

**Ministry of Science and Higher Education of the
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MAQSUT NARIKBAYEV UNIVERSITY**

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**A Legal-Business Framework for Technology Transfer and IP
Commercialization in Zambian Universities for Sustainable
Economic Growth**

**Educational Program 7M04210 - Intellectual Property and Business
Law**

PROJECT FOR THE ACADEMIC DEGREE OF MASTER OF LAW

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MASTER'S PROJECT

**On the topic: " A Legal-Business Framework for Technology
Transfer and IP Commercialization in Zambian Universities for
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**according to the educational program 7M04210 - Intellectual
Property and Business Law**

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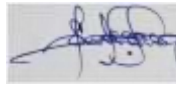
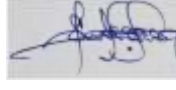
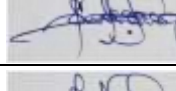
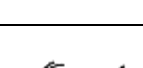
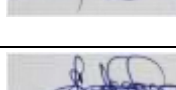
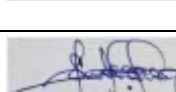
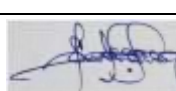
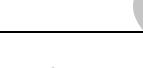
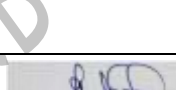
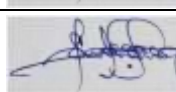
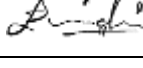
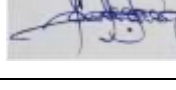
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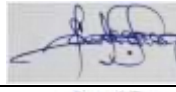
APPROVE

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The calendar plan for the preparation of a master's project

Name of the project stages	Period	A note on the implementation the project stages			
		Actual completion date	The degree of readiness of the completed stage of the project	Signature of the postgraduate	Signature of the supervisor
Review of literature and practical materials	24 Nov 2025	26 Dec 2025	10%		
Methodology development	31 Dec 2025	2 Feb 2026	25%		
Data Collection And processing	05 -31 Jan 2026	11-19 April 2026	30%		
Analysis and interpretation of the results obtained	01-15 Feb 2026	23 April 2026	40%		
Development of project recommendations	16-20 Feb 2026	25 April 2026	55%		
Preparation of the introduction and conclusion	21-25 Feb 2026	26-17 April 2026	60%		
Preparation of project: Preparation of the first section of the project	26 Feb -05 Mar 2026	10 Mar 2026	70%		
Preparation of the II section of the project	06-15 Mar 2026	20 April 2026	85%		
Preparation of the III section of the project	16-15 Mar 2026	20 -22 April 2026	88%		
Receiving feedback from the supervisor	01 April- 17 May 2026	14 -19 April 2026	89%		

(scientific supervisors)					
Preparation of a report, visual aids and presentations	18- 23 May 2026	20 - 28 April 2026	92%		
Defence of the master's project	25 May- 30 Jun 2026	22 May 2026	100		

Scientific supervisor of the master's thesis (project): Isaac Nketsiah (PhD)

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The plan was accepted for execution: Sundano Emmanuel Sundano

(Full name and signature of the postgraduate)



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List of abbreviations

TT	Technology Transfer
IP	Intellectual Property
DCs	Dynamic Capabilities
IPR	Intellectual Property Rights
R&D	Research and Development
HEI	Higher Education Institutions
UIC	University–Industry Collaboration
WIPO	World Intellectual Property Organization
TISC	Technology and Innovation Support Centre
PACRA	Patents and Companies Registration Agency

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1. INTRODUCTION AND BACKGROUND

1.1 Introduction

According to the Vision 2030 Policy, Zambia has set a goal of attaining middle-income status by 2030¹, with a strategic focus on reducing its dependence on natural resources and advancing an innovation-driven development model. Within this framework, Zambia seeks to reduce its historical dependence on copper exports and transition toward a diversified, knowledge-based economy driven by innovation, research, and technological advancement². This shift has been prompted by a sustained decline in economic growth and productivity over the recent decades, which has renewed scholarly and policy debates on the critical role of intangible drivers of economic development such as intellectual property (IP), research, technology, software, and human capital³.

In response to the pressure of globalisation and the widening gap between developed and developing countries, scholars argue that African countries, including Zambia, should adopt robust and forward-looking policy interventions to enhance competitiveness and stimulate sustainable growth⁴. Consequently, Zambia has over the years undertaken significant effort to modernise its innovation and IP governance framework in line with international standards and best practices⁵. Despite these reforms, concerns remain regarding the extent to which existing legal and institutional mechanisms effectively facilitate the commercialisation of university-generated knowledge and innovation. This commitment is reflected in the subsequent approval of the Zambian National Intellectual Property Policy by the cabinet of the Republic of Zambia, as documented in the 2020 Patents and Companies Registration Agency (PACRA) annual report and the overhaul of acts such as the proposed Copyright bill of 2025⁶, and the Trademark Act of 2023.

Given that existing literature has largely failed to articulate a coherent framework for policies and strategies aimed at Africa's knowledge

¹ Vision 2030

² Ibid.

³ Clement Moyo and Andrew Phiri, 'Knowledge Creation and Economic Growth: The Importance of Basic Research' (2024) 10 Cogent Soc Sci.

⁴ Simplice A Asongu and Nicholas M Odhiambo, 'Building Knowledge-Based Economies in Africa: A Systematic Review of Policies and Strategies' <<https://hdl.handle.net/10419/227953>> accessed 2 December 2025.

⁵ Maurice Bolo, 'Intellectual Property Rights, Public-Private Partnerships, Technology Transfer and Commercialization - Zambia : A Situational Analysis' (2025)

⁶ International Federation of Reproduction Rights Organisations (IFRRO), 'ARTICLE DETAIL ZAMBIAS COPYRIGHT BILL 2025 A TIMELY REFORM AND A KEY MOMENT TO GET THE FOUNDATIONS RIGHT' (2026) <<https://ifrro.org/page/article-detail/zambias-copyright-bill-2025-a-timely-reform-and-a-key-moment-to-get-the-foundations-right/>> accessed 5 May 2026.

economy⁷, there has been an increasing recognition among developing countries of the need to prioritise technology transfer as strategic development tool. Technology transfer from universities and public research organisations to industry is increasingly recognised as a strategic mechanism for translating publicly funded research into commercially viable products, services, and socio-economic value⁸.

Beyond their core mandate of teaching, universities are increasingly recognised for their critical role in research, innovation, and regional development⁹. This expanded role is commonly referred to as the “Third Mission (TM)”, which has gained prominence alongside the rise of the concept of knowledge economies in modern societies¹⁰. Globally, many universities have broadened their institutional mission to incorporate TM activities, which involve contributing to the social, economic, and cultural development of their countries and regions through the transfer of knowledge and technology to industry and society at large¹¹. Within this context, universities are no longer viewed solely as centres of teaching and research, but also as entrepreneurial institutions expected to contribute directly to national innovation systems and economic transformation. As centres of research and innovation, universities play a pivotal role in realising development aspirations by facilitating the creation, application, and dissemination of new knowledge¹².

1.2 Problem Statement

However, according to the Revised National Intellectual Property Policy (2020)¹³, Intellectual Property in Zambia is seen more as a legal and regulatory issue rather than a strategic economic asset, and this limited perception is reflected in the low levels of IP registration in the country, which further reinforces the already low levels of IP awareness

⁷ Asongu and Odhiambo (n 1).

⁸ Ramazan Uctu and others, ‘Technology Transfer Models of Universities and Public Research Organisations in South Africa: Changes before and after the IPR-PFRD Act of 2008’ (2022) 17 *Journal of technology management & innovation* 71

⁹ Ulrich Schmoch, ‘Germany: The Role of Universities in the Learning Economy’ [2011] *Universities in Transition* 261

¹⁰ Sirine Haj Taieb, ‘Measuring the Third Mission of European Universities: A Systematic Literature Review’ (2024) 46 *Society and Economy* 147

¹¹ Lorenzo Compagnucci and Francesca Spigarelli, ‘The Third Mission of the University: A Systematic Literature Review on Potentials and Constraints’ (2020) 161 *Technol Forecast Soc Change* 120284

¹² Precious Sampa and Sazib Hossain, ‘Innovation and Intellectual Property Rights: A Case Study of Zambia’ (2024) 4 *Middle East Research Journal of Economics and Management* 186.

¹³ Trade and Industry Ministry of Commerce, Revised National Intellectual Property Policy, Zambia.

among the general population¹⁴. This impact gap is particularly evident among creatives and artists whose livelihoods depends directly on the protection and commercial success of their IP¹⁵. Consequently, the limited awareness and utilisation of IP rights have contributed to low levels of IP exploitation and commercialisation, resulting in a noticeable gap in the literature on the subject¹⁶.

While Zambia has introduced reforms aimed at strengthening IP governance, there remains limited empirical evidence on how universities operationalise IP policies, engage in technology transfer activities, and commercialise research outputs. Existing studies¹⁷ have largely focused on legal protection mechanisms, with comparatively little attention paid to the institutional, entrepreneurial, and commercialisation dimensions of university innovation systems.

Intellectual property has been widely described as a “power tool” for economic development and wealth creation, yet it remains underutilised in many developing countries¹⁸. In the Zambian context, this underutilisation can be partly attributed to limited awareness among stakeholders, such as universities, regarding their role in the development, management and utilisation of IP¹⁹. This challenge is further compounded by the absence of a comprehensive legal-business framework designed to incentivise and support universities in the commercialising of their research output, unlike in South Africa, where university technology transfer frameworks are relatively more institutionalised and well-established²⁰. Over the past years, the Zambia government has invested in higher education infrastructure such as universities to ensure effective commercialization of their research output²¹. Therefore, the main aim of this research is to assess the legal-business framework for technology Transfer commercialization in Zambia Universities.

¹⁴ George Silondwa, ‘A Critical Analysis of the Use of Intellectual Property Rights by Selected Manufacturing Companies in Lusaka Zambia’ (29 October 2013)

¹⁵ Musonda Mukuka, ‘The Right to Think, Intellectual Property in Zambia’ (*Nkwazi Magazine*, 2025) <<https://nkwazimagazine.com/p-data-block-keybnbn5the-right-to-think-intellectual-property-in-zambiap/>> accessed 23 September 2025.

¹⁶ *ibid.*

¹⁷ Kunkuta, J. M. C. C. (2011). *Technology and the legal framework of its transfer in Zambia*.

¹⁸ WIPO, ‘IP for the Good of Everyone: Report of the Director General to the 2021 WIPO Assemblies’ (2021)

¹⁹ Chondonda Mohammad and Lukumba Phiri, ‘An Overview of Zambia’s Intellectual Property Regime: Key Issues and Developments’ [2025] Open Access Journal of Computer Science and Engineering

²⁰ Mapula Razwinani, Ndivhuho Tshikovhi and Keolebogile Shirley Motaung, ‘Benefits and Challenges of Research Commercialisation in South Africa: A Systemic Review’ (2024) 6 African Journal of Inter/Multidisciplinary Studies 1

²¹ Kunkuta, J. M. C. C. (2011). *Technology and the legal framework of its transfer in Zambia*.

This research aims to review the current legal and business practices, both the opportunities and obstacles for effective technology transfer from universities to industry.

1.3 Study Objectives

The main objective of this study is to propose a legal-business framework that would enhance technology transfer and IP commercialization in Zambia. Specifically, this study seeks to:

1. Analyse existing IP and innovation policies influencing university-based research commercialization in Zambia.
2. Assess the extent of the Third Mission activities and innovation capabilities within Zambian universities.
3. Identify legal, institutional, financial and cultural barriers affecting IP utilisation and commercialization.
4. Compare Zambia's technology transfer ecosystem with international best-practice models
5. Develop a contextualised legal-business framework for technology transfer and IP commercialization in Zambian universities.

1.4 Research Questions

The research aims to answer the question: ***What legal-business framework is required to enhance technology transfer and intellectual property commercialisation in Zambian universities to support the country's transition toward a knowledge-based economy?*** With sub questions as follows:

1. How effective are existing IP and innovation policies in supporting university-based commercialization in Zambia?
2. To what extent are Zambian universities engaged in Third Mission and technology transfer activities?
3. What legal, institutional, financial, and cultural barriers affect IP commercialization in Zambian universities?
4. What lessons can Zambia learn from international university commercialization models?
5. What contextual legal-business framework is most suitable for Zambia's higher education sector?

1.5 Hypothesis

The study is guided by following hypothesis derived from the comparative case analysis and theoretical framework;

a) Policy and Commercialization

- H1: There is a significant relationship between the effectiveness of university IP policies and the commercialization of research outputs in Zambian universities.

b) Third Mission and Innovation Capability

- H2: Universities with stronger Third Mission engagement demonstrate higher innovation and commercialization capabilities.

c) Institutional Support and Commercialization

- H3: Institutional support mechanisms such as Technology Transfer Offices positively influence IP commercialization outcomes.

d) Barriers and Commercialization

- H4: Legal, institutional, and cultural barriers negatively affect technology transfer and IP commercialization in Zambian universities.

e) International Best Practices

- H5: Adoption of selected international best practices can significantly improve the effectiveness of Zambia's university technology transfer ecosystem.

Section 2 focuses on a review of the relevant literature and theoretical perspectives on intellectual property commercialisation, technology transfer, university innovation systems, and comparative commercialisation frameworks to establish the analytical foundation for the study.

2. LITERATURE REVIEW

This chapter will examine the theoretical foundation underpinning technology transfer, Knowledge-based economies, the Third Mission (TM), innovation-driven development, and research commercialization. It synthesizes key theoretical perspectives that explain the role of universities, intellectual property and institutional frameworks in facilitating the transformation of research output into socio-economic value.

In addition, the chapter will also adopt a comparative approach by analysing selected international models and strategies employed in different countries to promote effective technology transfer and innovation. This comparative analysis will provide critical insights and contextual benchmarks that inform the development of an appropriate legal-business framework for research commercialization in the Zambian higher education and innovation ecosystem.

2.1 Conceptual and Theoretical Foundations of Technology Transfer and IP Commercialisation

The enactment of the Bayh-Dole Act by the US Congress in 1980 brought attention to the subject of Technology Transfer among numerous scholars²². The United States had significantly contributed to the global scientific and technological base since World War II, but many had voiced discontent with the federal laws then relating to the patenting of research-derived scientific knowledge²³.

Individuals who sought to use government-owned technology encountered a confusing web of rules and regulations set out by the relevant agencies, because there was no unified federal policy on patents for government-sponsored inventions or on the transfer of technology from the government to the private sector. Many people felt that the labs still contained pertinent study information that could be put to good use by others, and that the advancements attributable to university-based research were not being pursued because there was little incentive to seek practical uses for inventions to which the federal government retained title meaning²⁴.

The definitions of technology and Technology Transfer (TT) vary according to the discipline and the objective of the study. It should be

²² Tommy Hendrix and others, 'Conceptualizing a Seamless Model of Technology Transfer: Evidence from Public Research Institutes and Universities in Indonesia' (2024) 18 Foresight and STI Governance 46 <<https://doi.org/10.17323/2500-2597.2024.1.46.57>> accessed 3 February 2026.

²³ 'United States General Accounting Office GAO Report to Congressional Committees'.

²⁴ *ibid*.

mentioned that in literature, there are differences between technology transfer and knowledge transfer. According to some scholars, knowledge transfer is defined as "scientific knowledge used by scientists to advance science" and technology transfer as "scientific knowledge used by scientists and others in new applications"²⁵ with the latter having garnered the most attention in the literature on technology transfer. But, according to the World Intellectual Property Organization (WIPO), TT is synonymous with "technology commercialisation, "which is the process by which the outcomes of fundamental scientific research conducted by universities and public research organisations are applied to the commercial and useful products of private companies that are headed for the market"²⁶.

Technology transfer is broadly understood as the process through which innovative technologies, processes, or applications of knowledge developed within one organisational or disciplinary context are applied in another ²⁷. Vertical technology transfer describes the movement of knowledge along the research and development continuum, from basic research to applied research, from applied research to development, and from development to production. However, these transfers are not strictly linear; knowledge can move in both directions, and its form often changes as it progresses through different stages ²⁸.

In contrast, Horizontal technology transfer occurs when a technology developed or used in one organisation, sector, or context is transferred for use in another ²⁹. In this process, the Technology Transfer Office (TTO) plays a central intermediary role between Higher Education Institutions (HEIs) and industry, facilitating the protection, management, and commercialisation of research outputs³⁰.

The commercialisation of intellectual property is generally understood as the utilisation of intellectual property rights with the objective of generating economic benefit and the commercial transfer of technologies serves as a primary mechanism for implementing such rights. It has been argued

²⁵ José Bestier Padilla Bejarano and others, 'Open Innovation: A Technology Transfer Alternative from Universities. A Systematic Literature Review' (2023) 9 Journal of Open Innovation: Technology, Market, and Complexity 100090 <<https://doi.org/10.1016/j.joitmc.2023.100090>> accessed 27 February 2026.

²⁶ World Intellectual Property Organization, 'Incentives in Technology Transfer – A Guide to Encourage, Recognize and Reward Researchers and Professionals' <<https://doi.org/10.34667/tind.48658>> accessed 10 March 2026.

²⁷ Xin Huang, 'Technology Transfer in Higher Education' <https://doi.org/https://phd.lib.uni-corvinus.hu/1416/2/Xin_Huang_ten.pdf> accessed 19 February 2026.

²⁸ Edwin Mansfield, 'International Technology Transfer: Forms, Resource Requirements, and Policies on JSTOR' (*American Economic Association*, May 1975) 372 <<https://www.jstor.org/stable/1818878?seq=1>> accessed 16 February 2026.

²⁹ *ibid.*

³⁰ Huang (n 12).

that technology transfer should extend to all categories of intellectual property, given the defining characteristics of this phenomenon³¹.

In this study, we explore how university generated intellectual property can be commercialized through technology transfer as universities have been given the role to contribute directly to socioeconomic development beyond their traditional mandates of teaching and basic research³². They are now recognised as central actors in research commercialisation, innovation systems, and regional development, an expanded institutional role commonly described as the “Third Mission (TM)”. The concept gained prominence alongside the emergence of knowledge-based economies in modern societies³³. More universities are now actively engaged in knowledge and technology transfer, as well as the commercialisation of research outputs in addition to education and research^{34 35}.

Globally, higher education institutions have incorporated Third Mission activities into their strategic objectives, contributing to social, economic, and cultural development through structured engagement with industry and society³⁶. As hubs of research and innovation, universities facilitate the generation, application, and diffusion of knowledge, thereby advancing national and regional development goals³⁷. By focuses on the transformation of research results to methods, tools and finished products to address market and societal needs, it from universities to industry plays a crucial role socio-economic development through product introduction and improvement for the market and income generation for universities³⁸. Therefore, Universities have a unique advantage in the innovation systems because of the constant inflow of staff and students introducing

³¹ Anhelina Spitsyna, ‘problems of commercialization of intellectual property and transfer of technologies in the development of the national innovation system’ [2022] automobile roads and road construction 317 accessed 3 February 2026.

³² Dwitya K Amry, Ali J Ahmad and Dawei Lu, ‘The New Inclusive Role of University Technology Transfer: Setting an Agenda for Further Research’ (2021) 5 International Journal of Innovation Studies 9 <<https://doi.org/10.1016/j.ijis.2021.02.001>> accessed 3 February 2026.

³³ Sirine Haj Taieb, ‘Measuring the Third Mission of European Universities: A Systematic Literature Review’ (2024) 46 Society and Economy 147 <<https://doi.org/10.1556/204.2023.00030>> accessed 23 September 2025.

³⁴ Ulrich Schmoch, ‘Germany: The Role of Universities in the Learning Economy’ *Universities in Transition* (Springer New York 2011) <https://doi.org/10.1007/978-1-4419-7509-6_13> accessed 18 November 2025.

³⁵ Felrnando Alexandre and others, ‘Enhancing University–Industry Collaboration: The Role of Intermediary Organizations’ (2021) 47 The Journal of Technology Transfer 2021 47:5 1584 accessed 20 February 2026.

³⁶ Lorenzo Compagnucci and Francesca Spigarelli, ‘The Third Mission of the University: A Systematic Literature Review on Potentials and Constraints’ (2020) 161 Technol Forecast Soc Change 120284 <<https://doi.org/10.1016/j.techfore.2020.120284>> accessed 8 November 2025.

³⁷ Precious Sampa and Sazib Hossain, ‘Innovation and Intellectual Property Rights: A Case Study of Zambia’ (2024) 4 Middle East Research Journal of Economics and Management 186 <<https://doi.org/10.36348/MERJEM.2024.V04I06.002>> accessed 23 September 2025.

³⁸ Monika Boguszewicz-Kreft and others, ‘Technology Transfer Steps Towards the Commercialization of Research Results for Universities’ (2021) 55 WSB Journal of Business and Finance 26 <<https://doi.org/10.2478/WSBJBF-2021-0003>> accessed 10 May 2026.

fresh ideas, perspectives, and research capabilities, hence promoting innovation³⁹.

Within this framework, university–industry linkages are fundamental to effectively transfer technology. Strong and well-coordinated collaboration between universities and industry constitutes a necessary condition for the successful transfer and commercial application of knowledge and technologies⁴⁰.

2.2 Legal and Policy Frameworks Governing IP and Innovation in Zambia

Zambia has taken efforts to strengthen its national innovation ecosystem through policy reforms, stakeholder engagement, and international collaboration. Despite these initiatives, the country continues to face structural challenges, including weak intellectual property rights (IPR) enforcement, limited R&D funding, and low levels of IP awareness⁴¹.

The intellectual property legislation in the country is comprised up of several statutes issued over time with no comprehensive harmonization. The Patents Act governs invention patents however; it makes no provision for the ownership of inventions made by university staff utilizing institutional resources. While the Copyright and Performance Rights Act protect literary and artistic works, but it does not address academic employees' ownership of scientific and research achievements. And both Industrial Designs Act and the Trademarks Act operate independently, with no channels for coordination. While other policy documents such as the National Policy on Science and Technology seek to establish an enabling environment for scientific and technological advancement⁴² by promoting research and development (R&D), foster public–private partnerships (PPP) and integrate science and technology across key sectors of the economy⁴³. There is no one statute that consolidates rules

³⁹ Ramya Ravi and Manthan D Janodia, 'University-Industry Technology Transfer in India: A Plausible Model Based on Success Stories from the USA, Japan, and Israel' <<https://doi.org/10.1007/s13132-022-00908-z>> accessed 8 March 2025.

⁴⁰ Alexandre and others (n 20).

⁴¹ Charlene Musiza, 'Weaving Gender in Open Collaborative Innovation, Traditional Cultural Expressions, and Intellectual Property: The Case of the Tonga Baskets of Zambia' (2022) 29 International Journal of Cultural Property 45 <<https://doi.org/10.1017/S0940739122000042>> accessed 19 February 2026.

⁴² Malonga Hazemba and Anthony Halog, 'Systematic Review of How Environmental Management Policies Are Incorporated into National Development Plans in Order to Achieve Sustainable Development' (2021) 3 Environmental Challenges 100041 <<https://doi.org/10.1016/j.envc.2021.100041>> accessed 19 February 2026.

⁴³ Chang Liu, 'Infrastructure Public–Private Partnership (PPP) Investment and Government Fiscal Expenditure on Science and Technology from the Perspective of Sustainability' (2021) 13 Sustainability 2021, Vol 13, Page 6193 6193 <<https://doi.org/10.3390/su13116193>> accessed 19 February 2026.

governing university-generated intellectual property, commercialization methods, or contractual frameworks between institutions and industries

For example, in the health research sector, material transfer agreements require that biological samples and associated intellectual property remain state property and provide for benefit-sharing with research participants. However, implementation and enforcement mechanisms remain inconsistent and constrained⁴⁴.

Empirical evidence indicates that patent filings trend to increase with higher R&D expenditure and a greater number of science graduates, underscoring the importance of research investment and human capital development in driving innovation⁴⁵. Nonetheless, while government funding is necessary, its direct impact on innovation outcomes appears less definitive. This suggests that increasing financial allocations alone may be insufficient without effective governance, strategic allocation, and efficient utilisation of resources. Persistent weaknesses in IPR enforcement further undermine incentives for innovation and the broader commercialisation framework⁴⁶.

Synthesis Conceptual and Theoretical Foundations of Technology Transfer and IP Commercialisation

The literature demonstrates that technology transfer is both a legal and institutional process through which universities convert research and innovation into commercially valuable outputs. The Bayh–Dole Act significantly influenced global commercialisation systems by strengthening university ownership of publicly funded inventions. The review further shows that successful technology transfer depends not only on intellectual property laws, but also on institutional support systems, commercialisation structures, and university–industry collaboration. In developing countries such as Zambia, commercialisation remains constrained by weak institutional capacity and limited implementation. The literature, therefore, supports the need for an integrated legal-business framework to strengthen university commercialisation systems.

⁴⁴ Victor Chalwe and others, 'Governance of Biological Sample Sharing in Health Research: Material Transfer Agreements in Zambia and South Africa – Necessary but Not Sufficient?' [2025] Res Ethics <<https://doi.org/10.1177/17470161251376719>> accessed 19 February 2026.

⁴⁵ Musiza (n 26).

⁴⁶ *ibid*.

2.3 Third Mission (TM) Activities and Innovation Capabilities in Universities

Higher education is seen as an essential driver for innovation and development. Since the 1990s, the emergence of the new knowledge economy and the Bologna Process proposal have prompted significant changes in higher education, aiming at fostering more harmonisation and integration across European institutions while simultaneously improving their research and educational quality⁴⁷. Beginning in the 2000s, policymakers and scholars have shown interest in the capacity of universities to stimulate regional innovation due to various transformative developments. Beyond their fundamental roles in education and research, universities are progressively participating in activities that foster the social and economic development of their local regions⁴⁸, transitioning from mere knowledge creation and dissemination to becoming innovation-centric organisations that emphasise entrepreneurship, collaboration, sustainability, and social engagement⁴⁹. With the emergence of the knowledge economy developed the entrepreneurial university model, leading to the concept of the third mission. This concept encompasses a broad spectrum of activities undertaken by higher education institutions aimed at transferring knowledge to society and organisations, while also fostering entrepreneurial skills, innovation, social welfare, and the production of human capital^{50 51}.

In Africa, the seeds of the third mission in higher education were sown in the 1960s, evident by the final commitment of the 1962 UNESCO conference on the development of higher education in Africa, which declared for universities to stay "close and constant touch with society than stand as ivory towers"⁵². Similarly, post-independence African leaders emphasised the university's connection to Africa's growth and viewed it as a critical tool for national development. Recently, there has been renewed interest in the third mission of African universities since the early 2000s, including the African Standards and Guidelines for Quality

⁴⁷ Mehdi Tajpour, Hiroko Kawamorita and Kursat Demiryurek, 'Towards the Third Generation of Universities with an Entrepreneurial Approach' (2020) 4 International Journal of Technoentrepreneurship 122 <<https://doi.org/10.1504/IJTE.2020.113927>> accessed 12 March 2026.

⁴⁸ Gabriel René Moreno and others, 'The Social Third Mission of Universities: Towards a Unified Framework' (2025) 31 Economic Alternatives 563 <<https://doi.org/10.37075/EA.2025.2.13>> accessed 25 February 2026.

⁴⁹ Yuzhuo Cai and Ijaz Ahmad, 'From an Entrepreneurial University to a Sustainable Entrepreneurial University: Conceptualization and Evidence in the Contexts of European University Reforms' (2023) 36 Higher Education Policy 20 <<https://doi.org/10.1057/s41307-021-00243-z>> accessed 27 February 2026.

⁵⁰ Compagnucci and Spigarelli (n 21).

⁵¹ Tajpour, Kawamorita and Demiryurek (n 32).

⁵² UNECA, 'The Development of Higher Education in Africa - UNESCO Digital Library' *Conference on the Development of Higher Education in Africa, Tananarive* (1962) <<https://unesdoc.unesco.org/ark:/48223/pf0000056657>> accessed 10 May 2026.

Assurance in Higher Education (ASG-QA), where tm has an associated standard, which emphasises it as an independent role of universities.

In general, there are fewer studies on the third mission in Africa than there are on universities' teaching and research missions. Existing research on the third goal is focused toward European and American higher education contexts⁵³. Studies on the third mission in Africa, particularly in the Zambian, are sparse, therefore little is known about how the third mission is decoded within the African higher education environment, as well as the activities that African universities engage in to fill this function.

The phrase Third Mission has become associated with university entrepreneurship and the commercialisation of knowledge via technology transfer. Universities are progressively encouraging researchers, students, and staff to investigate and implement ideas that may be converted into entrepreneurial ventures, emphasising the monetisation of technology transfer and intellectual property. These activities often include the establishment of spin-off firms derived from research, partnership with industry and government, and the commercialisation of knowledge. The results of the Third Mission have concentrated on patents generated, spin-offs established, and initiatives conducted in partnership with industry⁵⁴. Research has demonstrated that university entrepreneurship is a significant catalyst for regional development⁵⁵.

2.3.1 Functions and Structures of Third Mission

The concept of the Third Mission (TM) has been widely characterised as ambiguous⁵⁶, largely because it encompasses a broad spectrum of university–society interactions. While commercialisation activities such as patenting, licensing, and spin-off formation are relatively measurable and represent direct contributions to economic and social development, academic engagement refers to more diffuse forms of knowledge-based collaboration with non-academic actors and organisations. These

⁵³ Verena Schnurbus and Ingi Runar Edvardsson, 'The Third Mission Among Nordic Universities: A Systematic Literature Review' (2022) 66 *Scandinavian Journal of Educational Research* 238 <<https://doi.org/10.1080/00313831.2020.1816577>> accessed 10 May 2026.

⁵⁴ Moreno and others (n 33).

⁵⁵ Rhiannon Pugh and others, 'Nuancing the Roles of Entrepreneurial Universities in Regional Economic Development' (2022) 47 *Studies in Higher Education* 964 <<https://doi.org/10.1080/03075079.2022.2055320>> accessed 27 February 2026.

⁵⁶ Compagnucci and Spigarelli (n 21).

interactions extend beyond cooperation with firms to include partnerships with public institutions and civil society more broadly ⁵⁷.

A defining feature of the Third Mission is its explicit orientation toward societal developmental objectives. Consequently, the concept excludes passive economic effects arising merely from the existence of universities such as employment generation, income multipliers, or construction-related expenditures since these do not constitute active contributions to shaping the social and economic environment.

In analytical terms, Third Mission activities may be structured along three principal dimensions: (1) *knowledge and technology transfer*, (2) *continuing and further education*, and (3) *social engagement* ⁵⁸. However, their scope and effectiveness depend on three interrelated conditions; Firstly, the internal configuration and strategic prioritisation of activities within the university, especially those linked to knowledge and technology transfer. Secondly, the degree of territorial embeddedness, reflecting the institution's integration within regional innovation and socio-economic systems, and thirdly, the institutional and regulatory frameworks that shape the governance structures, incentives, and operational capacities. Together, these elements provide a more precise and more operational understanding of the Third Mission ⁵⁹.

Evaluating Third Mission activities cannot be restricted to a marginal category alongside teaching and research. The primary analytical challenge resides in the broader scope of activities which are included in the Third Mission. It encompasses of several forms of interaction involving multiple institutional functions, rendering it methodologically challenging to identify and quantify ⁶⁰.

The primary challenge for universities is to integrate community engagement into their fundamental objectives of teaching and research, rather than perceiving the Third Mission as a supplementary or as an ancillary activity. The rising convergence of research, teaching, and innovation mandates needs a transition from traditional performance metrics, historically based on publications, citations, and student outputs towards more integrated evaluation frameworks. Escalating social expectations are necessitating colleges to restructure their governance

⁵⁷ Hendrik Berghaeuser and Michael Hoelscher, 'Reinventing the Third Mission of Higher Education in Germany: Political Frameworks and Universities' Reactions' <<https://doi.org/10.1007/s11233-019-09030-3>> accessed 2 March 2026.

⁵⁸ *ibid.*

⁵⁹ Compagnucci and Spigarelli (n 19).

⁶⁰ Giustina Secundo and others, 'An Intellectual Capital Framework to Measure Universities' Third Mission Activities' (2017) 123 *Technol Forecast Soc Change* 229 <<https://doi.org/10.1016/j.techfore.2016.12.013>> accessed 5 March 2026.

and performance frameworks to promote systematic partnership with industry and government ⁶¹.

Definitions of the Third Mission differ, with some encompassing of the “engagement of universities with societal needs,” participation in “non-academic activities,” and the “generation, use, application, and exploitation of knowledge beyond academic settings,” yet they possess shared conceptual elements ⁶². The Third Mission fundamentally signifies a significant and reciprocal collaboration between higher education institutions and stakeholders in business, government, and civil society. It broadens education beyond campus confines, guarantees that research outcomes yield societal value, and positions service as a direct contribution to public welfare. A recurring thread across these views is that Third Mission activities take place outside conventional academic environments and aim to tackle social and economic issues, ultimately striving for sustained socio-economic transformation ⁶³.

Ordinary capabilities are commonly viewed as an organisation’s capacity to efficiently undertake clearly defined operational and technical tasks through established systems of administration, governance, and routine practices. In contrast, Dynamic Capabilities (DCs) refer to an organisation’s ability to integrate, grow, and reconfigure internal and external capabilities in response to quickly changing circumstances ⁶⁴. Within strategic management literature, DCs are considered crucial because they help businesses to perceive opportunities, exploit them, and alter their structures and resources accordingly, particularly in dynamic and innovation-driven sectors ⁶⁵.

2.3.2 University Capacities

In the area of Higher Education Institutions (HEIs), past research reveals that universities function as hybrid organisations that blend administrative

⁶¹ *ibid.*

⁶² Lazarus Nabaho and others, ‘The Third Mission of Universities on the African Continent: Conceptualisation and Operationalisation’ (2022) 12 Higher Learning Research Communications 81 <<https://doi.org/10.18870/hlrc.v12i1.1298>> accessed 2 March 2026.

⁶³ *ibid.*

⁶⁴ Maribel Guerrero and others, ‘Driving Change in Higher Education: The Role of Dynamic Capabilities in Strengthening Universities’ Third Mission’ (2024) 63 1321 <<https://doi.org/10.1007/s11187-024-00869-4>> accessed 10 March 2026.

⁶⁵ Audrey Stolze, Klaus Sailer and Audrey Stolze@sce De, ‘Advancing HEIs’ Third-Mission through Dynamic Capabilities: The Role of Leadership and Agreement on Vision and Goals’ (2022) 47 J Technol Transf 580 <<https://doi.org/10.1007/s10961-021-09850-9>> accessed 10 March 2026.

governance structures with collegial academic traditions⁶⁶. Consequently, the transformation of universities into more entrepreneurial institutions should be regarded as a complicated and varied process. Studies analysing DCs within higher education reveal that these skills provide value in technology transfer procedures, which comprise a fundamental component of universities' Third Mission operations⁶⁷. Through the development of dynamic competencies, university leadership may support organisational adaptation and strategic transformation.

Such institutional adaptation often unfolds through protracted and repeated processes impacted by both exogenous factors, (such as policy reforms and market demands) and internal factors (like institutional culture and governance structures)⁶⁸. In this context, Dynamic Capabilities enable HEIs to experiment with novel initiatives and collaborative projects that gradually sensitise institutional stakeholders to Third Mission objectives, finally allowing these practices to become incorporated within the institutional framework⁶⁹.

These institutional developments have also contributed to the emergence of broader innovation frameworks such as the Triple Helix model, which conceptualises the relationship between universities, industry, and government as a dynamic system of interaction. Within this approach, governments play a central role in building legislative frameworks and regulatory environments, while universities and industry engage continuously through knowledge generation, technology development, and innovative activities. The Triple Helix therefore represents the growing relevance of knowledge in modern economies and shows the increased role of universities in promoting economic development and societal improvement⁷⁰. However, the specific forms of knowledge and technology transfer between universities and industry are substantially defined by the governmental climate and institutional structures inherent within each country's context⁷¹.

One of the most notable examples of this interaction is University–Industry Collaboration (UIC). The importance of universities to economic growth

⁶⁶ Ben Jongbloed, 'Universities as Hybrid Organizations: Trends, Drivers, and Challenges for the European University' (2015) 45 *International Review of Public Administration* 207 <<https://doi.org/10.1080/00208825.2015.1006027>> accessed 29 April 2026.

⁶⁷ Stolze, Sailer and De (n 44).

⁶⁸ Audrey Stolze, Klaus Sailer and Audrey Stolze@sce De, 'Advancing HEIs' Third-Mission through Dynamic Capabilities: The Role of Leadership and Agreement on Vision and Goals' (2022) 47 *J Technol Transf* 580 <<https://doi.org/10.1007/s10961-021-09850-9>> accessed 12 March 2026.

⁶⁹ Stolze, Sailer and De (n 44).

⁷⁰ Loet Leydesdorff, 'The Triple Helix Model and the Study of Knowledge-Based Innovation Systems' (2009) 42 *Int J Contemp Sociol*.

⁷¹ Bejarano and others (n 8).

through UIC has been extensively established, particularly in respect to the transfer of knowledge and technology from academic institutions to the productive sector^{72 73}. In recent years, the topic of UIC has attracted substantial attention among scholars, policymakers, and industry actors due to its ability to encourage innovation, boost competitiveness, and promote economic development⁷⁴. Broadly defined, UIC refers to structured relationships between universities and industries designed to promoting innovation and facilitating the practical application of academic knowledge. Such collaborations are especially helpful for organisations aiming to obtain competitive advantage, increase operational efficiency, and generate new market prospects. Innovation inside organisations is typically closely related with investments in research and development (R&D), and empirical studies have proven a favourable relationship between R&D activities and innovation performance⁷⁵.

In this context, universities serve as a continual source of scientific information and technical improvement, making them appealing partners for enterprises involved in R&D activities. Through collaborative arrangements, the scientific information generated within universities can be exploited by the productive sector to develop or improve products, processes, and technologies. As a result, university–industry partnership have become a vital mechanism via which academic research contributes to technological innovation and economic growth⁷⁶. Although UIC has garnered increased attention in recent decades, scholarly studies in this topic are not entirely new. Over time, the body of studies analysing university–industry interactions have risen dramatically. Scholars have increasingly used bibliometric methodologies to study patterns of collaboration, research trends, and theme developments within the UIC literature, contributing to a clearer understanding of how these relationships emerge within bigger innovation systems⁷⁷.

Synthesis: Third Mission Activities and Innovation Capabilities

⁷² Elisa Cordeiro Bastos, Aline Rossales Sengik and Jorge Tello-Gamarra, 'Fifty Years of University-Industry Collaboration: A Global Bibliometrics Overview' (2021) 48 Sci Public Policy 177 <<https://doi.org/10.1093/scipol/scaa077>> accessed 25 February 2026.

⁷³ Moreno and others (n 29).

⁷⁴ Bastos, Sengik and Tello-Gamarra (n 51).

⁷⁵ Takron Opassuwan and Wisuwat Wannamakok, 'Deciphering the Determinants of Firm's Engagement with Universities: An Insight into the Thai Industrial Landscape' (2024) 10 Journal of Open Innovation: Technology, Market, and Complexity 100248 <<https://doi.org/10.1016/j.joitmc.2024.100248>> accessed 12 March 2026.

⁷⁶ Nina Evans, Andrej Miklosik and Jia Tina Du, 'University-Industry Collaboration as a Driver of Digital Transformation: Types, Benefits and Enablers' (2023) 9 Heliyon e21017 <<https://doi.org/10.1016/j.heliyon.2023.e21017>> accessed 12 March 2026.

⁷⁷ Bastos, Sengik and Tello-Gamarra (n 51).

The literature shows that universities are increasingly expected to contribute to economic development through commercialisation, entrepreneurship, and industry engagement. The Third Mission and the concept of the entrepreneurial university highlight the growing role of universities in knowledge-based economies. The review further demonstrates that successful commercialisation depends on institutional adaptability, innovation-support systems, and collaboration among universities, industry, and government. Dynamic Capabilities are important because they influence how universities identify opportunities and respond to changing innovation environments. However, universities in developing countries often face institutional and financial constraints that limit commercialisation performance. These challenges are particularly relevant in Zambia, where commercialisation systems and university–industry linkages remain underdeveloped.

2.4 Barriers to IP Utilisation and Commercialisation

The combination of university capacities, policy frameworks, and institutional structures has a fundamental impact on the effectiveness of technology transfer and intellectual property commercialization inside higher education institutions. Understanding these processes necessitates a consideration of universities' roles in innovation systems, the impact of national and institutional policies, and the structural impediments that impede the translation of research into commercially viable products.

2.4.1.1 Policy and Institutional Gaps in Developing Economies

Universities have a unique advantage in innovation systems because of the constant inflow of staff and students introducing fresh ideas, perspectives, and research capabilities, hence promoting innovation⁷⁸. As a result, universities continue to be essential providers of knowledge, technology, and skilled human capital, capable of supporting emerging businesses and contributing to entrepreneurial ecosystems through Third Mission initiatives. Over recent years, developed countries have introduced a wide range of policies, programs, and institutional structures targeted at maximizing the benefits of university-industry partnership and knowledge transfer. These include legislative reforms such as the Bayh-Dole Act in the US, the revised German Employed Inventor Act, and broader intellectual Property Rights (IPR) regulations, as well as

⁷⁸ Ramya Ravi and Manthan D Janodia, 'Factors Affecting Technology Transfer and Commercialization of University Research in India: A Cross-Sectional Study' (2022) 13 India Journal of the Knowledge Economy 787 <<https://doi.org/10.1007/s13132-021-00747-4>> accessed 19 February 2026.

institutional structures such as scientific parks, incubation centres, and technology transfer offices⁷⁹.

In contrast, many emerging economies still face significant structural barriers. Weak intellectual property protection laws provide significant hurdles for the commercialization of research outputs. When innovators are unable to appropriately safeguard their intellectual property, the incentive to commercialize ideas is reduced. This difficulty is especially severe in developing countries, where enforcement procedures are frequently insufficient, providing significant risks to both local innovators and multinational corporations⁸⁰. Addressing these problems will necessitate constantly and major government engagement to increase technology transfer capabilities and expand support throughout the broader innovation ecosystem, thereby increasing technology absorption and fostering interest in innovation-driven activities.

2.4.1.2 Top-Down and Bottom-Up Approaches to Technology Transfer

Effective technology transfer involves a combination of top-down policy interventions and bottom institutional actions. While government policies play an important role, universities must also participate through coordinated efforts at numerous levels, including academics, students, technology transfer office (TTO) workers, and institutional leadership⁸¹. Internal university policies have been suggested to improve technology transfer outcomes by stimulating commercialization activities that would not otherwise occur and speeding up the transfer process. In reaction to Bayh-Dole-style legislation, several universities around the world have implemented internal regulatory frameworks to promote technology transfer and take a more aggressive role in commercializing research findings.

2.4.1.3 Institutional Policy Diffusion and National Innovation Systems

Empirical research, such as those conducted on Italian universities between 1993 and 2009, show that the implementation of technology

⁷⁹ Marina Ranga and others, 'Building Technology Transfer Capacity in Turkish Universities: A Critical Analysis' (2016) 51 Eur J Educ 90
<<https://doi.org/10.1111/EJED.12164>;CSUBTYPE:STRING:SPECIAL;PAGE:STRING:ARTICLE/CHAPTER> accessed 6 May 2026.

⁸⁰ James Nebus, Kah-Hin Chai and Annapoornima M Subramanian, 'Protecting Intellectual Property and Appropriating Value from Innovations in Weak Appropriability Regimes' (2021) 64 Research-Technology Management 37 <<https://doi.org/10.1080/08956308.2021.1921397>> accessed 14 March 2026.

⁸¹ Ranga and others (n 64).

transfer strategies frequently follows an identical pattern, with institutions replicating the practices of leading or prominent universities ⁸². At a broader level, both national and institutional intellectual property rules are crucial to enabling innovation and economic development ⁸³. However, limited coordination, low levels of IP awareness, and insufficient enforcement mechanisms within national IP regimes continue to impede effective technology transfer, especially in developing and least-developed nations ⁸⁴.

2.4.1.4 Barriers to Commercialisation and University–Industry Linkages

Accessing and utilizing research outputs is a major difficulty in the innovation process. Limited incentives for innovators, weak industrial links, and insufficient institutional infrastructure have been cited as important impediments in higher education institutions ⁸⁵. Strengthening institutional IP policy is thus critical for promoting collaboration between universities and industry, facilitating IP production, and improving technology transfer outcomes.

Innovation policy plays a central role in regulating and managing the components of the innovation system, including legal frameworks, institutional structures, and university–industry linkages. Science policy supports the generation and dissemination of knowledge, while technology policy facilitates the commercialisation of research and the transfer of knowledge from academic institutions to industry. These processes involve the exchange of intellectual property, which must be effectively regulated and protected through comprehensive policy frameworks. A robust national IPR regime, supported by complementary institutional policies at the university level, is therefore essential to guide the generation, protection, management, and commercialisation of intellectual property ⁸⁶.

⁸² Thiago J Soares, Ana LV Torkomian and Marcelo Seido Nagano, 'University Regulations, Regional Development and Technology Transfer: The Case of Brazil' (2020) 158 *Technol Forecast Soc Change* 120129 <<https://doi.org/10.1016/j.techfore.2020.120129>> accessed 14 March 2026.

⁸³ Vijay Kumar Sattiraju and others, 'Intellectual Property Rights Policies of Higher Education Institutions (HEIs) in India: A Cross-Sectional Study' (2022) 13 *Journal of Science and Technology Policy Management* 837 <<https://doi.org/10.1108/JSTPM-01-2021-0002>> accessed 20 March 2026.

⁸⁴ *ibid.*

⁸⁵ Ravi and Janodia (n 63).

⁸⁶ Sattiraju and others (n 68).

2.4.1.5 Challenges in Policy Development and Implementation

Delays, fragmentation, or a lack of clarity in national IPR regulations can severely limit universities' ability to engage in commercialization operations. For example, India's late adoption of a national IPR policy in 2016, combined with concerns about its lack of evidence-based alignment with business objectives, hindered its effectiveness in assisting higher education commercialization initiatives⁸⁷. More broadly, persistent issues such as poor policy coordination, low IP awareness, and insufficient enforcement continue to limit the efficiency of technology transfer systems in developing nations⁸⁸.

Synthesis: Barriers to IP Utilization and Commercialization

The literature identifies legal, institutional, and organisational barriers as major constraints to effective IP utilisation and commercialisation in developing countries. Although many countries have introduced intellectual property laws and innovation policies, implementation challenges remain significant due to weak institutional capacity, low awareness, and poor commercialisation systems. The review further shows that legal reform alone is insufficient without effective institutional support structures and university–industry collaboration. In Zambia, commercialisation remains constrained by fragmented governance systems, inadequate funding, and limited expertise in commercialisation. The literature, therefore, supports the need for a coordinated legal-business framework that combines effective intellectual property governance with stronger institutional and commercialisation support systems.

2.5 Comparative Analysis of Technology Transfer Ecosystems

Over time, innovation ecosystems have evolved to integrate structures such as technology transfer offices (TTOs), science parks, incubators, venture funds, and entrepreneurial support mechanisms into a coordinated system that intermediates between scientific research and market application across different contexts. However, despite this systemic integration, much of the existing literature has examined these components in isolation rather than as an interconnected whole. This has resulted in what has been described as “atomistic” insights, limiting a

⁸⁷ *ibid.*

⁸⁸ Vijay Sattiraju and others, 'National and Higher Education Institutions (HEIs) IP Policies: Comparison of Indian HEIs' IP Policies from a Global Perspective' (123AD) 14 *Journal of the Knowledge Economy* 1979 <<https://doi.org/10.1007/s13132-022-00915-0>> accessed 20 March 2026.

comprehensive understanding of cross-organisational interactions and the overall design of technology transfer systems^{89 90}.

2.5.1 Developed Countries

In developed economies, governments typically deploy dense and multi-layered policy frameworks to support technology transfer and commercialisation. While these systems share common objectives, they differ in their emphasis, governance structures, and legal design. Broadly, such policy interventions can be categorised into three key areas: policies that facilitate university–industry research collaboration; policies governing university patents and licensing; and policies that support the creation of academic spin-off companies linked to research activities⁹¹.

- ***University–Industry Research Collaboration***

University-industry research collaboration is largely based on the economic idea of market failure in research and development (R&D), particularly basic and general research, which resembles a quasi-public product. Due to effects, instability, and high costs, private companies frequently underinvest in such research, as well as collaborative ventures with universities.

In response, governments have implemented policy frameworks to encourage collaborative research. Key early interventions include the European Research Framework Programme (1984) and the United States National Cooperative Research Act (NCRA), which were later supplemented by legislation such as the Bayh-Dole Act and the Stevenson Act, which strengthened intellectual property rights, facilitated technology transfer, and encouraged collaboration. These policies contributed to the creation of a “entrepreneurial state” approach to innovation policy.

Empirical studies show that public funding for university-industry collaboration can boost innovation outcomes, improve research efficiency, and strengthen inter-organizational networks. However, the nature and

⁸⁹ Matthew Good, Mirjam Knockaert and Birthe Soppe, ‘A Typology of Technology Transfer Ecosystems: How Structure Affects Interactions at the Science–Market Divide’ (2019) 45 *The Journal of Technology Transfer* 2019 45:5 1405 <<https://doi.org/10.1007/s10961-019-09745-w>> accessed 20 March 2026.

⁹⁰ Angélica Pigola and others, ‘Collaborative Innovation: A Technological Perspective’ (2022) 10 *International Journal of Innovation* 204 <<https://doi.org/10.5585/iji.v10i2.22256>>.

⁹¹ Sandrine Kergroach, Dirk Meissner and Nicholas S Vonortas, ‘Technology Transfer and Commercialisation by Universities and PRIs: Benchmarking OECD Country Policy Approaches’ (2018) 27 *Economics of Innovation and New Technology* 510 <<https://doi.org/10.1080/10438599.2017.1376167>> accessed 21 March 2026.

intensity of such policy interventions vary greatly between countries, reflecting disparities in national innovation systems and policy agendas.

- ***University Patents and Licensing***

The Bayh-Dole Act was enacted to encourage technological innovation in the United States by establishing intellectual property rights for discoveries resulting from government financed research. Prior to the Act, the government kept ownership of such inventions through fragmented and inconsistent policies, which frequently limited their use. The Act simplified this structure by allowing universities and public research institutes to maintain ownership and commercialize their ideas, promoting knowledge utilization and technology transfer.

It is widely considered as a landmark piece of legislation, having encouraged similar changes around the world and being credited with increasing university patenting and licensing operations. However, some studies argue that its impact should be considered with other contributing variables, such as the formation of technology transfer offices (TTOs) and shifts in research concentration, particularly in high-value disciplines such as biotechnology. Furthermore, the expanding entrepreneurial role of universities has been contested in the literature, with TTOs having an important but variable role depending on institutional capacity, resources, and experience.

- ***Company spin-offs***

University spin-offs are widely acknowledged as an essential vehicle for transferring information from research institutions to the business sector, particularly in the context of the Third Mission. Proponents believe that these enterprises inherit the knowledge, skills, and research focus of its founders, who are typically academics or students, making them more closely aligned with information-intensive and high-value-added economic activities. However, the efficiency of spin-offs is still challenged, owing to a lack of a clear and consistent definition of what defines a university spin-off, as well as disparate measurements of performance such as invention output, patenting, investment attractiveness, or business growth. Concerns have also been expressed concerning potential trade-offs, such as diverting academic expertise away from research and toward commercial activity.

Despite these inconsistencies empirical research lends some support to the benefits of university spin-offs. According to research, such organizations frequently exhibit different "genetic" attributes, such as higher levels of human capital, stronger affiliations to research institutions, and increased participation in knowledge-intensive activities. Further

evidence reveals that founders' educational backgrounds and prior R&D expertise have a positive impact on innovation success and research intensity in these organizations. These findings underscore the potential of university spin-offs to contribute to innovation systems, as well as the importance of supportive legislative and institutional frameworks for maximising their influence.

Technology transfer from universities and public research institutes is integrated into STI policies in OECD economies, including business innovation, entrepreneurship, and higher education. Policy mixtures vary across country, as they appear to address distinct stages of knowledge transfer. Canada, France, and Japan have expanded their portfolios to promote transfers through R&D collaborations, joint research centres, and excellence projects, with the goal of altering the 'supply' of research by universities and PRIs to meet social and economic demands. Furthermore, in France, where the public research system is more strongly focused on basic research, the mix of governmental efforts supporting industry-science mobility is particularly rich⁹².

Canada has a strong university-centred research system that receives significant industrial financing, yet knowledge transfer to industry remains a major concern for Canadian institutions. This is attributable, in part, to the structure of the Canadian economy, which is dominated by small and medium-sized firms, as well as the corporate sector's relatively low R&D capability⁹³. While the French public research system is hybrid, it is dominated by major PRIs that have a wide range of strategic orientation and internal resource allocation options, as well as a few large research universities. Large domestic enterprises drive industry's R&D intensity, which is higher than in other OECD countries. However, despite ongoing policy attempts, transfer results have been minimal. The primary hurdles are in the public research policy area since researchers are not provided with the incentives to engage in such transfers or to conduct research in fields that are likely to have social or economic impacts⁹⁴.

United States

In the US, the Bayh-Dole Act allocates intellectual property rights emerging from publicly funded research to universities and other research organizations, serves as the foundation for the United States' technology transfer paradigm. This framework allows these entities to patent, license,

⁹² *ibid.*

⁹³ OECD, 'OECD Science, Technology and Innovation Outlook 2016' (2016) 2016 OECD Science, Technology and Innovation Outlook <https://doi.org/10.1787/sti_in_outlook-2016-en> accessed 20 March 2026.

⁹⁴ OECD, 'OECD Reviews of Innovation Policy: France 2014' [2014] OECD Reviews of Innovation Policy <<https://doi.org/10.1787/9789264214026-en>> accessed 21 March 2026.

and commercialize their inventions, including the formation of spin-off companies. At the same time, it maintains a broad, royalty-free license for government use, balancing public and commercial interests⁹⁵. The primary goal of this paradigm is to promote innovation and increase the commercialization of publicly financed research products.

This legislative approach is supplemented by targeted government programs such as the Small Business Innovation Research (SBIR), which aims to increase the participation of small, innovative firms in federally funded research and development while also encouraging the commercialization of the resulting innovations. Together, these mechanisms demonstrate that the US technology transfer system is primarily reliant on policy-driven instruments and program-based interventions, rather than thorough private-law codification^{96 97 98}.

European Union

In contrast, technology transfer in the European Union is shaped by a combination of national intellectual property and innovation laws, indicating a more decentralized regulatory strategy. For example, in the United Kingdom, the Patents Act 1977, particularly Section 39 regarding employees' inventions, states that inventions created by employees in the course of their normal duties or duties specifically assigned where an invention could reasonably be expected, are owned by the employer. This legal framework serves as the foundation upon which universities claim ownership of ideas generated by academic personnel, allowing institutions to engage in licensing and the formation of spin-off enterprises. As a result, Section 39 is an important statutory underpinning for the establishment of technology transfer offices at UK universities^{99 100}.

⁹⁵ Christopher Cauble, 'Unlocking Innovation the Bayh-Dole Act Unlocking Innovation: Understanding the Impact of the Bayh-Dole Act | Harness IP' (*Harness IP*, July 2024) <<https://www.harnessip.com/blog/2024/07/24/unlocking-innovation-the-bayh-dole-act/>> accessed 21 March 2026.

⁹⁶ Small Business Administration (SBA), 'Small Business Technology Transfer (STTR) Program Policy Directive'.

⁹⁷ 'Subpart 1819.73—Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Programs | Acquisition.GOV' <<https://www.acquisition.gov/nfs/subpart-1819.73%E2%80%94small-business-innovation-research-sbir-and-small-business-technology-transfer-sttr-programs>> accessed 21 March 2026.

⁹⁸ Maribel Guerrero and David Urbano, 'Effectiveness of Technology Transfer Policies and Legislation in Fostering Entrepreneurial Innovations across Continents: An Overview' (2019) 44 *J Technol Transf* 1347 <<https://doi.org/10.1007/s10961-019-09736-x>> accessed 21 March 2026.

⁹⁹ Patents Act 1977.

¹⁰⁰ Alex Bone, 'University Innovations – Who Owns Them? - Venner Shipley' (*Venner Shipley*, 2024) <<https://www.vennershipley.com/insights-events/university-innovations-who-owns-them/>> accessed 21 March 2026.

France

In France, technology transfer is supported by a formal legislative framework, most notably the *Loi de programmation pour la recherche (2006)*, which strengthened research and technology transfer governance by establishing rules and incentives for universities and public research organizations to manage and exploit intellectual property. This framework relies on previous legislative reforms, particularly the 1999 Innovation Law, which specifically advocated the establishment of TTOs and urged universities to take ownership and actively commercialize ideas resulting from publicly financed research. Together, these legal instruments have had a substantial impact on France's institutional approach to research commercialisation and university-led innovation^{101 102}.

China

China does not rely on a single, comprehensive legislative instrument comparable to the United States' Bayh-Dole Act; instead, it deploys a patchwork of national laws and regulations that jointly support university technology transfer and intellectual property (IP) commercialization. The Science and Technology Progress Law (amended 2007) is widely recognized as the most conceptually similar to the Bayh-Dole framework. This law gives universities and public research organizations more freedom to commercialize the outcomes of government-funded research and keep or lease associated intellectual property rights, moving incentives from state ownership to institutional control¹⁰³.

The Law on Promoting the Transformation of Scientific and Technological Achievements (1996) complements this framework by explicitly promoting, guiding, and regulating the transfer of publicly funded research outcomes to industry through mechanisms such as licensing, equity participation, and spin-offs¹⁰⁴. The law also promotes collaboration between universities and businesses, requires benefit sharing with inventors, and incorporates technology transfer performance into research evaluation systems. Furthermore, the Regulations on Intellectual Property Management of

¹⁰¹ 'Loi N° 2006-450 Du 18 Avril 2006 de Programme Pour La Recherche (1). - Légifrance' <<https://www.legifrance.gouv.fr/loda/id/JORFTEXT000000426953>> accessed 21 March 2026.

¹⁰² Géraldine Manderscheidt and others, 'Documents de Travail Faculté Des Sciences Économiques et de Gestion « Institutional Change and Academic Patenting : French Universities and the Innovation Act of the 1999 » Institutional Change and Academic Patenting: French Universities and the Innovati...' <<http://cournot2.u-strasbg.fr/beta>> accessed 21 March 2026.

¹⁰³ 'Law of the People's Republic of China on Promoting the Transformation of Scientific and Technological Achievements' (1996) <http://www.npc.gov.cn/zgrdw/englishnpc/Law/2007-12/11/content_1383582.htm> accessed 21 March 2026.

¹⁰⁴ Assefa Tesfaye Hailu, 'The Role of University-Industry Linkages in Promoting Technology Transfer: Implementation of Triple Helix Model Relations' <<https://doi.org/10.1186/s13731-024-00370-y>> accessed 19 February 2026.

State-Funded Research Results (2002), also known as the "Chinese version of Bayh-Dole," establish precise guidelines for patent management, licensing, profit-sharing, and reporting. These policies allow universities and research organizations to retain intellectual property ownership and share commercial profits with researchers, laying the groundwork for university-industry technology transfer in China¹⁰⁵

2.5.2 Developing Countries

Technology transfer ecosystems in developing countries are essentially determined by larger development imperatives, such as structural transformation, economic diversification, and achieving the Sustainable Development Goals (SDGs), rather than a narrow focus on commercialisation. In this context, technology transfer is frequently focused on important sectors including low-carbon energy, public health, and agriculture, where innovation may provide both commercial and social value¹⁰⁶¹⁰⁷¹⁰⁸. As a result, these ecosystems tend to prioritise development outcomes, viewing technology transfer as a tool for solving systemic issues like poverty reduction, energy access, and food security.

These systems are distinguished by their emphasis on international cooperation, such as foreign direct investment (FDI), development assistance, and collaboration with multinational corporations, rather than simply indigenous innovation capacity. As a result, policy frameworks frequently incorporate aspects of industrial policy, science, technology, and innovation (STI) policy, and investment promotion methods. Despite this integrative goal, such frameworks are usually fragmented, underfunded, and poorly enforced, reducing their overall effectiveness¹⁰⁹¹¹⁰. Institutional coordination deficiencies, restricted funding for R&D, and

¹⁰⁵ Shu Xin, 'The General Office of the State Council Forwarded the Notice from the Ministry of Science and Technology and the Ministry of Finance on Several Provisions Concerning the Management of Intellectual Property Rights of Research Results from National Scientific Research Projects' (*China Legal Publishing House*, 2024) <https://jsnews.jschina.com.cn/zt2024/fzsxxpt/hdxf/fgxwj/202404/t20240411_3389247.shtml> accessed 21 March 2026.

¹⁰⁶ Nimisha Pandey, | Heleen De Coninck and Ambuj D Sagar, 'Beyond Technology Transfer: Innovation Cooperation to Advance Sustainable Development in Developing Countries' <<https://doi.org/10.1002/wene.422>> accessed 22 March 2026.

¹⁰⁷ David G Ockwell and others, 'Key Policy Considerations for Facilitating Low Carbon Technology Transfer to Developing Countries' (2008) 36 Energy Policy 4104 <<https://doi.org/10.1016/j.enpol.2008.06.019>> accessed 23 March 2026.

¹⁰⁸ Vahid Marandi, 'Bridging Innovation and Policy: Comparative Pathways of National Vaccine Development in Low- and Middle-Income Countries' (2025) 16 Osong Public Health Res Perspect 425 <<https://doi.org/10.24171/j.phrp.2025.0208>> accessed 23 March 2026.

¹⁰⁹ *ibid.*

¹¹⁰ Christian P Schneider, | Edeltraud Guenther and Dominik Möst, 'International Technology Transfer to Africa in Light of the SDGs: What Do We Know about the Barriers? Africa, Barriers, Hurdles, Technology Transfer' (2024) 36 J Int Dev 2129 <<https://doi.org/10.1002/jid.3900>> accessed 22 March 2026.

ineffective regulatory enforcement mechanisms all impede these systems' ability to translate policy aims into real results.

Another major roadblock is the poor absorptive capacity of many developing countries. Firms and organizations frequently lack the technical skills, infrastructure, and human capital needed to effectively integrate, adapt, and disseminate imported innovations. This limits the developmental impact of technology transfer, especially when it is viewed as a one-time transaction for the acquisition of hardware or intellectual property rights rather than a continual learning process. In this regard, the literature emphasizes that effective technology transfer ecosystems must be viewed as part of a larger process of long-term technological capability building, which includes sustained investments in education, skill development, institutional strengthening, and local innovation systems ¹¹¹
¹¹².

As a result, more effective technology transfer strategies in poor nations promote interactive learning, local adaptation, and knowledge co-creation rather than transactional techniques. This includes expanding the links between universities, business, and government, improving institutional support mechanisms such as technology transfer offices, and incorporating technology transfer into national innovation objectives. Ultimately, the success of these ecosystems is dependent not only on access to external technology, but also on domestic actors' ability to internalize, refine, and disseminate these technologies in ways that promote sustainable and equitable growth.

Technology transfer (TT) regulatory regimes in developing nations, particularly in Africa and Latin America, are very heterogeneous and constantly evolving. Many nations continue to function under hybrid systems that blend historical regulatory regimes, which are frequently influenced by UNCTAD-inspired technology transfer regulations from the 1990s ¹¹³, with more recent changes targeted at boosting institutional capacity. These newer models usually include the formation of centralized technology transfer companies and the building of national networks of technology transfer offices (TTOs) ¹¹⁴. This layered legal development reflects both the historical evolution of regulatory approaches and current

¹¹¹ Pandey, Heleen De Coninck and Sagar (n 91).

¹¹² Ockwell and others (n 92).

¹¹³ New York, 'UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT UNCTAD Series on Issues in International Investment Agreements UNITED NATIONS TRANSFER OF TECHNOLOGY Internet Edition'.

¹¹⁴ Assoc BM Magaji, 'Issue 3 African Multidisciplinary Journal of Development (AMJD)' 12
<<https://doi.org/10.59568/AMJD-2023-12-3-22>> accessed 22 March 2026.

efforts to align technology transfer systems with global innovation activities.

Egypt

Egypt's technology transfer system shows both the potential and limitations of coordinated multi-institutional governance in developing countries. The framework, established under the Commercial Code (1999) and overseen by MHESR, comprises mandatory written contracts as well as a complete strategic policy architecture that addresses innovation, education, and industrial growth. Recent legislative developments, such as Law 23/2018 and TTO infrastructure development under the TICOs Programme, demonstrate a strong commitment. However, many weaknesses persist, including institutional coordination issues, a relationship between intellectual property protection and patent activity, the absence of cluster development plans, information asymmetries that influence private sector engagement, and a lack of sectoral prioritization. These deficiencies demonstrate that, while Egypt has made significant progress in the establishment of legal TT frameworks, operational efficacy is still limited by structural implementation issues common to developing economies^{115 116}.

Namibia

Namibia's Investment Promotion and Development Board (NIPDB) is a unique example of MSME-integrated FDI and technology transfer governance in developing nations. Despite relatively low overall innovation rankings (96th internationally), Namibia's institutional quality, as indicated by its top-ranked African IPA status and global leadership in educational expenditure, provides a solid basis for effective investment promotion. NIPDB implements four interconnected strategic mechanisms under the MSME Policy of 2016¹¹⁷: the MSME/BSO Database for ecosystem alignment, the in4MSME application for digital accessibility, the Chalet Cage programme for investor readiness and financial intermediation, and the Know2Grow project for technical capacity building. These efforts show a deliberate dedication to bridge institutional bureaucracy, government support systems, and private-sector competencies. The explicit sectoral prioritization structure (which includes

¹¹⁵ 'THE MINISTER OF FOREIGN AFFAIR DECREE NO. 23 | 2018 | ISSUED ON 17 - 07 - 2018 | PUBLISHED ON 25 - 08 - 2018' <<https://www.eastlaws.com/legislation-full-text/en/egypt/minister-foreign-affair-decree/25-08-2018/no-23?type=1&id=4927133>> accessed 23 March 2026.

¹¹⁶ Juan Pablo Naranjo Vallejo, 'Good Practices on Technology Transfer Regulations in Emerging and Developing Countries: Looking at the African and Latin American Context' (2025) 24 *Revista e-mercatoria* <<https://doi.org/10.18601/16923960.v24n2.02>>.

¹¹⁷ Republic of Zambia Ministry of Higher Education, 'National Science, Technology and Innovation Policy' (2020) <https://www.mots.gov.zm/wp-content/uploads/2022/06/National-ScienceTechnology-and-Innovation-Policy-A4_Print-Ready.pdf> accessed 6 March 2025.

renewable energy, green hydrogen, and extractive sectors) and the objective of elevating Namibia's start-up ecosystem to upper-quartile international rankings further evidence strategic coherence. Namibia's approach, particularly its database-driven MSME mapping and financing facilitation, exhibits functional convergence with comparable developing economy strategies (e.g., Costa Rica's SINCYT), suggesting emergent best-practice patterns in regional TT governance that merit policy diffusion consideration ¹¹⁸.

Costa Rica

Costa Rica's technology transfer governance is a unique voluntarist coordinating paradigm that challenges traditional developing-economy techniques. Costa Rica's unique institutional architecture and legal environment contributed to an extraordinary FDI attractiveness record during the pandemic, while having a moderate worldwide competitiveness ranking (68th). The Law No. 9971 (2021), a modification of Law No. 7169 (1990) ¹¹⁹, establishes a hierarchical National Science, Technology, and Innovation System under the Ministry of Science, Innovation, Technology, and Telecommunications (MICITT), with SINCYT serving as a voluntary information repository rather than a regulatory enforcement mechanism. Costa Rica's long-standing dependence on CINDE, a private non-profit IPA named the world's top investment promotion agency in 2022, proves the feasibility of private-sector FDI control. The deliberate absence of specific foreign direct investment regulation, combined with "passive" open-market policies, equal treatment principles, and MIPYMES-centred structural priorities, suggests that reduced regulatory intervention may enhance TT effectiveness. The subordination of TT offices to science rather than commerce ministries, and the voluntary (rather than mandatory) enterprise registration system, indicate that information coordination and incentive-based participation may outperform compulsory regulatory approaches in developing economy contexts ¹²⁰.

Despite these developments, insufficient IP regimes and fragmented regulatory environments remain persistent impediments. In many jurisdictions, weaknesses in IP protection, confusing rules regulating cross-border IP transactions, and the lack of comprehensive and enforceable TT policies erode investor trust and weaken incentives for local innovation ¹²¹. These inadequacies not only reduce the effectiveness

¹¹⁸ Naranjo Vallejo (n 101).

¹¹⁹ 'Law No. 7169 of June 26, 1990, on the Promotion of Scientific and Technological Development (as Amended up to Law No. 9971 of May 11, 2021), Costa Rica, WIPO Lex' <<https://www.wipo.int/wipolex/en/legislation/details/21978>> accessed 23 March 2026.

¹²⁰ Naranjo Vallejo (n 93).

¹²¹ Magaji (n 99).

of domestic technology transfer processes but also impair countries' capacity to attract and maintain high-quality overseas investment.

However, increasing data from a few jurisdictions indicates that focused reforms can produce favourable results. Countries like Costa Rica and several African states show that modernized TT frameworks, when combined with clear investment promotion strategies and well-coordinated TTO systems, can improve the quality of foreign direct investment (FDI) and the effectiveness of technology transfer processes¹²². These examples highlight the need of institutional coherence, regulatory clarity, and strategic alignment in creating functional and development-oriented technology transfer ecosystems.

Transferable Lessons from Technology Transfer Ecosystems for Zambia

The comparative literature demonstrates that effective technology transfer systems are shaped by the interaction between legal frameworks, institutional capacity, commercialisation infrastructure, and government support. The experience of the United States under the Bayh–Dole Act illustrates how clear intellectual property ownership rules can stimulate university patenting, licensing, spin-off formation, and stronger university–industry collaboration. Similarly, countries such as France, the United Kingdom, and China have strengthened commercialisation through coordinated policies, institutional support structures, and commercialisation incentives. However, the literature also shows that legislation alone is insufficient without effective implementation systems, Technology Transfer Offices, funding support, and commercialisation expertise. Experiences from Egypt, Namibia, and Costa Rica further demonstrate that developing countries often face institutional fragmentation and weak commercialisation infrastructure.

The comparative analysis reframes Zambia's technology transfer difficulty as a lack of legal systematization and implementation capacity, rather than a lack of law itself. From this literature, three legal design concepts emerge for technology transfer governance from which lessons can be drawn by Zambia in implementing a contextualised legal-business framework that strengthens institutional coordination, commercialisation capacity, and university–industry collaboration while adapting international best practices to local realities. The framework must incorporate statutory clarity, institutional professionalization, and procedural coordination as mutually reinforcing legal imperatives, drawing

¹²² *ibid.*

eclectically on comparative models while respecting local institutional restrictions.

Firstly, consideration of the principle of functional equivalence over formal replication. Zambia's reform should stress functional outcomes (clear ownership, professional intermediation, and researcher incentives) over formal adherence to developed-country statutes. Secondly, legal layering and coordination allows for effective systems necessitate synchronization of macro-level intellectual property legislation, meso-level institutional policies, and micro-level contractual practices. China's experience shows that layering varied legal tools can achieve coordination without codification, whereas Egypt's challenges show that formal comprehensiveness without practical coordination results in legal dysfunction. And lastly, the concept of regulatory proportionality to absorptive ability. Costa Rica and Namibia's models show that less regulatory intervention, paired with improved information infrastructure, may better serve development goals than ambitious statutory programs with limited implementation capacity.

Having examined the relevant literature, theoretical perspectives, and comparative commercialization frameworks, Section 3 outlines the research methodology adopted to investigate the legal and institutional factors influencing technology transfer and intellectual property commercialization in Zambian universities.

3 RESEARCH METHODOLOGY

3.1 Study Design

This study adopts a qualitative socio-legal and exploratory research design to examine how legal and institutional frameworks shape technology transfer and intellectual property (IP) commercialization in Zambian universities¹²³. The choice of a socio-legal approach reflects the need to move beyond a purely formalistic reading of the law and instead situate legal rules within their broader institutional and socio-economic context. In particular, the study engages with the distinction between “law in the books,” understood as the formal body of legislation, regulations, and policy instruments, and “law in action,” which captures how these norms are interpreted, implemented, and experienced within universities¹²⁴¹²⁵. This distinction is especially pertinent in developing country contexts, where the effectiveness of legal frameworks is often mediated by institutional capacity, governance structures, and resource constraints, leading to observable divergences between formal provisions and actual practice.

Methodologically, the study employs a multi-method qualitative design that brings together doctrinal legal analysis and empirical qualitative inquiry in a complementary manner. The doctrinal component involves a systematic examination of primary legal sources, including;

- a. National intellectual property legislation
- b. Subsidiary regulations,
- c. Science, technology and innovation (STI) policies
- d. University-level IP and commercialisation policies.

The purpose of this analysis is to map the formal legal architecture governing technology transfer and IP commercialization in Zambia, while also assessing the extent to which these frameworks demonstrate internal coherence, institutional enforceability, and alignment with international best practices.

Through this doctrinal and policy analysis, the study identifies regulatory gaps, institutional inconsistencies, policy fragmentation, and areas of

¹²³ John Creswell, *Research Design: Qualitative, Quantitative and Mixed Methods Approaches* (4th ed, SAGE Publications Ltd 2014)

<<http://www.drbrambedkarcollege.ac.in/sites/default/files/E%20Book%20Research%20Design%20Cresswell%202014.pdf>> accessed 21 February 2022.

¹²⁴ Saul McLeod, ‘Edward Thorndike: Law of Effect’ (*Simply Psychology*, 2018)

<<https://www.simplypsychology.org/edward-thorndike.html>> accessed 21 March 2022.

¹²⁵ Gutu O Wayessa and Anja Nygren, ‘Mixed Methods Research in Global Development Studies: State-Sponsored Resettlement Schemes in Ethiopia’ (2023) 35 *The European Journal of Development Research* 2023 35:6 1440 <<https://doi.org/10.1057/S41287-023-00588-8>> accessed 28 April 2026.

legal underdevelopment that may constrain commercialization performance within universities.

3.1.1 Comparative legal analysis

The doctrinal analysis further incorporates a comparative examination of selected international commercialization frameworks, particularly from South Africa, United States, and China. The comparative component is intended to identify transferable institutional and policy practices relevant to the Zambian higher education context.

The empirical component examines how legal and institutional frameworks operate in practice within universities. It explores:

- a. how institutional actors interpret and implement IP policies,
- b. how universities engage in commercialization activities,
- c. and what legal, institutional, financial, and cultural factors facilitate or constrain effective technology transfer

3.1.2 Integration of doctrinal and empirical components

The relationship between the doctrinal and empirical components is structured through a sequential and iterative logic. The doctrinal analysis is undertaken in the initial phase of the study to identify key legal provisions, policy objectives, commercialisation mechanisms, and institutional expectations. These insights informed the design of the empirical inquiry, including the development of questionnaire items and the selection of relevant documentary materials. This interaction between doctrinal analysis, documentary evidence, and limited empirical insights supports analytical triangulation and strengthens contextual interpretation. The empirical findings are subsequently used to assess the degree of alignment between formal legal frameworks and institutional practice, while also providing contextually grounded explanations for implementation gaps and institutional challenges.

3.1.3 Refinement: mixed methods to qualitative exploratory design

The study was initially conceptualized as a mixed-methods design incorporating both quantitative and qualitative components. However, following preliminary empirical engagement, the study evolved into a qualitative-dominant exploratory socio-legal design. This refinement reflects an intentional methodological adaptation aimed at achieving a deeper institutional and contextual analysis.

Given the complexity of legal implementation, governance dynamics, and institutional commercialisation processes within Zambian universities, a qualitative exploratory approach was considered more appropriate for capturing institutional realities, contextual variation, governance challenges and implementation practices.

The revised methodological orientation allows for a deeper examination of how technology transfer systems operate within universities, particularly in contexts where empirical research remains limited and institutional arrangements are still evolving.

This orientation is consistent with socio-legal scholarship, which emphasizes context-sensitive and interpretive inquiry when examining the relationship between law, institutions, and society.

3.1.4 Justification for the Study site

As a developing IP framework and an expanding economy in sub-Saharan Africa, Zambia offers substantial study opportunities to identify its advantages, disadvantages, and areas for development to spur economic growth and innovation¹²⁶. Zambia is chosen because it is actively reforming its IP and innovation framework and explicitly aims to transition “towards a knowledge economy” through Vision 2030 and related policies. Universities are central to this agenda yet operate within a “developing IP framework”, making them a critical site for examining gaps and designing an appropriate legal-business framework.

This study is further justified by the strategic importance of higher education institutions within Zambia’s national development agenda and the growing policy emphasis on innovation, commercialization, and knowledge-based economic transformation.

3.2 Population and Sampling

3.2.1 Target population

The target population comprises actors directly engaged in research, innovation and IP governance in public universities and relevant policy bodies: academic staff, research/innovation administrators, postgraduate students, TTO or research office staff, university legal officers, senior researchers involved in commercialisation, and selected policymakers/IP

¹²⁶ Sampa and Hossain (n 20).

officials. This group is best placed to provide information on existing practices and barriers.

3.2.2 Sampling technique

Purposive sampling of 3-5 top universities and key stakeholder groups is used to ensure the participation of institutions engaged in active research and intellectual property activities, as well as respondents with direct, specialised knowledge of technology transfer and IP governance¹²⁷. This non-probabilistic approach is appropriate for the exploratory socio-legal research where the aim is to access information-rich rather than to achieve statistical representation. This non-probabilistic sampling strategy is appropriate for exploratory socio-legal research because the objective is analytical depth and contextual understanding rather than statistical generalisation¹²⁸.

3.2.3 Sample size

The original sample size was determined by the number of eligible academic administrators, etc at the selected universities with a target of approximately thirty (30) respondents. This sample size was intended to allow for meaningful descriptive analysis of the patterns in awareness, policy use, and perceived barriers. However, as described in section 3.2, only six (6) valid responses were ultimately received.

Given the low response rate, the study was methodologically repositioned as a qualitative-dominant exploratory socio-legal study supported by limited descriptive survey evidence. The five survey responses were therefore treated as supplementary qualitative indicators rather than as a statistically representative quantitative dataset.

Although the study initially contemplated a broader survey-based empirical component, the achieved response rate necessitated a shift toward qualitative exploratory interpretation supported by limited descriptive survey data.

3.2.4 Sample inclusion criteria

These criteria ensure participants can speak knowledgeably to the research questions. Inclusion is limited to:

¹²⁷ Creswell (n 99).

¹²⁸ Michael Quinn Patton, 'Qualitative Research and Evaluation Methods' (2015) 3rd Qualitative Inquiry 598 <<https://doi.org/10.2307/330063>> accessed 28 April 2026.

- 1) Top universities in Zambia with active research and innovation functions.
- 2) Academic staff, research/innovation administrators and postgraduate students engaged in research.
- 3) TTO/research office staff, legal officers, senior researchers with commercialisation experience, and policymakers/IP officials directly involved in IP or TT governance.

3.3 Data Collection and Management

3.3.1 Data collection instruments

A structured questionnaire with Likert-scale items was used to assess understanding of intellectual property and Third Mission policies, as well as perceived legal, institutional, and cultural constraints.

A document analysis methodology for national and university-level policies and comparison instruments will also be provided.

3.3.1.1 Documentary Sources

Documentary sources included:

- The Zambian National Intellectual Property Policy,
- PACRA reports,
- National STI policies,
- University IP policies,
- Research commercialisation policies,
- and selected international comparator frameworks.

These documents were analysed to identify policy objectives, institutional arrangements, commercialisation mechanisms, governance structures, and implementation gaps.

3.3.1.2 Documentary Analysis Procedure

Documents were analysed using qualitative content analysis, focusing on legal provisions, institutional mandates, commercialisation incentives, policy implementation structures and university-industry collaboration mechanisms. The analysis further examined the extent to which Zambian frameworks align with international best practices in university technology transfer

3.3.2 Data collection procedure

Questionnaires were distributed online via Google Forms to eligible respondents within sampled universities and institutions. Relevant policy and legal documents were collected from university websites, PACRA publications, government repositories, and institutional policy archives. Document analysis of national IP/STI policies, legislation, and university IP/research policies, as well as selected international models, was carried out concurrently to identify normative frameworks and benchmarks.

3.3.3 Data management and storage

All research materials, including survey responses, documentary records, and analytical notes, were stored on password-protected, encrypted devices. Participant identifiers were removed and replaced with codes to ensure confidentiality. Access to research materials was restricted solely to the researcher.

3.3.4 Measurement of variables

The variables and justifications can be found in

Appendix A: Table 1 the appendix

Key quantitative variables include:

- IP awareness and Third Mission awareness (multi-item Likert scales).
- Use of IP and TT policies (frequency/extent scales).
- Perceived barriers (legal, institutional, cultural) to IP utilisation and commercialisation, reflecting challenges such as low IP awareness and weak enforcement.

Qualitative "variables" are operationalized as themes: legal and policy gaps, institutional capacity (e.g., Third Mission, dynamic capabilities), and experiences with technology transfer agreements.

3.3.5 Critical Limitation: Low Response Rate

A critical limitation of the study pertains to the low response rate achieved during the questionnaire strand. Of the intended number of people targeted which was thirty (30) of six (6) responses were received, yielding a response rate of just under twenty percent (20%). This level of response is statistically insufficient to support inferential analysis or population level

generalisation and must be transparently acknowledged as a material constraint on the scope of the empirical findings.

3.3.5.1 Likely Causes of the Low Response

Several factors may account for this outcome. Firstly, being organisational gatekeeping with Zambian universities, a well-documented feature of empirical access in developing countries higher education research, limiting the penetration of the instrument to the intended respondents¹²⁹.

Secondly, the relatively low institutional salience of IP and technology transfer as operational concerns within many Zambian universities, as suggested by the broader literature, may have reduced the respondent's sense of relevance or competence to engage with the survey¹³⁰. Third, time constraints, competing institutional priorities, and survey fatigue during the survey administration period are likely to have suppressed participation.

The low response rate may itself reflect broader institutional challenges relating to engagement with technology transfer and IP governance, although this interpretation should be approached cautiously.

It is symptomatic of the limited institutional engagement with technology transfer and IP commercialisation that the study seeks to interrogate. As such, it reinforces rather than undermines the study's central limited capacity, and insufficient institutional prioritisation of IP and technology transfer activities.

3.3.5.2 Methodological Reconstitution

In response to this limitation, the study was methodologically reconstituted as a qualitative-dominant, exploratory socio-legal study, consistent with the interpretivist and socio-legal orientation described in section 3.1 above. Under this reconstitution design, the five survey responses are treated as supplementary qualitative indicators rather than primary quantitative dataset. They are analysed as descriptive findings through frequency distribution and thematic extraction and are interpreted in dialogue with rather than in isolation from, the secondary and documentary data.

¹²⁹ Sibeso Lisulo, 'Widening University Access and Participation in the Global South: Using the Zambian Context to Inform Other Developing Countries by E. Mboyonga (2025). London/New York: Routledge Publishers.' (2025) 13 Journal of Student Affairs in Africa <<https://doi.org/10.24085/JSAA.V13I1.6124>> accessed 29 April 2026.

¹³⁰ Ramazan Uctu and others, 'Technology Transfer Models of Universities and Public Research Organisations in South Africa: Changes before and after the IPR-PFRD Act of 2008' (2022) 17 Journal of technology management & innovation 71 <<https://doi.org/10.4067/S0718-27242022000100071>> accessed 28 April 2026.

This integrative approach is methodologically consistent with the convergent logic of mixed-method research, which holds that the value of each data strand is enhanced when considered in relation to others, even where one strand is empirically limited¹³¹. The reconstitution design is further legitimised by a substantial body of methodological literature supporting the use of small, non-representative sample in exploratory legal and social research. As mason¹³², observes qualitative research does not aim for statistical representativeness but for theoretical and analytical depth; small sample can yield significant analytical insight when interrogated with appropriate rigour.

The findings of this study must accordingly be understood as exploratory and indicative in character. They provide a preliminary mapping of the legal and institutional landscape, grounded in rigorous documentary and comparative analysis, and supplement by limited primary empirical data. Future research employing larger, and more representative sample will be necessary to confirm, refine or challenge the framework.

The findings of this study must accordingly be understood as exploratory and indicative in character. They provide a preliminary mapping of the legal and institutional landscape, grounded in rigorous documentary analysis, and supplemented by limited primary empirical data. Future research employing larger, more representative samples will be necessary to confirm, refine, or challenge the framework proposed herein.

3.4 Data Analysis

Doctrinal and documentary data were analysed using thematic and qualitative content analysis focusing on legal frameworks, institutional structures, commercialisation mechanisms, implementation gaps and international best practices.

Themes were developed deductively from the conceptual framework, study objectives and research questions. The analysis also incorporated comparative legal interpretation to identify lessons relevant to Zambia's commercialisation ecosystem.

¹³¹ Saul McLeod, 'Mixed Methods Research Guide With Examples' (March 2024) <<https://doi.org/10.13140/RG.2.2.31329.93286>>.

¹³² Jennifer Mason, *Qualitative Researching* 2002 (SAGE Publications Ltd).

3.5 Validity and Trustworthiness

The questionnaire was pre-tested with a small group of academics and administrators to improve clarity, relevance, and contextual appropriateness of the research instrument.

Trustworthiness of qualitative findings was strengthened through doctrinal triangulation, documentary comparison and interpretive consistency across data sources. Content validity was grounded in established technology transfer and IP commercialization literature.

3.6 Ethical considerations

Participation in the study was voluntary, and informed consent was obtained from all participants. Confidentiality and anonymity were maintained through coded identifiers, secure storage and restricted access to research materials. These safeguards were particularly important given the institutional sensitivity surrounding IP governance and commercialisation practices.

Having outlined the methodological approach employed in the study, the Section 4 presents and discusses the findings derived from the doctrinal analysis, documentary review, comparative legal analysis, and illustrative survey evidence in relation to the study objectives.

4 FINDINGS AND DISCUSSION

This chapter presents the findings of a legal documentary legal analysis of Zambia's national legislation, policies, and institutional documents, complemented by illustrative qualitative data from five survey participants. The analysis is structured around the following four thematic findings: 1) legislative fragmentation in intellectual property administration; 2) policy goals without statutory implementation; 3) institutional vacuum in university technology transfer infrastructure; and 4) misalignment between international commitments and local implementation. Each finding is supported by comparative legal analysis drawn from selected jurisdictions to identify institutional and policy lessons relevant to Zambia's commercialization environment. The findings are discussed in relation to the study objectives and provide the basis for the proposed legal-business framework presented in the subsequent chapter.

4.1 Findings

Finding 1: Legislative Fragmentation in Intellectual Property Administration

Zambia's intellectual property legislation is comprised up of several statutes issued over time with no comprehensive harmonization. The Patents Act governs invention patents; however, it makes no provision for the ownership of inventions made by university staff utilizing institutional resources. The Copyright and Performance Rights Act protect literary and artistic works, but it does not address academic employees' ownership of scientific and research achievements. The Industrial Designs Act and the Trademarks Act operate independently, with no channels for coordination. There is no one statute that consolidates rules governing university-generated intellectual property, commercialization methods, or contractual frameworks between institutions and industries. The Companies Act establishes broad incorporation standards but makes no special provisions for university spinoff development. The Public Finance Management Act oversees public institutions' revenue but does not handle licensing, income, royalty distribution, or institutional equity participation in spin-off ventures. As a result, Zambia currently lacks a comprehensive legislative framework specifically governing university-generated intellectual property and research commercialization. This fragmentation creates uncertainty regarding ownership, commercialization responsibilities, and institutional coordination.

The absence of harmonized commercialization legislation limits the ability of universities to translate research outputs into marketable innovations and weakens institutional confidence in commercialization activities.

Comparative Legal Analysis

This fragmentation indicates a sharp contrast to jurisdictions with unified technology transfer governance established through comprehensive legislation. South Africa's Intellectual Property Rights from Publicly Funded Research and Development Act (2008) consolidates ownership regulations, mandates institutional IP administration, provides disclosure processes, and imposes benefit-sharing duties in a single statutory instrument. Section 4 of the Act grants recipient institutions ownership of publicly sponsored intellectual property, while Sections 6-8 require required disclosure, review, and preservation procedures. This legislative unification lowers transaction costs by providing a single statutory reference for all stakeholders.

The US Bayh-Dole Act (1988), although narrower in scope, tackles the specific problem of fragmented federal agency ownership by setting uniform rules for all funding agencies. Its legal innovation is not comprehensiveness, but rather pre-emptive uniformity by superseding agency-specific rules that formed the "confusing web of regulations" prior to its introduction.

China's approach indicates that legislative unification can be achieved gradually rather than through a single statute. The Science and Technology Progress Law (amended 2007), the Law on Promoting the Transformation of Scientific and Technological Achievements (1996), and the Regulations on the Intellectual Property Management of State-Funded Research Results (2002) all achieve functional equivalence to Bayh-Dole through layered legislative development. However, China's experience demonstrates the coordination issues of multi-statute models, which necessitate inter-ministerial structures to ensure coherence.

Implication for Framework Development

The findings suggest that Zambia requires a coordinated legal framework that clearly regulates ownership, commercialization procedures, institutional responsibilities, and university–industry collaboration. Given Zambia's institutional capacity constraints, a harmonised legislative model similar to South Africa's approach may provide greater clarity and administrative efficiency for university commercialization activities.

Finding 2: Policy Ambition without Statutory Operationalization

The Revised National Intellectual Property Policy (2020) outlines goals such as "promoting the use of intellectual property as a tool for wealth creation and socio-economic development" and "strengthening the institutional framework for IP administration." However, the Policy does not include an implementation date, no designated responsible institutions other than the existing Patents and Companies Registration Agency (PACRA), and no statutory instruments or regulations that give its contents legal meaning.

The National Science, Technology, and Innovation Policy (2020) make similar commitments to "promote technology transfer and commercialization of research results" and "strengthen university-industry linkages." However, the Policy's implementation structure defines no precise legislative processes, funding allocations, or accountability methods for these goals. The Policy acknowledges that "the current legal framework does not adequately provide for the commercialization of research outputs," but does not suggest any legislative changes to solve this issue.

These documentary findings were also reflected in the limited survey responses, which generally indicated uncertainty regarding institutional implementation and the effectiveness of existing intellectual property systems.

This policy implementation gap weakens institutional commitment to commercialization activities because universities operate without clear statutory obligations or operational guidance.

Comparative Legal Analysis

India's experience with delayed IPR policy implementation exemplifies the effects of policy-statute misalignment. India's National IPR Policy was adopted in 2016, over two decades after economic liberalization, and critics have pointed to a lack of "evidence-based alignment with business objectives." The Policy's hortatory language, which is identical to Zambia's, produced expectations but no enforceable responsibilities, resulting in implementation stasis as institutions sought legal clarification that never came.

France's Loi de programmation pour la recherche (2006) exemplifies an alternate approach: policy objectives are contained in programmatic legislation, with defined institutional mandates, funding methods, and evaluation standards. Article 4 of the Law establishes technology transfer as a statutory function of public research organizations, with subsequent

decrees defining operational conditions. This legislative operationalization turns policy ambitions into legally binding responsibilities.

Costa Rica's voluntarist paradigm represents a third way. Rather than enacting technology transfer obligations, Costa Rica developed SINCYT as an information coordination structure and relied on private-sector investment promotion (CINDE) to foster university-industry collaboration. This method proposes that information infrastructure, and incentive alignment can partially replace statutory prescription in capacity-constrained situations. Costa Rica's success, however, was based on pre-existing institutional quality and FDI appeal, both of which Zambia lacks.

Implication for Framework Development

The findings suggest that Zambia requires statutory operationalization of existing innovation and intellectual property policies. This should include legally recognized technology transfer responsibilities for universities, mandatory institutional commercialization policies, and dedicated implementation mechanisms supported by financing and institutional oversight.

Finding 3: Institutional Policy Gap

Documentary Evidence Analysis indicates that certain institutions have established Intellectual Property (IP) policies. However, the existence of these policies does not guarantee successful technology transfer and commercialization outcomes. While some provisions regarding ownership rights and disclosure processes exist, there is frequently insufficient articulation of commercialization methods to make the research result more marketable. The rules provide a foundation for the treatment of produced IP, primarily for teaching purposes, but because there is no statutory instrument requiring universities to establish TTOs, engage technology transfer professionals, or maintain IP management systems, commercialization is not generally considered.

These findings were also reflected in the survey responses, where several respondents expressed concern regarding limited institutional support for industry collaboration and commercialization activities.

The absence of institutional structures for commercialization weakens universities' ability to effectively fulfil their Third Mission through innovation, entrepreneurship, and industry engagement.

Comparative Legal Analysis

The United Kingdom's approach illustrates how employer-employee invention legislation can establish institutional infrastructure in the absence of clear statutory requirements. Section 39 of the Patents Act of

1977 grants ownership of employee inventions generated in the course of normal duties to the employer, allowing universities to claim intellectual property and, as a result, establish TTOs to manage these claims. This private law basis for public institution commercialization demonstrates that technology transfer infrastructure can develop from broad legal concepts rather than specialized innovation statutes.

France's Innovation Law (1999) exemplifies the mandated institutional approach, expressly requiring universities to "take ownership and actively commercialize ideas resulting from publicly financed research" and making TTOs legislative mandates. This model assures institutional capability, but it necessitates significant public investment and risks formal compliance without operational success if financing is insufficient.

China's Regulations on IP Management of State-Funded Research Results (2002) take a hybrid approach, requiring universities to implement IP management procedures while allowing for organizational flexibility. This allows for flexibility to institutional scale and disciplinary variance while ensuring minimal requirements. The Regulations also set professional qualification criteria for IP management staff, addressing human capacity issues directly.

Implication for Framework Development

The findings suggest that Zambia requires stronger institutional commercialization structures supported by coordinated national oversight. A tiered institutional framework involving a National Technology Transfer Hub, University Innovation Offices, and flexible institutional IP management systems may provide a practical approach for strengthening commercialization capacity while accommodating institutional differences across universities.

Finding 4: Misalignment Between International Obligations and Domestic Implementation

Documentary evidence reveals that Zambia has ratified the World Trade Organization (WTO)'s Trade Related aspects of Intellectual Property Rights (TRIPS) Agreement (1995), the Patent Cooperation Treaty (PCT), and the Africa Regional Intellectual Property Organisation (ARIPO)'s Harare Protocol. The Africa Continental Free Trade Area (AfCFTA) Protocol on Intellectual Property Rights for 2021 has been signed but not yet ratified. These documents provide basic criteria for intellectual property protection, enforcement, and cross-border collaboration. However, domestic legislation fails to adequately enforce these commitments in the context of university research. The TRIPS Agreement's technology transfer requirements (Articles 7 and 8) are not

mirrored in domestic legislation. The PCT's international filing methods are managed by PACRA but are not incorporated with university research governance. Zambian universities make little use of ARIPO's regional patent system. The sections of the AFCETA IP Protocol on cross-border research collaboration and intellectual property commercialization are still awaiting ratification and implementation¹³³.

Comparative Legal Analysis

South Africa's IPR-PFRD Act complies with TRIPS by requiring that technology transfer methods "be consistent with South Africa's international obligations while incorporating flexibilities for the public interest." The Act's benefit-sharing requirements (Section 10) carry out the goals of TRIPS Article 7 which is "social and economic welfare" through a local statutory system.

China's Science and Technology Progress Law (as revised in 2007) displays proactive international alignment by including WIPO's development agenda suggestions and introducing technology transfer as a tool for "international scientific and technological cooperation." This legislative framework places domestic technology transfer governance inside global innovation networks.

Zambia has overlooked the use of the African Regional Intellectual Property Organization (ARIPO) frameworks, which provides potential for regional harmonization. The Banjul Protocol on Marks and the Harare Protocol on Patents facilitate regional filing and protection, lowering transaction costs for cross-border technology transfer. However, there are no rules in ARIPO's framework for university-generated intellectual property or research. Thus, commercialization represents a regional governance deficit that may be addressed through national law.

Implication for Framework Development

The findings suggest that Zambia requires stronger alignment between international intellectual property commitments and domestic commercialization systems. This should include integrating technology transfer principles into national legislation, strengthening institutional support for ARIPO utilisation, and developing regional collaboration mechanisms to support university commercialization and cross-border research partnerships.

¹³³ 'PROTOCOL TO THE AGREEMENT ESTABLISHING THE AFRICAN CONTINENTAL FREE TRADE AREA ON INTELLECTUAL PROPERTY RIGHTS'.

4.2 Summary

The study sought to answer the research question; *What legal-business framework is required to enhance technology transfer and intellectual property commercialization in Zambian universities to support the country's transition toward a knowledge-based economy?*

The findings demonstrate that Zambia's university commercialization environment is constrained by fragmented legislation, weak policy implementation systems, limited institutional commercialization capacity, and inadequate integration of international intellectual property obligations into domestic practice.

The first study objective was to analysis the existing IP and innovation policies that influence university-based research commercialization in Zambia. In response to this, *finding 1* reveals a fragmented nature of Zambia's IP policies and the absence of a harmonization framework to encourage commercialization, thereby addressing the purpose to assess existing regulations.

On the other hand, the second objective aimed to assess the extent of TM Activities and Innovation Capabilities of Zambia universities. To this, *finding 2* discusses the limited institutional engagement with technology transfer and the lack of operational Third Mission activities, fulfilling the objective to assess TM activities.

The third objective was to identify legal, institutional, and cultural barriers to IP utilization and commercialization, and the *finding 3* specifically identified legal, institutional, and policy deficiencies as barriers to effective commercialization, matching the purpose to identify such barriers.

The fourth objective aimed to compare Zambia's technology transfer ecosystem with best-practice models in other countries, here *finding 2* reveals how different countries create technology transfer ecosystems by using a comprehensive comparative legal analysis of both developed and developing countries (e.g., South Africa, US, China, France, Costa Rica) to benchmark Zambia's ecosystem, directly addressing the comparative objective.

The study objectives were addressed through doctrinal analysis, documentary review, and comparative legal examination. The findings collectively support the development of a contextualised legal-business framework for Zambia that integrates harmonised commercialization legislation, institutional structures for commercialization, coordinated implementation systems, and stronger innovation governance mechanisms.

Table 2 provides the summary of the findings.

Objective	Finding addressed	Discussion
<i>Analysing the existing IP and innovation policies that influence university-based research commercialization in Zambia.</i>	Finding 1	The finding shows a fragmented nature of Zambia's IP policies and the absence of a harmonization framework to encourage commercialization, thereby addressing the purpose to assess existing regulations.
<i>Assessing the extent of the TM activities and innovation capabilities within Zambia universities.</i>	Finding 2	The finding discusses the limited institutional engagement with technology transfer and the lack of operational Third Mission activities, fulfilling the objective to assess TM activities
<i>Identifying legal, institutional and cultural barriers to IP utilisation and commercialization.</i>	Finding 3	The finding identified legal, institutional, and policy deficiencies as barriers to effective commercialization, matching the purpose to identify such barriers
<i>Comparing Zambia's technology transfer ecosystem with best-practice models in other countries.</i>	Finding 2	The finding shows how different countries create technology transfer ecosystems by using a comprehensive comparative legal analysis of both developed and developing countries (e.g., South Africa, US, China, France, Costa Rica) to benchmark Zambia's ecosystem, directly addressing the comparative objective.
<i>Developing a contextualised legal-business framework suited for Zambia Universities.</i>	Findings 1,2,3 and 4	The discussion and conclusion combine the findings into concrete proposals for a legal-business framework customised to Zambia,

The findings and discussion presented in this chapter have demonstrated the legal, institutional, and commercialization challenges affecting

technology transfer and intellectual property commercialization within Zambian universities. Building on these findings, Section 5 provides a summary of the study, highlights its theoretical, methodological, policy, and practical contributions, and presents recommendations aimed at strengthening commercialization governance and supporting Zambia's transition toward a knowledge-based economy.

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5 SUMMARY, CONTRIBUTIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter concludes the study, which examined the legal-business framework required to strengthen technology transfer and the commercialization of intellectual property (IP) in Zambian universities. The study was motivated by Zambia's broader aspiration to transition toward a knowledge-based economy under Vision 2030, and by the increasing recognition that universities play an important role in innovation, commercialization, and socio-economic development. The study examined how existing intellectual property laws, innovation policies, institutional systems, and commercialization structures influence university-based technology transfer in Zambia.

Following methodological refinement, the study adopted a qualitative-dominant socio-legal approach integrating doctrinal legal analysis, documentary review, comparative legal analysis, and limited illustrative survey evidence. The study focused on intellectual property governance, institutional commercialization capacity, Third Mission activities, and university–industry collaboration within Zambian universities.

The findings revealed that although Zambia has introduced several intellectual property and innovation policies, commercialization activities remain constrained by weak implementation systems, institutional disconnection, limited commercialization infrastructure, and inadequate coordination between universities, industry, and government institutions.

This chapter presents the study's conclusions, its theoretical, methodological, policy, and practical contributions, recommendations for policy and institutional reform, recommendations for future research, limitations of the study, and the conclusion.

5.2 Summary

This study examined the legal-business framework required to strengthen technology transfer and intellectual property commercialization in Zambian universities. As established in Chapter One, particularly Sections 1.2 and 1.4, the study was motivated by concerns regarding weak commercialization systems, low intellectual property utilization, and the absence of a coordinated framework capable of supporting university-based innovation and commercialization in Zambia.

The findings presented in Chapter Four demonstrated that Zambia's commercialization environment remains constrained by dispersed

intellectual property legislation, weak policy operationalization, limited commercialization infrastructure, and inadequate coordination between universities, industry, and government institutions. In Finding 1 of Chapter Four, the study established that Zambia's intellectual property framework operates through fragmented statutes that inadequately regulate university-generated research commercialization. This finding directly addressed Objective One outlined in Section 1.4, which sought to analyse the existing intellectual property and innovation policies influencing university commercialization in Zambia.

The study further established in Finding 2 that although Zambia has introduced innovation and intellectual property policies, many of these policies remain largely aspirational because they are not adequately supported by implementation systems or enforceable institutional obligations. This conclusion reflects the policy–implementation gap discussed earlier in Sections 2.2 and 2.4 of the literature review, where the study identified weak institutional coordination and implementation deficiencies as common barriers affecting commercialization systems within developing countries.

Regarding Objective Two, the findings in Chapter Four demonstrated that many universities possess limited institutional commercialization capacity. As discussed in Section 2.3 of the literature review, Third Mission activities and entrepreneurial university functions depend heavily on institutional adaptability, commercialization structures, and university–industry collaboration. However, finding 3 revealed that many universities in Zambia lack Technology Transfer Offices, commercialization professionals, and structured innovation systems necessary for effective commercialization management.

The study also identified several legal and institutional barriers affecting intellectual property utilization and commercialization, thereby addressing Objective Three. As discussed in Sections 2.4 and 4.1, these barriers include weak institutional implementation systems, limited commercialization expertise, inadequate industry engagement, and institutional inconsistencies across commercialization governance structures.

Objective Four sought to compare Zambia's technology transfer ecosystem with international best-practice models. The comparative analysis conducted throughout Sections 2.5 and 4.1 demonstrated that countries such as the United States, South Africa, France, and China have developed commercialization systems supported by coordinated legislation, institutional commercialization structures, and strong university–industry collaboration mechanisms. However, the study also

established that successful commercialization depends not only on legislation, but equally on implementation systems and institutional capacity.

Finally, Objective Five focused on developing a contextualized legal-business framework suited to Zambian universities. Drawing from the conceptual framework developed in Chapter One, the literature review in Chapter Two, the methodological approach in Chapter Three, and the findings in Chapter Four, the study concludes that Zambia requires a coordinated commercialization framework integrating intellectual property governance, institutional commercialization systems, implementation mechanisms, commercialization funding, and university–industry collaboration.

Overall, the study concludes that Zambia’s primary commercialization challenge lies less in the absence of intellectual property laws and more in weak institutional implementation systems and inadequate commercialization coordination. The study therefore provides a basis for strengthening commercialization governance through a contextualized legal-business framework aligned to Zambia’s institutional realities and development priorities.

5.3 Contributions of the Study

5.3.1 Theoretical Contribution

This study contributes to the growing body of literature on intellectual property commercialization, university technology transfer, and innovation governance within developing countries. As discussed in Sections 2.1, 2.3, and 2.5 of Chapter Two, much of the existing literature on technology transfer and commercialization originates from developed countries, particularly the United States and Europe. This study contributes to the literature by examining commercialization challenges within the Zambian context through a socio-legal perspective.

The study further contributes theoretically by integrating the Triple Helix Theory, Third Mission Theory, Dynamic Capabilities Theory, and National Innovation Systems approach into a unified analytical framework for understanding commercialization governance within developing economies. As reflected in the conceptual framework developed in Chapter One and the synthesis sections in Chapter Two, the study demonstrates that commercialization effectiveness depends not only on intellectual property protection, but also on institutional commercialization

capacity, implementation systems, commercialization culture, and coordinated university–industry collaboration.

The findings presented in Chapter Four further contribute to existing literature by demonstrating that commercialization challenges within developing countries are primarily institutional and implementation-oriented rather than purely legislative. This contribution is particularly reflected in Findings 1, 2, and 3, where the study identified the relationship between fragmented governance systems, weak commercialization structures, and limited institutional capacity.

5.3.2 Methodological Contribution

This study contributes methodologically by demonstrating the usefulness of qualitative socio-legal research in examining technology transfer and intellectual property commercialization within developing countries. As discussed in Chapter Three, particularly Sections 3.1 and 3.3, the study adopted a qualitative-dominant socio-legal approach combining doctrinal analysis, documentary review, comparative legal analysis, and illustrative survey evidence.

Unlike purely doctrinal legal studies that focus only on legal texts, this study examined how intellectual property laws and commercialization policies operate within institutional and governance contexts. The methodological integration of legal analysis and institutional inquiry enabled the study to identify implementation gaps between policy ambition and commercialization practice.

The study also demonstrates the value of comparative legal analysis in identifying transferable commercialization lessons from jurisdictions such as the United States, South Africa, France, and China, while recognizing the importance of contextual adaptation to Zambia's institutional and economic realities.

5.3.3 Policy Contribution

The study makes an important policy contribution by identifying the gap between Zambia's intellectual property and innovation policy ambitions and the institutional systems required to operationalize commercialization activities. As discussed in Section 1.2 of Chapter One and Findings 1 and 2 in Chapter Four, Zambia possesses several intellectual property and innovation policies but lacks coordinated implementation systems capable of supporting university commercialization.

The study further contributes to policy discussions by proposing a contextualized legal-business framework integrating commercialization governance, institutional commercialization systems, implementation mechanisms, and university–industry collaboration. This framework emerged from the comparative and analytical discussions presented in Sections 2.5 and 4.1.

In addition, the study contributes to ongoing policy debates regarding the role of universities within Zambia’s national innovation system and the country’s transition toward a knowledge-based economy under Vision 2030.

5.3.4 Practical Contribution

Practically, the study contributes by proposing institutional mechanisms capable of strengthening commercialization performance within Zambian universities. As discussed in Finding 3 of Chapter Four, many universities currently lack institutional commercialization structures such as Technology Transfer Offices and commercialization support systems.

The study therefore proposes the phased development of institutional commercialization mechanisms including Technology Transfer Offices, University Innovation Offices, commercialization training systems, and a National Technology Transfer Hub. These proposals are grounded in the comparative lessons discussed in Section 2.5 and the institutional implementation gaps identified in Chapter Four.

The study also contributes practically by highlighting the importance of commercialization awareness, commercialization expertise, implementation coordination, and industry engagement in strengthening university-based technology transfer systems.



Figure 1. Graphical description of the study's proposed Legal-business framework from the findings of this study.

5.4 Recommendations and Justifications for Policy and Practice

The recommendations presented below are based on the findings, literature review, and comparative analysis conducted in the study.

5.4.1 Recommendation 1: Develop a Coordinated University Research Commercialization Framework

Justification

The study found that Zambia's intellectual property and commercialization systems remain dispersed across multiple statutes and institutional mandates. Existing laws governing patents, copyrights, trademarks, company formation, and public finance do not adequately regulate university-generated intellectual property or commercialization activities. This institutional inconsistency creates uncertainty regarding ownership, licensing, commercialization responsibilities, and benefit-sharing systems.

The study therefore recommends the development of a coordinated university research commercialization framework capable of harmonizing commercialization governance, institutional responsibilities, and implementation procedures. This may be achieved either through a dedicated Research Commercialization Act or through coordinated amendments to existing intellectual property and innovation legislation.

5.4.2 Recommendation 2: Support the Phased Establishment of Technology Transfer Offices in Research-Intensive Universities

Justification

The findings demonstrated that many Zambian universities lack institutional commercialization structures and professional commercialization personnel. The absence of Technology Transfer Offices weakens universities' ability to manage intellectual property, negotiate licenses, support patent applications, and engage effectively with industry.

The study therefore recommends the phased establishment of Technology Transfer Offices in research-intensive public universities supported by commercialization professionals, legal officers, licensing specialists, and innovation support personnel. Given institutional and financial limitations, smaller institutions may initially rely on shared commercialization support systems coordinated through a National Technology Transfer Hub.

5.4.3 Recommendation 3: Strengthen University–Industry Collaboration Mechanisms

Justification

The study found that weak collaboration between universities and industry continues to limit commercialization and technology transfer activities in Zambia. Many universities operate with limited engagement with private sector actors, reducing opportunities for collaborative research, licensing, commercialization partnerships, and practical utilization of research outputs.

The study therefore recommends the development of formal university–industry collaboration mechanisms supported through joint research programs, commercialization partnerships, innovation hubs, and industry engagement platforms. These mechanisms may function as coordinated spaces where universities, industry actors, and government agencies collaborate on research commercialization, prototype development, licensing activities, and market-oriented innovation projects.

Strengthening collaboration between universities, government, and industry may improve commercialization performance and support broader innovation ecosystem development.

5.4.4 Recommendation 4: Develop Commercialization Funding and Innovation Support Systems

Justification

The findings demonstrated that commercialization activities remain constrained by limited funding, weak commercialization infrastructure, and inadequate innovation support systems. Commercialization processes such as patent filing, prototype development, licensing, and spin-off formation often require financial and institutional support that many universities currently lack.

The study therefore recommends the establishment of commercialization and innovation support funds to support patent protection, prototype development, start-up incubation, and market-oriented research activities. Given budgetary constraints, these funding systems may be developed through public–private partnerships involving government institutions, universities, development partners, and private sector stakeholders.

The study further recommends the development of university innovation hubs and commercialization incubators to support entrepreneurial and commercialization activities within universities.

5.4.5 Recommendation 5: Strengthen Commercialization Awareness and Capacity Building

Justification

The study found that limited awareness and commercialization expertise continue to affect technology transfer activities within universities. Many researchers possess a limited understanding of intellectual property management, licensing systems, commercialization procedures, and industry engagement.

The study therefore recommends the introduction of regular commercialization training programs covering intellectual property management, licensing, entrepreneurship, commercialization governance, and university–industry engagement. Such training may be coordinated through collaboration between universities, the Ministry of Higher Education, PACRA, ARIPO, and relevant innovation support institutions.

Strengthening commercialization awareness and professional expertise may improve institutional commercialization performance and encourage greater participation in technology transfer activities.

5.5 Recommendations for Future Research

This study focused primarily on the legal and institutional dimensions of university technology transfer and intellectual property commercialization within Zambia. Future research may therefore expand the scope of analysis in several important areas.

First, future studies may adopt broader empirical approaches involving larger respondent samples across multiple universities and innovation institutions. Such studies may provide deeper empirical insight into commercialization practices, institutional experiences, and stakeholder perceptions regarding technology transfer systems.

Second, future research may examine commercialization systems within specific sectors such as agriculture, mining, biotechnology, health innovation, or digital technologies. Sector-specific studies may provide deeper understanding of how commercialization challenges differ across innovation sectors.

Third, future studies may undertake comparative regional analysis examining technology transfer systems across Southern African countries. Such studies may provide broader insight into regional commercialization governance, institutional coordination, and policy implementation systems.

Finally, longitudinal studies examining the implementation of commercialization reforms over time may provide deeper understanding of how institutional commercialization systems evolve within emerging innovation environments.

5.6 Limitations of the Study

Although the study provides important insight into technology transfer and intellectual property commercialization within Zambian universities, several limitations should be acknowledged.

First, the study relied primarily on doctrinal analysis, documentary review, comparative legal analysis, and limited illustrative survey evidence. The low survey response rate limited the empirical scope of the study and restricted broader statistical generalization.

Second, the study focused primarily on selected universities and institutional policy frameworks within Zambia. Consequently, the findings may not fully capture commercialization experiences across all higher education institutions or innovation sectors within the country.

Third, the study adopted a qualitative exploratory socio-legal approach. While this approach provided important contextual and institutional insight, it does not establish causal relationships between commercialization variables.

Fourth, access to commercialization information was limited by institutional confidentiality, weak record-keeping systems, and the limited public availability of commercialization data and university policy documents.

Despite these limitations, the study provides valuable socio-legal and institutional insight into the commercialization challenges affecting Zambian universities and offers a contextualized legal-business framework for strengthening university technology transfer systems.

5.7 Conclusion

This study examined the legal-business framework required to strengthen technology transfer and intellectual property commercialization in Zambian universities. The findings demonstrated that although Zambia possesses significant policy potential for supporting innovation and commercialization, commercialization systems remain constrained by weak institutional implementation, limited commercialization infrastructure, and inadequate coordination between legal frameworks and commercialization practice.

The study further demonstrated that successful commercialization systems require more than intellectual property legislation alone. Effective technology transfer depends on coordinated interaction between commercialization governance, institutional support structures, commercialization expertise, funding systems, and university–industry collaboration mechanisms.

Accordingly, the study proposed a contextualized legal-business framework aimed at strengthening commercialization governance, institutional coordination, innovation capacity, and university commercialization systems within Zambia. In this regard, the study provides a basis for future policy discussion and institutional reform regarding the role of universities within Zambia’s national innovation system and the country’s broader transition toward a knowledge-based economy.

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I. APPENDICES

Appendix A: Table 1. Table for Variable Justification

Question number	Question	Literature review part	Reference	Answers research objective
LTU 1	I understand key provisions of the IP policy (ownership, revenue sharing, disclosure procedures).	Page 2 under Problem Statement	Precious Sampa and Sazib Hossain (2024).	1
LTU 2	I understand the term “Third Mission” (universities’ engagement beyond teaching and research e.g., industry collaboration, commercialization, community engagement).	Page 2 under introduction	Sirine Haj Taieb, (2024)	1
LTU 3	My university clearly communicates its policies on research commercialisation and technology transfer.	Page 6 under literature review	Malonga Hazemba and Anthony Halog, (2021)	2
LTU 4	My university’s IP policies are easy to understand and apply.	Page 6 under literature review	Malonga Hazemba and Anthony Halog, (2021)	2
IPTT 1	Have you ever disclosed an invention or creative work to the university?	Page 6 under literature review	Malonga Hazemba and Anthony Halog, (2021)	
IPTT 3	Time taken from disclosure to decision was reasonable	Page 14 under literature review	Angélica Pigola and others, (2022), Sandrine Kergroach, Dirk Meissner and Nicholas S	2

			Vonortas, (2018)	
IPTT 4	Administrative/legal processes delayed commercialization.	Page 14 under literature review	Angélica Pigola and others, (2022), Sandrine Kergroach, Dirk Meissner and Nicholas S Vonortas, (2018)	2
IPTT 5	My university provides adequate support (TTO, legal, business) for commercialising research	Page 14 under literature review	Angélica Pigola and others (2022) Sandrine Kergroach, Dirk Meissner and Nicholas S Vonortas, (2018)	3
	Weak enforcement of IP rights nationally	Page 13 under literature review	James Nebus, Kah-Hin Chai and Annapoornima M Subramanian, (2021)	3
	Limited incentives for researchers to commercialise IP	Page 7 under Literature review	Giustina Secundo and others (2017)	3
PB 1	Weak enforcement of IP rights nationally	Page 6 under literature Review	Kunkuta, J. M. C. C. (2011)	3
PB 2	Unclear or inconsistent IP laws	Page 6 under literature Review	Kunkuta, J. M. C. C. (2011)	3

PB 3	Insufficient internal capacities (TTO staff, legal expertise, business skills)	Page 12 under literature review	Kunkuta, J. M. C. C. (2011)	3
PB 4	Lengthy administrative approval processes		Kunkuta, J. M. C. C. (2011)	3
PB 5	Lack of institutional support structures		Kunkuta, J. M. C. C. (2011)	3
TMDC 1	My university actively encourages staff and students to engage in entrepreneurial and Third Mission activities. (1–5)	Page 8 under literature review	Gabriel René Moreno and others, (2025)	5
TMDC 2	The university adapts its structures and strategies in response to new innovation and commercialisation opportunities	Page 11 under literature review	Audrey Stolze, Klaus Sailer and Audrey Stolzesc De, (2022)	5
TMDC 3	The university actively identifies commercial opportunities from research.	Page 11 under literature review	Audrey Stolze, Klaus Sailer and Audrey Stolzesc De, (2022)	5
TMDC 3	There are structured support systems (funding, mentorship) for commercialization.	Page 11 under literature review	Audrey Stolze, Klaus Sailer and Audrey Stolzesc De, (2022)	5
TMDC 3	The university updates its policies based on commercialization experience.	Page 11 under literature review	Audrey Stolze, Klaus Sailer and Audrey Stolzesc De, (2022)	5

Appendix B: Questionnaire used for data collection

MAQSUT NARIKBAYEV UNIVERSITY

School of Law

Department of International Law

Dear Participant,

My name is **Sundano Emmanuel Sundano**, and I am a **Master's student at Maqsut Narikbayev University in Kazakhstan**. I am currently conducting a research study entitled:

"A Legal-Business Framework for Technology Transfer and IP Commercialization in Zambian Universities for Sustainable Economic Growth."

As part of this study, I am collecting data from academic staff, research and innovation administrators, postgraduate students, Technology Transfer Office (TTO) and research office staff, university legal officers, senior researchers involved in commercialization, as well as selected policymakers and intellectual property officials.

I would be sincerely grateful if you could kindly take a few moments from your busy schedule to complete this questionnaire. The information you provide will be used strictly for academic purposes only.

Please be assured that all responses will be treated with the utmost confidentiality. Your participation in this study is entirely voluntary, and by choosing to participate, you are giving consent for your responses to be used for the purposes of this research. You are free to decline participation or withdraw from the study at any time without any penalty or negative consequence.

Please note that there is no monetary compensation for participation in this study.

Thank you very much for your time, support, and valuable contribution to this research.

For Questions or Further Information

Should you have any questions or require any clarification regarding this study, please feel free to contact the researcher:

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Alternative Email: sundano.sundanoemmanuel@gmail.com

Section A: Demographic Details

1. Role at the university:
2. Faculty/discipline:
3. Number of years in your current role
☐ 0–2 years ☐ 3–5 years ☐ 6–10 years ☐ 11+ years
4. Type of institution: ☐ Public ☐ Private ☐ Research-intensive
5. Level of involvement in commercialization: ☐ None ☐ Occasional ☐ Active
6. Participation in IP decision-making: ☐ Yes ☐ No

Section B: Literacy to Usability (LTU)

Please Tick (✓) in the box depending on the extent to which you agree with the following statements using percentage levels on a scale between 1 to 5 where,

1 = Strongly Disagree

2 = Disagree

3 = Neutral

4 = Agree

5 = Strongly Agree

1 2 3

4 5

LTU 1	I understand key provisions of the IP policy (ownership, revenue sharing, disclosure procedures).					
LTU 2	I understand the term “Third Mission” (universities’ engagement beyond teaching and research e.g., industry collaboration, commercialization, community engagement).					
LTU 3	My university clearly communicates its policies on research commercialisation and technology transfer.					
LTU 4	My university’s IP policies are easy to understand and apply.					

Section C: Use of IP and TT policies (IPTT)

IPTT 1: Have you ever disclosed an invention or creative work to the university?

Yes ☐ No ☐

IPTT 2: If yes, what was the outcome?”

☐ Patent filed ☐ Licensed ☐ Not progressed ☐ Still in process

Please Tick (✓) in the box depending on the extent to which you agree with the following

statements using percentage levels on a scale between 1 to 5 where,

- 1 = Strongly Disagree
- 2 = Disagree
- 3 = Neutral
- 4 = Agree
- 5 = Strongly Agree

1 2

3	4	5					
IPTT 3	Time taken from disclosure to decision was reasonable						
IPTT 4	Administrative/legal processes delayed commercialization.						
IPTT 5	My university provides adequate support (TTO, legal, business) for commercialising research.						

IPTT 6. Have you participated in any of the following (tick all that apply):

- ☐ Patent application
- ☐ Licensing agreement
- ☐ Start-up/spin-off creation
- ☐ Industry collaboration

Section D: Effectiveness of IP and Innovation Policies (EIP)

Please Tick (✓) in the box depending on the extent to which you agree with the following statements using percentage levels on a scale between 1 to 5 where,

- 1 = Strongly Disagree
- 2 = Disagree
- 3 = Neutral
- 4 = Agree
- 5 = Strongly Agree

1 2 3 4

5							
EIP 1	The ownership of IP is clearly defined in my institution.						
EIP 2	Revenue-sharing arrangements are fair and transparent.						
EIP 3	Policies support collaboration with industry.						
EIP 4	Legal procedures for IP protection are effective.						
EIP 5	Institutional policies encourage commercialization of research						

Section E: Perceived barriers ()

Please Tick (✓) in the box depending on the extent to which you agree with the following statements using percentage levels on a scale between 1 to 5 where,

- 1 = Strongly Disagree
- 2 = Disagree
- 3 = Neutral
- 4 = Agree

5 = Strongly Agree

1 2 3 4

5

	Legal Barriers					
PB 1	Weak enforcement of IP rights nationally					
PB 2	Unclear or inconsistent IP laws					
	Institutional Barriers					
PB 3	Insufficient internal capacities (TTO staff, legal expertise, business skills)					
PB 4	Lengthy administrative approval processes					
PB 5	Lack of institutional support structures					
	Cultural Barriers					
PB 6	Limited incentives (financial or career) for researchers to commercialise IP					
PB 7	Low awareness or interest in commercialization					
PB 8	Fear of IP misuse or theft					
	Market Barriers					
PB 9	Limited collaboration between universities and industry					
PB 10	Limited industry demand for research outputs					
PB 11	Lack of funding for commercialization (e.g., prototyping, proof-of-concept)					
PB 12	Low industry demand for university research					

Section F: Third Mission and dynamic capabilities

Please Tick (✓) in the box depending on the extent to which you agree with the following statements using percentage levels on a scale between 1 to 5 where,

1 = Strongly Disagree

2 = Disagree

3 = Neutral

4 = Agree

5 = Strongly Agree

1 2 3

4 5

TMDC 1	My university actively encourages staff and students to engage in entrepreneurial and Third Mission activities.					
TMDC 2	The university adapts its structures (e.g., creation of TTOs, incubators) and strategies in response to new innovation and commercialisation opportunities.					
TMDC 3	The university actively identifies commercial opportunities from research.					
TMDC 4	There are structured support systems (funding, mentorship) for commercialization.					

TMDC 5	The university updates its policies based on commercialization experience.					
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Section G: Open-ended

OE 1. What single change (law, policy, or institutional practice) would most improve technology transfer and IP commercialisation in your university?

Ans:

OE 2. Please describe a specific experience with IP commercialization, highlighting challenges and outcomes

Ans:

OE 3. What legal reforms would most improve IP commercialization in Zambia?

Ans:

OE 4. What institutional model (e.g., centralized TTO, independent entity) would work best?

Ans:

OE 5. Are there practices from other countries Zambia should adopt?

Ans:

OE 6. Are you familiar with how other countries manage university IP commercialisation?

☐ Yes ☐ No

(If Yes) Please specify countries or systems you are familiar with.

Ans:

Thank you for your time and valuable contribution to this research.