline, is another weakness in most experiences. Without setting intermediate milestones, management cannot evaluate progress or the strengths of the oU'ice, making it diU'icult to set new goals and identify the resources needed to improve TTOs' activities. Similarly, few TTOs have SOPs in place to identify and monitor such activities according to precise quality standards.

Training needs: Strategy development and management tools are necessary to design an eU'ective roadmap.

5. Another activity that requires attention is the development of collaborations, networking and stakeholders' engagement (both internally and with external stakeholders). There is a clear indication that too often, the mindset of the academic and non-academic staU' involved in managing the TTO activities prevents the establishment of working collaboration, sometimes missing the opportunities oU'ered by the networking activities: the language used by universities and the private sector is often diU'erent, and the needs of either party are seldom met. Specific training is necessary to solve this issue.

Training needs: Communication, service development, and mentorship and training teams will identify the necessary standards.

6. The result of both the indeterminate definition of TTO and the challenges in developing networks and collaborations (and, in part, the fact that most TTOs are not independent oU'ices) is the uncertainty around the activities expected by the TTO. IP is one aspect; commercialisation is another, but research collaboration, networking, developing working business models, and monitoring are all actions necessary for the development of new prototypes and patents. The focus on IP development without the other actions hinders TTO results in many cases. Strategies for selecting startups, oU'ering direct support to their R&D activities, finding commercial partners, finding funds, managing contracts, and managing licenses (negotiation) are all activities that should be included in a clear strategy, and during the development of a successful business model that incentivises commercialisation and that generates an income for the university.

Training needs: Develop strategies for how to create a connection between strategy and service development.

7. The lack of personnel with specific skills is an issue that incubators and TTOs have in common. Experts in IP management and licensing support are only one of the critical sets of expertise for TTO operations. Expertise in negotiation and technology assessment (besides the already mentioned market trends) is also necessary.

Training needs: the training material must identify which experts should be assigned to both incubators and TTOs.

8. To support all the activities of the TTOs, the identification of success stories to be presented to potential users/partners/network is also essential and indicated as a missing point in the data (explicitly or inferred from the information provided). Furthermore, the TTO must be equipped with the skills necessary to identify market trends and opportunities.

Training needs: Communication and training activities, and coordination between the two topics.

9. Finally, the data highlight the necessity of developing key performance Indicators (KPIs) for monitoring the TTOs' activities, and for monitoring the eU'icacy of the services provided. Today, such indicators are limited to counting the establishment of startups (without monitoring their success rate) or the number of patents (without monitoring actual commercialisation). KPIs should be explicitly indicated in the strategy and reviewed periodically.

Training needs: Identify management KPIs and training for mentors and administrative personnel.

10. Most of the characteristics identified and described in this chapter are direct consequences of the integration of the existing TTOs into other oU'ices, not as a standalone structure, nor as a branch of the incubators. That hinders collaboration between the incubator and TTO, without addressing the misalignments between them. Finally, the collaboration between incubators and TTOs would improve the support for startups and the identification of funding (or self-funded activities).

Training needs: Develop a common training material that provides tools to both incubators and TTOs.

The training material developed from this baseline report is expected to address most of them, with the scope of suggesting a structure for improving the oU'er and the quality of such oU'er from the TTOs.

6.3 Areas identified for training, and specific recommendations

Based on the conclusions above, this section identifies the areas for intervention and the need for training, suggesting a possible way to organise training on incubators and TTOs in WP4. Since the functions of incubators and TTOs are not neatly separated in most (or all) universities, we suggest organising the training to include all functions, and adding TTOs as a supplemental and complementary function of incubators.

<u>Business model</u>

- Study which oU'erings exist already in your area and find a niche. Being a general incubator makes it challenging to specialise your competencies and services. Moreover, it can be confusing for investors and challenging to develop the necessary high-quality networks.
- To promote sustainability, a mechanism should generate income/revenue from the services oU'ered. Free services will be a challenge to sustain.
- Relationships with the rest of the university must be well defined so that the incubator can be flexible and responsive to emerging opportunities while simultaneously benefiting from the relationship with the university.

Management

- The incubator manager should have expertise in innovation management and entrepreneurship.
- To ensure consistent relationship building with external and internal partnerships and to be able to benefit from existing networks, the manager should have a longer-term tenure. • Make sure that you have the right expertise attached or employed.
- Shield your employees from the university human resource unit to avoid (presumably arbitrary) redeployment of staU with specific capacities developed over time.
- Begin by entrenching the incubator independently with clear mandates to avoid slow starts, derailment, and distractions.
- The M&E system should incorporate business sustainability indicators to track the performance of both the incubator and businesses emanating from it.
- Creation of strong partnerships based on identified needs and assigned missions.
- It is important to involve people who are engaged in the domain – will be innovative, will get contacts, seek information, and visit other incubators.
- Commitment and support from the top-level management of the university.
- Establish a clear vision of how the incubator supports the university's strategy and mission, and use this as a selling point towards the top-level management.

Services

- The training and mentorship plan should be designed to benefit from the expertise already available in the organisation, if possible, and aUordably and sustainably.
- It is important to have the necessary basic prototyping capacity in-house.
- Clearly identify and communicate the services oUered.
- Understand the students and how to be there for them. Organise bootcamps, organise monthly events (for example, Innovation Week).

Funding

- Identify suitable grant opportunities and begin to make grant applications. Have staU specifically dealing with this function.
- Aim to create a mechanism to connect the startups to sources of capital or investors to grow their businesses. Do not expect to be able to rely on the university's internal budget in the long run.
- Ensure in-house capacity for grant writing to facilitate continuous access to capital.

Intellectual property

- There is a need for a mechanism to ensure that IP generated from research done in the university is identified, protected and commercialised.
- Create an incentive structure for university staU and students to bring their IP to the incubator.
- Find a way of assuring the support for the commercialisation of staU and students' innovations.
- Sensitise the university community through regular workshops and training on IP creation and benefits.

- Identify staU to undergo training and incentivise them. Relieve them of some workload to be able to increase the productivity of IP. Internal and external linkages
- Foster linkages with industry to get support for the innovators.
- Clearly separate functions to avoid ambiguity and ineUiciency, but instead provide synergies between related functions.
- Commercialisation requires collaboration with investors and industry.

7 Appendix A – Interview guides

7.1 Survey/interview themes for incubation centres

This section details the questions sent to the KIs to describe how incubator functions are performed at each university, who is involved in the activities, and the issues the KIs identified from their experience.

The purpose of such a survey is to establish an understanding of the current state of practice in existing incubation centres. For those universities that do not yet have such centres, the themes can be used to discuss their ambitions and development needs.

The questions needed to be adjusted to the specific local context, including the actual level of development of entrepreneurship activities at the university in question.

The same questions were used for the in-depth semi-structured interviews that followed.

Themes	Questions
Presentation/basic info	Can you please introduce yourself (e.g., incubator manager, innovation hub manager, or similar) and your role(s) in relation to the incubator?
Background and history	Can you give a brief description of the history of the incubator (when it was started, how it was started, by whom it was started, how it has developed over time, …) (ideally, we should be able to develop a timeline of key events during the incubator's lifetime.
	What were the main challenges during the incubator's historical development, and who were the main facilitators who helped overcome such challenges?
	Are there any other entrepreneurship-related activities associated with the university?
Organisation	What is the incubator's organisational structure, and how is it staffed?
	What institutional framework exists for the incubator? (Strategy, budget, plans, funding sources, governance structure, place in the university's organisational structure, …)
	Does your incubator have a set of operational guidelines/standard operating procedures (in place, or being developed)? What are your experiences with such guidelines? Who is/was involved in developing the SOPs? What sources have inspired your guidelines?
	If Uplift were to design a set of operational guidelines, what recommendations would you make regarding content and format?
Services and products	What kind of services (business development, networking, supervision, training, …) does the incubator offer and for whom, and in collaboration with whom?

	What are the best and most successful elements in your service delivery?
Themes	Questions
	Which areas of your service delivery do you think could be improved, and what do you need to do to improve them?
	What other operations does the incubator perform? What are your experiences with these operations?
Performance	How has the incubator performed over time? What are the key metrics? Does an M&E system exist, and how does it function?
	What are the strengths and weaknesses of the incubator from the manager's perspective?
	If Uplift were to establish an M&E model for incubators, what recommendations would you give for the design?
Ecosystem	How would you characterise the 'entrepreneurial ecosystem' in the geographical location of the university?
	Who are your most important collaborators inside the university?
	Who are your most important collaborators outside the university?
	Can you describe how your incubator is situated in the 'entrepreneurial ecosystem' in the geographical location of the university? (functions and linkages within the university and outside the university)
Capacity development needs	Has the incubator identified development needs that Uplift can help the incubator to address?
	In your experience, what knowledge and skills did the incubator manager and staff lack the most during its past operations?
	In your experience, what kinds of resources or capabilities that external partners could provide did the incubator lack most during its past operations?
	What kind of competencies (knowledge, skills and/or attitudes) on incubators/incubation would you find useful to address through training for a) university management, b) incubator manager and staff, and c) other stakeholders?
Your recommendations	What suggestions or recommendations would you give universities that want to establish incubators? (For example, regarding services portfolio, staffing, governance structure, incubatee recruitment and graduation, networking, promotion, funding, etc.)
Written documentation	Does any written material exist that can shed some light on the historical development of the incubator and entrepreneurship ecosystem of which it is part? Are there any evaluations, strategies, policies, studies, or similar that can be included in the baseline study data?

Additional issues	Are there any other topics you would like to mention in relation to your experience with incubator management?

7.2 Survey/interview themes for TTO

This section details the questions sent to the KIs to describe how TTO functions are performed at each university, who is involved in the activities, and the issues the KIs identified from their experience.

The meaning of such a survey is to establish an understanding of the present state of practice in the existing oU'ices. For those universities that do not yet have such oU'ices, the themes can be used to discuss their ambitions and development needs.

The questions needed to be adjusted to the specific local context, including the actual level of development of entrepreneurship activities at the university in question.

The same questions were used for the in-depth semi-structured interviews that followed.

Themes	Questions
Presentation/basic info	Could you please introduce yourself (TTO manager or similar) and your role(s) regarding the incubator?
Background and history	Can you give a brief description of the history of the TTO (when it was started, how it was started, by whom it was started, how it has developed over time, …) (ideally, we should be able to develop a timeline of key events during the TTO's existence.
	What were the main challenges during the TTO's historical development, and who were the main facilitators who helped overcome such challenges? What changes were made to the TTO system?
	Are there any other TTO-related activities associated with the university?
Organisation	What is the organisational structure of the TTO, and how is it staU'ed?
	What institutional framework exists for the TTO? (Strategy, budget, plans, funding sources, governance structure, place in the university's organisational structure, …)
	Does your TTO have operational guidelines or standard operating procedures? What are your experiences with such guidelines?
	If we UPLIFT-Ag were to design a set of operational guidelines, what recommendations would you give regarding the content and format?
	What changes have been made to the way the TTO has been organised since its foundation?
Services and products	What kind of services (assessment of the commercial value of research output, protection and handling of IPR, promotion of collaborative research between university and industry, encouragement of entrepreneurship and commercialisation, …) does the incubator oU'er, and for whom and in collaboration with whom?

	What are the best and most successful elements in your service delivery?
	Which areas of your service delivery do you think could be improved, and what do you need to do to improve them?
Themes	Questions
	What other operations does the TTO perform? What are your experiences with these operations?
	What changes have been made to the TTO's services since its foundation?
Performance	How has the TTO performed over time? If significant changes occurred, what caused such changes?
	Does an M&E system exist, and how does it function? What are the key metrics you apply? Do you think the indicators are adequate?
	What are the strengths and weaknesses of the TTO from your perspective?
	If Uplift were to establish an M&E model for TTOs, what recommendations would you give for the design?
Ecosystem	Can you describe how the TTO is situated in the 'entrepreneurial ecosystem' in the university's geographical location? (functions and linkages within the university and outside the university)
	How would you characterise the 'entrepreneurial ecosystem' in the geographical location of the university?
	Who are your most important collaborators inside the university?
	Who are your most important collaborators outside the university?
Capacity development needs	Has the TTO identified development needs that Uplift can help the incubator to address?
	In your experience, what knowledge and skills did the TTO manager and staU' lack the most during their past operations?
	What kind of competencies (knowledge, skills and/or attitudes) on technology transfer and associated themes would you find useful to address through training for a) university management, b) TTO manager and staU', and c) other stakeholders?
Your recommendations	What suggestions or recommendations would you oU'er universities seeking to establish a TTO? (For example, collaboration with industry, regarding services portfolio, staU'ing, governance structure, interaction with researchers, networking, promotion of the TTO services, funding, etc.)
Written documentation	Does any written material exist that can shed some light on the historical development of the TTO function at the university? Are there any evaluations, strategies, policies, studies, or similar that can be included in the baseline study data?

Additional issues	Are there any other topics you would like to mention in relation to your experience with TTO management?

8 Appendix B Guide for case study data collection

To complement the initial information for each case study collected online via semi-structured interviews, the following data collection tool was sent to key informants at each partner university to allow them to provide additional information, rectify or provide supplementary data.

8.1 Incubation baseline case study description template

University name:

Informant: NN

Instruction: The purpose of this document is to obtain a comprehensive description of your incubator, if you have one at your university. All text in red below is support text which will be deleted. If you are uncertain about any of the topics, please don't hesitate to contact Nico (**cnh@ifro.ku.dk**) or Andrea (**andrea.landi@ifro.ku.dk**).

Key performance metrics [42]

[You are welcome to choose a diUerent starting year according to your history and data availability. You don't need to have the same starting year for all the criteria.]

Total number of startups enrolled in the incubator since 2020	Total number of startups graduated from the incubator since 2020	Total (estimated) number of jobs created since January 2020	The amount of capital raised (equity, debt, and grants) secured by the startups since 2020	Number of new products or services launched in the market by incubated startups since 2020
Incubatee or start-up capacity of the incubator (how many can be hosted at a given time)	Number of incubatees currently housed by the incubator			
Internal operational budget of the incubator in 2024	Total external funding obtained for the incubator operations in 2024	The estimated number of mentorship hours provided to incubatees per year		Is an M&E system in place (including an incubatee satisfaction survey)

[42] The number of categories and their wording have developed throughout the data collection on basis of the experiences obtained.

[Under the following headings (in black), please add the information you can provide] **History**

Organisation and institutional framework

Text.

[Performance Metrics]

For example**, m**easuring the success of technology transfer activities through metrics like number of patents filed, licenses executed, and startups created] **StaU'ing**

Text.

Intellectual property management

[IP property management refers to:

- Identification: Recognising potentially valuable IP within the institution.
- Protection: Securing patents, copyrights, trademarks, and other forms of IP protection.
- Maintenance: Ensuring ongoing compliance and renewal of IP rights.]

Text.

Business model

Text.

Operating budget

Text.

Commercialisation

[Commercialisation refers to activities such as:

- Licensing: Negotiating and managing licenses with external entities.
- Startups: Supporting the creation of spin-oU' companies based on institutional research.
- Market Analysis: Assessing market potential and identifying suitable commercial partners.]

Text.

Legal and regulatory compliance

[Under this heading, you could refer to aspects such as:

- Contracts: Drafting and reviewing agreements related to IP and commercialisation .
- Regulations: Ensuring compliance with local, national, and international laws, e.g. what are the principles in the national IPR legislation, and how does it impact your work?]

Text.

Funding and investment

[Under this heading, you could refer to aspects such as:

- Grants: Securing funding from government and private sources.
- Investors: Attracting venture capital and other forms of investment for startups]

Text.

Internal relationship management

[Internal refers to: Collaborating with researchers, faculty, and students] Text.

External relationship management

[External: Building partnerships with industry, investors, and other stakeholders] Text.

Marketing and outreach

[Under this heading, you could refer to aspects such as:

- Promotion: Showcasing the institution's innovations and capabilities.
- Networking: Participating in conferences, trade shows, and other events to build connections]

Text.

Education and training

[Under this heading, you could refer to aspects such as:

- Workshops: Providing training on IP, commercialisation , and entrepreneurship.
- Mentorship: OU'ering guidance and support to researchers and startups]

Text.

Strengths and weaknesses of the incubator

Table X summarises the strengths and weaknesses identified by the incubator manager.

[Please feel free to add themes that you find relevant to the table]

Table X. Strengths and weaknesses from the perspective of the incubator manager.

Theme	Strengths	Weaknesses
Location (physical location of the incubator)	•	•
Strategy (plan for development and implementation)	•	•
StaU' (size of workforce, recruitment, motivation)	•	•
Theme	Strengths	Weaknesses

Skills (employees' skill level, training programmes)	•	•
Business model (create, capture, configure value)	•	•
Facilities	•	•
Values (the values governing the management's behaviour)	•	•
Style (the management style and how it influences employees' productivity and satisfaction)	•	•
Structure and organisation (chain of command, accountability,)	•	•
Systems (SOP, routines, workflow)	•	•
Internal relations	•	•
External relations	•	•

Future development needs for the incubator

[Please consider what might be relevant to focus on if you aim to use the UPLIFT-Ag project to improve your current practices]

The incubator management identified the following development needs:

- Text
- Text
- Text
- Text.

Suggestions or recommendations for other universities aiming to establish an incubator

Text.
In the following, we present the recommendations provided by the [name of the incubator] management on what other universities should consider when engaging in the establishment of a technology transfer oU̓ice function

[Feel free to add issues to the existing list or add new topics (headings) if you have additional aspects that are not on the list.]

Business model

- Text.
- Text.
- Text.

Management

- Text.
- Text.
- Text.

Service provision

- Text.
- Text.
- Text.

Funding

- Text.
- Text.
- Text.

Intellectual property management

- Text.
- Text.
- Text.
- Text.

Key reference documents

Do you have any of these documents or other relevant documents related to incubation and innovation? Can you share them with us?

- Research policy
- University corporate strategy
- …

8.2 TTO baseline case study description template

University name:

Informant: NN

Instruction: The purpose of this document is to obtain a comprehensive description of your TTO function, if you have one at your university. By 'TTO function', we refer to any activity that engages in some level of technology transfer management and not necessarily a complete technology transfer oU'ice as such. All text in red below is support text which will be deleted. If you are uncertain about any of the topics, please don't hesitate to contact Nico (**cnh@ifro.ku.dk**) or Andrea (**andrea.landi@ifro.ku.dk**).

Key metrics

[You are welcome to choose a diU'erent starting year according to your history and data availability. You don't need to have the same starting year for all the criteria.]

Total number of patents registered per year since 2020	Total number of utility models registered per year since 2020	Total number of trademarks registered per year since 2020	Total number of copyrights registered per year since 2020	Number of active innovation-related MoUs with external partners
The number of patents obtained	The number of utility models obtained	The number of trademarks registered	The number of copyrights registered	The number of partnerships with industry and other research institutions at the moment
The total number of invention disclosures received since 2020	Total number of licence agreements closed since 2020	Total revenue from university-owned IPR since 2020	Number of startups formed based on universitydeveloped technologies since 2020	Average case processing time since 2020
The number of new IPR cases reported by researchers and postgraduate students	The number of licenses signed with external entities to commercialise IPR (independent of IPR ownership)	Income from licensing agreements, including royalties and milestone payments.	The number of new companies created based on university technologies.	The time used to process an application for IPR (from disclosure until IPR is oU'icially obtained)

[Under the following headings (in black), please add the information you can provide] History

Organisation and institutional framework

Text.

[Performance Metrics]
For example**, m**easuring the success of technology transfer activities through metrics like number of patents filed, licenses executed, and startups created] StaU'ing Text.

Intellectual property management [IP

property management refers to:

- Identification: Recognising potentially valuable IP within the institution.
- Protection: Securing patents, copyrights, trademarks, and other forms of IP protection.
- Maintenance: Ensuring ongoing compliance and renewal of IP rights.]

Text.

Business model

Text.

Operating budget

Text.

Commercialisation

[Commercialisation refers to activities such as:

- Licensing: Negotiating and managing licenses with external entities.
- Startups: Supporting the creation of spin-oU' companies based on institutional research.
- Market Analysis: Assessing market potential and identifying suitable commercial partners.]

Text.

Legal and regulatory compliance

[Under this heading, you could refer to aspects such as:

- Contracts: Drafting and reviewing agreements related to IP and commercialisation .
- Regulations: Ensuring compliance with local, national, and international laws, e.g. what are the principles in the national IPR legislation, and how does it impact your work?]

Text.

Funding and investment

[Under this heading, you could refer to aspects such as:

- Grants: Securing funding from government and private sources.
- Investors: Attracting venture capital and other forms of investment for startups]

Text.

Internal relationship management

[Internal refers to: Collaborating with researchers, faculty, and students] Text.

External relationship management

[External: Building partnerships with industry, investors, and other stakeholders] Text.

Marketing and outreach

[Under this heading, you could refer to aspects such as:

- Promotion: Showcasing the institution's innovations and capabilities.
- Networking: Participating in conferences, trade shows, and other events to build connections]

Text.

Education and training

[Under this heading, you could refer to aspects such as:

- Workshops: Providing training on IP, commercialisation , and entrepreneurship.
- Mentorship: OU'ering guidance and support to researchers and startups]

Text.

Strengths and weaknesses of the TTO

Table X summarises the strengths and weaknesses identified by the TTO manager.

[Please feel free to add themes that you find relevant to the table]

Table X. Strengths and weaknesses from the perspective of the TTO manager.

Theme	Strengths	Weaknesses
Location (physical location of the TTO)	•	•
Strategy (plan for development and implementation)	•	•
StaU' (size of workforce, recruitment, motivation)	•	•
Skills (employees' skill level, training programmes)	•	•
Business model (create, capture, configure value)	•	•
Facilities	•	•
Values (the values governing the	•	•
Theme	Strengths	Weaknesses
management's behaviour)		

Style (the management style and how it influences employees' productivity and satisfaction)	•	•
Structure and organisation (chain of command, accountability,)	•	•
Systems (SOP, routines, workflow)	•	•
Internal relations	•	•
External relations	•	•

Future development needs for the TTO

[Please consider what might be relevant to focus on if you aim to use the UPLIFT-Ag project to improve your current practices]

The TTO management identified the following development needs:

- Text
- Text
- Text
- Text.

Suggestions or recommendations for other universities aiming to establish a TTO

Text.

In the following, we present the recommendations provided by the [name of TTO] management on what other universities should consider when engaging in the establishment of a technology transfer oU'ice function

[Feel free to add issues to the existing list or add new topics (headings) if you have additional aspects that are not on the list.]

Business model

- Text.
- Text.
- Text.

Management

- Text.
- Text.

- Text.

Service provision

- Text.
- Text.
- Text.

Funding

- Text.
- Text.
- Text.

Intellectual property management

- Text.
- Text.
- Text.
- Text.

Key reference documents

[Do you have any of these kinds of documents? Can you share them with us?]

- IP policy
- Research policy
- University corporate strategy
- …


CHUKA UNIVERSITY


KENYATTA UNIVERSITY
ELIMU NI NGUVU


TAITA TAVETA UNIVERSITY
Home of Ideas


RUMURI
UNIVERSITE DU BURUNDI


UNIVERSITY OF LAY ADVENTISTS OF KIGALI
UNILAK
Knowledge & Wisdom
Since 1997


UPLIFT
AGRICULTURE


UNIVERSITE de NGOZI


UNIVERSITY of RWANDA
UR


UNIVERSITÀ POLITECNICA DELLE MARCHE


Technology Innovation Wealth


HNU
Hochschule Neu-Ulm
University of Applied Sciences


SIGILLVM VNIVERSITATIS HAFNIENSIS
REFORMATVM 1537
FVNDATVM 1479


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