

UNIID Africa

**LINKING UNIVERSITIES AND MARGINALISED COMMUNITIES:
UGANDAN CASE STUDIES OF INNOVATION FOCUSED ON LIVELIHOOD
IMPROVEMENTS IN INFORMAL SETTINGS**

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Introducing the UNIID Africa Project

With the economic crises, contestation about the role of universities in industrial and other innovation processes has shifted. The emphasis in the past has tended to be on whether and how universities should support economic development and growth through industrial innovation processes, and what research, new knowledge and technology can contribute, particularly in relation to high-technology formal sectors. Much research centred on how to enhance technology transfer, establish effective incubation facilities, support patents and licencing, or other forms of profitable commercialisation of intellectual property.

Such a discourse tends to obscure a more inclusive and developmental form of engagement and interaction that could contribute to innovation and economic development. In countries that belong to the Organisation for Economic Co-operation and Development (OECD), the recent economic crisis has shifted debate from innovation for global competitiveness, to consider how to mobilise shrinking resources to best address growing inequality, poverty and unemployment. In emerging economies, there are growing claims that science, technology and innovation-led growth can in fact result in higher levels of poverty and inequality *within* a country.

Thus, while in the recent past the link between innovation and growth was indivisible, recently a new debate has emerged, centred on the connection between innovation and social inclusion. By inclusive development, we mean

...development that reduces poverty, enables all groups to create opportunities, share the benefits of development and participate in decision-making (<http://www.undp.org>, n.d.).

Indeed, in transitional and developing contexts like those in southern Africa, for many years, universities were challenged to establish a new social compact where they became key agents for inclusive social and economic development. Greater emphasis is accorded to the roles the knowledge work of university academics play in poverty reduction and the ability of all social groups to create opportunities, share the benefits of development and participate in decision-making.

New study on innovation in southern Africa

Such an emphasis drives the focus of the present study, *Universities and Innovation for Inclusive Development (UNIID) Africa*, funded by the International Development Research Centre (IDRC). It seeks to build a stronger African empirical research base in collaboration with partners in four

Southern African Development Community (SADC) countries - Botswana, Malawi, South Africa, and Tanzania - as well as Nigeria and Uganda. The UNIID-Africa project seeks to address the limited attention paid to how universities contribute to innovation for inclusive development, specifically, to innovation activities that provide livelihoods to the excluded and disadvantaged.

The project aims to make a conceptual and methodological contribution to research on innovation, development and higher education. It challenges the focus of innovation studies - typically on science and technology, radical innovation, and economic development in formal sectors - and extends the remit to encompass innovation that is incremental, takes doing, using, and-interacting modes, and is based in informal settings. In turn, the tendency of development studies to focus on top-down development is challenged in favour of inclusive development that focuses on participation by the marginalised as active agents to ensure sustainable benefits.

Linking knowledge generation and the public good with innovation

Similarly, the innovation studies literature is often marked by a conceptual myopia towards the substantive knowledge-generation role of universities and their contribution to the public good. A corresponding myopia exists within the higher education literature, which has insufficient accounts of the role of universities in innovation, technology transfer and diffusion toward economic development. The project seeks to overcome this impasse by linking the knowledge imperatives of universities in relation to the public good and social justice, with those of innovation and technology transfer.

Based on such ambitious conceptual integration, the research aims to conduct empirical research in African universities, in order to make innovation that may be taking place visible; to make the nature of university-community interactions explicit; and to highlight the university as an actor in the innovation system engaging the community. In terms of higher education governance, it addresses issues of accountability to social needs, and promoting scholarship that is more socially and economically responsive to (local) contexts. In terms of the implications for higher education management, the issue is how to create a stronger coherence between research, teaching and community engagement. Finally, the research aims to identify what kinds of incentives will be appropriate as drivers and to address bottlenecks.

Methods and mapping

An interlocking set of research and policy oriented activities commenced in October 2012, founded on a survey methodology to map forms of university interaction with the full range of possible social partners in each country – whether firms, farmers, communities, government, or social organisations. Such a process will provide an overview of the main kinds of partners, the main types of relationships, channels of interaction, the outcomes and benefits of interaction and the main barriers and blockages, across distinct types of institution in each higher education system. The analysis will draw on interviews with senior university management and academics, as well as analysis of institutional documents to understand the governance and management conditions within universities that support diverse patterns of interaction.

The mapping will provide a rich descriptive foundation of existing interactive practice within the universities in a national system of innovation, an empirically contextualised baseline for investigating specific cases of innovation for inclusive development.

We plan a set of comparative case studies in which universities and communities interact to innovate in informal settings to enhance livelihoods. For example, adaptations and diffusion of cell phone technology to inform small scale farmers' harvest and marketing practices; or women market stallholders' cooperative practices; or exploiting local knowledge of local conditions in collaboration with university knowledge to establish commercially viable enterprises.

Comparing case studies within and across country contexts will provide an evidence base of the facilitators of and constraints on innovative and interactive practice in sectors critical to the informal livelihoods of marginalised communities. Such analysis allows for policies to be informed by insights from the local level and by the priorities of the poor.

Together, the mapping of university practice and the in-depth exploration of innovation in informal settings will allow us to interrogate critically the policy options and interventions typically proposed in the innovation systems literature. The research ultimately aims to inform better targeted policy adaptation and formulation in universities, and amongst the higher education, science and technology, and economic development communities in each country, towards inclusive development.

This report explores the role Ugandan universities play in interacting with informal communities to innovate for inclusive development. More particularly, the report details the work of three

universities—Makerere University, Gulu University, and Mbarara University of Science and Technology—to support community livelihoods in three different, informal community settings in the country.

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The approach employed is theoretically informed by research in the field of writing studies that conceptualizes writing as a social activity, heavily entwined with the research process, and a key tool used to construct knowledge. The project is indebted to *Informed Research* for their innovative approach to research writing coaching, and to supporting interdisciplinary researchers in the global South as they begin to build a field of research investigating issues related to innovation for inclusive development.

Acronyms

CBME – Community Based Medical Education
DCS – Department of Computer Science
DPD – Department of Planning and Development at Makerere University
GDP – gross domestic product
GU – Gulu University
IDRC - International Development Research Centre
ICTs – Information and Communications Technologies
ITFC – Institute of Tropical Forest Conservation
IUCEA – Inter University Council for East Africa
MAK – Makerere University
MRU – Multiple Resource Use
MTCS - Medium Term Competitiveness Strategy
MUST – Mbarara University of Science and Technology
MUZ – Multiple Use Zone
NDP – National Development Plan
NGO – Non-governmental Organisation
NSI – National System of Innovation
OECD - Organisation for Economic Co-operation and Development
PEAP - Poverty Eradication Action Plan
SADC – Southern African Development Community
SSA - sub-Saharan Africa
SETIs – Science, Technology and Engineering Institutions
STEM - Science, Technology, Engineering and Mathematics
STI – Science Technology and Innovation
THPs – Traditional Health Practitioners
UNCST – Uganda National Council for Science and Technology
UNIID - Universities and Innovation for Inclusive Development
UOBDU - United Organisation for Batwa Development in Uganda
UFA – Uganda Forestry Authority
UWA – Uganda Wildlife Authority
VSLA – Village Savings and Loan Association
WAI – Weighted Average Index

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Introducing the UNIID Uganda Project

The aim of this ‘Universities and Innovation for Inclusive Development’ (UNIID) report is to present findings from a three year research study in Uganda. The study examined the ways that academics at three Ugandan universities interact with community actors in marginalised, informal communities in Uganda around innovations in order to bring about inclusive development. We not only examined how universities and communities interact, we also considered how governmental and university policies shape such interactions between universities and communities. Following Cozzens and Sutz’s (2012) assertion that universities can play a significant role in innovation for inclusive development, our overarching aim was to better understand the role universities can play in bringing about inclusive development.

Our research explores the role three Ugandan public universities play in the national innovation system and in bringing about inclusive development locally. We explore how government and university structures shape such interactions, and how particular interactions support both the livelihoods of people who are traditionally marginalised and the local environment. To clarify the role of universities in Uganda’s national innovation system, our research seeks to address the following questions that focus on innovation in the national context as well as in the country’s higher education context:

- (a) How does innovation tend to be conceptualised in the Ugandan government’s policies and initiatives?
- (b) How does the higher education system tend to be nested in the country’s national system of innovation?
- (c) How are Ugandan public universities organised and structured to interact with external social partners, specifically marginalised communities?
- (d) How do academics in distinct fields at Ugandan public universities interact *in practice* with external social partners for the specific benefit of marginalised communities?
- (e) What are the emerging instances of university-external social partner interactions to promote innovation for inclusive development that can be identified in these institutions – and how do these serve as exemplars to inform what is possible?

Based on these research questions, the study seeks to address the two following overarching research questions:

- (1) How do we encourage universities and their academics to extend their scholarship to the benefit of marginalised social partners, in research and teaching networks focused on innovation for inclusive development?
- (2) What facilitates and/or constrains interactions between universities and marginalised communities that promote innovation to enable livelihoods in informal settings and support inclusive development?

To answer these questions, we started by tracing how innovation is conceptualised in Uganda, particularly in its government policies and higher education context; moved to examining patterns of interaction in Ugandan universities; and then examined three particular instances of university-community interactions in three different informal, marginalised communities in Uganda. Our study moved from examining the national, to the higher education context, to the particular, local communities. That said, it is important to note that the higher education system and the local communities are, of course, nested within Uganda's national system of innovation.

Studying the role Ugandan universities play in the national system of innovation could have taken many different directions. We could have looked at their work with other universities, with NGOs, with government agencies, or with private sector industries. Instead, we narrowed our attention to the work between universities and informal, marginalised communities. This was a deliberate choice. And just as firms increasingly rely on knowledge producers in universities, public research institutes, and other intermediary organisations, so too, is there a growing sense that the livelihood activities of marginalised communities could benefit from knowledge intensification. As a part of the study, we wanted to understand how university actors were interacting locally, and how those local interactions could bring about innovations for inclusive development.

The case study design centred on identifying existing cases of academics' interaction with marginalised communities around innovations to enhance the livelihoods of these communities. These instances of interaction were selected from three public universities in the country's national system of innovation. It is important to highlight, these cases of interaction are not common in Ugandan universities. In fact, interactions between universities and informal communities are quite rare. Extensive research was required to find suitable cases for empirical study.

While we hope to contribute to understandings about innovation, our focus here is first and foremost on the interactions themselves. Our goal is not to simply delineate types of innovations or

to count the number of innovations taking place between these two groups. Instead, we will look more broadly at interactions, recognising that the interactions themselves—regardless of whether or not they bring about particular innovations—are crucial to inclusive development. As we will see, the nature of the interactions, and the ways that they worked to integrate indigenous and technical knowledges, played a key role in the interactions studied and in contributing more broadly to inclusive development locally. In turn, the present report provides an account of how academics in public universities in Uganda interact with external actors not only to bring about innovations but also to generate knowledge to help solve social problems of the marginalised communities as well as problems between these communities and government actors.

It is also important to note, that—although the purpose of this study is to examine how academics at three selected public universities in Uganda are interacting with external social actors in general and informal marginalised communities more particularly— we are not seeking to evaluate these academics’ nor the interactions’ performance. Rather, we are focused on these institutions to ascertain how they interact with external social partners to support innovation in informal settings.

Structure of the report

This chapter has introduced this project’s overarching aim. We have made explicit our research questions, and our intention to examine university-community interactions and the ways that they bring about innovations while contributing to inclusive development. Chapter 1 presents our analytical framework, introducing current scholarship on innovation for inclusive development and defining our key terms. Chapter 2 makes explicit our methodology. In this chapter, we present our research design, showing how we moved from examining national structures, to the examining the higher education context, to analysing three university-community interactions. We also explain the different research methods we employed.

Chapters 3 through 9 are devoted to our analysis. Chapter 3 gives an overview of Uganda’s national system of innovation. We attend to Uganda’s national and higher education policies and structures with a view of uncovering how those policies and structures conceptualise innovation. Our analysis of Uganda’s national system of innovation highlighted how innovation has traditionally been conceptualised as involving the work of organisations engaging inter-institutionally to bring about high-level, national changes. Chapters 4 through 6 examine how the policies and structures at three different public universities in Uganda shape interactions between university actors and community actors. Chapter 4 highlights patterns of interaction at Makerere University (MAK). Chapter 5

highlights patterns of interaction at Gulu University (GU). Chapter 6 details patterns of interaction at Mbarara University of Science and Technology University (MUST).

After tracing the national context (Chapter 3), and the higher education context (Chapter 4 through 6), we analyse university-community interactions involving three universities working in three different, informal communities in Uganda. Chapter 7 analyses interactions between MAK University academics and Buyijja Traditional Health Practitioners (THPs). The research-based interactions centre on supporting the THPs in finding alternative, sustainable ways to support their livelihoods, and, in turn, support the health needs of the community. Chapter 8 focuses on interactions between Gulu University academics and youth in the post-conflict context of rural, northern Uganda. The teaching-based interactions centre on providing information and communication technologies (ICT) training to youth in order to support their livelihoods, and, in turn, support other community member in accessing and using computers. Chapter 9 analyses interactions between MUST University academics and the Batwa community forest dwellers. The research-based interactions centre on supporting the Batwa community in improving their sustainable practices and supporting their livelihoods while also lessening the impact their livelihoods have on the environment.

Each of the aforementioned cases (Chapters 6 through 9) introduces the case, traces the nature of the interaction (as it unfolded over time), and then analyses key concepts. We provide an in-depth analysis of the following:

- Overview of the interaction (e.g., social actors involved, relations between actors, sequence of events, community livelihood problem the interaction sought to address);
- Structure of the interaction;
- Organisational arrangement and interface structures of the interaction (e.g., policies, supports, funding);
- Drivers of interaction (e.g., motivations);
- Type(s) of innovation emerging from the interaction (e.g., market, organisational, process, product, social);
- Knowledge and skills transferred through the interaction;
- Community's participation in the interaction;
- Outcomes and benefits of the interaction to the respective actors; and
- Enabling and constraining factors impacting the interaction.

Following the analysis (Chapters 3 through 9), Chapter 10 synthesises key findings related to the abovementioned analytical concepts across the three case studies. From there, Chapter 11 explicitly responds to the research questions, and offers implications for communities, universities, and government agencies to support innovation for inclusive development. Chapter 11 also considers how the study's findings speak to scholarship in the field of innovation for inclusive development.

Chapter 1. Innovation for Inclusive Development

This chapter introduces our analytical framework. We trace current scholarship in the field of innovation for inclusive development while making explicit our understanding of key concepts. We also make explicit our analytical focus on interactions between university academics and marginalised community members in informal settings.

Recent scholarship

Knowledge and innovation are critical drivers of economic development and social progress in modern economies (Lundvall, 1992, 1995). Economic and social progress are determined by how knowledge resources are harnessed to bring about innovations (Malerba & Nelson, 2012). While there has been much scholarship in the field of innovation for inclusive development, little attention has been given to the ways universities interact in the informal sector. Recent studies have focused on the role educational institutions play in the national system of innovation. For example, Kruss, Visser, Aphane, and Haupt (2012), conducted a comparative analysis of university practices, examining the ways universities interact with firms in three African countries. Further, other studies have also highlighted the need for universities to make their teaching, research, and community engagement activities more relevant to local communities (see, for example, Kruss, 2005; Kruss, Visser, Aphane & Haupt., 2012; Zaglul, Sherrard & Juma, 2006). Recently, scholars have also explored university-industry linkages, highlighting a disjuncture between the ways universities and industries perceive one another (Etzkowitz & Zhou, 2008; Kruss, Visser, Aphane & Haupt., 2012). Again, few studies have traced interactions between universities and marginalised, informal communities. Our research seeks to address this need. Given that the informal sector economy is a primary way that people support their livelihoods in Uganda, we focus our attention on development for inclusiveness in informal communities. We will consider how teaching, research, and community engagement efforts can benefit marginalised communities (Cozzens & Sutz, 2012; Kruss, 2012). Quite broadly, we will examine the nature of interactions between external social partners and academics based at three selected public universities in Uganda; their implications for the country's National System of Innovation; and the potential role Ugandan universities can play in inclusive development. The research presented in this report contributes to emerging literature on what is loosely termed social innovation (Cassiolato, Lastres & Stallivieri, 2008) or grassroots innovation (Gupta, 2003), a part of the broad field of innovation studies.

At large, our study is motivated to understand the relationship between innovation and inclusive development. In its general usage, the term ‘innovation and inclusive development’ has a broad scope. The term ‘inclusive innovation’ (Foster & Heeks, 2013), ‘social innovation’, ‘innovation for inclusive growth’ (George, McGahan & Prabhu, 2012), and a host of others are used variously by a range of international development organisations such as the World Bank and UNDP. Key research groups have emerged in countries ranging from India, Brazil and Argentina, the UK, and South Africa, as well as across country networks such as Group for Research on Innovation for Inclusive Development (GRIID). Debate centres on the comparative value of a wide range of concepts and approaches such as ‘below the radar’ (Chataway, Hanlin, Mugwagwa & Muraguri, 2009), ‘bottom of the pyramid’ (Prahalad, 2006; Peerally & Figuieredo, 2013), ‘social technologies’ (Muller, 2010), ‘grassroots innovation’ (Gupta, 2003; Letty, Shezi & Mudhara, 2012), ‘agricultural innovation’, ‘technology development for the poor’ (Hall, Clark & Frost, 2010a; Hall, Clark & Frost, 2010b), and so on. The conceptual differences between these terms can be vast. For example, ‘below the radar’ and ‘bottom of the pyramid’ innovation approaches focus primarily on the innovation strategies of private sector formal firms in relation to low-income groups as potential markets. While there is some confusion about the use of different terms associated with innovation for or among the poor, there are growing attempts to clarify understandings (see, for example, Fressoli, Smith & Thomas, 2012; Gordon, Horn & Sleiman, 2012; Iizuka, 2013). Our study also aims to contribute to these efforts by clarifying how innovation for inclusive development is brought about in Uganda.

An emergent trend in the appropriation of the innovation systems literature in developing country contexts is “to redirect, part of science, technology and innovation policies from private firms to the civil society, focusing on the poor” (Fressoli, Smith, & Thomas, 2012, p. 3). While we acknowledge that, at times, techno-economic growth and equality can operate in tension not in tandem (Cassiolato, Lastres & Maciel, 2003; Dalum, Johnson & Lundvall, 2010; Fajnzylber, 1989; Nelson, 1977; Pisani, 1984), we are motivated to better understand how development can be inclusive and best support marginalised communities.

Analytical framework

This section presents our analytical framework, defining key concepts: (1) National System of Innovation; (2) innovation; (3) interaction; and (4) inclusive development.

National System of Innovation (NSI). The main elements of the National System for Innovation (NSI) framework include: internal organisation of firms, inter-firm relationships, the public sector, institutional set-up of the financial sector, and research and development intensity and organisation (Lundvall, 1992). While the framework did not initially include education, Adeoti (2002) included ‘education and training’ as an element of the NSI when analysing the role of NSI in building technological capability in developing countries. Similarly, we include education and training in our understanding of NSI. For Berdegue (2005), “a pro-poor innovation system could be defined as a multi-stakeholder social learning process, that generates and puts to use the new knowledge and which expands the capabilities and opportunities of the poor” (p. 15).

Innovation systems in the informal economy have different characteristics to formal sector innovation system. Kramer-Mbula and Wamae (2010) identify five themes that are relevant in this context but currently under-researched. Firstly, innovation in response to shifting demands, including the demands of low income consumers, input factors, operating conditions, and the formal sector. The informal sector is dynamic and adaptive – and this entails innovation. Secondly, skills development in the informal sector usually without the benefit of formal institutions, does take place, and it is critical for innovation outcomes. Thirdly, the role of the informal sector in global value chains, both formal and informal is significant for scale and sustainability. Fourth, the role of intermediary organisations is well researched in the formal sector but not in the informal sector. Finally, the relationship between innovation in the informal sector and its social and policy context is under-researched. There is some extant research in this area (e.g., Daniels, 2010; Muller, 2010; Mytelka & Farinelli, 2000); however, this consists mostly of isolated case studies and a critical mass and comparative analysis remain elusive.

Innovation. In this study, innovation is defined in line with the innovation studies literature as the development of new products, processes, and organisational structures into an economy or society. The level of novelty can be ‘new to the world’, or it can be ‘new to the country’, or ‘new to the firm’. In the instance of this research project, innovation is largely ‘new to the community’ or ‘new to the informal livelihood setting’ in which it is being implemented. Wherever there is technological or organisational upgrading, there is innovation to some extent. The innovation studies approach commonly uses the ‘National System of Innovation’ (NSI) as a framework within which to situate innovation. Definitions of the NSI include:

- “The network of institutions in the public and private sectors whose activities and interactions initiate, import, modify and diffuse new technologies” (Freeman, 1995).

- “The elements and relationships, which interact in the production, diffusion and use of new, and economically useful, knowledge ... and are either located within or rooted inside the borders of a nation state” (Lundvall, 1992).
- “A set of institutions whose interactions determine the innovative performance ... of national firms” (Nelson, 1993).

We are particularly interested in social innovations. In our study of innovation in the informal sector, ‘social innovation’ is particularly evident. Innovations are primarily aimed at improving lives and livelihood, rather than making a profit for a firm (Dagnino, 2010; Fressoli, Smith & Thomas, 2011; Cassiolato, Soares & Lastres, 2008).

Interaction. We draw from recent understandings of interaction for this study in that we view interaction as “largely contextual and historically specific” (to borrow from Muller’s [2010] definition of engagement, p. 85). Interaction can take different forms, and can be motivated by different factors. For example, Kruss (2012) posits that the drivers of interaction can be primarily financial, with the aim of mobilising resources for the institution or industry, or primarily intellectual, with the aim of improving knowledge resources of the institution or industry. As illustrated in Figure 1.1 below, interactions can also include:

- Traditional forms of partnership comprising of sponsorships and donations by industry to universities;
- Entrepreneurial forms of partnership with a focus on commercialisation of research results/outputs;
- Service forms of partnership comprising of consultancies and contractual engagements between universities and industry; and
- Network forms of partnership involving multi-stakeholder relationships and collaborations with economic and/or social incentives for agents’ participation in networks (Kruss, 2012).

While all of the aforementioned forms of interaction play a role in bringing about innovation, Kruss (2012) and Cozzens and Sutz (2012) position network forms as crucial in supporting marginalised communities. In this study, interaction is complex; it was hard to identify “a neat list of forms of interaction per institution” (Kruss, Visser, Aphane & Haupt., 2012, p. 187).

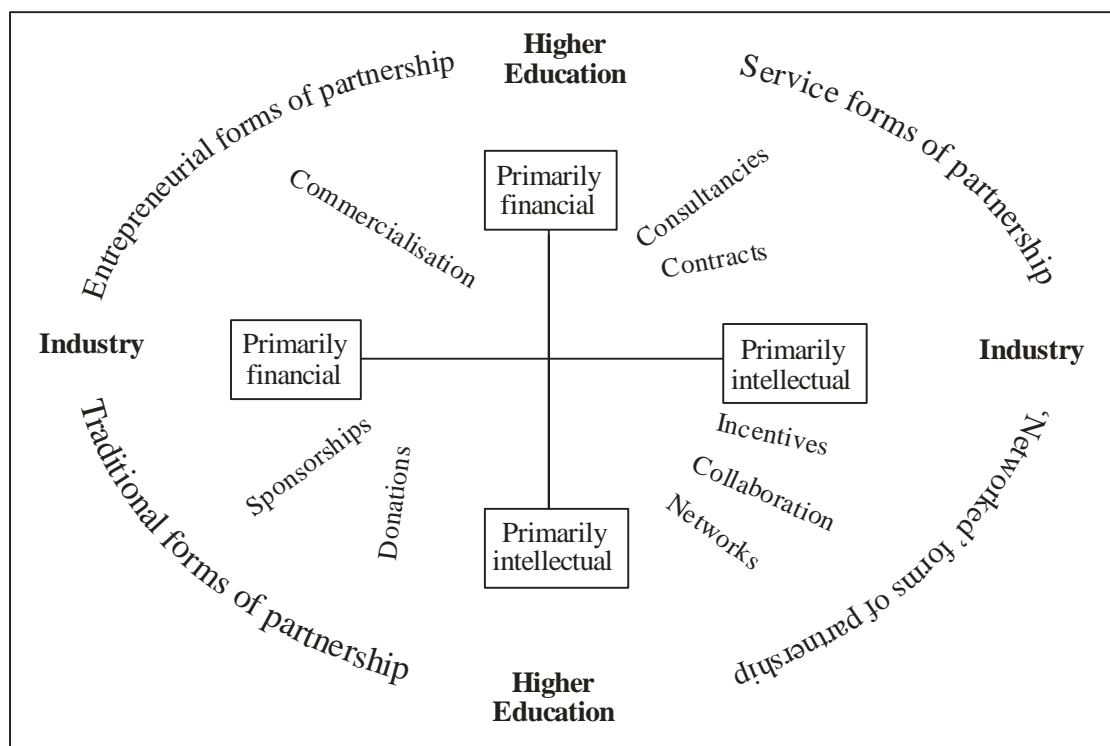


Figure 1.1. *Types of interactions* (Kruss, 2012).

Inclusive development. Our study also draws on current understandings of inclusive development. According to Cozzens and Sutz (2012) inclusive development encompasses actions that are both by and for marginalised groups, which include communities and individuals excluded from circles of social and economic power (p. 2). By inclusive development, we mean:

...development that reduces poverty, enables all groups to create opportunities, share the benefits of development and participate in decision - making (UNDP, n.d.).

We also have a sense of what development is not. In this study, development is not “economic growth alone and economic development alone” (Cozzens & Sutz, 2012, p. 8), nor is it equated with catching up. Ideally, inclusive development involves marginalised groups in all stages of the collaborative project, including problem identification, idea generation, proposal evaluation, design, fabrication, evaluation and solution to the problems (Gomez-Marquez, 2010). Thus, marginalised individuals should be active agents in all interactions, and not simply the beneficiaries of the actions of the experts from the universities.

Analytical focus

Our study focuses on the ways university actors interact with marginalised groups. Our focus on university actors and marginalised groups is deliberate. Employing Cozzens and Sutz’s (2012)

conceptual framework, we turn our attention to academic interactions involving informal or marginalised communities (see Figure 1.2 below).

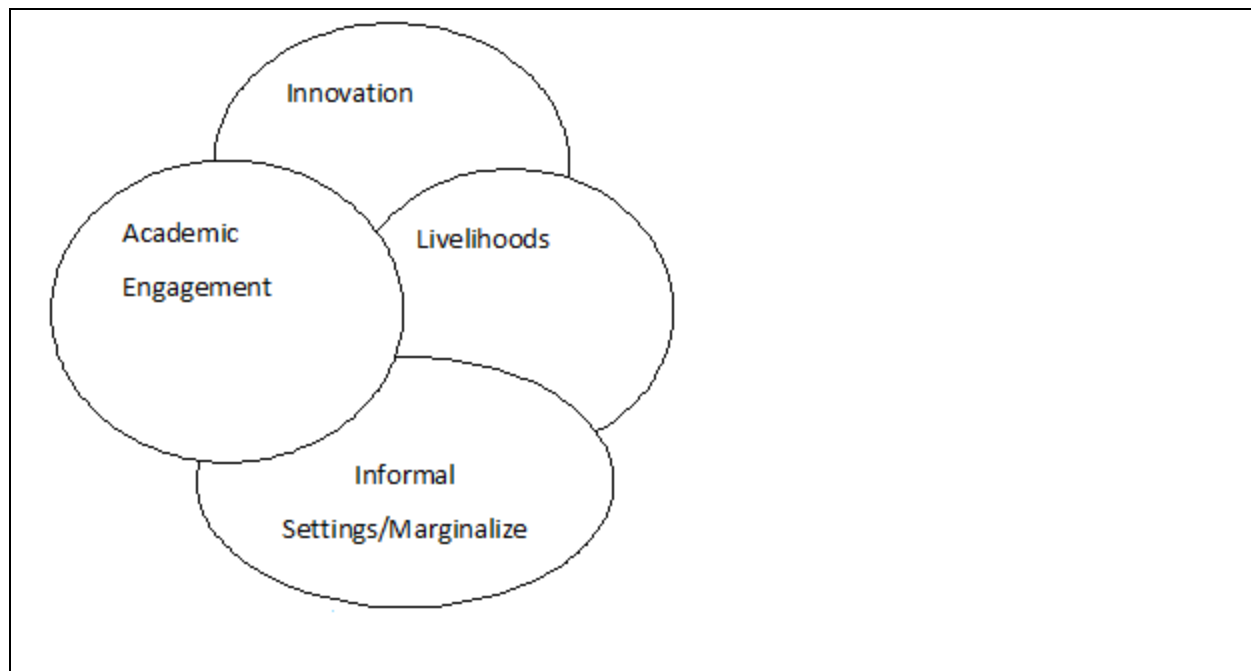


Figure 1.2. *UNIID Analytical focus.*

Within this context, we draw from Hall, Mytelka & Oyeyinka (2005, p. 20), who identify a set of research objectives relevant to understanding innovation systems at any scale:

- Assessing the extent of institutional interactions;
- Assessing the impediments to flows of knowledge between nodes;
- Assessing the opportunities for and constraints to interactive learning and institutional innovation;
- Assessing policy and practices that can give rise to failure of the component parts working as a system.

Accordingly, we proceed from the assumption that within the NSI approach, the key to understanding the nature and direction of innovation activity lies in understanding the actors in the system and the relationship between these actors, mapping and evaluating channels for knowledge flows. Important actors typically include firms, universities, and government research agencies, but, in the case of the UNIID research study, our focus is on innovation for inclusive development. This means we will substantially broaden this actor set to include those in the informal sector, such as small-scale farmers or community co-operatives, as well as other actors such as non-governmental organisations (NGOs), community groups, local government, and indigenous knowledge producers.

Significant aspects of relationships include the flow of skills, intellectual property (including indigenous knowledge), knowledge, technology, and funding, as well as structures of power and regulations. Innovation studies measures and analyses the characteristics of the actors, the nature of their relationships, and drivers of innovation (skills, knowledge, funding, regulation, markets, networks, and so on) as dynamic and evolutionary processes.

Our focus in this study is on “innovation for and by marginalised groups in informal settings” (Cozzens & Sutz, p. 2). In the African context, understanding university involvement in innovations in informal setting is particularly significant, given the size of the informal sector. Marginalised groups are prevalent in informal settings although the two concepts should be distinguished. Marginalised groups refer to people who experience various livelihood challenges, and who are excluded from access to economic, political, technological, intellectual, and/or natural resources. Informal settings refer to a set of places where people live, namely, marginalised households and communities as well as a set of places where they work, namely, the ‘informal economy’ (Cozzens & Sutz, 2012, p. 5). The informal economy is defined as those economic activities that fall outside government regulations, including both the informal sectors and informal employment in the formal sector. The formal and informal economic spheres are a continuum and include inter-related activities (de Soto, 1989). Marginalised communities and households can earn a living in both spheres. This definition, as set out by Kraemer-Mbula and Wamae (2010) excludes the informal criminal economy from the analysis. The informal economy is the important area of analysis for development studies as it is growing both in rich and poor countries (Portes, Castells & Benton, 1989). For example, in the developing country context, the informal sector provides between 50 and 75 percent of employment (Chen, 2004), and around 18 percent in developed countries (Schneider, 2002). Understanding the dynamics of innovation in this context thus takes on additional significance.

Chapter 2. Research Methodology

This chapter provides an overview of the research methodology and methods used for this study. As mentioned in chapter 1, the empirical study was undertaken at three public universities in Uganda. As will be further discussed in the next chapter, these institutions were purposively selected based on their historical development, as well as for reasons of convenience. Specifically, this chapter discusses the study's two overarching research activities, the data collection tools employed for each activity, as well as the data analysis methods that we used to analyse the collected data.

Research objective and design

The broad goal of the UNIID Africa research project is to consider how to deepen and extend the universities' role in collaborative and participatory innovation networks that include a range of social partners, including communities, local government, social movements, households, farmers, firms (large and small, formal and informal). This broad goal is to be achieved through two main research activities: *research activity I*, which seeks to map the interactions of university academics with a broad spectrum of external social actors; and *research activity II*, which seeks to analyse three selected case of interaction between university actors and socially marginalised communities to innovatively address the communities' livelihoods issues.

Research activity I was undertaken to provide a larger understanding of the ways in which this study's three public universities and their academics are interacting and encouraged to interact with external social partners. In particular, we sought to analyse the mission/purpose of the universities, in terms of their strategic interests, the types of interactions that their academics engage in with external social actors, the main channels of interactions used by the academics, as well as the outputs, outcomes and benefits emerging from the interactions. Research activity I also explored the academics' main drivers to engage in interactions with external social actors as well as constraints to developing these types of interactions.

Research activity II emerged from the mapping exercise undertaken in activity I. From gaining a better understanding of the ways in which university academics at three public universities in Uganda were interacting with external social partners, we sought to conduct an in-depth analysis of three specific cases of interaction. These cases would provide in-depth description and analysis of only one very specific type of engagement – an interaction between university academics and

members of informal, marginalised communities attempting to innovative to address the communities' particular livelihoods issue(s). We were interested in the characteristics of such interactions in order to understand how such interactions can be encouraged, strengthened, and extended in the future. These case studies targeted interactions between universities and marginalised communities that use innovation to enable livelihood in the informal settings and support inclusive development. The type of interactions explored in activity II could take the form of action research, diffusion of technologies, engaged research that involves local communities, collaboration with the non-profit organisations that serve the communities, or engagements between individual scholars and local communities.

The envisaged theoretical contribution of this study is to use the case studies to describe these activities, and, with this knowledge, begin to develop an analytical framework that can account for the effects of university interventions and community activities and the conditions under which we may promote innovation for inclusive development. A key dimension of this analysis is the role of university as an intermediary knowledge partner within networks of knowledge producers and users located within the localised system of innovation. The emphasis is on the role of the university as an enabler—in the context of each case study as an enabler of a specific innovation that has benefited the livelihoods in the communities in which they operate. The key research question is thus:

What are the emerging instances of university-external social partner interactions to promote innovation for inclusive development that can be identified in these institutions – and how do these serve as exemplars to inform what is possible?

The analytical focus is on identifying the conditions under which interaction promotes innovation for inclusive development or not.

The unit of analysis is thus the *interaction* between university and community. Our analytical framework focuses on illuminating different dimensions of the interaction, drawing on the working definitions adopted from the work of Cozzens and Sutz (2012).

The main research design used in this study is mixed methods as we used a combination of both quantitative survey data, as well as qualitative open-ended and semi-structured interviews and document analyses. A more detailed description of the data collection approach followed in each of the research activities is presented in the following sections.

Activity I: Data collection and analytical approach

We used three main data collection tools to collect data for this study's activity I. After seeking permission and approval for the study to be undertaken at the three selected public universities in Uganda, the initial stage of the research involved engaging in semi-structured interviews with top university officials to better understand the concepts of interaction and engagement at these institutions. To complement the data collected through interviews, and in order to provide a more detailed assessment of the university policies and systems, institutional documents were also collected and analysed. Finally, we also engaged in structured interviews using questionnaires with academics at these three universities. These individuals were purposively selected from departments and academic units that were identified to be engaging in academic work that involved interactions with external social actors. The sections below describe these methods in greater detail.

Semi-structured interviews with senior university officials

The first data collection tool used during activity I of this study was semi-structured interviews with each institution's senior university officials. After securing permission through each university's Office of the Vice Chancellor to undertake research at the three institutions, initial contact was made with members of each university's senior administration, as well as leaders in each institution's academic and administrative units in order to schedule and conduct interviews. Table 2.1 below provides a detailed overview of the university officials that participated in these interviews.

Table: 2.1. *University Officials Interviewed*

Makerere University	Gulu University	Mbarara University S & T
<ul style="list-style-type: none"> ▪ Deputy Vice Chancellor (Academic); ▪ Principal, College of Humanities and Social Sciences; ▪ Principal, College of Health Sciences; ▪ Principal, College of Agricultural and Environment Sciences; ▪ Principal, College of Engineering, Design, Art and Technology; ▪ Principal, College of Natural Sciences; ▪ Principal, College of Veterinary Medicine, Animal Resources and Biosecurity; ▪ Principal, College of Education and External Studies; ▪ Principal, College of Computing and Information Sciences; ▪ Deputy Director, Research and Graduate Training in Charge of Innovations; ▪ Director, Planning and Development; ▪ Director, Quality Assurance; ▪ Director, Gender Mainstreaming Division; 	<ul style="list-style-type: none"> ▪ Vice Chancellor; ▪ Dean, Faculty of Science; ▪ Dean, Faculty of Medicine; ▪ Dean, Faculty of Agricultural and Environmental Studies; ▪ Dean, Faculty of Education and Humanities; ▪ Dean, Faculty of Business and Development Studies; ▪ Director, Institute for Peace and Strategic Studies; ▪ Director ,Institute of Graduate Studies and Research; ▪ Director, Planning and Development; ▪ Head, Department of Computer Science. 	<ul style="list-style-type: none"> ▪ Deputy Vice Chancellor; ▪ University Secretary; ▪ Administrator in charge of Planning; ▪ Dean, Faculty of Medicine; ▪ Dean, Faculty of Science; ▪ Dean, Faculty of Development Studies; ▪ Director, Institute of Computer Science; ▪ Director, Institute of Tropical Forest Conservation (ITFC) Bwindi; ▪ Head, Department of Community Health; ▪ Head, Department of Pharmacology; ▪ Coordinator, Community Based Medical Education Unit.

-
- Deputy Academic Registrar
in charge of Senate;
 - Dean, School of Public
Health;
 - Dean, School of Animal
Resources and Bio Safety;
-

Each interview lasted approximately 45-60 minutes and was audio-recorded. The semi-structured interviews questions focused on the ways in which university academics were or were not engaging in interactions with external social partners, as well as institutional policies and strategies currently in place to facilitate as well as constrain such engagements. A detailed overview of the interview questions used during these sessions can be found in Appendix A of this report.

In terms of participants, Table 2.1 above illustrates that key members of each institution's university administration participated in these interviews such as, deputy vice chancellors, principals of colleges, deans of schools and faculties, heads of departments, and leaders of select administrative units. At Makerere University, 16 senior members of management were interviewed. At Gulu University, 10 senior members of management were interviewed. And at Mbarara University of Science and Technology, 11 senior members of management were interviewed¹.

Institutional document analysis

During the interviews, university officials continuously referred to key institutional documents, such as university policies related to research, teaching, and engagement that were significant to our research focus. Following these sessions, we collected these documents for purposes of further analysis. Table 2.2 below provides an overview of the key institutional documents that were collected and analysed from the three institutions.

From these semi-structured interviews and analysis of institutional documents, we sought to answer two of our research questions introduced in this report's introductory chapter:

- (a) How are public universities in Uganda organised and structured to interact with external social partners, specifically marginalised communities?

¹ It is important to note that we needed to interview a wide variety of senior administrators from the three universities because none of the institutions have policies to direct the universities' research agenda or standalone research units that are headed by a director or manager; therefore, questions about research and engagement had to be asked to members of various faculties, colleges, and departments.

- (b) How do academics in distinct fields at Ugandan universities interact *in practice* with external social partners for the specific benefit of marginalised communities?

Table: 2.2. *Institutional Documents Identified and Analysed*

Makerere University	Gulu University	Mbarara University of S & T
<ul style="list-style-type: none"> ▪ Strategic plan ▪ Research policy ▪ University Almanac 	<ul style="list-style-type: none"> ▪ Strategic plan 	<ul style="list-style-type: none"> ▪ Strategic plan

Structured interviews with Universities’ academics

In addition to the semi-structured interviews conducted with members of the three institutions’ senior management and document analyses, we also conducted more structured interviews using questionnaires with academics in these institutions’ individual departments and units. From these structured interviews, we sought to learn about the ways these academics were or were not engaging in interaction with external social partners. An example of the questionnaire used these structured interviews can be found in Appendix B of this report. At each of the three universities, we were assisted in purposively selecting individual academic staff members to participate in our study by the heads of relevant academic departments. These individuals were selected because they were considered to be actively engaged in research and professional activities that demonstrated some degree of interaction with external social partners. At Makerere University, a total of 55 academics were initially contacted to participate in this phase of the data collection process, with 31 academics agreeing to participate. At Gulu University, 45 academics were approached to take part in the study, with 30 of these individuals participating. And finally, at Mbarara University of Science and Technology, 30 out of the 50 academics initially contacted participated in this component of the data collection process. At each institution, academics completed these questionnaires with the assistance of a member of the study’s project team. Table 3.3 below provides an overview of the number of academics that participated from the institutions’ various academic units.

Table 2.3. *Academic units of participating academics*

Makerere University	Gulu University	Mbarara University of S & T
Engineering (4)	Natural Science (9)	Human Medicine (9)

Natural Science (4)	Agricultural Sciences (3)	Management Studies (3)
Agricultural Sciences (8)	Human Medicine (10)	Social and Development Studies (5)
Computer Science (5)	Computer Science (4)	Environment and Natural Sciences (7)
Forestry (3)	Social Science (4)	Computer Science (6)
Veterinary Medicine (4)		
Human Medicine (3)		

As illustrated in Table 2.3, most of the academics sampled were based in disciplines within the natural and applied sciences, with only a few participants coming from the disciplines of the social sciences, economics, and management studies. This focus on academics in the natural and applied sciences came from senior administrators' recommendations as, during interviews with these senior officials, they tended to identify academic units where members were engaging in research and teaching activities linked to external social partners.

Data analysis

As outlined below, data from research activity I was analysed based on the distinct data collection method used to gather the data.

- (a) Semi-structured interviews with university senior management: As described earlier in this chapter, each interview with a member of the university's senior administrator was audio-recorded and transcribed verbatim. Interview data was analysed to identify key institutional documents related to engagement with external social actors as well as key members of the university community who are engaging with external social actors for teaching or research purposes.
- (b) Collection and analysis of key institutional documents: Key institutional documents related to engagement that were identified during interviews with members of the three universities' senior management team were collected and analysed. We looked for information about university policies and structures that currently facilitate or constrain university academics' engagement with external social partners.
- (c) Statistical analysis of the structured interview data using the Statistical Package for Social Scientists: We also used descriptive statistics with a focus on measures of central tendency and Weighted Average Index (WAI) to assess the degree of importance of respondents' perceptions that were captured on a Likert scale type scale. The Likert scale used for the study ranges from 1 to 4 where 1 is "no interaction at all"; 2 is "isolated instances of interaction"; 3 is "interaction on a moderate scale; and 4 is "interaction on a wide scale".

In the computation of WAI, 4 is assigned to the highest level of perception on the Likert scale while 1 is assigned to the lowest level. Accordingly, if for a particular factor, all respondents claim the highest degree of importance (i.e. “interaction on a wide scale”), then the WAI would be 4.0, while the same would be 1.0, if all respondents claim the lowest degree of importance (i.e. “no interaction at all”). This approach was previously used by Adeoti and Odekunle (2010) as well as by Kruss (2012) in their studies of university interactions with firms and other external actors in Nigeria and South Africa respectively.

The WAI is expressed as:

$$WAI = \frac{\sum_{i=1}^4 F_i W_i}{N}$$

where

F_i is the frequency of response;

W_i is the weight or number assigned to the response on the likert scale; and

N is the total number of responses.

Activity II: Case studies of university-community interactions

Guided by findings from activity I, the mapping component of this investigation, we then sought to purposively select three case studies that could be used for this second stage of the data collection process. We used findings from this preliminary stage of data collect, to identify three cases of university academics (at our three public universities) interacting to help members of marginalised, informal communities innovate in order to address the communities’ identified livelihoods issues. In attempting to gather a list of possible cases of interaction, we quickly discovered how difficult it was to find instances of interactions that could meet our selection criteria (see list below). Although we relied on a variety of methods to find possible cases for this component of the investigation, such as discussions with, and recommendations from, university administrators and heads of academic units, recommendations from our institutions’ community engagement offices, as well as findings from our analyses of institutional documents, it was findings from our initial interviews with members of each institutions’ senior management team that proved to be the best method to identify cases for further analysis. Not only did this earlier stage in this research process help us find cases for the case study component of this investigation, it also helped us establish relationships with academics involved in these interactions and set the groundwork for further fieldwork.

It is important to highlight that our challenges to find instances of academics interacting with informal, marginalised communities to support innovations for inclusive development in the

Ugandan context led us to reflect on reasons why such difficulties might be the case. From these reflections, we realized that perhaps one of the main reasons academics at these three public universities do not commonly engage in this type of interaction is because they perceive the outcomes of such interactions to not be of academic value. This became even more apparent as we realized that it was much more common to find instances of university academics being involved in interactions that support their teaching and research activities around some type of ‘quality of life’ interaction in marginalised communities, such as issues related to public health or food security rather than an innovation to assist marginalised, informal communities.

Throughout the process of selecting three cases of interaction for this stage of the research study, we evaluated individual instances of interaction against the study’s selection criteria, which is outlined below. The first step in the evaluation process was to assess whether each instance of university-community interaction was centred on an innovation that was helping the community address a particular livelihoods issue. Questions used to evaluate cases for this component of the interaction are as follows:

- Are new products, processes, organisational structures developed through the interaction?
- Are skills developed in support of this technical or organisational novelty?
- Are there links between the case study project and other actors in the innovation system?

In addition, each interaction needed to be between university actors and members of an informal, marginalized community and be working to improve this community’s livelihood. Yet, despite the communities’ informality and marginality, we were not necessarily interested in innovations that were focused on the public good, frugal innovations, nor bottom of the pyramid innovations. In addition, both the process and the outcomes of interaction needed to be inclusive of the voices and needs of marginalised groups. Questions used to evaluate this aspect of the interaction are as follows:

- Can these communities be characterised as marginalised?
- Does the interaction contribute towards improved livelihood of the community members?
- Do the local communities participate in the identification of the problem which the interaction is seeking to solve?
- Do the local communities provide input into the possible solution?
- Do local communities participate in the process, including proposal evaluation, setting the terms of engagement, monitoring and evaluation?

- Do local communities contribute their knowledge in a collaborative process of knowledge production?
- Is the case study set in the informal economy or within the informal employment in the formal economy?
- Does the case study include the participation of marginalised household and communities located in informal settings?

Despite the difficulties that arose in finding three suitable cases of interaction that satisfied all of these criterion, we eventually were able to select three cases of interactions that, to some degree, met all of these criterion. Yet, it is important to note that some of these cases better satisfied some of these criteria than others – an issue that will be further discussed in the report’s concluding chapters.

Case study design and field work

Once the cases of university-informal community interactions were identified, we relied on the following research methods to collect data: (1) collection and analysis of key documents related to each interaction; and (2) semi-structured interviews with actors involved in the interactions.

Collection and analysis of key documents

Prior to beginning the interview component of the case studies, we first conducted more extensive background research to ensure our interviews were as effective as possible in collecting data to best understand the interactions. This was particularly important given this study’s exploratory nature and its attempt to venture into new empirical and theoretical territory by focusing on a type of interaction that was new to the interdisciplinary field of innovation for inclusive development. Some of the background documents collected and analysed during this phase of the data collection process, particularly to inform the development of interview questions, were the following:

- UNIID Africa Research Project Activity 1 Uganda Study Report, which provided an examination of the social engagement activities in three public universities in Uganda: Makerere University (MAK), Gulu University (GU) and Mbarara University of Science and Technology (MUST). This report provided general information about each university partner as well as more focused information about its institutional structures and policies regarding community engagement;
- Government policies related to key issues each interaction sought to address;
- Literature searches for any background information and previous research related to the interactions;

- Background information about partners involved in each interaction such as the community and any other known partners. In contexts where local actors and activities did not have a significant online presence, meetings and telephone conversations were used to gather background information.

Semi-structured interviews and site visits

Once we established a strong understanding of the three interactions, as well as developed well-informed interview questions, we began the interview component of our data collection process. Interview participants were purposively selected to participate based on their involvement in the three interactions. We relied on a snowballing method to find other individuals we should interview during this phase of data collection. This means, during an interview, we asked each interviewee to recommend and potentially introduce us to other individuals who they felt were important in the interaction. We also relied on each interaction's core academic to function as a key informant, helping the study team members schedule site visits as well as interviews with other academics, students, community leaders, community participants, and other partners involved in each interaction. In addition to each interaction's key academic being helpful in acting as a liaison person and connecting us with the community members, community leaders also played strategic roles, helping us network with community members.

We conducted our interviews with community leaders and community participants 'on site', at the location where the activities of the interaction were being implemented at the community level. Our interviews with academics involved in the interactions were conducted at the academic's respective institutions. Site visits allowed us to observe the location and activities taking place in the community and we used these observations to triangulate the information we collection from the interviews and document analyses. We also gathered important contextual information by conducting site visits, for example, from these visits we were able to learn about housing (formal or informal) issues, local economic activities, levels of development in the community, the condition of the natural environment, the level of poverty and marginalisation, and so on.

Interviews were semi-structured and relied on an interview guide that was first constructed by this study's lead research team in South Africa. We then adapted this interview guide based on the documents collected and analysed in relation to each of the three interactions. In particular, each interview protocol was customised for the different members of each interaction. For example, protocols were prepared for interviews with academics, community leaders, community participants, and other social partners respectively. Appendices provide examples of each of these protocols (*Refer*

to appendices CI, CII, CIII and CIV for details). We followed ethics guidelines established by the Human Sciences Research Council’s Research Ethics Committee. This means, prior to participating in an interview, each participant was informed of the study’s purpose, asked to sign an informed consent form, and all steps were taken to ensure an interviewee’s identity remained confidential. Each formal interview was digitally recorded in an audio format and later transcribed into a text format.

Although the interviews were intended to be semi-structured, they often took a narrative approach, meaning that the interviewee typically explained the story or history of the interaction and other information tended to flow from this discussion. Considering the complexity of each case study in light of the UNIID conceptual framework, a narrative approach was seen as the best way to capture all of the required information in a way that made sense to both the interviewer and interviewee. Thus, in each interview, the interviewee told the story of engagement, from its origin to its current state. Along the way, the conceptually informed questions were used as entry points to systematise the underlying story of the case study.

Table 2. 4 below provides a detailed overview of the different members of each interaction that participated in the interviews. A minimum requirement for each interaction was that both the interaction’s central academic, as well as the leader of the social partner’s organisation participate in an interview.

Table: 2.4. *List of interview participants*

University	Social Partner	Interviewees
Makerere University (Central Uganda)	Traditional herbalists	Academics from the Department of Botany Leader of the community Leader of the traditional healers Leader of an NGO
Gulu University (Northern Uganda)	Youth groups	Academics from the Department of Computer Science (DCS) Community Leader Youth who benefited from

	ICT skill development program
	A manager in an NGO
Mbarara University of The Batwa and Bakiga Science and Technology community members (MUST) (Western Uganda)	Academics/researchers from The Institute of Tropical Forest Conservation (ITFC) A Community Ranger from the Uganda Wildlife Authority (UWA) Community leaders Community participants

Data analysis

After collecting data for the case studies, concepts from the literature on innovation for inclusive development (as introduced in Chapter 1 and discussed below) were used in the analysis. In returning to our study's main research question, which was introduced earlier in this chapter - What facilitates and/or constrains interactions between universities and marginalised communities in Uganda that promote innovation to enable livelihoods in informal settings and support inclusive development? – our main goal in the analysis process was to understand what aspects of each interaction were enabling and constraining interactions between these two groups. More particularly, we wanted to understand how patterns of interaction between universities and external social actors are shaped by institutional (national and university) frameworks (e.g., structures, supports, policies). As will be illustrated in chapters 7, 8, 9, and 10 of this report, the following analytical concepts were used to analyse data collection from each of the case studies:

- Overview of the interaction (e.g., social actors involved, relations between actors, sequence of events, community livelihood problem the interaction sought to address);
- Structure of the interaction;
- Organisational arrangement and interface structures of the interaction (e.g., policies, supports, funding);
- Drivers of interaction (e.g., motivations of each group to participate in the interaction);
- Innovation types (e.g., market, organisational, process, product, social);
- Knowledge and skills transferred through the interaction;
- Community's level of participation in the interaction;
- Outcomes and benefits from the interaction for each group;
- Enabling and constraining factors impacting the interaction.

The next chapter presents a detailed account of the initial UNIID research exercise undertaken to analyse the nature and role of universities in the national system of innovation in Uganda. As will be illustrated in this chapter, this component of the study allowed us to identify and gain an informed understanding of the ways in which innovation has tended to be conceptualized in the context of Uganda, particularly through government policies and structures, as well as the ways in which Uganda's institutes of higher education have tended to be encouraged to engage and actually engaged in activities related to innovation. In addition, this component of the study also helped us select the three universities that would serve as our study sites for the mapping and case study components of this investigation.

Chapter 3. Uganda's National System of Innovation

The purpose of this chapter is to explore the concept of innovation in Uganda in general and the country's higher education context more specifically in order to better understand how innovation has typically been understood and supported by policies and other structures in these particular settings. For our purposes, an innovation system is characterised as:

a network of firms and other economic agents who, together with the institutions and policies that influence their innovative behaviour and performance, bring new products, new processes and new forms of organisation into economic use. (United Nations, 2010, p. 16)

This understanding calls attention—not to stand-alone institutions—but to interactions between actors that are embedded in particular institutional and policy contexts. Further, this understanding calls attention to the particular actors, processes and outcomes. This characterisation of innovation informed our analysis in part. The aim of this chapter is to highlight how the boundaries of what counts as innovation is conceptualised in Uganda. This chapter responds to the following questions:

How does innovation tend to be conceptualised in the Ugandan government's policies and initiatives?

How does the higher education system tend to be nested in the country's national system of innovation?

As will be illustrated in this chapter, the Ugandan government's key development and innovation policies and initiatives tend to enact a particular view of innovation, one that positions organisations as actors/agents, institutional and inter-institutional processes as key processes, and technical, economic, and national developments as key outcomes. Put another way, this chapter will demonstrate how innovation in Uganda has a distinctly formal institutional character that involves the work of formal institutional/organisational actors, who participate in formal institutional and inter-institutional processes, to bringing about formal large-scale, national changes. This chapter will also highlight how universities are key actors in the national system of innovation. As we will explore, universities in Uganda are viewed as critical to innovation and development efforts across sectors as they not only educate the future workforce, they are also in key positions to perform research while also furthering advancement and innovation.

Uganda - national context

In order to understand Uganda's National System of Innovation (NSI), it is first necessary to understand the specifics of its past and present political and economic context. Since gaining independence from Britain in October of 1962, Uganda has had a rich political history. Uganda has moved to using a democratically elected government (as of 1996) and to using a multi-party political system (as of 2006). While there have been many political initiatives, there have also been struggles. The hostile political climate in the 1970s and 1980s led to the mismanagements and drastic decline in the performance of the economy. These political challenges have also contributed to various difficulties, including, the corruption and misappropriation of public funds, poor infrastructure, and weak private and public sectors.

To address the weakness of the private and public sectors, because of these political struggles, the government sought to introduce various economic initiatives. As a part of this economic development plan, the government has focused on social infrastructure and on industrial development. Since the 1980s, the government has supported liberalisation and pro-market policies. For example, the government introduced the the Structural Adjustment Programme in the early 1980s, and the Economic Recovery Programme in 1987. The government has also worked to adopt public sector management practices while also making efforts, particularly throughout the 1990s and 2000s, to revitalise the economy through macroeconomic management and structural reform programmes. For example, the government used the Poverty Eradication Action Plan (PEAP) from 1997 to 2008, the Medium Term Competiveness Strategy (MTCS) for private sector development (2000 to 2005; 2005 to 2009), and the National Development Plan (NDP) from 2010/11 to 2014/15. These efforts have supported macroeconomic development of the country, leading to gross domestic product (GDP) growth averaged at 7 percent per year for most of the 1990s and 2000s (World Bank, 2015) and have led to a reduction in poverty.

The current Ugandan economy includes both formal and informal components. The formal economy can be broadly divided into three sectors, namely agriculture, industry, and services. From 2008 to 2013, the agricultural sector contributed about 24 percent to the country's gross domestic product, while the industrial and services sectors contributed about 26 percent and 50 percent, respectively (MOFEP, 2013). In recent years, however, there have been some structural transformation in the Ugandan economy with the agricultural sector's contribution in GDP

decreasing and the service sector's contribution increasing. The relatively low productivity of Uganda's agricultural sector is attributed to the lack of modern methods for crop and livestock production (World Bank, 2012), to the lack of skill development initiatives, and to the lack of support from universities for rural agricultural innovations. Uganda's industrial sector—composed of manufacturing, mining/quarrying, electricity/water supply, and construction—is also experiencing constraints. Constraints to industrial development in Uganda include, for example, ineffective/ inadequate policies, governance, technologies, entrepreneurial developments, industrial/ institutional supports, engineering industries (to produce capital goods), human resources and communications/ technological capacities (UNIDO, 2007). Uganda's service sector includes wholesale and retail trade; hotel and restaurant services; transport and communications; real estate activities and financial services; as well as public administration, defense, education, health, and other professional services. It is worth noting that the formal sector depends on informal labour, which is marked by a lack of formal skills and also relies on the use of rudimentary or obsolete tools, traditional methods of production and service delivery, as well as informal organisational arrangements.

Key development challenges

Within the Ugandan context, there are key development challenges, particularly with the use of economic, natural, and human resources as, since the economic decline in the 1960s, Uganda has experienced continued economic challenges. For example, in 2012, Uganda was ranked as 161th of 187 countries on the Human Development Index (UNDP, 2013) and the country's per capita income was listed at US\$510 in 2013 (UNCTAD, 2014). Further, as of 2009/2010, only 12% of households used electricity for lighting (Uganda Bureau of Statistics, 2010). Uganda has also experienced challenges with natural resources. The Ugandan economy is highly dependent on natural resources, including both agriculture and minerals. Within the agricultural sector, food crops constitute 55% of the overall output, forestry 18%, fishing 10%, livestock 9%, and cash crops 8%. Uganda produces large quantities of a variety of cash crops such as coffee, tea, cotton, maize, simsim, and a variety of food crops such as cassava, beans, bananas, potatoes, maize, and so on. It is estimated that approximately 77 percent of the labour force in the rural areas are engaged in agriculture, making it an important source of employment and livelihood for millions of people living in the rural areas. While the agricultural sector makes a large contribution to the national economy, its productivity is the lowest due to the lack of modern methods of crop and livestock

production (World Bank, 2012). Uganda also has large deposits of a number of minerals. That said, the contribution of mining and quarrying to GDP is small. The country's mineral potential has not been fully assessed and exploited except for the recent oil explorations in the western parts of the country along the border with the Democratic Republic of Congo. Thus, in spite of mining being an industry that could potential be pivotal in transforming Ugandan's economy, industrial development is a daunting task, largely because of many constraints faced by the economy in general and industry in particular. A key way to address this challenge is to translate economic policies into development programmes that effectively use the country's natural resources while also engaging people in productive enterprises. Further, there is a need to effectively manage natural resources while introducing initiatives that can support human capital formation, including the skilling of the youth population, enterprise development, and productive employment creation. There are problems with the Ugandan workforce, such as poor labour force skills and low productivity in the labour force. Further, the government is faced with improving human capital development/utilisation through education, health care and law; as well developing public services and supporting the private sector development of science, technology and innovation in the different sectors of the economy. The government is often criticised for not doing enough to reduce poverty and support the livelihood of a majority of Ugandans who still live under abject poverty. Recent statistics indicate that in spite of the economic interventions aimed at reducing household poverty in Uganda, there were still 19.7% of the Ugandans living below the poverty line in 2012/2013 (Uganda Poverty Status Report, 2014).

Policies and initiatives

To understand how innovation initiatives can speak to the current context of Uganda described above, it is important to understand past and present government policies and initiatives that have being developed in an attempt to address the development challenges discussed above. By no means exhaustive, this section will highlight selected policies and initiatives that are relevant to this study's focus on innovation that address livelihoods issues of informal and marginalized communities. The policies are listed in chronological order, starting with Uganda's Poverty Eradication Action Plan of 1997 and moving to its recent National Development Plan (2010/11).

Table 3.1. *National initiatives and their objectives*

Initiatives	Objectives
Poverty Eradication Action Plan (PEAP) 1997	<p>Overall, the PEAP policy (MOFPED, 1997) aimed to increase national competitiveness, economic growth and prosperity for all (as expressed in the main economic development agenda “Vision 2025”) by focusing on public sector growth and development. Specifically, the first PEAP (1997) aimed to: attain good governance and security after a long period of political instability; accelerate and sustain economic growth; and increase capacity to create employment and generate incomes. Subsequent PEAPs also emphasised production and competitiveness in addition to income, insecurity, conflict management and disaster preparedness.</p>
Medium Term Competitiveness Strategy for the Private Sector (MTCS) 2000 to 2005; 2005 to 2009	<p>Broadly, the MTCS policies (MOFPED, 2000; 2005) aimed to stimulate private sector growth and development, to revive the Ugandan economy, and to reduce poverty. These initiatives were underscored by the understanding that the private sector plays an important role in the transformation of the economic and industrial sector in Uganda. Specifically, the MTCS policies aimed to: reform infrastructure; strengthen the financial sector; improve access to financial services; improve institutional frameworks for investment and export promotion; and improve human capital development.</p>
Industrial Development and Competitiveness Improvement Programme 2007 to 2025	<p>With support from the United Nations Industrial Development Organisation (UNIDO), the Industrial Development and Competitiveness Improvement programme (UNIDO, 2007) aims to foster a vibrant and competitive industrial sector, to upscale agro-processing through policy reforms, and to support industrial development. Specifically, this programme aims to: provide support for industrial development and competitiveness; link industries to global production systems and related supply chains; ensure the partnership of government ministries/departments, the private sector and academia; and adopt an approach to policy development and implementation that involves a public-private partnership.</p>

National Development Plan (NDP)	Overall, the NDP aims to transform Uganda society to a modern and prosperous country within 30 years. Specifically, the NDP aims to: improve household incomes; improve employment availability/quality; improve economic infrastructure; improve social service access; promote science technology and innovation; enhance human capital development; strengthen good governance, defense, security; and promote sustainable population while managing environmental and natural resources (MOFPED, 2010, p. 5). Speaking to specific development indicators, the NDP also aims to raise average per capita income levels; raise human development and gender equality indicators, and improve the country’s competitiveness to levels associated with the middle income countries (to name a few).
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To summarise, the aforementioned Ugandan policies and initiatives position (1) institutions (e.g., government ministries/departments, public sector industries, universities) as key actors; (2) formal institutional and inter-institutional processes as key processes; and (3) national, higher-level changes as key priorities. This means these initiatives position organisations (e.g., government ministries/departments, public sector industries, universities)—not individuals—as key actors. For example, the Poverty Eradication Action Plan (1997) positions government ministries/departments as key actors. Second, the Medium Term Competitiveness Strategy (2000) positions private sector industries—particularly those in the financial sector—as key actors. Third, the Industrial Development and Competitiveness Improvement Programme (2007) positions government ministries/departments, private sector industries, and universities as key actors. Lastly, the National Development Plan (2010/11) positions government ministries/departments, private sector industries and individual households as key actors. Individuals and groups in the informal sector are not mentioned as key actors, and as will be discussed in this report’s final chapters, this finding has important implication for our study that is focused on the informal sector.

Second, the nature of the processes involved also has a distinctly formal institutional character as they policies tend to promote work in and between various institutions (e.g., government ministries/departments, public sector industries, universities). For example, the Poverty Eradication Action Plan (1997) focuses on improving production and competitiveness in addition to income, insecurity, conflict management and disaster preparedness, which involve making changes within

the public sector. The Medium Term Competitiveness Strategy (2000) focuses on reforming infrastructure, strengthening the financial sector, and improving institutional frameworks, which involve making organisational changes in the formal institutions located within the private and public sector. Next, the Industrial Development and Competitiveness Improvement Programme (2007) promotes various institutional processes/transfers, including between government ministries/departments, universities, and private sector industries. This, again, involves institutional processes. Lastly, the National Development Plan (2010/2011) involves various institutional processes/transfers within and between government department/ministries and private sector industries.

While the National Development Plan (2010/11) does mention improving household income, it is important to underscore that these aforementioned Ugandan policies and initiatives focus on bringing about a higher-level, national change. For example, the Poverty Eradication Action Plan (1997) focuses on the public sector to address poverty issues and help people become employed. The Medium Term Competitiveness Strategy (2000) focuses on the private sector, specifically to help the economic (service sector) and industrial sector become efficient. Next, the Industrial Development and Competitiveness Improvement Programme (2007) seeks to build relationships between the private and public sectors of the economy while fostering partnerships between the university and the public sector. Lastly, the National Development Plan (2010/2011) focuses on public and private sector development as well as on bringing about change at the household level.

Analyses of these high level national policies that have been implemented with the intention of addressing the country's development challenges illustrate that that informal sector and the micro level activities, typically at the household level, tend to be overlooked for large scale, more formal interventions. This finding illustrates the need for an investigation such as ours that is focused on ways in which informal communities are innovating to address their own livelihood challenges. As will be discussed in later chapters of this report, such an investigation can potentially determine ways in which activities taking place at the local community levels in the country can inform higher level policies decisions to better address livelihoods challenges.

Ugandan Higher Education

Higher education context

Uganda has seven public universities, two public degree-granting institutions, twenty one private universities and a host of other tertiary institutions offering diploma courses (e.g., engineering, agriculture, human medicine, teacher education, cooperatives). Broadly, Uganda public universities have a mandate to teach, research and innovate. The Universities and Other Tertiary Institutions Act (2001), for example, states public universities are responsible for providing higher education, promoting research, advancing learning, disseminating knowledge, giving the opportunity to acquire higher education to all persons (regardless of ability, race, sex or their political or religious views), and providing accessible physical facilities (Section 24).

The current Ugandan university context is characterised by three changes: 1) an increasing/changing student population; 2) an increasing number of science and technology programmes; and, 3) increasing regional integration efforts. First, the number of students accessing higher education in Uganda has increased dramatically in recent years. For example, between 2006 and 2010, there was a 34.1% increase in student enrolment - from 137,190 to 183,985 students (Uganda National Council for Higher Education, 2013). There was also an increase in female registration from 57,721 (42.1%) in 2006 to 80,391 (44%) in 2010 (Uganda National Council for Higher Education, 2013). The number of students in universities has continued to rise in comparison with the numbers in other tertiary institutions (see Table 3.2). Second, when it comes to disciplines of study, at the university level, although the majority of students are enrolled in the arts and the humanities (65% in 2010), the number of students enrolled in Science and Technology continues to increase, from 20% in 2005 to 30% in 2010 (Uganda National Council for Higher Education, 2013). Third, Ugandan Higher Education is also characterised by recent, regional integration efforts aimed at revitalizing cooperation between Higher Education institutions in the East African member states through the re-establishment of the Inter-University Council for East Africa. (IUCEA). The IUCEA has the mandate to champion networking among universities in East Africa, provides a forum for academic debate on matters that relate to higher education development, and helps to harmonize and maintain internationally comparable standards through the development of quality assurance processes and good practices for institutional management.

Table 3.2. *Student enrolment in Ugandan higher education*

Year	1990s	2000	2001	2002	2003	2004	2005	2006	2010
Students	27000	60000	65000	80000	85836	108295	124313	137190	183985
% growth	170	122	8.3	23.1	7.3	26.1	14.8	9.4	26.4

Source: Uganda National Council for Higher Education, 2013

Key development challenges

Despite these positive developments, there are many challenges in the Uganda Higher Education context inhibiting post-secondary institutions from fulfilling their national goals of teaching, researching and innovating (Visitation Committee to Public Universities Report, 2007). Some of these challenges stem from limited funding in the higher education sector and limited/inadequate human resource capacities and infrastructures. There are also challenges with student enrolment in (and student access to) universities in Uganda. Even with the increasing enrolment (described above), the number of school age people enrolled in tertiary education in 2010 was 5.4% of the population, which is below the Sub-Saharan average of 6%, below the world average of 26%, and below the preferred average of 40% needed for economic security. Within the Uganda Higher Education context, most universities are operating with academic staff who lack PhD qualifications. This is a key development challenge as having PhD education is considered to be an important requirement for being able to engage in effective teaching and research at the university level. Additionally, while there has been a huge increase in student enrolment at Ugandan post-secondary institutions, there is not nearly enough opportunities for a skilled workforce. In Uganda, there are problems with “brain drain”—the emigration of highly educated people to other countries because of Ugandan universities’ low remuneration and the country’s social economic crisis. When it comes to the University workforce, there is a shortage of professional staff, a shortage of teaching and non-teaching staff, as well as management issues, and poor remuneration, not to mention a high cost of living and tax rate in Uganda itself.

Table 3.3. *Lecturer: Student ratios, Staff with PhD and Professors at Selected Universities in Uganda*

University	Student enrolment	Staff	Academic staff	Staff to student Ratio	Staff w/ PhD	Professors
Makerere University	33,112	3,332	1,436	1: 23	312	81
Kyambogo University	22,290	1,087	607	1:36	30	08
Makerere University Business School	15,593	795	448	1:34	27	16
Gulu University	3,752		388	1:10	23	08
Mbarara University of Science & Technology	2,778	470	190	1:15	35	10
Busitema University	762	388	48	1:16	16	04
Kampala International University	13,938		440	1:32	26	
Nkumba University	6,804	297	139	1:48	24	08
Uganda Christian University	7,897		336	1:24	20	
Uganda Martyrs University	3,454		196	1:18	24	
Uganda Management Institute	950				02	

Source: Uganda National Council for Higher Education, 2013

Ugandan post-secondary institutions also have inadequate and deteriorating infrastructure as there is a lack of facilities, including sufficient lecture halls, computer labs, libraries, and laboratories. Table 3.4 below provides an overview of academic facilities in selected public and private universities in Uganda. These numbers clearly illustrate that there is a strong need within the Ugandan Higher Education context to improve learning facilities.

Table 3.4. *Academic facilities at selected public and private universities in Uganda*

University	Student Enrol ment	No. of Comput ers	Student to compute r ratio	Lecture Halls		Library	
				Lecture Space (square meters)	Lecture Space per Student (square metres)	Library Space (square meters)	Library space per student
Makerere University	33,112	4,960	7:1	19,262	0.6	5,618	0.2
Kyambogo University	22,290						
Makerere University Business School	15,593	449	35:1	4,717	0.3	1,500	0.1
Gulu University	3,752	110	34:1	2,524	0.7	610	0.2
Mbarara University of Science & Technology	2,778	120	23:1	1,890	0.7	540	0.2
Kampala International	13,938	300	46:1	3,276	0.2		

University								
Nkumba	6,804	190	35:1	3,191	0.5	1,538	0.2	
University								
Uganda	7,897	156	19:1	3,816	0.5	5,246	0.6	
Christian								
University								
Uganda Martyrs	3,454	155	16:1	1,235	0.4	1,033	0.3	
University								
Uganda	950	136	7:1	603	0.6	189	0.2	
Management								
Institute								

Source: Uganda National Council for Higher Education, 2013

Research development and dissemination. There is a need to increase research development and dissemination in the Ugandan Higher Education context as well as recent studies indicate that there is little research being undertaken in public universities in Uganda because of a lack of research funds and poor research infrastructure (Mamdani, 2007). Further, there is an underutilisation of research findings, which is attributed to the inadequate infrastructure and non-existence or non-functional institutional mechanisms for disseminating research knowledge and more specifically technology and knowledge transfer. While the most common form of research dissemination is through local or international peer reviewed journals, there is a need for other ways of mobilising findings to promote innovation and inclusive development. These difficulties are attributed to public universities policies that emphasise teaching at the expense of research, and that promote academic staff (without taking into account research productivity). There is a need for future links between universities and other sectors. Recently, past studies have shown the link between universities and businesses in Uganda is under developed (see, for example, Nabudere, 2010; Mamdani, 2007; Mugerwa, 2009). While these studies have pointed out the insufficient links, they have also highlighted the connection between learning and innovation and the need for future partnerships between universities and industries. These studies have highlighted a need for business engagement links, particularly with patenting, licensing and start-ups (Lundvall, 2000) that respond

to society’s changing demands. This is a traditional way of facilitating innovation centred on linking universities and private sector industries.

Policies and initiatives

To understand how innovation initiatives can speak to the current context in Ugandan Higher Education, it is important to understand past and present policies and initiatives related to the country’s post-secondary education context. By no means exhaustive, this section highlights selected, relevant policies and initiatives related to higher education and innovation.

Initiatives	Objectives
Uganda National Council for Science and Technology (UNCST) 1990	This organisation was created in 1990 to spearhead research and innovation between different actors in the economy by developing various policies and strategies. Their mandate is to advance the role of innovation in national development, and to integrate science and technology into the national development process (Uganda National Council for Science and Technology, 2015). More specifically, the aim of the organisation is to: “(1) Improve or streamline national science and technology policy environment to foster scientific and technological innovation; (2) Strengthen national system for research, product development, technology transfer and intellectual property management; (3) Increase public understanding and appreciation of science and technology; (4) Strengthen the UNCST institutional research base and technical capacity (UNCST, 2015).
National Science and Technology (S&T) Policy 1994-2009	This policy was introduced following the Statutory Act of 1990, which established the Uganda National Council for Science and Technology. This policy was a work in progress from 1994 to 2009 – see box below.
National Science, Technology and Innovation Policy (STI)	The main goal of this policy is “to strengthen national capability to generate, transfer and apply scientific knowledge, skill and technologies that ensure sustainable utilisation of natural resources for the realisation of Uganda’s developmental objectives” (Ministry of Finance, Planning and Economic Development, 2009, p.13). The STI policy aims: (1) to create an enabling

2009	policy environment to foster STI and augment their contribution to national development; (2) to build the STI sector capacity to generate and transfer technology; (3) to establish and strengthen the legal and regulatory framework to ensure ethics and safety in STI development/ application; and (4) to strengthen the STI coordination framework to enhance the sector's performance and contribution to national development.
STI Sector Plan 2011	The STI sector plan (2011) outlines how the Science, Technology and Engineering Institutions (SETIs) which are responsible for implementing STI programmes can budget for and directly access funds through their sectoral budgeting processes. It provides for the initial five year cost of coordination and implementation of the STI policy at an estimated cost of UG Shs 830 billion. This is a big improvement from the meager UG Shs 8 billion which government had committed in 2007/2008 as an annual allocation towards scientific research and innovation activities conducted by distinguished local researchers. In addition to the financial commitments to research and development through support to SETIs, Government has provided capitalisation grants to the STI Fund with up to Ushs.50 billion in the short term. This is aimed at financing scientific research and innovations that are of strategic national importance, acquisition of intellectual property rights by local innovators and the recognition of scientific excellence among local scientists. This fund is to be replenished through 20 percent of the contributions from scientific and technical services offered by SETIs. Additional funds to the STI sector are being provided through the Uganda Joint Country Assistance Strategy as well as public-private sector partnership initiatives.
Education Sector Strategic Plan (ESSP) 2004 to 2015	The ESSP plan aims to support higher education, and to produce tertiary graduates who are innovative, creative, and entrepreneurial to serve in private and public sectors. More specifically, the key interventions outlined in the ESSP to promote higher education in Uganda are in respect of reforms aimed at improving curricula and instruction in priority disciplines so as to link the graduates more closely to Uganda's national development needs and those of

the labor markets. In this respect priority is given to science, mathematics, technology, and other subjects critical to Uganda's national development. It also seeks to integrate Information and Communications Technology (ICT) into courses, so that every graduate - and faculty member - is computer literate. However, this can only succeed in as far as the institutions of higher learning are able to attract and retain faculty staff by improving their conditions of service. Another intervention is aimed at promoting applied research, and publications. To this end, the National Council of Higher Education is supposed to help and encourage universities to further develop their capacity for research - particularly applied research - intellectual exchange, and publications. It encourages faculty and students to make research part of their normal working lives and to keep up-to-date with current research in their fields.

Higher Education Science and Technology Development Initiative <i>2012</i>	<p>Funded by the African Development Bank, this initiative aims to expand science and technology learning facilities in six public universities and two degree granting institutes. The main aim of this project is to contribute to skills development in response to national labour market demands and it is in line with the National Development Plan 2010-2014 that among other things seeks to support industrialisation through improving competitiveness in science and technology. The project will contribute towards capacity building of staff by supporting training, establishing incubation centres and revamping ICT facilities as well as improving teaching in the beneficiary organisations. An expected output of this project is to increase enrolment of science students to 35,000 while another 20,000 will benefit through distance learning. Thus to some extent there is commitment towards improving skill development in the STI sector in Uganda (African Development Fund, 2012).</p>
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To summarize, these policies and initiatives related to the country's higher education context tend to position (1) actors in science and technology disciplines as key actors; (2) government, academic and private industry processes as key processes; and (3) large scale outcomes as key aims. While there is a small focus on teaching, most of the efforts are related to increasing research outputs and very few

links are made with the informal sectors of the country despite most people being based in this context.

Innovation in Uganda

This chapter has set out some of the key challenges both political and economic in the Ugandan context as well as how the government has sought to address these challenges in the past 20 years through the creation of specific economic policies and initiatives. It has also attempted to discuss the role of higher education in Uganda plays in addressing the country's specific development challenges. This section summarises key findings while considering how innovation has been conceptualised in the Ugandan context.

This chapter has traced recent political and economic initiatives in Uganda, highlighting how—since gaining independence in 1962—the country has made continued efforts to support national and economic development. This chapter has explored how Uganda is characterised by a poorly developed educational and knowledge infrastructure as well as underdeveloped financial and skills markets. As we have explored, there are various political and economic challenges within the Ugandan context, including high levels of poverty, low levels of productivity, and limited labour force skills. Further, within the Ugandan higher education context, there are challenges with funding, student enrolment, human resource capacities, infrastructure, community partnerships, and research development/dissemination.

In attending to the key developmental challenges and the key policies and initiatives in Uganda, we learn about the ways that innovation has been conceptualised. Within Uganda, the boundaries of what counts as innovation has been conceptualised as: the work of formal institutions [actor] in formal institutional and inter-institutional processes [process] with the aim of technical, economic and national development [aim] in the formal sector. Put another way, innovation in the Ugandan context is seen as formal institutions bringing about economic/national change in and through formal institutional and inter-institutional processes.

In Ugandan policies and initiatives, it is striking that organisations are positioned at the key actors/agents of innovation. These organisations include enterprises, government ministries, professional associations, research and development institutions, non-governmental organisations (NGOs), innovation and productivity centres, extension services, standards setting bodies, universities, vocational training centres, information gathering and analysis services, banking and

other financing mechanisms. It is worth underscoring, too, that several policies position institutions in the fields of Science, Technology, Engineering and Mathematics (STEM) as key players in bringing about change. Examining critically who is positioned as an active participant, also tells us about who is positioned as a passive recipient. When it comes to who is positioned as a key actor, it is important to note that there is little to no mention of community participants, marginalised communities, or community groups in informal settings (farmers, cooperatives, individuals, micro-enterprises).

In Ugandan policies and initiatives innovation is characterised as involving formal institutional processes, occurring in and between formal institutions. These processes again foster work between various institutions (e.g., government ministries/departments, public sector industries, universities). It is worth noting that focusing on organisational—not individual—efforts calls attention to practices and relations that are shaped by and responsive to particular institutional customs. There is little to no mention of using tacit or indigenous knowledges, holistic processes or small scale interventions that start individually or locally. That said, several policies and initiatives do highlight the importance of effectively using natural resources. With this view, innovation is not about something coming out of nowhere, but is about repurposing/utilising existing natural resources.

The aforementioned Ugandan policies and initiatives have positioned technical, economic and national development as key aims. When it comes to what the policies and initiatives aim to achieve, in highlighting the importance of technical, economic and national development, the policies bracket the importance of other outcomes. For example, the policies bracket the importance of social, cultural or environmental development outcomes, sustainable initiatives, social responsiveness, or community development. Further, the policies overlook livelihood oriented projects that respond to the livelihood problems of individual people.

This chapter has, again, explored how Ugandan policies and initiatives enact a particular view of innovation—positioning organisations as actors/agents, institutional and inter-institutional processes as key processes, and national or economic changes as key outcomes. Moving forward, we will consider how this somewhat traditional understanding of innovation—that links those in private sector industries to research institutions—tends to overlook the activities of individual people functioning outside of formal institutions and structures and how our learnings from studying these activities can potentially inform future national policy decisions. In order to do this,

the following chapters (4 through 6) investigate the ways in which university actors at three public institutions are encouraged to and actually engage with external social actors.

Chapter 4. Mapping Patterns of Interaction at Makerere University

Our interactions with external social partners have produced a lot of good outcomes for the university. There is a remarkable improvement in the visibility of Makerere University both locally and internationally and this has been translated into an improvement in the barometric ranking of the university (now standing at 4th position in Africa just behind top South African Universities). It has helped in releasing negative feelings about the university thereby helping in turning around the university and raising the brand name Makerere University. The university is becoming more attractive locally, regionally and internationally. As a result, academics are getting into joint research projects and partnerships with their counterparts in universities based in developed countries more especially Europe and America where the tradition of university research and publications is well developed. It has also helped the university to win more research grants from international donor agencies and well known Philanthropies such as the Rockefeller, Ford, Belinda and Gates and the recent MasterCard Foundations²

- Makerere University Administrator

The aim of this chapter is to examine how Makerere University's organisational mandate, policies, and structures are shaping interactions with external social actors. The chapter responds to the following research question established in this report's introductory chapter:

How is Makerere University organised and structured to interact with external social partners, specifically marginalised communities?

To answer the question, we start by giving an overview of the university, and then move to findings from the mapping investigation component of this study that sought to map patterns of interaction between the university and community. While MAK has predominantly been a teaching university with limited research activity, our analysis shows how the University has tried to reposition itself in recent years to become a research-driven institution. This chapter highlights the ways that university-community interactions can be research-based - a research focus that is explored in this chapter as well as the case study in Chapter 7.

² From interview with Makerere University administrator

University background

Established in 1922, Makerere (MAK) University is the largest and third oldest higher institution of learning in Uganda. With an enrolment of 30,000 undergraduate students and 3,000 postgraduate students, MAK currently has ten faculties (including nine colleges and one school of law) as well as one university-affiliated business school. While MAK has educated many civil servants in the public sector, and some in the private sector, there have been questions about whether or not MAK is contributing enough to innovation (see, for example, Mamdani, 2007) or to contemporary scholarship that supports economic development.

The main campus of MAK is located on Makerere Hill, five kilometres from the centre of Kampala, the capital city of Uganda in the north-western direction. The College of Health Sciences campus is located on Mulago Hill, adjacent to Mulago National Referral Hospital; two kilometres east of the main campus. The Agricultural Research Institute campus is located in Kabanyola; about 17 kilometres north of the main campus. The university estate also includes: Buyana Stock Farm (which is a part of the College of Veterinary Medicine, Animal Resources and Biosafety), the Kasangati Health Centre (which is a part of the School of Public Health), the Kibale Forest Reserve (which is a part of the Institute of Environment and Natural Resources), and the Budongo Forest Reserve (which is a part of the School of Forestry and Nature Conservation).

Makerere University is, of course, part of the national higher education sector. Since 2001, MAK has been governed under the Universities and Other Tertiary Institutions Act (2001). MAK's development has gone hand in hand with Uganda's socio-economic and political development since the attainment of independence on October 9th, 1962. Since the 1960s, the development of MAK has been influenced by the turbulent political conditions that prevailed in Uganda in the 1970s, 1980s, and 1990s. The University's strategic direction is underpinned by the broader national and international policy frameworks such as the Millennium Development Goals, the Poverty Eradication Action Plan, and the more recent National Development Plan. Figure 4.1 below outlines the University's vision, mission, and core values.

Vision statement

To be the leading institution for academic excellence and innovations in Africa.

Mission statement

To provide innovative teaching, learning, research and services responsive to National and Global needs.

Core values

Makerere University in pursuit of its mission will be guided by the following core values:

1. Allegiance to the institution.
2. Integrity.
3. Customer responsiveness.
4. Professionalism.
5. Openness to diversity.

(Source: Makerere University, 2011)

Figure 4.1. Makerere University vision, mission, and core values

Guided by the values of allegiance to the institution, integrity, customer responsiveness, professionalism, and openness to diversity, the University's mission is "to provide innovative teaching, learning, research and services responsive to National and Global needs" (Makerere University, 2011). This mission not only underscores the importance of teaching, learning, research, and outreach; it also acknowledges the importance of making a national and international contribution. The strategic plan also aims to strengthen the university's governance, financing, and human resources initiatives (Makerere University, 2012).

The Strategic Plan (2012) also promotes learner centred approaches (focused on providing experiential and flexible pedagogical approaches to support students); research-driven efforts (focused on undertaking research and producing knowledge to support the national economy); and knowledge transfer partnerships and networks (focused on working with communities and public and private sector agencies to improve the university's entrepreneurial and innovative capacity). These three pillars prioritise partnerships with external stakeholders that contribute to social development.

University organisational structure

The governance of MAK is executed at different levels. At the highest level, the University Council is responsible for policy making related to university management. The University Council includes 28 members, and is managed by the Vice Chancellor and other principal officers, including, the Deputy Vice Chancellor of Finance and Administration, the Deputy Vice Chancellor of Academics, the Registrar, the Bursar, and the University Librarian. The University Council also oversees six committees that focus, for example, on ICT development, quality assurance, and gender mainstreaming.

A second level of management is comprised of the Principals of the Colleges, Deans of Schools and Heads of Academic Departments. Chaired by the Vice Chancellor, the university senate, which is chaired by the Vice Chancellor, and includes representatives from different academic units in the university is also responsible for university management. The university senate is responsible for general academic planning, admissions, examinations, and all disciplinary matters that involve student academic conduct in the university.

While the university structure was typical of colonial era university administrations, the university initiated a college governance structure in July of 2011. This structure has created a four tier system that improves the autonomy of newly established constituent colleges. The current structure seeks to decentralise administrative powers away from the central administration to the lower college and teaching units. Of particular interest to this study, the colleges and teaching units—not the university’s central administration—are responsible for making decisions about interactions with external partners. The current governance structure empowers different academic units to develop academic programmes that are later discussed at the university senate before being forwarded to the university council for final approval. One senior university administrator described how this process allows community members to be involved in the planning processes:

“The community members share their wisdom with us and they help our researchers in the development of relevant research projects as well as developing the curriculum for teaching at the university”³”.

This new arrangement is quite radical as it means programming is not done in a top-down approach but rather from interactions with community members. Program coordinators (these are distinguished academics in the schools or departments who are responsible for initiating and

³ From interview with senior university administrator at Makerere University

coordinating the development of curricular for new academic programs) also play a role in linking communities with the colleges.

Faculties and academic programmes. While MAK used to have ‘teaching units’ instead of colleges, MAK transitioned to be organised by faculties in 2010. As mentioned above, MAK currently has ten faculties (including nine colleges and one school of law) as well as one university-affiliated business school. There are 96 academic departments within the ten faculties. The colleges and autonomous units include: the College of Health Sciences; the College of Agricultural and Environmental Sciences; the College of Engineering, Design, Art and Technology; the College of Natural Sciences; the College of Veterinary Medicine, Animal Resources and Bio Safety; the College of Education and External Studies; the College of Computing and Information Sciences; the College of Humanities and Social Sciences; the College of Business and Management Sciences; and the School of Law. MAK is also affiliated to Makerere University Business School and thirteen other institutions in Uganda.

MAK offers academic programmes that cover diverse areas of training in the natural and applied sciences, as well as the social sciences, including economics, law, and business administration. The Makerere University Fact Book 2012/2013 (Makerere University, 2013) lists the university providing a total of 265 programmes, including: 14 diploma programmes, 112 bachelor’s programmes, 114 master’s programmes, 13 postgraduate diploma programmes, and six PhD programmes. At the time of our study, however, the university had expanded to offer 14 diploma programmes, 130 bachelor degree programmes, 17 postgraduate diploma programmes, and 130 master’s degree programmes. Further, all of the colleges have the ability to offer doctoral degrees either by research only or by course work and dissertation. MAK offers a diversity of academic disciplines with academic programmes both at the undergraduate and postgraduate levels.

Student enrolment. MAK enrolled a total of 37,214 students in 2011/2012. Of the student population, the highest enrolments of students can be found in the colleges of humanities and social sciences followed by education and external studies and business and management sciences. Whereas the science based colleges, such as agriculture and environment sciences, health sciences, engineering and technology, natural sciences and veterinary medicine enrol relatively lower numbers of students. MAK has more students enrolled in undergraduate courses compared to the low number in the postgraduate courses. This suggests MAK is more of a teaching university than a

research university. That said, the university has been trying to improve its reputation as a research university by expanding the research-based graduate programmes.

To do this, University administrators have recently worked to expand research programming and to increase student enrolment in graduate courses, particularly in the science based disciplines. To support these initiatives, the university, through the government of Uganda has sought financial support from development partners to improve its research infrastructure by establishing research facilities and centralised, multidisciplinary laboratories to contribute to addressing the emerging health, environmental, agriculture and energy threats. Through these developments, MAK has tried to position itself as a leading research university with a focus on postgraduate training.

University policies and guidelines

To support its Strategic Plan (2011), that, again, aims “to provide innovative teaching, learning, research and services responsive to National and Global needs,” the university has implemented, or is in the process of implementing several policies, including, a research mobilisation policy (for fundraising for development), a research and innovation policy (to contribute nationally), an intellectual property management policy, a gender mainstreaming policy, and an engagement policy. One senior University manager described the policies as contributing to the university mission and vision, saying:

The mission of the University is well aligned with the need to promote research and innovation. Interaction is embedded in the new orientation of the university which focuses on Knowledge Transfer Partnerships and Networks (KTPN). This essentially involves linking the university to external social actors. In this regard, the university formed a division which links it with the private sector. The mandate of this unit includes planning and organising awards of honorary degrees (Doctorates) to recognised members of the public⁴

Both the university mission and the university organisational structures have worked to promote knowledge transfer and to promote partnerships with external social actors in the different aspects of teaching, research, and outreach programmes. In order to complete their programmes, MAK students are required to spend part of their time doing practical work with an organisation. This

⁴ From interview with Makerere University senior administrator

“field attachment” or “internship” is intended to support students in interacting with the community in order to complement the knowledge acquired from university lectures.

Initiatives and structures shaping external interactions

University administrators have been working to increase incentives for MAK academics to engage with external partners. For example, administrators have been lobbying large donor agencies to provide funding for community-oriented research projects. Similarly, the university encourages academics to develop grant proposals that respond to community development needs and challenges. One senior university manager noted:

The university is developing a system that supports competitive research grants and here one is expected to demonstrate that the outcome of research is able to benefit society or solve a socio economic problem (the emphasis should be on applied research). The grant application guidelines, which usually have the call for proposals, shows the peer review criteria which is followed in evaluating grant proposals. Some grants—for example NORAD – provide financial incentives for the best research and here a research team can get a cash prize of up to US \$5,000. Since promotion is mainly based on research output commonly measured in terms of publications in peer review journals, as well as community service, this also provides an incentive to staff to be able to engage in activities that promote interactions with external partners, particular research that is relevant to society as well as taking part in community outreach programmes.⁵

Additional incentives that the university appears to be using to increase research productivity and engagement include recognition of prominent scholars in university functions and the wide publicity of the good work that the academics do to contribute to scholarship and society in general. These are succinctly expressed in the words of one senior university administrator:

If you are to talk about incentives for academic staff to engage in academic work and scholarship that encourages interactions with external social partners, a number of things come to mind. The university recently came up with a policy recognising prominent scholars by giving them academic chairs and naming prominent buildings or research centres within the university after them. For example, the well celebrated history and cultural studies scholar who once served in Makerere University, Professor Ali Mazrui, has a centre at the main university campus named after him. Professors who do outstanding work and contribute to

⁵ From interview with Makerere University senior administrator

social progress are also recognised at special university functions such as on graduation day with a special occasions held for them at the main ceremonies hall. In some cases the good works of professors are publicised in the national or regional media or internally within the university in the monthly newsletter. All these can provide incentives for academic staff to engage in research and interact with external social partners⁶

Just as the University has tried to recognise those doing external work, the University has also established the Makerere University Private Sector Forum to support interactions with external social partners. Coordinated by the Department of Planning and Development (DPD), the aim of the programme is to facilitate greater linkages between the university and the private sector both within and outside Uganda. The aim of the Private Sector Forum is to link the university with the private sector to support the commercialisation of research and innovation. To further support interactions with the private sector, the DPD also works to raise funds from development partners and donors. It is important to note that while the DPD works to coordinate with private sector industries, the University does not have a unit coordinating Outreach Programmes in the university.

Although these examples discussed above illustrate that some efforts have been taken to increase external partnerships between university actors and members of the Ugandan society and beyond, interviews with senior university officials reveal that there is some pessimism about the capacity of the university to provide sufficient incentives to spur academics into engaging in external social partnerships. Similarly, as findings from our questionnaires will illustrate below, many academics felt the university had inadequate incentives for them to work hard and engage with external social partners. For example, academic staff are poorly paid and hence lack the motivation to do their work effectively. As a consequence, they tend concentrate only on teaching and do very little research due to lack of research funds. It is only in exceptional cases where people get indirect incentives through engagement with the communities (directly/indirectly) in the form of field allowances.

Patterns of interaction

In this section, we map patterns of interactions between academics at MAK and different external social actors. This analysis provides additional evidence which builds on the data gathered through structured interviews held with senior managers of the university. Our focus is on identifying the

⁶ From interview with Makerere University senior administrator

key external social partners academics tend to interact with, the types of relationships these interactions take, the channels of information and knowledge transfer, the outputs of these interactions, as well as the outcomes and benefits of the interactions, obstacles and challenges to the interactions, and the incentives for individual academics to interact with external social partners.

It is important to underscore that the results of this study are not generalisable. That said, we did opt to compute the findings in order to promote readability and in order to better identify patterns emerging. Thus, these findings should be interpreted with care since the data is not-representative of the entire academic staff at Makerere University⁷. Also note, the empirical results for each of the points of analysis are included in the tables below. Each of the results consist of the computed Weighted Average Index (WAI) and the Standard Deviation from data derived from a 2013 survey of academics at Makerere.

Key external social partners

Of the academics we surveyed in 2013, the most important external social partners with whom academics interact are (1) individuals/households; (2) specific local communities; (3) funding agencies; and (4) small scale (non-commercial) farmers. This finding is striking as many of the interactions seem to centre on social development or community engagement, which is a key mandate of the University. The external partners with whom academics have the least interactions predominantly falls in the private sector. The external partners they viewed as least important included: (1) multi-national companies; (2) welfare agencies; (3) large national firms; and (4) sectoral organisations. There were limited/few interactions with formal private sector group. This finding echoes that of Cloete, Bailey, Pillay, Bunting and Maassen (2011) who found that academics at most public universities in sub-Saharan Africa have a weak relationship with actors in the private sector. Some of the academics we surveyed were less-motivated to engage with the private sector because they tend to view private sector interactions as ‘non-academic’ and not contributing to research outputs or the production of academic material that is of high enough quality to be published in peer-reviewed journals. To analyse the findings of our 2013 study, we computed the Weighted

⁷ At Makerere University, 55 academics were initially contacted out of which 31 agreed to take part in our 2013 study. The selected academics were given a copy of the questionnaire which they completed with the support of a study team member. The disciplines represented in this study include: medicine, agriculture, ethnobotany and environment studies, forestry, computer science, and engineering.

Average Index (WAI) and the standard deviation for data collected using a scale (as reported in Table 4.1 below).

Table 4.1. *Makerere University academics' external social partners (Weighted Average Index and the Standard Deviation)*

External Social Partner	WAI (Mean)	Std. Deviation
Individuals and households	3.1000	1.02889
A specific local community	3.0345	.80869
International universities	3.0667	.86834
National universities	3.0333	.88992
African universities	3.000	.87099
Funding agencies	3.0000	.74278
Small-scale farmers (non-commercial)	2.9333	1.04826
National government departments	2.8667	.97320
Development agencies	2.8621	.81892
Non-governmental agencies (NGOs)	2.7241	.97897
National regulatory and advisory agencies	2.7241	.97897
Local government agencies	2.5333	.93710
Community organisations	2.5172	.89522
Small, medium and micro enterprises	2.3333	.95893
Schools	2.300	.87691
Commercial farmers	2.2069	.92398
Clinics and Health Centres	2,1333	.97320
Provincial/ regional government agencies	2.0667	1.04286
Religious organisations	2.000	.94686
Sectoral organisations	1.9286	.90701
Large national firms	1.8667	.97320
Welfare agencies	1.7333	.73968
Multi-national companies	1.6667	.80230

Types of relationships with external social partners

The academics we surveyed reported that the most important interactions they have with external social partners are research based. They viewed (1) engaging in research consultancies; (2) engaging in collaborative research and development projects; (3) educating students to be socially responsive; and (4) offering customised training and short courses as they most important types of relationships. Their primary focus on research is not surprising as MAK academics are required to conduct research in order to further their academic careers. While research can involve any number of external social partners, some departments specifically focus on research consultancies with economically or socially marginalised communities. The types of relationship that were of least importance to surveyed academics were the following: (1) providing clinical services and patient or client care; (2) commercialising a new product; (3) providing expert testimony; and (4) engaging in contract research. It is not surprising that working with clinics and healthcare is ranked low as those initiatives are typically limited to academics in medicine. The low ranking of the commercialisation of new products is also connected to the limited connections MAK researchers tend to have with the private sector (described above). Table 4.2 outlines the most important types of relationships in which the MAK researchers we surveyed are engaged.

Table 4.2. *Types of relationships that academics at Makerere University engage in with external social partners (Weighted Average Index and Standard Deviation)*

Types of Relationships	WAI (Mean)	Std. Deviation
Research consultancy	3.0000	.87099
Collaborative research and development projects	3.0000	.98261
Education of students so that they are socially responsive	2.8667	.93710
Customised training and short courses	2.8333	.91287
Community-based research projects	2.8333	.83391
Collaborative curriculum design	2.8276	.87371
Technology transfer	2.8000	.92476
Monitoring, evaluation and needs assessment	2.7667	.85836
Continuing education or professional development	2.6667	1.02833

Work-integrated learning	2.6667	.95893
Design and testing of new interventions or protocols	2.6000	1.03724
Student voluntary outreach programmes	2.5714	.99753
Service learning	2.5333	1.00801
Policy research, analysis and advice	2.4667	1.00801
Design, prototyping and testing of new technologies	2.4333	1.07265
Alternative modes of delivery to accommodate non-traditional students	2.3667	.96431
Contract research	2.3333	1.15470
Expert testimony	2.1333	.97320
Joint commercialisation of a new product	1.7667	.85836
Clinical services and patient or client care	1.6000	1.10172

Channels of information and knowledge transfer to external social partners

As a part of our analysis, we also measured how knowledge was being transferred to external social partners. For the academics we surveyed, the most important channel of information and knowledge transfer were through: (1) students; (2) training and capacity development or workshops; (3) informal information exchange; and (4) participatory or action research projects. This implies that the university relies heavily on its students and graduates to channel information and transfer knowledge to the external social partners. This, again, happens through the students' interactive learning placements. The academics we surveyed also reported transferring knowledge to external social partners through informal reports and the electronic mass media. The least important channels of information and knowledge transfer involved technology-based approaches. The academics we surveyed identified: (1) patent applications and registration; (2) spin-off firms from the university; (3) technology incubators or innovation hubs; and (4) technology development and application networks as the least important channels of information and knowledge transfer to their external social partners. This is to be expected as few of the external social partnerships were of a highly technological nature. Table 4.3 details the most to least important channels used to transfer knowledge to external social partners for the academics we surveyed.

Table 4.3. *Channels used to transfer knowledge to external social partners (Weighted Average Index and Standard Deviation)*

Channels of Information	WAI (Mean)	Std. Deviation
Students	3.4667	.62881
Training and capacity development or workshops	3.0667	.86834
Informal information exchange	2.8667	.86037
Participatory or action research projects	2.7333	.86834
Reports and policy briefings	2.7000	.87691
Cross-disciplinary networks with social partners	2.5667	.97143
Oral or written testimony or advice	2.5000	1.00858
Interactive websites	2.3333	.80230
Radio, television or newspapers	2.2667	.86834
Intervention and development programmes	2.1379	.89920
Technology development and application networks	2.0667	1.01483
Technology incubators or innovation hubs	1.7667	.85836
Spin-off firms from the university (commercial or not for profit)	1.7000	.95231
Patent applications and registration	1.5000	.82001

Outputs of interaction with external social partners

As a part of our study, we also analysed the outputs of interactions with external social partners. The most important outputs from the interactions between the academics and external social partners reported were academic in nature. These outputs included (1) producing academic publications; (2) training students with relevant skills and values; (3) producing dissertations; and (4) collaborating with other academics. The academics we surveyed also mentioned the importance of outputs related to scientific and technical information and to government policies. For the academics we surveyed, the least important outputs were related to the production of: (1) cultural artefacts; (2) community infrastructure and facilities; (3) new or improved products; and (4) scientific discoveries. See table 4.4 for an overview of the most to least important outputs emanating from the MAK academics' interactions with external social partners.

Table 4.4. *Outputs of interactions with external social partners (Weighted Average Index and Standard Deviation)*

Outputs of Interaction with External Social Partners	WAI (Mean)	Std. Deviation
Academic publications	3.6667	.54667
Graduates with relevant skills and values	3.5667	.50401
Dissertations	3.4333	.89763
Academic collaboration	3.1333	.77608
Reports, policy documents and popular publications	2.9000	.88474
New or improved processes	2.1000	.99481
Scientific discoveries	1.9000	.92289
New or improved products	1.8276	.83331
Community infrastructure and facilities	1.7000	.79438
Cultural artefacts	1.3333	.54667

Outcomes and benefits of interaction with external social partners

For the academics who participated in our 2013 questionnaire, the most important outcomes and benefits of interactions with external social partners were intellectual in nature. The academics we surveyed ranked: (1) theoretical and methodological developments; (2) academic and institutional reputation; (3) training and skills development; and (4) public awareness and advocacy as the outcomes and benefits of the highest importance from external social partnerships. While intellectual outcomes were ranked of highest importance, outcomes related to community empowerment and development were also important for the academics we surveyed. These efforts are consistent with the university's goal of contributing to socio economic development. The least important outcomes of interactions with external social partners were related to the private sector, particularly to: (1) firm employment generation; (2) firm productivity and competitiveness; (3) novel uses of technology; and (4) policy interventions. See Table 4.5 below for the data.

Table 4.5. *Outcomes and benefits of MAK academics' interactions with external social partners (Weighted Average Index and Standard Deviation)*

Outcomes and Benefits of Interaction	WAI (Mean)	Std. Deviation
Theoretical and methodological development in an academic field	3.9333	5.57663
Academic and institutional reputation	3.3000	.79438
Training and skills development	3.0667	.90719
Public awareness and advocacy	2.9333	.73968
Cross-disciplinary knowledge production to deal with multi-faceted social problems	2.7931	.84606
Improved livelihoods for individuals and communities	2.7667	.89763
Improved quality of life for individuals and communities	2.6897	.95062
Community-based campaigns	2.4000	.85501
Community employment generation	2.3333	.88409
Community empowerment and agency	2.3333	.88409
Incorporation of indigenous knowledge	2.2667	.94443
Regional development	2.2000	.99655
Intervention plans and guidelines	2.1667	.83391
Policy interventions	2.0000	.98261
Novel uses of technology	1.9667	1.06620
Firm productivity and competitiveness	1.8667	.89955
Firm employment generation	1.8621	1.04136

Obstacles and challenges of interaction with external social partners

We also analysed the obstacles and challenges that constrain academics' interactions with external social partners. Our findings show that institutional weaknesses in the university tends to constrain academics' partnerships with external social partners. The obstacles and challenges the academics we surveyed identified include: (1) limited financial resources for competing university priorities; (2) sustainable external funding; (3) institutional recognition systems do not reward academic interaction; and (4) University administration and bureaucracy does not support interaction with external social partners. Interestingly, most challenges were related to institutional structures and supports. This underscores the need for the university to develop policies and guidelines to support interactions with external social actors. Alternatively, fewer issues stemmed from the following

constrains: (1) risks related to student involvement; (2) legal problems; (3) tensions between traditional and new academic paradigms; and (4) the lack of mutual knowledge about partners' needs and priorities. The following table shows the Weighted Average Index (WAI) and the Standard Deviation for the obstacles and challenges of interactions with external social partners (as reported by MAK academics).

Table 4.6. *Obstacles and challenges of interactions with external social partners (Weighted Average Index and Standard Deviation)*

Obstacles and Challenges of Interaction	WAI (Mean)	Std. Deviation
Limited financial resources for competing university priorities	3.8333	.53067
Sustainable external funding	3.5862	.76642
Institutional recognition systems do not reward academic interaction activities sufficiently	3.3103	.83474
University administration and bureaucracy does not support academic interaction with external social partners	2.8621	1.07396
Negotiating access and establishing a dialogue with external social partners	2.7333	.98027
Lack of clear university policy and structures to promote Interaction	2.6552	1.05947
Unequal power relations and capabilities in relation to external social partners	2.6207	1.03103
Lack of mutual knowledge about partners' needs and priorities	2.5357	.96426
Tensions between traditional and new academic paradigms and methodologies	2.4138	1.03448
Legal problems	2.0690	.90710
Risks of student involvement in interaction with external social partners	1.8621	.77567

Particular patterns of interaction

As a part of our analysis, we also interviewed Makerere University administrators and academics about the interactions with external social partners. During the interviews, they identified several different ways academics interact with social partners. We learned that research consultancies and students' interactive learning placements are two of the primary ways the university connects with external social actors. The following figure lists past and present interactions with external social partners (as identified by University academics).

One leading academic in Agriculture remarked:

In our college [College of Agriculture and Environmental Sciences], especially in the disciplines of agriculture and food production, we now encourage staff to engage in applied research which is participatory in that scientists have to engage the rural farmers under the umbrella of the 'Community Action Research Program.' In this case, farmers are given the opportunity to evaluate the agricultural technologies developed by the university academics. The university research scientists, on the other hand, have to work with the farmers and incorporate farmers' views into their research projects. These research projects are specifically aimed at dealing with problems of food security among the poor rural community members and also in helping them to cope with the challenges of climate change⁸

Another Engineering academic remarked:

The Innovation Systems and Clusters Programme Uganda seeks to develop innovations through linking academia with the informal business community members. These linkages are promoted based on needs identified by the business community. It also involves capacity building through the attachment of the students to the small business organisations right from their first year of their Engineering degree course. This attachment is meant to help the student gain practical production and business skills which can be used in future. While in the organisation students reflect on the knowledge learnt in class to solve practical business problems by giving ideas on how to improve on machine repairs and layout, business planning, records and information management and better communication through e-mail and the creation of blogs.

⁸ From interview with Makerere University academic

At a more advanced level students engage in the design of machines and systems under the supervision of the university professor. All these involve an interactive engagement between the student, university professor and the business people. This interaction is a continuous process with adjustments and flexibility aimed at achieving a deeper understanding and learning. The expected outputs of these engagements are machines replicated, cheaper local resources and the standardisation of production systems in the business organisations⁹

Conclusion

This chapter began by looking at the higher-level institutional values, the mid-level institutional structures, and the micro-level patterns of interactions with external social partners. The emerging strategic focus of MAK, that emphasises learner centeredness, academic research, and knowledge transfer partnerships and networks, aims to transform the university into a research driven institution with strong ties to external stakeholders. The aim of the institution's Strategic Plan (2011) is to contribute nationally and internationally, and to promote interactions with external social actors.

Our analysis of the institutional structures/supports show that—while some structures help to foster interactions—others work to constrain them. For example, interactions are supported by policies that require students to engage with the community as a part of their educational requirements. Further, the fact that individual faculties are encouraged to engage with external social partners (without having to seek permission or go through formal university channels first) helps to promote interactions. While these are some institutional structures that support interaction with external social partners, it is important to highlight that many of the academics we surveyed felt there was a need for more financial support for interactions, as well as a need for University recognition/promotion systems to reward community interactions. Many academics felt the university had inadequate incentive structures in place to reward them for engaging with external social partners. Given that academic staff are poorly paid (and limited research funding is available), many academics opt to fulfil the teaching component of this position without investing in research. Further, our analysis of patterns of interaction showed that there are little/few private sector relationships. The majority of interactions are research consultancies involving academic, intellectual

⁹ From interview with Makerere University academic

outputs. Our analysis also showed the primary channel of transferring knowledge was through MAK university students.

The case study in Chapter 7 is an example of a research-based interaction between Makerere University academics and Traditional Health Practitioners in Buyijja. While this chapter gave an overview of the nature of the interactions, the case study details the particular interactions and the ways the innovations worked to support inclusive development.

Chapter 5. Mapping the Patterns of Interaction at Gulu University

The core activities of GU (teaching and learning, research and innovation, and outreach) appropriately fit within the mission of the university. The different activities undertaken at the university, including curriculum development, teaching, and research all have outreach components embedded in them. In each of the academic departments, there is an aspect of outreach involved in the teaching and research programmes. These include, for example, students and lecturers in human medicine undertaking clerkship in the communities, agriculture interacting with rural farmers, education interacting with students in secondary schools through teaching practice, and, in the Institute for Peace and Strategic Studies, interacting with the post-war communities in peace building and conflict resolution¹⁰

- Gulu University Senior Administrator

The aim of this chapter is to examine how Gulu University's organisational mandate, policies and structures are shaping interactions with external social actors. The chapter responds to the question:

How is Gulu University organised and structured to interact with external social partners, specifically marginalised communities?

To answer the question, we start by giving an overview of the University, and then move to mapping patterns of interaction between the university and community. Our analysis shows how the needs of the local community have helped to shape the direction of the University, and the University's focus on community transformation. This is important to highlight as it shows that the University is not simply speaking to the community, but that the community is also shaping the University.

University background

Established in 2001, Gulu University (GU) is a public university that has been operational since 2002. Located in Gulu, the largest regional town in northern Uganda, the University is

¹⁰ From interview with Gulu University Senior Administrator

approximately 320 kilometres from the capital city Kampala. The main campus of Gulu University is located approximately five kilometres in the North Eastern direction of Gulu town.

While Gulu initially specialised in agriculture and was named the Gulu University of Agriculture and Environmental Science, overtime, the focus shifted to embrace a broader mission and to include other disciplines. Gulu has undergone a number of structural changes since its inception in 2002, where it initially focused on the academic disciplines of agriculture and environment. Since then the university has evolved and it now displays characteristics of a conventional university with academic programmes covering diverse areas of training in the natural and applied sciences, as well as major courses in social sciences and humanities. The university is governed under the Universities and Tertiary Universities Act 2001, and revised in 2003. As a public university, it is by law governed by the University Council as the supreme governing body.

The key mandate of Gulu University is to play a leading role in the provision of skilled human resources for national development in the areas of education, health, agriculture, technology, research, and other services. The University's Strategic Plan (2010: 5) states that the University's mission is: "To undertake applied research and other community outreach services aimed at community transformation". This objective focuses on developing and strengthening community outreach programmes, particularly peace building and conflict transformation initiatives. Speaking to the mandate, recent projects have focused on capacity building for local government and vocational training for health researchers as well as on peace building (through the Community Outreach Peace Project). The University focuses on teaching/learning, research/innovation, and community outreach. GU also promotes partnerships and networks at national and international levels to support sustainable development and social transformation. To promote external partnerships, the university has facilitated international academic staff exchanges and organised collaborative research projects.

University mission

As outlined in Figure 5.1 below, the mission, vision, and core values of Gulu University are focused on supporting human development and community transformation (Gulu University, 2010). The Strategic Plan promotes "providing higher education, research and quality professional training for community transformation" (p.5).

Vision statement

To be a leading academic institution for promotion of community transformation and industrialisation for sustainable development.

Mission statement

To expand access to higher education, conduct applied research and provide quality professional training to the delivery of appropriate services directed towards social transformation and conservation of biodiversity.

Core values

The key principles that guide GU staff conduct are:

- Professionalism;
- Integrity;
- Effectiveness and Efficiency;
- Accountability and Transformation;
- Teamwork;
- Gender responsiveness;
- Concern for people with disabilities.

Source: Gulu University, 2010

Figure 5.1. *Gulu vision, mission, and values*

The University's vision highlights both community transformation and sustainable development. Similarly, the mission statement also promotes social transformation through applied research. The University's focus on applied research is important to note as the difference between university-community interactions that are research-focused and university-community interactions that are teaching-focused is a point of analysis in this study. Outreach is embedded in the teaching/learning and research/innovation work of the university, which is a way of responding to the needs of the local area. The University's mission underscores contributing to community development in northern Uganda, an area that, until recently, has been entrenched in conflict. Thus, local demands for support drive the University. For example, much support is needed locally to ensure the sustainable use of natural resources and to support the livelihoods of local community members. Acknowledging how the needs of the community have helped to shape the direction of the university, one senior university official stated in their interview:

Being a rural kind of university with the motto of community transformation, and based on its location in an area that experienced two decades of severe conflict and war, Gulu University has an important role to play

*in the post war peace building, resettlement, and recovery process. The transformation process is seen in the works of training and research in the different academic units. For example, the emphasis in science education is to train science teachers for the rural schools; the training of doctors tries to prepare them to work in rural communities; the focus of training in agriculture is to get graduates who can act as extension workers in supporting farmers to improve crop and animal production through the adoption of improved farming methods and effective ways of adapting to climate change*¹¹.

University organisational structure

As per the Universities and Other Tertiary Institutions Act (2001), under which GU governed, GU is headed by a Chancellor with the Vice Chancellor serving as the institution's chief executive officer. The Vice Chancellor is supported by the Deputy Vice Chancellor and a host of other officers in charge of different aspects of the university administration such as the Academic Registrar, the University Bursar, the University Secretary, the University Librarian, Director Planning and Development, and the Dean of Students.

The University is governed by the University Council, who oversees the overall administration and ensures the due implementation of university functions. The Council is divided into committees that perform individual functions. The Senate is responsible for academic matters at the University, including, teaching, research and educational standards/assessments. The University Council is responsible for connecting the university to external stakeholders (as per the GU Client Charter).

Faculties and academic programmes. In 2002, the university started with one faculty—the faculty of Science Education—and one institute—the Institute of Human Resource Development. By 2013, the university was home to five faculties and two institutes, including, the Faculty of Medicine; the Faculty of Agriculture and Environment; the Faculty of Science; the Faculty of Education and Humanities; the Faculty of Business and Development Studies; the Institute of Peace and Strategic Studies; and the Institute of Research, Graduate Studies and Staff Development. Each of these faculties offer different academic programmes at the undergraduate and postgraduate levels. The University is home to three ordinary diploma programmes, 16 bachelor degree programmes, five postgraduate diploma programmes, and six master degree programmes. Given that GU is relatively small, there are only a few academic programmes offered.

¹¹ From interview with Gulu University senior administrator

University policies and guidelines

In the first ten years of its existence, GU tried to position itself as an institution embedded in a community in northern Uganda and, in this respect, it tried to orient its teaching and research activities towards meeting community development needs. As its mission proclaims, the University seeks to play a role in community transformation in the post-war context of northern Uganda. Yet, despite this strong community orientation, there are still no policies in place at the institutional level to guide this orientation. In particular, there is still no policy in place to guide the promotion of community outreach programmes (activities) in the university. One senior administrator discussed this issue in their interview:

There is no general policy on the promotion of outreach. However, in disciplines such as agriculture, the university puts emphasis on the integration of teaching and learning with indigenous knowledge in the communities. This requires students to constantly get to the communities and learn the way they practice agriculture¹².

To support its outreach programmes, the university had been relying on guidelines; yet, in interviews with various members of staff, it became apparent that the University is attempting to develop a community outreach policy as consultations have been done with various stakeholders. The excerpt from the interview illustrates how the abovementioned guidelines are currently being used to guide community interactions:

The university has guidelines that the different faculties use to facilitate them in integrating community outreach activities into their teaching and research as an attempt to contribute towards community transformation¹³

The guidelines are used to facilitate curriculum development by recognising the needs of communities and how innovations, developed by the university in partnership with external actors, can be used to improve people's livelihoods. It is also a university requirement that every research project undertaken by an academic staff member should have an aspect that involves interactions with communities. In this respect, the university emphasises the integration of indigenous

¹² From interview with Gulu University senior administrator.

¹³ From interview with Gulu University senior administrator

knowledge with the modern scientific or social scientific knowledge in the teaching and outreach programmes. This is more emphatically recognised in disciplines such as human medicine, agriculture, peace and conflict studies, and education.

Initiatives and structures shaping external interactions

In discussing the relationship between research and teaching at GU, one senior university administrator remarked:

The university puts a lot of emphasis on the importance of research in informing teaching. A number of research projects have been undertaken in medicine, agriculture, and pure science, as well as the humanities. Researchers are encouraged to develop research projects that are fairly responsive to community needs and to interact with the community members during and after research and encourage them to take up the innovations or improvements arising from the research¹⁴

While GU has tried to promote research and develop a strong relationship between research and teaching (as the university administrator describes above), it is important to note that GU is a relatively young university with limited postgraduate training options. This means the research infrastructure is underdeveloped as there is a shortage of facilities and a shortage of faculty members who have trained at the doctoral level and thus have sufficient experience in teaching and research. Yet, University administrators have been active in supporting the development of research capacity and activities aimed at community outreach. For example, the university is developing research partnerships with other organisations and universities at both local and international levels. Additionally, the university is also developing its capacity for applied research that responds to community needs and development challenges.

Despite these attempts though, our analysis of the types of interactions GU academics are involved in illustrated that most university-community interactions have been service-based. Overall, the academics we surveyed and interviewed have not been focused on bringing about innovations or working with private sector firms. Outreach and community service is considered to be an important pillar of the institution. The following are some of the university-based initiatives that have worked to strengthen community outreach:

¹⁴ From interview with Gulu University senior administrator

- Established an outreach services committee;
- Engaged in active collaboration with other institutions and the private sector;
- Focused on applied research that is responsive to community development challenges;
- Encouraged staff and students to participate in outreach programmes by providing incentives such as recognition at university events;
- Offered facilities for community activities;
- Disseminated information and knowledge to communities;
- Encouraged communities to be active partners with the university in the implementation of community outreach programmes;
- Developed a mechanism to monitor the implementation of outreach activities; and
- Involved students in community services through their outdoor training activities.

This list of activities clearly illustrates that the university is trying to embed itself in the community in order to increase its relevance and contribute to community transformation and national development. Although much of the focus is on community-based efforts, university administrators also encourage academics to engage in active collaborations with other universities and institutions. It is important to note that findings from our interviews also suggested that community-based interactions are more prevalent in the medical, agriculture, and peace studies fields.

The study of how Gulu academics interact with external social actors also involved identifying incentives provided to the institution's academics in order to encourage them to develop strong interactions with external social actors. While overall the academics we interviewed reported there is lack of a clear policies and mechanisms to support field attachment and community outreach programmes at the university, they did identify a few incentives the University has put in place to encourage engagement with external social actors such as the following:

- Transportation support to travel to communities or research sites;
- Allowances for staff participating in outreach activities (e.g., for meeting expenses and for the upkeep of academic staff while in the field supervising students and engaging with community members);
- Research grants administered by the Institute for Research and Graduate Studies and vetted through a competitive process. Part of these funds are dedicated to scholarships for students

registered to undertake graduate studies with a research component that involves work in the communities;

- Findings that translate to research outputs and to peer reviewed scientific journals (and, in turn, help them to advance academically);
- Community work, which is a requirement for promotion. To be promoted at Gulu University, one should engage in community outreach activities, which can be demonstrated in terms of the number of grants won and the community outreach activities undertaken.
- Recognition in the University Newsletter (particularly for students) of research/service to communities.

Although there are some incentives offered by the University to encourage academic staff and students to engage in interactions with external social partners (as highlighted above), it is hard to ascertain the motivations of the Gulu academics and how these motivations shape interactions with external social partners.

Patterns of Interaction

In this section, we map the scale and patterns of interactions within and between the university academics and external social partners. The section details findings from our 2013 study of 30 Gulu academics¹⁵. As discussed in this report's methodology chapter, it is important to highlight that the findings from this component of the investigation are not generalisable. That said, we did opt to compute the findings in order to promote readability and in order to better identify patterns emerging. Below we present an analysis of the findings from our questionnaires about the key external social partners that GU academics are interacting with; the types of relationships that they are engaging in; the channels used in information and knowledge transfer during these interactions; the main outputs, outcomes, and benefits from these interaction, and the obstacles and challenges they face attempting to engage in such interactions. Empirical results for each of these points of analysis are included in the tables below. Each of the results consist of the computed Weighted Average Index (WAI) and the Standard Deviation from data derived from a 2013 non-generalisable survey of academics at GU.

¹⁵ As a part of our study, we approached 45 academics at Gulu University to participate in the questionnaire of which 30 agreed to participate. The academics completed the questionnaire with assistance from a member of this study team.

Key external social partners

Our analysis highlighted the external social partners that academics considered to be most important to interact with. For the academics we surveyed, the most important external social partners they interact with are: (1) individuals and families; (2) funding agencies; (3) specific local communities; (4) national government departments; and (5) NGOs. The least important external social actors they interact with are: (1) trade unions; (2) political organisations; (3) multi-national companies; and (4) social movements. Table 5.1 provides an overview of these findings.

Table 5.1. *External Social Partners (Weighted Average Index and Standard Deviation)*

External Social Actor	WAI (Mean)	Std. Deviation	N
Individuals and households	2.8667	1.00801	30
Funding agencies	2.7586	.89655	30
A specific local community	2.6333	1.03335	30
National government departments	2.5333	.81931	30
Non-governmental agencies (NGOs)	2.5172	.85584	30
Community organisations	2.5172	.93295	30
Development agencies	2.4483	.85445	30
Local government agencies	2.3333	.99424	30
Small-scale farmers (non-commercial)	2.1786	1.11583	30
Civic associations	1.8333	.98553	30
Commercial farmers	1.8000	1.03057	30
Small, medium and micro enterprises	1.7667	.97143	30
Religious organisations	1.7333	.86834	30
Large national firms	1.6333	.76489	30
Social movements	1.5000	.77682	30
Multi-national companies	1.4667	.62881	30
Political organisations	1.3667	.66868	30
Trade unions	1.2667	.63968	30

Types of relationships with external social partners

As a part of our analysis, we also surveyed Gulu academics about the types of relationships they tend to have with external social partners. We found the most important types of relationships that the academics use to engage with external social partners are largely geared towards solving community problems through research. The academics we surveyed reported the most important types of relationships are: (1) community-based research projects; (2) monitoring, evaluation and needs assessment; and (3) participatory research networks. These results are consistent with the University's focus on conducting applied research and facilitating the economic recovery and peace building process in post-war northern Uganda. Our findings also suggest the types of relationships that the academics consider to be of less importance: (1) commercialising new products; (2) engaging in collaborative research and development projects; and (3) engaging in contract research. It is striking that the least important types of interactions typically involve private sector firms. The finding that Gulu academics' have limited connections with the private sector is in line with earlier observations by Kruss, Visser, Aphane, and Haupt (2012), who found that universities in sub Saharan Africa tend to not be effectively linked with the private sector. See Table 5.2 for a detailed overview of these findings.

Table 5.2. *Types of Relationships between Academics and External Social Partners (Weighted Average Index and Standard Deviation)*

Type of Relationship	WAI (Mean)	Std. Deviation	N
Community-based research projects	2.4828	1.02193	29
Monitoring, evaluation and needs assessment	2.4138	.82450	29
Participatory research networks	2.4138	.82450	29
Design and testing of new interventions or protocols	2.2414	.95076	29
Research consultancy	2.1379	.99010	29
Technology transfer	1.9310	1.03272	29
Policy research, analysis and advice	1.8276	.84806	29
Design, prototyping and testing of new technologies	1.8276	.96618	29
Contract research	1.8276	1.00246	29

Collaborative research and development projects	1.8276	.92848	29
Joint commercialisation of a new product	1.4828	.82897	29

Channels of information on knowledge transfer to external social partners

We also surveyed academics about the most important channels of information and knowledge used by the academics at GU in their interactions with the external social partners. The Gulu academics we surveyed tended to rely on the conferences, seminars and workshops to disseminate information to external social partners. This is striking as these outlets are primarily academic. While academic outlets are, of course important, the academics we surveyed also stressed the importance of disseminating information through (2) training or capacity development workshops and through (3) participatory or action research projects, which suggests they also value connecting with the community. Some academics also described the importance of electronic mass media and technical reports. Notably, academics considered contractual and specialised outlets as the least important ways of reaching out to partners. This is important to underscore as typically producing (1) patent applications/registrations; (2) producing spin-off firms; and (3) producing technology/innovation hubs is linked with interactions in the private sector. Table 5.3 highlights the most important channels to transfer knowledge for the Gulu academics we surveyed.

Table 5.3. *Channels of Information used by Academics in Interactions with External Social Actors (Weighted Average Index and Standard Deviation)*

Channels of Information	WAI (Mean)	Std. Deviation	N
Public conferences, seminars or workshops	3.3667	.71840	30
Training and capacity development or workshops	2.9310	.98018	30
Participatory or action research projects	2.5000	.76564	30
Oral or written testimony or advice	2.3667	.96431	30
Popular publications	2.3103	.91363	30
Cross-disciplinary networks with social partners	2.3103	.74757	30
Radio, television or newspapers	2.2667	1.04826	30
Reports and policy briefings	2.1667	.94989	30

Intervention and development programmes	2.1034	1.02872	30
Interactive websites	2.0690	1.01475	30
Demonstration projects or units	2.0690	.90710	30
Technology development and application networks	1.7931	.92398	30
Research contracts and commissions	1.6786	.74526	30
Software development or adaptation for social uses	1.6786	.98449	30
Technology incubators or innovation hubs	1.3929	.66121	30
Spin-off firms from the university (commercial or not for profit)	1.3214	.64613	30
Patent applications and registration	1.2500	.50000	30

Outputs and benefits of interaction with external social partners

Our analysis of the outputs of interactions shows that—for the Gulu academics we surveyed—the most important outputs are academic. They mentioned (1) educating graduates with relevant skills; (2) producing dissertations; (3) producing academic publications; and (4) producing academic collaborations as the most important outlets. This is not surprising as all of these things comprise a significant component of academics’ formal work. One senior university administrator stated:

It is important that our core academic staff undertake research and share their results with the broader academic community through conferences and workshops. This helps in raising the profile of the university and also acts as a good testing ground for the researchers to assess the quality of their research work¹⁶

For the academics we surveyed, the outputs that are considered to be of least importance are (1) spin-off companies; (2) cultural artefacts; and (3) scientific discoveries. This suggests the academics who participated in our study are less motivated to produce cultural or scientific outputs, which, again, connects well to how academics strengthen their reputations and secure promotions. Interestingly, while it was not a part of our initial questionnaire, our interviews with senior university administrators showed faculty and students are increasingly being encouraged to communicate the results of their empirical studies to the relevant and most affected communities. The table below shows the most important outputs of interactions for the Gulu academics we surveyed.

¹⁶ From interview with Gulu University senior administrator

Table 5.4. *Outputs of Academic Interactions with External Actors (Weighted Average Index and Standard Deviation)*

Outputs of interactions	WAI (Mean)	Std. Deviation	N
Graduates with relevant skills and values	3.4483	.62069	30
Dissertations	3.1000	.80301	30
Academic publications	2.7667	.85836	30
Academic collaboration	2.7667	.85836	30
Reports, policy documents and popular publications	2.3667	.80872	30
New or improved processes	2.0667	.90719	30
Community infrastructure and facilities	2.0333	1.06620	30
New or improved products	1.6333	.88992	30
Scientific discoveries	1.6207	.92527	30
Cultural artefacts	1.3793	.76175	30
Spin-off companies	1.3793	.76175	30

Outcomes and benefits of interaction with external social partners

As a part of our questionnaire, we also surveyed Gulu academics about what they feel the most important outcomes and benefits are in their interactions with external social partners. Our findings show that—for the Gulu academics we surveyed—the most important outcomes and benefits of the academic interactions with external social partners include: (1) improved teaching and learning; (2) public awareness and advocacy; and (3) improved quality of life for individuals and communities. This is, again, particularly important to Gulu University because of its location in an area that has suffered a long period of conflict. For the academics we surveyed, the least important outcomes and benefits related to: (1) firm employment generation; (2) firm productivity and competitiveness; and (3) regional development. This underscores the weak link that the university academics have with the private sector, which is consistent with earlier studies (e.g., Kruss, et al., 2012). See Table 5.5 below for the data.

Table 5.5. *Outcomes and Benefits of Academic Interactions with External Social Actors (Weighted Average Index and Standard Deviation)*

Outcomes and Benefits of Interactions	WAI (Mean)	Std. Deviation	N
Improved teaching and learning	3.2667	.69149	30
Public awareness and advocacy	3.2000	.76112	30
Improved quality of life for individuals and communities	2.9333	.90719	30
Training and skills development	2.9000	.75886	30
Improved livelihoods for individuals and communities	2.9000	.92289	30
Academic and institutional reputation	2.9000	.80301	30
Community-based campaigns	2.7931	1.02987	30
Cross-disciplinary knowledge production to deal with multi-faceted social problems	2.7333	.78492	30
Relevant research focus and new research projects	2.6000	.89443	30
Theoretical and methodological development in an academic field	2.5667	.93526	30
Intervention plans and guidelines	2.5000	.90019	30
Incorporation of indigenous knowledge	2.4286	.80638	30
Community empowerment and agency	2.3667	.92786	30
Policy interventions	2.1333	.89955	30
Regional development	2.0667	.78492	30
Community employment generation	2.0000	.87099	30
Firm productivity and competitiveness	1.5517	.81309	30
Firm employment generation	1.5000	.82001	30

Obstacles and challenges of interaction with external social partners

We also surveyed Gulu academics about their perceived obstacles and challenges in interacting with external social partners. The challenges they identified include: (1) sustainable external funding; (2) competing priorities on time; (3) too few academic staff; and (4) institutional recognition systems do not reward academic interaction activities sufficiently. These findings illustrate that resources and

supports are needed for research and the funding of community outreach programmes. Alternatively, the academics who participated in our questionnaire were least concerned about: (1) legal problems; (2) risks of student involvement; (3) tensions between traditional and new academic paradigms and methodologies; and (4) the lack of mutual knowledge about partners' needs and priorities. See the results in Table 5.6 below.

Table 5.6. *Obstacles and Challenges faced by the Academics in their Interactions with External Social Actors (Weighted Average Index and Standard Deviation)*

Obstacles and Challenges	WAI Mean	Std. Deviatio n	N
Sustainable external funding	3.5667	.67891	30
Competing priorities on time	3.2667	.82768	30
Too few academic staff	3.1333	.73030	30
Institutional recognition systems do not reward academic interaction activities sufficiently	3.1000	.80301	30
Negotiating access and establishing a dialogue with external social partners	3.0333	.85029	30
Lack of clear university policy and structures to promote interaction	3.0000	.87099	30
Unequal power relations and capabilities in relation to external social partners	2.8333	.91287	30
Lack of mutual knowledge about partners' needs and priorities	2.7667	.81720	30
Tensions between traditional and new academic paradigms and methodologies	2.5000	.93772	30
Risks of student involvement in interaction with external social partners	2.2333	.85836	30
Legal problems	1.8333	.98553	30

Further shedding light on the challenges in interacting with external social partners, one academic stated:

Although the community is very receptive and supports the university in its community outreach and extension work, there are many challenges faced. There is lack of sufficient technical manpower to provide the necessary support to the students and to be able to reach out to the community members. There is also lack of effective logistics for movement to the communities located in many difficult to reach areas because of the poor road networks. Technical infrastructure (laboratories and equipment) is also lacking in the university which therefore deters the academics from carrying out scientific investigations on the basis of which they can offer appropriate solutions to the farming challenges faced by the farmers. For example, offering advice on effective means of crop and animal disease control and improved agronomic practices should be informed by empirical work based on scientific analysis¹⁷

Here the academic highlights the ways in which logistical challenges impact GU academics' abilities to interact with external social actors. These issues will be further explored in our Gulu University case study in Chapter 7.

Particular patterns of interaction

As a part of our analysis, we also interviewed Gulu University administrators about the issues related to institutional interactions with external social partners. During the interviews, they identified several different ways that GU academics are interacting with external social partners. For example, at Gulu University there are attachment programmes that see University students working with and learning from communities. There are also community-based research programmes that see academics conducting research in the field. Further, there are community interventions that see University academics providing health or social service type support in the fields of healthcare or conflict resolution, for example. The following figure highlights examples of past and present interactions with external social partners (as identified by University administrators).

One Gulu University administrator stated:

We practice community outreach through the student-farmer extension agenda. Under this arrangement students are attached to the farmers and they are allowed to interact with farmers under supervision from academic staff. While the students learn from the farmers about the indigenous knowledge on farming and

¹⁷ From interview with Gulu University academic

challenges associated with the use of small holder farming practices, the students also extend knowledge and skills to the farmers on modern good farming practices. Feedback from the farmers is used to improve the learning process at the university and there has been some success to this effect¹⁸

Another senior faculty administrator observed:

The focus of our medical training at GU is to contribute to skills development to facilitate community health transformation. To achieve this, we use an integrated approach that entails research, training, contributing to quality health care in communities, and collaborating with other national and international development partners. For example, students and faculty carry out research and provide health care interventions that address the health needs of community members. Faculty members, along with the students, go and engage with community leaders to mobilise community members so as to undertake diagnostics of the diseases in the communities and train community members on preventive measures to undertake as well as advise on the correct nutrition to follow. This is implemented through direct interaction with the communities using group discussions, workshops, and working jointly with rural health workers and school teachers¹⁹

One senior administrator from the Faculty of Medicine observed:

We encourage our researchers to collaborate internally and to develop a culture and adopt an interdisciplinary approach to research. This is necessary to help them identify interventions that are holistic in solving community health needs. For example, in order to ensure good health, nutrition is important. While the health professionals, through research, come up with prescription of the most recommended diet for people to live healthy or that will enable patients to recover effectively, colleagues in agriculture will help the community members to determine the correct food they should produce and how to produce and prepare it for consumption²⁰

As one university senior official stated:

¹⁸ From interview with Gulu University senior administrator

¹⁹ From interview with Gulu University senior administrator

²⁰ From interview with Gulu University senior administrator

The focus of the university, particularly the Faculty of Medicine, is to undertake medical education for Community Transformation through training of medical doctors and offering related skill enhancement programmes to the government medical workers based in the rural health centres. In this regard, academic staff do research to determine the best possible interventions in managing health conditions of people in the communities. They also carry out community based medical education to the students. Students, on the other hand, carry out community outreach activities which provide support to the health workers' needs in the rural areas. In particular, they do some basic training, supervision, and sensitisation of community members on aspects of hygiene and general guidance on how to maintain high quality of health²¹

Another senior university manager who is closely associated with the University's efforts of peace building and reconciliation in post war northern Uganda also noted:

Gulu University is a third party in the conflict resolution challenge in northern Uganda. In order to effectively take part in the conflict resolution challenge, we have developed the idea of mentorship which directly focuses on how the university can link research to community interactions and transformation. Community outreach started by looking at people in the war camps and determining how to provide help to resettle them and also solve their pressing social problems. Thus, the peace centre at the university was modelled around community development and transformation. The initial work at the centre focused on solving practical community problems arising from war, more especially conflict over land which came up when people were trying to resettle and get back to their normal lives²²

One university administrator observed:

The university considers interaction with the local community to be core to its mission and development. The university regularly hosts workshops in which members of the local community are invited to come and engage with university academics on how to resolve land conflicts and identify ways of engaging in sustainable development. One such engagements involves inviting the local traditional chief 'rwot' to chair discussions on important socio economic issues that are deemed to be relevant to community peace and development²³

²¹ From interview with Gulu University senior administrator

²² From interview with Gulu University senior administrator

²³ From interview with Gulu University senior administrator

One senior university administrator observed:

The university seeks to give opportunity to the people who were victims of war and could not effectively study to get knowledge on how to improve their livelihoods. In this respect, we are supporting a programme that focuses on facilitating the flow of knowledge to the people in communities so as to help them improve [their] health and get engaged in productive agricultural and other community-based projects that can help improve their livelihoods²⁴

Conclusion

This chapter has illustrated the structure and pattern of interaction between Gulu academics and external social partners. We started by introducing the university, including the mission, the organisational structures, the policies and guidelines, and the incentives/systems in place to promote interactions with external social partners. Through this analysis, we saw how—while there is no formal policy on engagement—it is part of the University’s mandate, and there are various guidelines to support it, particularly at the departmental level. Quite remarkably, we also saw how Gulu’s location in a post-conflict context has helped to shape the institution’s mission. Through our analysis, we also saw that academics are required to involve the community in their research, and that academics need to engage with communities (and secure research grants) in order to get promoted. While there is a need for more funding and more formal supports to help academics engage in interactions with external social partners, it appears that Gulu academics do have some institutional incentives to engage externally.

As a part of our analysis, we also traced patterns of interaction between the Gulu academics we surveyed and external social actors. In doing so, we not only learned about academics’ experiences, we also learned more about how the university structures and supports shape the interactions. Our findings suggest that the academics we interviewed are more involved in community-based or academic interactions—not interactions with private sector firms. We also saw that academic and community-based outputs are viewed as the most important (as opposed to outputs related to private sector firms). One striking finding is that the outcomes and benefits that the academics we surveyed identified were primarily other-oriented and geared at improving the livelihoods of others (e.g., improved teaching and learning, public awareness and advocacy, and improved quality of life

²⁴ From interview with Gulu University senior administrator

for individuals and communities). The incentives to participate, on the other hand, were primarily aimed at improving the livelihood or reputation of the researcher. In turn, one finding is that—for interactions to be effective—they need to be mutually beneficial – benefitting both the community and the academic involved. Lastly, the academics we surveyed identified several structural challenges that constrain their interactions with external social partners such as a lack of sustainable external funding, competing priorities on time, limited/few academic staff; and inadequate institutional recognition. This, again, illustrates a need for more institutional structures and supports to promote university-community interactions. Future efforts should therefore be geared towards strengthening the technical capacity and infrastructure of the university, institutional structures, policy framework, and the academics’ capacity to mobilise external funding in order to support its agenda for outreach programmes.

The case study in Chapter 8 is an example of a university-community between Gulu University academics and disadvantaged youth in post-conflict northern Uganda. While this chapter gave an overview of patterns of the interactions and of University structures shape interactions, the case study details a particular interaction. The case study also examines the ways Gulu academics worked to bring about innovation for these youth and support inclusive development locally.

Chapter 6. Mapping Patterns of Interaction at Mbarara University of Science and Technology (MUST)

MUST has tried to develop its institutional capabilities to become a truly research and community based university. We focus on the development of people and society. In most of our undergraduate degree programmes, for example, human medicine, computer science, science education, environment and development studies, we challenge the faculty and students to follow a system of learning that makes the students look beyond the boundaries of their specific disciplines and instead establish links with other related disciplines so as to benefit from integrated learning. This multidisciplinary approach to learning encourages scientific and social innovation and hence inculcates the spirit of entrepreneurship in the students but also shapes their attitudes to develop competencies that are relevant to solving community problems. To achieve this, learning has to be undertaken both in the classrooms and in the communities²⁵

- MUST University Senior Administrator

The purpose of this chapter is to examine how the organisational mandate, policies, and structures at Mbarara University of Science and Technology (MUST) are shaping interactions with external social actors. In this chapter, we respond to the question:

How is Mbarara University of Science and Technology organised and structured to interact with external social partners, specifically marginalised communities?

We start by giving an overview of the University, and then move to mapping patterns of interaction between the university and community. Our analysis underscores the role that students play in university-community interactions. As we will see below, community engagement is built into the mission of the university, the programme requirements, and the day-to-day coursework at MUST University.

²⁵ From interview with Mbarara University senior administrator

University background

Established in 1989, Mbarara University of Science and Technology (MUST) is commonly known as Mbarara University. The main campus of MUST is located in Mbarara town in mid-western Uganda, approximately 286 kilometres south west of Kampala, the capital city of Uganda. The University was founded to promote the development of Science and Technology in Uganda through university teaching, research, and innovation. The aim was to complement the efforts of other research institutes so as to support modern industrial development and economic transformation in Uganda.

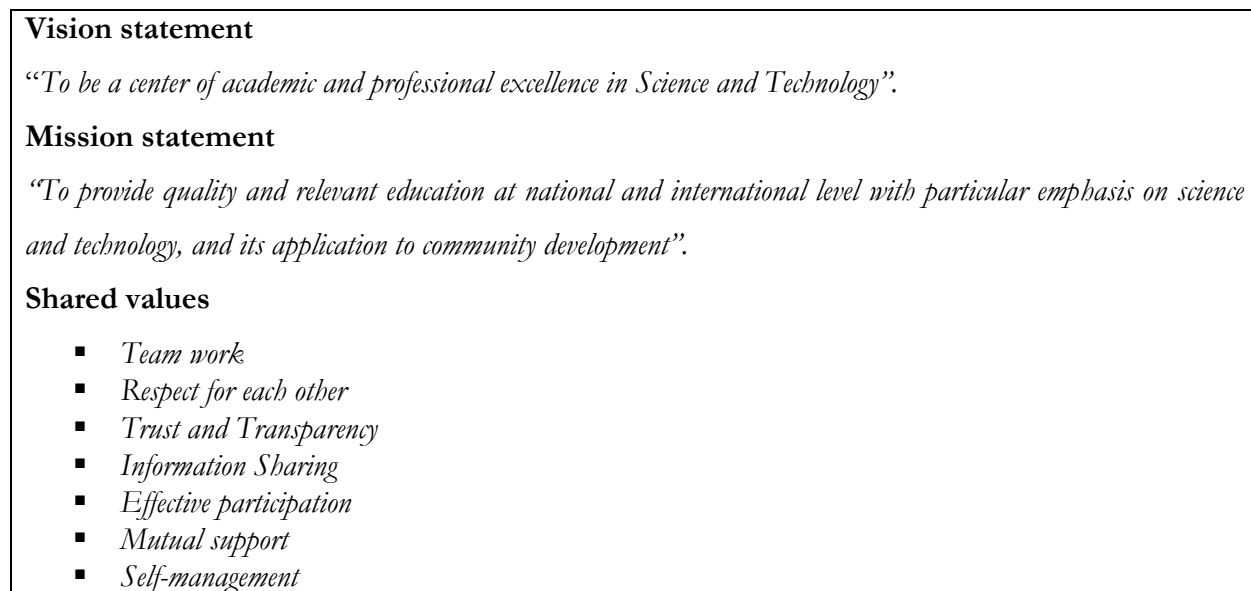
With 3,508 students as of January 2012, MUST currently has two faculties and four institutes. The two faculties are the Faculty of Medicine and the Faculty of Science. The four institutes are the Institute of Interdisciplinary Training and Research; the Institute of Computer Science; the Institute of Management Science; and the Institute of Tropical Forest Conservation. The University is also in the process of establishing the Faculty of Applied Science and Technology. The enrolment of students at MUST has steadily increased since its inception in 1989, when it started with only 43 students admitted in the Bachelor of Medicine and Bachelor of Surgery (MBCChB) degree programme. As of January 2012, MUST had a total of 3,508 students enrolled in the different degree programmes at both the undergraduate and postgraduate levels.

Since May, 2012, MUST has embarked on an ambitious development plan in which it commissioned the construction of the new campus at Kihumuro located seven kilometres away on the Mbarara - Bushenyi road. This development has involved the construction of the Faculty of Applied Sciences and Technology. The University will also construct the Faculty of Energy, Petroleum and Mineral Studies, as well as the Science and Incubation centres in the new campus.

University mission

The university is driven by an orientation towards the development of excellence in Science and Technology and in being of service to the rural communities. The main aim of the university is to promote quality education, primarily in science and technology. Its key mandate is to impart university education within Uganda with a particular emphasis on scientific and technological education and their application to rural development. According to the university strategic plan 2004-2014, the core objectives of the institution are: to produce the necessary human resources in applied sciences, technology and management skills; to advance, transmit and preserve knowledge

from one generation to the next; to generate and disseminate knowledge and innovation; to provide services to the public in analysing and solving problems; and to teach students to understand and appreciate local, national, and international issues (Mbarara University, 2004). These objectives reflect the aspirations of the expressed in the university vision, mission and core values outlined in Figure 6.1 below.



Source: Mbarara University, 2004

Figure 6.1. Mbarara University’s vision, mission, and core values

As outlined above, the University’s overarching aim is to contribute locally, nationally, and internationally to work in science and technology.

University organisational structure

MUST has an organisational structure that is administered by three bodies: the University Council, the University Senate, and the University Top Management. The council members and its Chairman are appointed in line with the provisions of the Universities and other Tertiary Institutions Act of 2001. Under the same Act, the President of the Republic of Uganda is a Visitor. MUST is accredited by the National Council for Higher Education in Uganda. The University is also well-known for its efforts to train community workers and healthcare professionals. These efforts have received national and international recognition for best practices in outreach and community relations from the Association of Commonwealth Universities, European Union, and Civil Society of Uganda.

University Council. MUST is governed by the University Council. The Council is the supreme governing body of the University and is responsible for the overall administration and ensuring that the University objectives and functions are duly implemented. The council members include university staff, students, and members from the Ministry of Education, other government departments, university convocation, the private sector, and the general public. The University Council in MUST has five committees: the Finance and General Purpose Committee, the Planning and Development Committee, the Estates and Works Committee, the Appointments Board, and the Students' Welfare and Disciplinary Committee.

Leaders. As is the case in other universities, there are various leaders at MUST. The Chancellor is the titular head of MUST, who presides over all graduation ceremonies, and confers degrees and other academic titles and distinctions of the University. Under the direction of the Visitor (who is his Excellency the President of the Republic Uganda), the Chancellor also has the ability to order a visitation of the University to be conducted. The day-to-day running of the university is in the hands of the Vice Chancellor, who is responsible for academic, administrative, and financial affairs of the University. The Vice Chancellor is assisted by one Deputy Vice Chancellor as well as other top University officials, including the University Secretary, the Academic Registrar, the Dean of Students, and the University Librarian.

University Senate. The University Senate is responsible for the organisation, control, and direction of academic matters at Mbarara. It is responsible for teaching, research, and general standards of education and assessment. Members of the University Senate include academic staff, senior administrative staff, non-academic staff, the public, students, and appointees of the Minister of Education and Sports.

Faculty boards. Each faculty/institute has a board chaired by the Dean or a Director, in case of the institutes. Decisions made at the faculty level feed into Top Management Committee, Senate, and the University Council, in that order. The university also has the Contracts Committee as a requirement of the Public Procurement and Disposal of Public Assets Act 2003. This Committee is made up of five members and works closely with the University Procurement Unit, to ensure fairness, transparency, and value for money in the procurement process.

Central grants office. In addition to the structures of the university responsible for academic, financial, and administrative affairs, the University also has a central grants office. This office is responsible for coordinating all research grants projects in the university, sourcing grant opportunities, and motivating the academic staff to write proposals and compete for research funds. It also supports the researchers by providing any relevant information they need to compete and win research grants. This office also supports researchers in complying with the funding bodies and reporting/account for disbursed research funds. As described above, there is some university management support for research and innovation.

Institutional Review Board. As part of its institutional governance structure, MUST has also established an Institutional Review Board to increase participation in research in Uganda. Certified by the Uganda National Council for Science and Technology, the organisation's main purpose is to review the science and ethics of national and international research proposals/protocols submitted to the Board, while safeguarding the rights, safety, and welfare of the research participants involved in research studies.

Innovation centres. While MUST strives to promote academic and professional excellence in science and technology, there is still a need for more institutional structures and supports. At the time of the report, there were still no operational innovation centres at the University. That said, University administrators were in the process of developing a Science and Innovation Incubation centre to be hosted at the new campus in Kihumuro. Some MUST academics were also in the process of partnering with the 'Consortium for Affordable Medical Technologies,' an initiative involving researchers and practitioners in Uganda and abroad, who want to develop affordable health technologies for the poor.

Academic units and programmes. As a university, MUST is continuously expanding and developing by introducing new academic units and programmes. As of October 2014, it had four faculties and three institutes: the Faculty of Medicine; the Faculty of Science; the Faculty of Applied Sciences; the Faculty of Development Studies; the Institute of Computer Science; the Institute of Tropical Forest Conservation; and the Institute of Interdisciplinary Training and Research. Within the above mentioned academic units, MUST offers 13 bachelor degree programmes, 19 master's degree programmes, and six doctoral programmes.

University policies and guidelines

There are limited university policies and guidelines in place at MUST University. At the time of our investigation, most of the institution's policies were still in the developmental stage. That said, the University has successfully implemented a Research Policy that advises staff on how to deal with innovations, as well as how to protect the rights of people who make discoveries and innovations (by implementing intellectual property rights). While formal policies are still in progress, our interviews with senior university administrators revealed that its leaders are committed to creating a learning environment that integrates different disciplines and attends to the needs of the communities. To a large extent, the university places a lot of emphasis on applied research, teaching, and learning that incorporates aspects of community outreach. One senior member of the administration remarked in an interview:

The focus of the university is in using a multi-disciplinary approach to training. In this respect, the training policy is geared towards service courses and it is a requirement that every new course should have a structure that includes a practical approach to training with a community outreach component before it can be approved by the university senate²⁶

As the administrator remarks, community outreach is built into the curriculum. The university emphasises research uptakes in the community as well as by communities and community-based organisations.

Initiatives and structures shaping external interactions

There are various University-based initiatives, structures, and incentives shaping external interactions. While our interviews with university officials and academics suggest the incentives provided by the university are not sufficient in motivating academic staff to take part in interactions with external social partners, there are some structures in place that we will highlight in this section. The structures that shape—both constrain and enable—academics to participate in external interactions are primarily related to funding/support and recognition/promotion.

²⁶ From interview with Mbarara University senior administrator

Funding and support. While our analysis found there are limited resources provided for community-based interactions, we did find there were some incentives. The University encourages its academic staff to seek external funding for research (with support from the University research grants office). The University has also tried to identify academics in other institutions with whom its faculty members can collaborate. In this regard, senior scholars from collaborating universities can collaborate with MUST researchers in order to develop research projects. MUST academics are also being encouraged to write research grant proposals through the coordination of the research grants office. The University also provides some limited funds to support academics in presenting papers at academic conferences. One qualifying condition for these funds is that the research done should involve communities and should be able to provide feasible interventions in solving socio economic problems in the communities. This encourages staff to focus on solving community problems. The University also offers some funding for academics to travel to conferences. The University also offers staff development fellowships to support staff in engaging in interactive activities with external social partners. This helps to promote research projects that involve analysing community livelihood problems and providing interventions to overcome the problems and or influence public policy.

Recognition and promotion. The university values research and scholarly outputs. In order to get promoted, academics need to undertake research and publish in peer reviewed journals. They are also encouraged to engage in community outreach work, which is a part of the criteria for promotion. Promotion is performance based and requires academics to engage with the external community through research or community service work. This hiring practice encourages community engagement. The university also recognises outstanding academic work both in the MUST newsletter and in the Medical Students Journal. These outlets help to draw attention to the work of academics who are engaging with external social partners and in particular communities. This publicity can encourage academics to engage with external social partners. In speaking of how the University tries to support research, one University official stated:

There are limited incentives to the academic staff to support their quest for research and development. However, collaborating institutions sometimes give awards to outstanding researchers e.g. under the collaboration with Harvard University. There is an annual research dissemination conference that is based on a call for papers by the Vice Chancellor and in this conference it is now being suggested that researchers with

good quality papers are rewarded for their contribution to research. Sometimes there are also initiatives at faculty level aimed at providing incentives to staff to engage in research activities and innovation. A good example is the CAMTECH programme under the Faculty of Medicine which gives opportunity for creative people to come together and showcase their potential by contributing ideas for innovation. However, the low pay for the staff is a disincentive for people to concentrate on academic work²⁷

As the University official highlights, additional efforts are needed to support structural and policy reforms in order to encourage more staff to engage with external social partners and to support inclusive development.

Patterns of interaction

In this section, we map the scale and patterns of interactions within and between the MUST university academics and external social partners. The section details findings from our 2013 study of 30 MUST academics²⁸. It is important to highlight that the findings from this component of the study are not generalisable. That said, we did opt to compute the findings in order to promote readability and in order to better identify patterns emerging. Below we present an analysis of the key external social partners academics at MUST tend to interact with, the types of relationships that the academics engage in, the channels used in information and knowledge transfer, the outputs of interaction, the outcomes and benefits of interaction, and the obstacles and challenges to engage in such interactions. Results for each of the points of analysis are included in the tables below. Each of the tables consists of the computed Weighted Average Index (WAI) and the Standard Deviation, which was data derived from the 2013 survey of academics at MUST.

Key external social partners

Findings from our questionnaires illustrated that MUST academics tend to interact most frequently with the following external social partners: (1) funding agencies; (2) national universities; (3) individuals and households; and (4) other African universities. While interactions with individuals and households did rank quite high for the academics, the findings illustrate that the most important

²⁷ From an interview with Mbarara University senior official

²⁸ At Mbarara University of Science and Technology, 50 academics were contacted to participate in this component of the study, with 30 agreeing to complete the questionnaires. As was the case with the other two public universities, the sampled academics were assisted by members of the research study team to complete the questionnaires.

external actors for MUST academics were academic and formal in nature. It is important to note though, that the degree and pattern of interaction varies from one discipline to another, depending on the significance of the interactions in their teaching programmes, the level of research involving the communities, and the level of funding opportunities to support the interaction programmes. For the academics we surveyed, the least important interaction were with: (1) trade unions; (2) civic association; (3) political organisations; and (4) religious organisations. Table 6.1 below illustrates these findings in greater detail.

Table 6.1. *External Social Partners (Weighted Average Index and Standard Deviation)*

Social Partners	WAI (Mean)	Std. Deviation
Funding agencies	3.0333	.49013
National universities	3.0323	.75206
Individuals and households	2.8710	.80589
African universities	2.8387	.63754
International universities	2.8387	.77875
Non-governmental agencies (NGOs)	2.8065	.65418
Science councils	2.8065	.79244
National regulatory and advisory agencies	2.7742	.61696
Local government agencies	2.6774	.54081
A specific local community	2.6774	.79108
Development agencies	2.6774	.83215
National government departments	2.6129	.76059
Provincial/regional government departments or agencies	2.5806	.50161
Welfare agencies	2.5806	.71992
Community organisations	2.4194	.88597
Small-scale farmers (non-commercial)	2.3871	.88232
Sectoral organisations	2.3871	.76059
Clinics and health centres	2.3548	1.01812
Small, medium and micro enterprises	2.3548	.83859

Schools	2.2581	.81518
Multi-national companies	1.9677	.94812
Social movements	1.9355	.67997
Large national firms	1.8387	.89803
Commercial farmers	1.8387	.86011
Religious organisations	1.6452	.70938
Political organisations	1.5484	.80989
Civic associations	1.4839	.72438
Trade unions	1.2581	.63075

Types of relationships with external social partners

Our findings from the questionnaires illustrate that the most important types of relationships **MUST** academics have with external social partners are related to educating, researching, and service learning. For example, the academics we surveyed reported the most important types of relationships are: (1) educating students to be socially responsive; (2) monitoring, evaluating and performing needs assessments; (3) service learning; and (4) engaging in community-based research projects. As a university striving to use Science, Technology and Innovation (STI) to contribute to socio economic development, it is not surprising to find that the most important types of relationships that academics at the university use in their interactions with external social partners are largely geared towards engaged learning, involving research and community problem solving. At the forefront of this is the education of students to be more socially responsible. It would appear that as the university strives to fulfil its traditional mandate of teaching and supporting learning, this is done in a manner that seeks to prepare the graduates to be responsive to social needs of the communities. Our findings also show the types of relationships that are considered to be less important are those that use linkages with formal organisations both in the public and private sector. More particularly, academics viewed: (1) commercialising new products; (2) transferring technology; (3) engaging in contract research; and (4) designing, prototyping and testing new technologies as the least important interactions. This suggests that academics do not value interactions with formal organisations in the private and public sector. This finding is similar to Cloete et al.'s (2011), who reported that university – government – industry relationship is weak in most of sub-Saharan Africa.

Table 6.2 provides a detailed overview of the most to least important types of relationships that the MUST academics we surveyed engage in with external social partners.

Table 6.2. *Types of Relationships between Academics and External Social Partners (Weighted Average Index and Standard Deviation)*

Types of Relationships	WAI (Mean)	Std. Deviation
Education of students so that they are socially responsive	3.0000	.44721
Monitoring, evaluation and needs assessment	3.0000	.73030
Service learning	2.9000	.66176
Community-based research projects	2.8387	.63754
Participatory research networks	2.8387	.89803
Alternative modes of delivery to accommodate non-traditional students	2.8065	.60107
Policy research, analysis and advice	2.8065	.79244
Work-integrated learning	2.8000	.61026
Continuing education or professional development	2.7419	.72882
Student voluntary outreach programmes	2.6774	.83215
Collaborative curriculum design	2.6774	.70176
Expert testimony	2.6774	.65254
Collaborative research and development projects	2.6774	.70176
Design and testing of new interventions or protocols	2.6129	.91933
Customised training and short courses	2.5161	.76902
Research consultancy	2.5161	.81121
Clinical services and patient or client care	2.4516	.99461
Design, prototyping and testing of new technologies	2.4516	.80989
Contract research	2.4516	.76762
Technology transfer	2.1290	.76341
Joint commercialisation of a new product	1.6129	.84370

Channels of information on knowledge transfer to external social partners

The study also sought to identify the most important channels of information and knowledge used by the academics in their interactions with external social partners. For the academics we surveyed, the most important outlets were through: (1) public conferences, seminars or workshops; (2) informal information exchanges; (3) training, capacity development or workshops; and (4) students. It is striking that the traditional channels used by the academics are considered to be the most important channels for disseminating information and knowledge to external social partners. It is also important to note that these channels are mainly used in academic engagements. It is also important to highlight the importance of students, who are viewed as an important tool to disseminate information and knowledge to the university's external social partners. This tool is pragmatically being used by academics in disciplines like medicine and education. Some academics also mentioned transferring knowledge through reports and policy briefs, popular publications, research networks, participation in community programmes, as well as action research, which is most typically geared to formal public organisations, development agencies, and the private sector. The least important channels for academics to disseminate information and knowledge to their external social partners were through: (1) spin-off firms from the university; (2) patent applications and registrations; (3) software development or application for social uses; and (4) technology incubators or innovation hubs. These channels are more technical or scientific and are typically geared to private sector industries. One explanation for the low rank is that there is limited research of an advanced scientific nature happening at MUST. Table 6.3 highlights the most important channels to transfer knowledge for the MUST academics we surveyed.

Table 6.3. *Channels of Information and Knowledge Transfer (Weighted Average Index and Standard Deviation)*

Channels of Information and Knowledge Transfer	WAI (Mean)	Std. Deviation
Public conferences, seminars or workshops	3.3548	.48637
Informal information exchange	3.1935	.65418
Training and capacity development or workshops	3.0645	.77182
Students	3.0323	.60464
Reports and policy briefings	2.8710	.88476

Popular publications	2.7742	.66881
Oral or written testimony or advice	2.7742	.66881
Demonstration projects or units	2.7742	.66881
Cross-disciplinary networks with social partners	2.6774	.70176
Research contracts and commissions	2.6452	.60819
Participatory or action research projects	2.6129	.49514
Intervention and development programmes	2.3548	.70938
Radio, television or newspapers	2.2258	.84497
Technology development and application networks	2.0645	.81386
Interactive websites	1.7742	.88354
Technology incubators or innovation hubs	1.7097	.78288
Software development or adaptation for social uses	1.5806	.80723
Patent applications and registration	1.2903	.69251
Spin-off firms from the university (commercial or not for profit)	1.2581	.57548

Outputs of interaction with external social partners

Our analysis of the outputs of interactions shows that—for the MUST academics we surveyed—the most important outputs are academic. They mentioned (1) educating graduates with relevant skills; (2) producing dissertations; (3) producing academic collaborations; and (4) producing academic publications as the most important outlets. This focus on academic outputs is not surprising because the key function of the university is teaching, learning, and research with the results obtained in form of graduates, dissertations, publications, and policy documents. For the academics we surveyed, the least important outputs identified were: (1) cultural artefacts; (2) spin-off companies; (3) scientific discoveries; and (4) new or improved products. It is striking that these genres do not have the same weight as MUST academics are typically promoted for their research or academic outputs—not for their cultural or technical contributions. See Table 6.4 for a detailed overview of the most important to least important types of outputs from the interactions.

Table 6.4. *Outputs of Academic Interactions with External Social Partners (Weighted Average Index and Standard Deviation)*

Outputs of Interactions	WAI (Mean)	Std. Deviation
Graduates with relevant skills and values	3.4194	.50161
Dissertations	3.1613	.63754
Academic collaboration	3.0968	.59749
Academic publications	3.0000	.57735
Reports, policy documents and popular publications	3.0000	.73030
New or improved processes	2.5161	.67680
Community infrastructure and facilities	2.2903	.69251
New or improved products	2.0645	.62905
Scientific discoveries	2.0323	.70635
Spin-off companies	1.5806	.76482
Cultural artefacts	1.4194	.67202

Outcomes and benefits of interaction with external social partners

As a part of our study, we also surveyed MUST academics about what they felt the most important outcomes and benefits of their interactions were. The most important outcomes and benefits related to learning and capacity development of the university students and other community members. The academics we surveyed identified the most important outcomes and benefits to be the following: (1) public awareness and advocacy; (2) improved teaching and learning; (3) academic and institutional reputation; and (4) training and skills development. Much of academics' work at MUST is geared to community-based and educational initiatives and these findings illustrate that a significant amount of outcomes and benefits are geared towards community empowerment. This further reinforces other efforts towards improving learning in the university and trying to be of use to the community. For the academics we surveyed, the least important outcomes and benefits identified included: (1) firm productivity and competitiveness; (2) firm employment generation; (3) novel uses of technology; and (4) incorporating indigenous knowledges. The fact that incorporating indigenous knowledges is viewed as somewhat less important is important to highlight as

incorporating indigenous knowledges can be a key outcome for interactions with marginalised communities. This could also suggest that initiatives may need to shape the conversation in academia to better integrate different forms of knowledges. It is also important to highlight that many of the least important outputs typically happen in interactions with private sector firms. This, again, shows that private sector interactions are limited in scope. This is likely to be because of the weak linkages between the university academics and the private sector. See Table 6.5 for a summary of the data.

Table 6.5. *Outcomes and Benefits of Academic Interactions with External Social Partners (Weighted Average Index and Standard Deviation)*

Outcomes and Benefits of Interaction	WAI (Mean)	Std. Deviation
Public awareness and advocacy	3.3448	.66953
Improved teaching and learning	3.2903	.58842
Academic and institutional reputation	3.1613	.77875
Training and skills development	3.1290	.71842
Community-based campaigns	3.0968	.74632
Intervention plans and guidelines	2.9677	.87498
Policy interventions	2.9355	.62905
Improved quality of life for individuals and communities	2.8710	.84624
Cross-disciplinary knowledge production to deal with multi-faceted social problems	2.8710	.56225
Improved livelihoods for individuals and communities	2.7742	.88354
Community empowerment and agency	2.7419	.63075
Relevant research focus and new research projects	2.7097	.82436
Theoretical and methodological development in an academic field	2.6774	.65254
Regional development	2.6452	.60819
Community employment generation	2.5161	.76902
Participatory curriculum development, new academic programmes and materials	2.4839	.62562

Incorporation of indigenous knowledge	2.3548	.60819
Novel uses of technology	2.1290	.95715
Firm employment generation	1.7097	.78288
Firm productivity and competitiveness	1.4839	.76902

In-depth interviews also revealed that the reports and publications generated through academic engagement with external social partners have, in some cases, yielded improvement in public policy. In this regard, they have contributed to the design of interventions to solve community problems, for example in health care delivery. Other benefits have included changes in attitudes among community members. For example, community members have adapted more sustainable practices for natural resources and conservation, engaged in more productive economic work, and improved the operations of the police force through ICT training and hence better service to the communities. All of these outcomes have supported the university's mission to contribute to community development.

From our interviews and questionnaires, we also learned that, for MUST academics, the opportunity to earn an extra income is a huge motivator for external engagement. Income generating projects allow academics to earn extra money while engaging with external social partners through research, training or capacity building. This is key as it allows academics to supplement their income.

Obstacles and challenges of interaction with external social partners

An important objective of this study was also to identify and analyse the obstacles and challenges that impede interactions between academics and external social partners. The challenges academics identified in this regard included: (1) sustainable external funding; (2) limited financial resources for competing university priorities; (3) lack of clear university policies and structure to promote interaction; and (4) competing priorities on time. In this respect, poor funding, heavy workloads stemming from limited academic staff, absence of a clear university policy on interactions, and lack of skills in negotiating access to the external social partners are all factors that hinder academics' abilities to interact with social external partners. As one senior academic remarked:

Poor funding of higher education and in particular universities in Uganda has affected the capacity of MUST to fund activities that promote interactions with external social actors and the generation of innovation needed to support inclusive development. As a result of the poor funding, facilitation for community outreach activity is poor and the university faculty lack motivation to engage with communities²⁹

It is also evident that the bureaucratic tendencies in the university, absence of rewards for interactions, and the social inequalities between the academic staff and the external actors negatively contribute to supporting such interactions. Other constraints include: academic ideology, lack of knowledge about partners' needs and priorities, risks associated with the use of students, and legal problems associated with interacting with external actors. While there are many challenges, the academics who participated in our questionnaire were least concerned about: (1) legal problems; (2) risks of student involvement; (3) the lack of mutual knowledge about partners' needs and priorities; and (4) tensions between traditional and new academic paradigms. The result of this analysis is presented in Table 6.6.

Table 6.6. *Obstacles and Challenges faced by the Academics in their Interactions with External Social Partners (Weighted Average Index and Standard Deviation)*

Obstacles and Challenges to Interactions	WAI (Mean)	Std. Deviation
Sustainable external funding	3.5161	.62562
Limited financial resources for competing university priorities	3.4839	.50800
Lack of clear university policy and structures to promote interaction	3.2581	.51431
Competing priorities on time	3.1935	.65418
Negotiating access and establishing a dialogue with external social partners	3.0323	.60464
Too few academic staff	3.0000	.63246
University administration and bureaucracy does not support academic Interaction with external social partners	2.9355	.81386

Institutional recognition systems do not reward academic interaction activities sufficiently	2.9032	.65089
Unequal power relations and capabilities in relation to external social partners	2.8065	.74919
Tensions between traditional and new academic paradigms and methodologies	2.6774	.54081
Lack of mutual knowledge about partners' needs and priorities	2.5806	.71992
Risks of student involvement in Interaction with external social partners	2.4667	.62881
Legal problems	1.7419	.81518

In regard to this issue of constraints, findings from our interviews also illustrated that challenges to interactions also stem from documenting the interactions. For example, we learned that some academics worked to integrate computer software into health management in rural areas but this integration has not been formally brought about. Similarly, other interviewees alerted us to the fact that a substantial amount of work has been done in the university in relation to interactions with external social partners that has not been documented. For example, one academic remarked:

There are many results of interaction between faculty in MUST and the external community members that have yielded positive outputs but unfortunately they have not been documented. There is need to document these achievements and also have a tracer study to determine the level of success and impact created by the research outputs and innovations³⁰

The above observation clearly indicates that one may not be able to accurately account for the interactions with external social partners due to lack of records or low levels of reporting. Similarly, in some cases, useful results are derived from research work but, because they are not patented or published in highly ranked peer reviewed journals, they may be shelved and hence not counted as outputs from interactions. Under reporting is therefore likely to paint a false picture in terms of how much the University has been achieved in relation to interactions with external social partners.

³⁰ From an interview with Mbarara University senior administrator

Particular patterns of interaction

We also interviewed MUST administrators and academics about academics' interactions with social partners. In the interviews, they identified several past and present interactions in which MUST academics have been involved. Such interactions have included community-based education (that sees students interacting with communities as a part of their coursework), student field attachments (that see students participating in communities to graduate), as well as teaching/research programmes, and outreach programmes.

Community-based education. The University encourages learning that integrates both classroom learning and community service. Students are required to engage with community as a part of their training and research. For example, in the Faculty of Medicine, Institute of Computer Science, Institute of Development Studies, and the Institute of Tropical Forest Conservation, training involves field attachments and work in the communities. A key reason for this activity is to motivate students to serve in rural communities following completion of their studies. For example, one senior university manager stated:

The university policy requires academic staff to involve students in their research and to take these research projects to the communities so that students are helped to develop strong mindsets for working with communities³¹

Similarly, an official from the Department of Planning stated:

The university has developed a strong orientation towards training students with a focus on community development challenges. To achieve this, it has made it compulsory for all university students to enrol for a course in development studies and this is being emphasised in all academic disciplines in the university. The teaching of development studies is considered to be important in helping the students to understand and appreciate work in communities. This helps in shaping the attitudes of the students towards appreciating community problems and development challenges and through that be able to actively and effectively serve in those communities after graduation³²

³¹ From interview with Mbarara University senior administrator

³² From interview with Mbarara University official

It would appear that an outward oriented approach to training is helping the university to produce graduates who can serve in the communities and also provide opportunity for reaching out to the communities and be able to share useful knowledge for purposes of socio- economic development.

Student field attachments. While community engagement is built into students' course requirements, students are also required to participate in field attachments. One senior academic and university administrator remarked:

The main interactions that involve work in the communities have been formalised and institutionalised in that the university identifies communities or organisations in the communities and a memorandum of understanding is signed with the external partner. Students are placed in these communities to study or undertake practical work. For example, medical students go to work in rural health centres and are supervised by their professors. Students of science education also go to rural schools to undertake their school practice under supervision of their professors. Individual academic staff sometimes also undertake their personal initiative to engage with communities through research and specific development programmes³³

Another senior university official observed:

When students are engaged in their internship or community outreach activities, they facilitate community learning. In the case of medical students, community clinics, are used to create community awareness. At the same time, the interactions in the communities help the students to learn about what is going on in the communities, how people live their lives, the socio-economic context in which they live, and how this contributes to their quality of life, particularly health and nutrition. This will place the students in a much better position to determine the issues that they should focus on in creating community awareness on improved hygiene and preventive healthcare³⁴

Teaching and research programmes. There are a number of teaching and research programmes at MUST that involve interaction with communities, some of which are actually marginalised. For example, there is the Community Based Medical Education (CBME) programme based at the Faculty of Medicine, the Research in Practice and the Community Placement based at the Faculty of

³³ From an interview with a Mbarara University senior administrator

³⁴ From an interview with a Mbarara University senior official

Development Studies, and the Research and Capacity Building for Nature Conservation based at the Institute for Tropical Forest Conservation (ITFC) in Bwindi. More information about all three programmes is outlined below (as compiled from interviews conducted in 2013). Community Based Medical Education (CBME) at the Faculty of Medicine is responsible for training health service providers to better support the health needs of the people. The aim of CBME is to prepare health service providers to provide community-based support and to promote socio-economic development in both rural and urban areas. To achieve this, the university has, over the years, developed an approach the CBME programme that places students in communities to undertake their clerkship and learn how to diagnose health problems in the communities. CBME promotes interactions, sharing experiences, and co-learning. The Faculty of Development Studies has developed the 'Research in Practice' community placement. Through this placement, students are involved in community-based research. Working in teams, they are tasked with contributing practical, research-based solutions to community problems. In some instances, selected MUST students are paired with visiting students from other foreign universities who are under the student exchange programme and they are made to work on a research and community development project under the supervision of an academic staff from MUST. In addition to the above programmes, the university has also developed and implemented a research and capacity building programme in conservation hosted at the ITFC in Bwindi. ITFC, the focus of one of our case studies, is a post-graduate research institute that supports and undertakes research, monitoring, and capacity development in order to improve conservation understandings and practices in the region. ITFC works closely with communities to understand the environmental context, and to identify interventions to promote the sustainable use of natural resources.

Outreach programmes. There are a number of community outreach programmes at MUST, including, the leadership and community placement programme, business clinics, community peace and conflict resolution, promotion of awareness on Science and Technology through the School Visitation Programme, the application of ICTs in Community Policing and the Army. For purposes of illustration, we will discuss two important examples of these initiatives - the Leadership and Community Placement programme and the Promotion of Science and Technology School Visitation Programme (Information Communications Technology for All - ICT4All). The Leadership and Community Placement programme is a course carried out in the fourth year of students' medical training that emphasises the use of the multidisciplinary approaches to understand and manage

healthcare challenges in the community. The course aims to instil leadership knowledge and skills to medical students in order to support them to become stronger community health managers. The course supplements the other courses undertaken by students in primary healthcare, community diagnosis, health systems, and family medicine. As a cross cutting course, it is expected to develop managers who can lead effective implementation of primary healthcare and Uganda's minimum healthcare. It is also expected to help the students develop positive attitudes towards working in rural community placements.

The Information and Communications Technology for All programme brings together academics from the Institute of Computer Science and members of the community. The aim of this programme is to improve the livelihoods of the people in marginalised communities through technology. The programme has worked with community leaders, rural school teachers and their head teachers to adopt, implementing, and manage new educational technologies. The programme also provides technological support for marginalised communities in the form of re-furbished or new computers, providing internet, educational software, and technical support.

Figure 6.2 highlights particular interactions, including, research projects, community-based education programmes, university partnerships, and outreach programmes in which MUST academics and their students are currently involved.

As one academic testified:

We have been involved in a regional research project with researchers from Tanzania on the Lake Victoria Environment Management Project. As a sociologist, I have worked with fisheries scientists and engineers in this project to develop low cost technology to process fish waste into commercially viable products. As a result of this study we have developed policy briefs to guide governments on how to scale up these technologies so as to benefit more poor people who live on the shores of the Lake Victoria that is now being threatened by environmental degradation³⁵

One University academic stated:

³⁵ From an interview with a Mbarara University academic

Students pursuing courses in education have been to communities without schools and mobilised the community members to use locally available resources to build a model school³⁶

An official from the Department of Planning and Development stated:

The university maintains active collaborations with a number of universities abroad. These include but are not limited to: Massachusetts Institute of Technology (MIT), Harvard University, University of Rwanda, Vellore Institute of Technology, Lund University, Maastricht University, University of Ghent, Calgary University. All these collaborations are useful in that they facilitate MUST academic staff in getting access to state of the art research facilities in these universities and also improve their capacity to undertake advanced scientific research. Joint publications with senior professors from these universities further helps in raising the profile of academics in MUST and its reputation³⁷

One senior administrator remarked:

Through the different outreach programmes, MUST has been able to contribute towards solving community problems and this has impacted on the livelihoods of the people in rural communities. For example, university experts in medicine and health sciences have been reaching out to the government health centres and providing their expertise to solving health problems beyond what the Ministry of Health staff can do. This has impacted greatly in improving health service delivery in rural areas and hence improved health care and livelihoods of the people³⁸

An official from the Department of Planning stated:

The university has developed a strong orientation towards training students with a focus on community development challenges. To achieve this, it has made it compulsory for all university students to enrol for a course in development studies and this is being emphasised in all academic disciplines in the university. The teaching of development studies is considered to be important in helping the students to understand and

³⁶ From an interview with a Mbarara University academic

³⁷ From an interview with a Mbarara University senior official

³⁸ From an interview with a Mbarara University senior administrator

*appreciate work in communities. This helps in shaping the attitudes of the students towards appreciating community problems and development challenges and through that be able to actively and effectively serve in those communities after graduation*³⁹

Conclusion

This chapter examined MUST University's structures, policies, and initiatives as well as patterns of interaction of MUST academics with external social partners. The aim of the University, as we have explored, is to promote scholarship in science and technology while also contributing to community development. This focus informs the teaching, research, and innovation efforts, and, to an extent, its academics' external social partnerships. Our analysis of the institutional structures/supports illustrate that—while some structures help to foster interactions—others work to constrain them.

The University has various community-based education programmes built into its academics programmes as students are required to engage with communities as a part of their coursework, as well as to satisfy their programme requirements. Academics are also motivated to engage externally to receive funding, to secure promotions, and to receive recognition. While there are some formal institutional supports in place to encourage interactions, we also found that interactions are constrained by limited funding, difficulties accounting for/documenting interactions, and inadequate resources/supports to sustain interactions. Many academics felt the university had inadequate incentives for them to engage with external social partners. Given that academic staff are poorly paid (and there are few research funding opportunities currently available), many academics tend to opt to fulfil their teaching requirements without investing in research. In mapping patterns of interaction, we also learned that although MUST focuses on science and technology, there few interactions are focused on the private sector. Instead the majority of interactions are academic or community-based, involving other universities, funding agencies, or communities. Similarly, most outputs are of an academic nature and most channels for exchanging knowledge are academic.

The case study in Chapter 9 is an example of a research-based interaction between MUST University academics and the Batwa community. While this chapter gave an overview of patterns of the interactions and of University's structures shaping interactions, the case study details a particular

³⁹ From an interview with a Mbarara University senior official

interaction. The case study also examines the ways MUST academics have worked to bring about innovation and support inclusive development at a local level.

Chapter 7. Supporting the Livelihoods of Traditional Health Practitioners (THPs) through interactions with Makerere University Academics



Figure 7.1. *Ways of preparing herbal medicine in rural communities in Uganda. [Source: National Council for Traditional Healers and Herbalists Association in Uganda.*

This case study details interactions between Makerere University (MAK) researchers and Traditional Health Practitioners (THPs) in Buyijja, a community in central Uganda. The interaction responded to a troubling situation: the Buyijja THPs needed to extract herbs from their local environment in order to be able to provide healthcare to their community members, as well as sustain their livelihoods; however, engaging in this activity was destroying the environment. Therefore, they had to find alternative ways of sustaining their livelihoods and supporting the health needs of the local community. Responding to this challenge, the aim of the interaction was to support the livelihood of the THPs while also supporting the sustainable use of local resources and providing traditional healthcare to meet the needs of a population with limited health supports. The interactions involved researchers from MAK working with THPs to conduct research and strengthen herbal medicine knowledges and practices. With knowledge flowing bi-directional, from the community to the university and vice versa, the interactions brought about different innovations for inclusive development. More particularly, the interactions brought about process innovations, introducing alternative and more-sustainable ways of harvesting, extracting, preserving, and packaging herbal plants. The interactions also brought about organisational innovations, helping the THPs organise with one another. While the case did support both the community actors and university actors involved, it also made a significant contribution to the local community—both to support the health

and nutrition of the community, as well as increase the sustainability of the land. The research-centred interaction is also an example of how scientific knowledges and local/traditional knowledges can be integrated to support innovation. The case is unique in that it contributes mutually to the community and the university while also supporting the ecological sustainability of the area.

The 'Traditional Health Practitioners' community in Buyijja is a marginalised community of herbalists and spiritualists, who use herbal medicine to support the healthcare needs of community members, as well as sustain their own livelihoods. The THPs include people who refer to themselves as herbalists, spiritualists, diviners, and faith healers. As a part of their work, THPs supply herbal medicine and other traditional forms of health care to the community from their homes or from designated healing areas. Each member works independently to harvest, prepare, and sell herbs. There are few formalised supports/structures, no formally registered entities, and no formal links to pharmaceutical companies. That said, these individuals do have some established communal practices. For example, they are active in harvesting, processing, and selling herbal medicine. They also actively supply herbal medicine to the immediate community, to neighbouring villages, and to herbal medicine dealers who come from the neighbouring towns and Uganda's capital city, Kampala.

As of January, 2013, there were 800 THPs within Buyijja, who relied on five square kilometres of land to harvest their herbal medicines. Therefore, not only do these practitioners have limited access to natural resources, they also have a marginal social status in society as they are a disadvantaged, informal group, who live in an isolated community approximately 40 kilometres away from Kampala. The Buyijja community has very limited infrastructure and little to no economic opportunities outside of traditional healing or subsistence farming. The community is underdeveloped with only one primary school and limited housing; there are small settlements of brick and mortar houses with old, rusty iron sheet roofs. THPs are quite marginalised and their traditional practices are often viewed as 'backward' and 'uncivilised.' That said, they play a critical role in supporting the primary health care needs of their surrounding community as many people in the community cannot access medical centres where western-based medical care is provided (due to the long distances between their homes and the centres, the poor transportation infrastructure, and

the costs of medical services and pharmaceuticals). Thus, the THPs play a vital role in a community with limited and inadequate governmental supports.

As outlined briefly above, this interaction between MAK researchers and the THPs of Buyijja was motivated by a troubling situation in the community. The THPs were experiencing profound livelihood challenges as the herbal plants they use for the medical practices were being over-exploited. This threatened both the growth and survival of the eco-system, the health of the community, and the livelihoods of the THPs. The government had also restricted the community's access to the forests and wetlands in order to protect the growth and survival of the herbal plants. This was troubling as the THPs needed to extract herbs from the land in order to support their livelihoods and support the health needs of the community; yet, in doing so, they were bringing harm to the local ecological system. It was for these reasons that the community of THPs sought support from the university. They wanted to find a way to sustain their livelihood practice, as well as improve the sustainability of their practices without bringing harm to the environment. Given the limited resources in the area, as well as the ways in which their access to natural resources had been restricted, they were in need of drastic changes. It is also worth noting, that working in traditional medicine was one of the only options for the community to sustain their livelihoods as other food and cash crops had deteriorated in the area.

Overview of the interaction

The interaction between the university and the THPs started in 1991 when the university conducted an ethnobotanical study on the Rwenzori Mountain forest area in Bundibugyo District in western Uganda. Published by Oryem-Origa, Kakudidi, Katende and Bukenya-Ziraba (1995), the study used a community participatory approach to explore human use of certain plants with the intent of creating an inventory of the plants in the area, as well as to identify conservation problems. The study helped the community understand the social and cultural value of the plants in their surrounding area, understand the importance of sustainable practices, and become involved in identifying solutions to local problems. Further, the research-based interaction helped build trust between the university researchers and the THP community.

While the initial research project helped the researchers build trust and establish ties in the community, the interaction between the MAK university academics and the THPs in the Rwenzori Mountains was interrupted in the late 1990s by the insecurity caused by the war between the Allied

Democratic Forces and the Government of Uganda Army. As a result, research scientists at Makerere University shifted their research sites to other more peaceful areas of Uganda such as the country's central regions, particularly around the Mabira Forest area in Mukono District approximately 40 kilometres from the capital city Kampala. From there, they extended their focus to other districts in Eastern and Northern Uganda. Initially the researchers did not have any formal agreement with the communities but rather informally engaged them as subjects in the research studies.

Eventually, the university researchers initiated a Memoranda of Understanding with the community in 2003 to ensure that ethical standards were being observed in their research practices and that the research was documented. This was a requirement of the university, and also became a requirement of the Uganda National Council for Science and Technology in order to uphold ethical standards. While the researchers were motivated to partner with the community, initially the THPs, who were from unstructured, informal communities, were reluctant to participate with the researchers. To overcome the THPs reluctance, the university researchers sought assistance from the traditional community leaders. One senior professor at MAK describes the beginning stages of this relationship:

In the beginning, the community members were reluctant to participate in the research. We then approached the traditional leader in the community who was able to talk to a few subjects. The subjects respect their traditional leader so were able to start moving to the bushes and forests to collect the herbal plant species. After collecting the herbs, the THPs would then come and tell us the plant name and explain what it is able to cure. The presence of the traditional leader was therefore instrumental in encouraging the THPs to open up and share with us their long cherished traditional herbal medicine knowledge⁴⁰

As the professor highlights, the THPs were initially reluctant and suspicious of the researchers' activities but eventually, over time, they became more active in working with the researchers. One way in which they were motivated to participate was that one of the researchers shared some information with them about the food and medicinal properties in local plants that they could use to improve their livelihoods. This researcher explains the situation:

⁴⁰ From interview with senior academic at Makerere University

I was able to document 48 plants used by the community. Out of these, I was able to successfully screen eight of the plants in the laboratory and they were all found to be quite nutritious. They were also found to be able to inhibit the growth of bacteria. I encouraged the community members to pick out some of the plants using improved methods, use the plant extracts for domestic purposes, and also process, and pack the rest for commercial exchange in the markets in order to earn income and improve their livelihood⁴¹

Once the community members realized how they could learn from and benefit from the university, they began to participate more heavily in the interaction. In turn, they have developed mutually beneficial relationships with the academics as they have been active in identifying and responding to their own livelihood issues in partnership with the academics. They have also helped the university academics identify different plants and provide information on their usefulness to the community as well as how they are harvested and prepared for use by the community members.

In 2005, PROMETRA Uganda, an Association for the Promotion of Traditional Medicine, contacted Makerere University to support the THP community. They wanted support in determining the efficacy and effectiveness of herbs in treating community diseases. Further, they wanted support in adopting more sustainable ways of practicing traditional medicine, improving the THPs' status in society, and improving the THPs' access to governmental supports. Having PROMETRA serve as an intermediary helped link the university to the THPs and strengthen the interaction.

With the support of PROMETRA, the THP community began meeting with academics at the Forest School in the Mpigi District near the capital city of Kampala, where they shared their traditional healing knowledges and practices with one another. Through this, they conducted research and trained herbalists. Under this arrangement, students from Makerere University were allowed to undertake their internship on ethnobotanical studies at the Forest School. This gave them the opportunity to interact with and learn from THPs who also come to the centre to learn. The Forest School collaboration helped to strengthen the connection between PROMETRA and the THPs. One community leader how this happened in his interview:

⁴¹ From an interview with a Makerere University researcher

We have worked together with MAK and PROMETRA to develop improved ways of harvesting and extracting herbs from plants. The partnership with MAK and PROMETRA has helped us to get training and adopt more sustainable methods of natural plant resource management. These include new, improved, and modern techniques of planting herbs, extraction of herbal medicine while minimising losses, packaging and marketing of herbs. We have also learnt and adopted improved methods of crop production, post-harvest management and marketing of agricultural products and handicrafts, as well as better ways of organising ourselves to fight for our rights⁴²

In this narrative account, the community leader details various innovations that have emerged in and through the THPs' interactions with MAK and PROMETRA. It is also important to note that the interactions, and subsequent innovations, have centred on the exchange of knowledge, flowing from the university to the community. One academic involved in the interaction stated:

We pick traditional healers and engage them in discussions regarding what they do and through this process, [and] gather a lot of knowledge from them. One such case was in a project funded by the Botanical Gardens International. Here we engaged the THPs in an exercise aimed at producing a priority list of medicinal plants from Uganda. THPs were mobilised to give their opinion and views as well as show their list of preference and priority for the herbal plants. The 'brainstorming' session yielded a lot of useful information on the preferred plants and why they are preferred. Another similar case was when we involved the THPs in discussions on the Draft Policy to regulate their conduct in Uganda. Different traditional healers were brought together and asked to give their views on what should be done to improve their conduct in Uganda. The focus here was on the code of conduct and ethics for the traditional healers and the policy on herbal medicine and traditional healers⁴³

Here the academic describes particular community-based practices that are used to exchange knowledge and learn from the community members. Throughout the interactions, the THPs and university actors began to work more collaboratively, sharing with one another. The THPs also increasingly took on leadership positions, educating others in their local community, as well as in the wider research community. For example, they shared their knowledges at research conferences at MAK University. Not only did the community produce knowledge, the university was also active in

⁴² From an interview with a THP community member.

⁴³ From an interview with a Makerere University academic.

writing user manuals for THPs on practices for propagating plants, harvesting plants, as well as on extracting, preserving, and packaging herbs. In addition, university researchers have been active in creating scientific records to codify and expand the community’s knowledge.

Structure of the interaction

Figure 7.1 below depicts the various actors involved in the interactions, the flows of knowledge and resources from and to each actor involved in the interaction, as well as how these knowledges contribute to the innovations emerging from the interaction. From there, Tables 7.1 and 7.2 provide overview of the organisational mandates of the primary and secondary actors involved in these interactions.

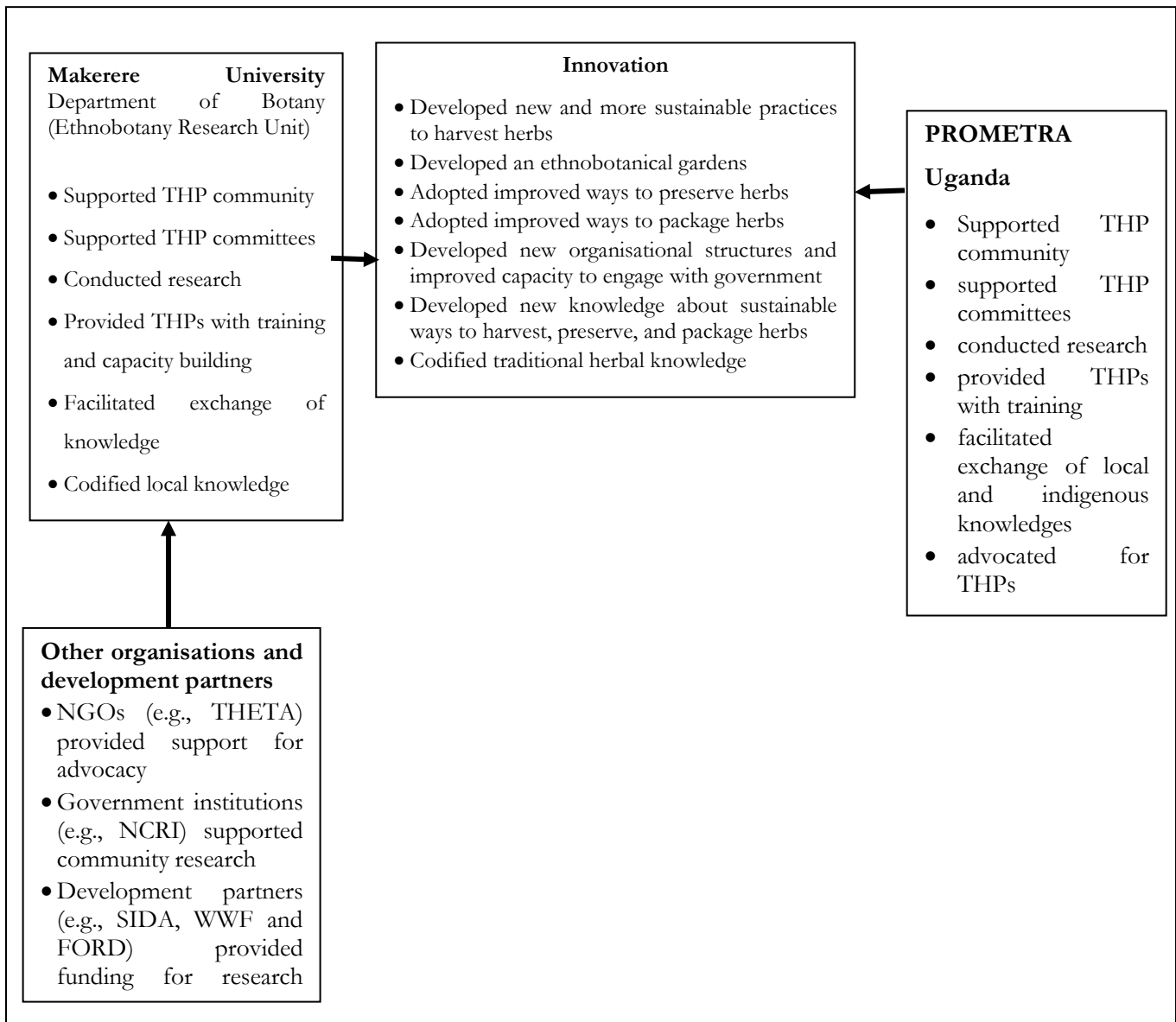


Figure 7.2. Structure and flow of knowledge in the interaction

Table 7.1. *Primary actors involved in the interaction*

Actor	
Department of Botany	The Department of Botany at Makerere University specialises in teaching and research in botany and, more specifically, ethno botany ⁴⁴ . They also collaborate with other departments at Makerere University (e.g., agriculture, forestry, environment, chemistry, pharmacology) and with other scientists both inside of and outside of Uganda. As a part of their work with the THPs in Buyijja, they tried to identify ways to improve the THPs' use of herbal plants, ways to harvest the herbal plants more sustainably, and ways to preserve and package herbal medicine.
PROMETRA Uganda	PROMETRA Uganda, an association for the promotion of traditional medicine, is an NGO and social enterprise that works to protect and nurture the medicinal plants that are important to traditional healers. It also works to conserve and sustain the use the plants and to document traditional information/knowledge about the plants in local languages to benefit the wider community. PROMETRA is a registered NGO with an executive director and a board of directors. PROMETRA works to support the livelihoods of the THPs in the Buyijja community.
Traditional Health Practitioners (THPs)	The THP community of Buyijja is an informal community, who have been practicing traditional healthcare for generations. As of January, 2013, there were approximately 800 registered THPs in Buyijja who depended on collecting plants from a forest that is five square kilometres. These plants are their primary source of livelihood.

⁴⁴ Ethno botany focuses on the relationship between plants and humans. More particularly, in this study, the researchers examined the pharmacological and nutritional properties of the herbs.

Table 7.2. *Secondary actors involved in the interaction*

Actor	
National Council of Traditional Healers and Herbalists Association of Uganda	Formed in 1990, NACOTHA is a non-governmental organisation of traditional healers and herbalists in Uganda. It aims to unite all THPs in order to improve their livelihoods, improve community health and health promotion, strengthen the use of traditional medicine in primary healthcare, and foster collaborations between traditional healers, herbalists, orthodox medical practitioners, and the community. NACOTHA organises community workshops, lobbies the government, and works to empower THPs across Uganda.
Natural Chemo-therapeutic Research Institute	NCRI is a government of Uganda Research Institution mandated to undertake research on traditional health practices in Uganda. Working under the Ministry of Health, NCRI tests the quality and safety of herbs, and then supports THPs by producing reports and offering training workshops in partnership with MAK and PROMETRA. NCRI has produced various policies and regulations to guide THPs' practices.
Traditional and Modern Health Practitioners Together Against Aids	Founded in 1992, THETA is a local organisation that supports the health needs of disadvantaged communities. THETA works to improve the health of Ugandans by promoting collaboration between traditional and biomedical health systems. A registered NGO since 2005, the organisation supports THPs in HIV prevention and care, and in mitigating the impact of HIV/AIDS on families, communities, and clinical care. THETA also supports research collaboration between THPs and bio-medical health practitioners.

Organisational arrangements and interface structures

Community. At the beginning of the interaction, the THP community was quite informal and unstructured. The community had struggled to organise, to mobilise their agenda, and to seek external support from others. The community of THPs had not worked together to articulate their community problems or to seek solutions to their challenges. As mentioned above, each member of the community tended to work independently to harvest, prepare, and sell herbs. There were few formalised supports and structures but there were no formally registered entities and no formal links to pharmaceutical companies.

University. Makerere University has helped to shape the interaction. First of all, it is important to highlight that Makerere does not have a highly structured and formal system to promote community outreach activities. Instead, the university has adopted a flexible system in which each academic unit is tasked with the responsibility of determining the most effective way to interact with external actors. The university defines social inclusiveness in a broad way so as to allow the institution's different units to adopt flexible ways to enact this concept, depending on their professional practices. The university encourages interactions with external social actors and maintains a culture of non-interference. As one senior academic at the University describes:

Since the university has developed a learning, research and innovation policy which calls for community engagement, as researchers, we have to go to the communities and study how these people interact with the environment especially the plants⁴⁵

The University's innovation policy calls for community engagement. To bring this about, different academic units initiate interaction independently and then seek approval from the school boards and finally the university senate. This allows the academics to engage with local communities without the university having top-down control over the academics. While there are limited formal structures, over the years, Makerere University has been increasingly active in fostering partnerships with external social partners. They have focused on 'Knowledge Transfer Partnerships and Networking,' and have promoted work with other universities, communities, public sectors, and private sectors. The university administrators have encouraged faculty to engage in applied research that responds to the needs of communities.

Government. There are few government supports for the THP community. The THPs are not recognised as a profession, nor are they entitled to government supports. For example, there is not a clear regulatory framework to support the activities of THPs. Further, the actions of some government agencies have marginalised the THPs through instituting restrictions on access to the forests where the herbs are harvested from. This is the case with gazetted forest areas that are public land under the trusteeship of the Uganda Forestry Authority (UFA) and Uganda Wildlife Authority (UWA). While the THP community has struggled to attain support to address their challenges, it is important to highlight that limited government healthcare supports have also helped to shape the

⁴⁵ From an interview with a Makerere University senior researcher

interaction and promote the livelihoods of the THPs. With a high population growth rate in the area, the government has struggled to provide healthcare to meet the needs of the population and there has been an increasing demand for traditional medicine. In some ways, the limited formal, governmental support in relation to formalized healthcare has helped to further the work of the THPs and foster their collaboration with the university.

Drivers of the interaction

People in this village are poor and depend on the forest and bush for survival. As one community leader explained:

We use the forest to get natural herbs which are processed and used to treat diseases in the community and also sell some to get income for paying school fees for children and buying food. Life started getting hard and difficult because the plants were disappearing and there are now government restrictions on harvesting plants from the environment. We had to form a group to work with PROMETRA and Makerere University to help us learn better how to harvest and utilise the wild plants for medicine and earning income⁴⁶

This excerpt from an interview with a THP community leader illustrates that one of the central motivations for the community members to engage in the interaction was for them to sustain their livelihood. Entering into the interaction, the THPs sought to improve their knowledges about herbal plants and their practices and to, in turn, protect and potentially improve their livelihood. Further, community members were motivated to develop sustainable ways to cultivate herbal plants, in order to ensure a continued supply of herbal plant materials.

The MAK university academics were also motivated to engage in this interaction as the project gave them the opportunity to engage in community-based applied research. The interactions also gave them the opportunity to develop knowledge in the field of ethnobotany by identifying plants with medicinal and nutritional properties. As one senior professor in Botany described:

One of the main areas of our research is 'herbal medicine'. It is generally known and believed that the custodians of the knowledge of herbal medicine are the communities from which these herbal products are derived. These are the traditional medicine men, spiritual healers, and herbalists. So, in order to fully

⁴⁶ From an interview with a THP community leader.

*understand the human interactions with plants, particularly for medicinal and nutritional purposes, we were motivated to identify and study those communities whose primary source of livelihoods is the harvesting of plants for medicinal value*⁴⁷

While the university researchers were motivated to participate in the interaction for intellectual reasons (as the quote from the senior professor above highlights), they were also motivated to participate for financial and social reasons. Through the project, professors were able to secure a number of research grants from SIDA, WWF, and the MacArthur Foundation. In addition, the University researchers also expressed that they were motivated to offer support to the community in order to contribute to community development efforts. One academic at MAK describes this desire:

*...during field research, I noticed and realised that women go through many difficulties and therefore we needed to help them in improving income from the practice of traditional medicine*⁴⁸

Similarly, others expressed that social consciousness was a motivator for the interactions with community members. Their involvement in this interaction also enabled university researchers to train graduate students in community-based research.

Innovation

The interaction between the MAK academics and the Buyijja THPs has brought about a few key innovations. While the innovations are primarily “socially oriented” (Dagnino, 2010), there have also been several key process and organisational innovations. It is also striking to note that the innovations are not necessarily oriented toward ‘marketability’ and are not inherently commercial. Instead they are focused on improving people’s livelihoods. Furthermore, the innovations are “grassroots” (Cozzens & Sutz, 2012) in the sense that they draw on local and traditional knowledges to bring about changes. The innovations are outlined below.

Process innovation is evident in the following:

- THPs have changed their understanding of herbal plant species and the potential impacts of their practices on the sustainable use of natural resources;

⁴⁷ From an interview with a senior Makerere University researcher.

⁴⁸ From an interview with a Makerere University researcher

- THPs and MAK researchers have identified/recommended more sustainable methods of processing (e.g., harvesting, extracting, preserving, packaging) herbal plants from the forests, contributing to natural resource management;
- THPs and MAK researchers have identified previously wild plants that can be propagated and domesticated through the development of ethnobotanical gardens;
- THPs learned how to plant and undertake the agronomic management of herbal plant gardens in their communities;
- THPs received training on multiplying indigenous medicinal plants as well as in improving plant harvesting, herbal extracting, and packaging;
- THPs, PROMETRA, and MAK researchers have worked to standardise nutri-medicines, to add value to the traditional African medicinal and nutritional plants, and to make them more accessible to the wider community (which has also increased the THPs' incomes);
- THPs, PROMETRA, and MAK researchers have integrated medicinal plants and nutritional supplement plants that were previously used to manage infections, which has helped to improve the quality of life for community members;
- THPs have been able to exploit some plants commercially to improve their livelihoods and generate incomes.

Organisational innovation is evident in the following:

- Interaction helped to organise/mobilise the work of the National Council of Traditional Healers and Herbalists Association of Uganda (NACOTHA), an organisation that was formed in 1990. The organisation has helped to coordinate different engagements, to increase the capacities of the THPs to engage with policy makers, and to encourage the THPs to engage in more formal processes (such as registering their enterprises);
- NACOTHA has also helped the THPs to advocate collectively for their rights, for their access to natural resources (e.g., forests and wetlands), and for their practices to be recognised as viable alternative means of healthcare delivery in poor communities;
- Some THPs have connected more formally—attending workshops, sharing/accessing reading materials, and connecting with others—to exchange information and broaden their knowledge base;

- THPs, who used to work individually, have shared their knowledge communally at the Forest School.

Knowledge and skills

Sometimes the THPs come and ask for where plants can be found and, based on their knowledge of botany and plant taxonomy, MAK faculty and students help them to locate the plants habitats e.g. high altitude areas, swamps, etc. There is also now more interaction between the THPs and university students. This interaction is free and both students and the THPs are willing to share knowledge. Additional interactions between MAK faculty and THPs are being undertaken to facilitate knowledge transfer for value addition to the herbs⁴⁹

As one senior MAK professor describes above, there have been numerous knowledge/skills flows in and through the interaction. The flow of knowledge and skills in this interaction has been mutually beneficial, flowing from the university to the community and from the community to the university. While at times the knowledge flows have been uni-directional (or perhaps top-down) with the university sharing codified knowledge about herbal plants with THPs, at other times there has been an exchange of both scientific knowledge and traditional knowledge.

Through the training and capacity building, the THPs have improved their knowledge about their herbal practices, and improved their income-generating skills. They have developed skills in researching, in organisation-building, in negotiating, and in developing/applying technical knowledge. They have improved their own ability to sustain their livelihoods.

One member of the THPs interviewed remarked:

Our people have been practicing traditional health care since time immemorial. They have learnt and developed the skills overtime through practice under the guidance of the elders. My father was born in this place over ninety years ago and he also learnt how to treat people using local herbs from his grandparents. I

⁴⁹ From an interview with a senior Makerere University researcher.

too learnt from him through observation and following the instruction that he would give to me. There are now more people joining us these days because it is becoming a good source of income⁵⁰

As this member of the THPs describes above, traditional healthcare is an inter-generational practice that has become increasingly popular. As a part of their work, THPs draw on various indigenous knowledges and practices. For example, the preparation of herbal medicine involves the use of different parts of the plant such as the roots, leaves, bark, or the extraction of sap from the tree trunks. There are also different techniques used to prepare and preserve the herbs. These include sun drying and pounding, boiling, cold water extraction, steaming, and others.

There are different methods of administering the local herbs to the sick people including oral (drinking, chewing and eating as vegetable or fruits), topical (bathing, inhalation, bath, message, body smear as well as applying on incisions). In and through this interaction, the THP community shared their knowledges with the academics while the academics shared their scientific knowledges with the community.

The MAK researchers have also learned a lot about the communities, and about the local knowledges (as detailed in the figure above). One professor, for example, mentioned that researchers have learned a lot about what communities are doing, how they are doing particular activities, and why they are doing activities. Researchers have also been able to incorporate local and traditional knowledge into their own research processes and into their own research outputs. As one academic described:

We pick traditional healers and engage them in discussions regarding what they do and through this process, [and] gather a lot of knowledge from them. One such case was in a project funded by the Botanical Gardens International. Here we engaged the THPs in an exercise aimed at producing a priority list of medicinal plants from Uganda. THPs were mobilised to give their opinion and views as well as show their list of preference and priority for the herbal plants. The 'brain storming' session yielded a lot of useful information on the preferred plants and why they are preferred. Another similar case was when we involved the THPs in discussions on the Draft Policy to regulate their conduct in Uganda. Different traditional healers were brought together and asked to give their views on what should be done to improve their conduct in Uganda.

⁵⁰ From an interview with a THP.

The focus here was on the code of conduct and ethics for the traditional healers and the policy on herbal medicine and traditional healers⁵¹

Quite remarkably, the academic describes—not only drawing from the knowledges of the THPs—but also employing particular community-based practices to better elicit local knowledges from THPs. This is striking as it underscores the importance of creating communal, safe spaces to better exchange knowledge. It also underscores that knowledge is exchanged in and through particular practices and relations happening at particular times.

It is also important to note that exchanging knowledge is a political practice. In some communities, traditional knowledges about herbal medicines are passed on secretly from generation to generation. With that, it is striking that some THPs have formed groups—attending workshops, sharing/accessing reading materials, and connecting with others—to exchange information and broaden their knowledge base.

Throughout this interaction, knowledge has also been produced formally. For example, university actors have been involved in writing user manuals for THPs on practices for propagating plants, harvesting plants, as well as on extracting, preserving, and packaging herbs. University researchers have been active in creating scientific records to codify and expand the community's knowledge. This is, again, a political practice as there have been concerns raised by local politicians and community social activists regarding the ownership of intellectual property rights associated with the rich traditional knowledges that have been exchanged.

Community participation

Community participation has been central to the success of the interaction; however, this was not always the case. Initially, THPs, who were from unstructured, informal communities, were suspicious of the researchers and reluctant to participate in the interaction. Yet, as the project progressed with the support of local leaders, the THPs became more active in the engagement. THPs began to participate more once they saw how they could learn from and benefit from the university in and through their interaction. In turn, they have developed mutually beneficial relationships with the academics. Further, they have played a key role in identifying needs,

⁵¹ From an interview with a Makerere University researcher.

generating ideas, as well as designing and evaluating projects. The community has increasingly become more active in organising and taking on leadership roles. This is evident, for example, in the foundation of the National Council of Traditional Healers and Herbalists Association of Uganda (NACOTHA). The community members have also been active in sharing with others. For example, the THPs have shared their experiences and their knowledges about herbal plants and herbal medicine practices with the wider research community as a part of MAK conferences.

Outcomes and benefits

There were a number of outputs, outcomes, and risks both on the side of the academics and the community members. The following table highlights the outputs (e.g., achievable and tangible products) and outcomes (e.g., changes in behaviours, attitudes, practices, capacities, policies, relationships, and technologies) that were brought about in and through the interaction between the Traditional Health Practitioners (THPs) and the Makerere university actors.

Table 7.3. *Outputs and outcomes for community and university actors*

Benefits	
Community actors	University actors
Outputs	Community actors improved their ability to support their livelihoods, generate an income, and increase their sales
	University actors produced various publications (e.g., publications, MA theses, PhD theses, scientific publications in peer reviewed journals)
	Community actors worked to codify indigenous knowledges (in partnership with university actors)
	University actors worked to codify indigenous knowledges (in partnership with community members)
	Community actors built gardens near their homestead, planting various herbs (to lessen the impact on the local forests and wetlands)
	University actors developed a production manual (in partnership with PROMETRA)
	University actors presented their research locally and internationally at various conferences and workshops

	University actors produced resources for local communities (e.g., manuals, pamphlets, workshops, seminars, and training sessions). One document, for example, supported the propagation and domestication of plants with medicinal and nutritional values (nutri-medicinal plants).
Outcomes	Community actors developed improved ways to harvest, preserve, and package herbs (in partnership with university actors)
	University actors developed improved ways to harvest, preserve, and package herbs (in partnership with community actors)
	Community actors worked to standardise herbal medicines and herbal medicine production processes (in partnership with university actors)
	University actors worked to standardise herbal medicines and herbal medicine production processes (in partnership with community actors)
	Community actors worked to incorporate indigenous knowledges into modern health care programmes (in partnership with university actors)
	University actors worked to incorporate indigenous knowledges into modern healthcare programmes (in partnership with community actors)
	Community actors improved their use of natural resources and their return on social investment
	University actors' research outputs have improved healthcare practices in communities, and have made theoretical and empirical contributions to the field
	Community actors have improved their ability to produce herbal products (using their indigenous knowledges)
	University actors have strengthened their understanding of social and environmental ethnobotany and herbal plant production
	Community actors have expanded their professional networks/resources, connecting with the MAK community
	University actors, including students, have developed their understanding of local communities and their ability to

and other organisations	work in partnership with others. They have also improved their capacity to engage communities in matters of ecological sustainability
	University students received multidisciplinary training that brought together chemistry, botany, food science, and veterinary medicine
	University improved its reputation through their community engagement and through their increased publications

The key outcome of this case is that THPs are able to utilise the natural resources in their community in more sustainable ways to both protect their livelihood and the plant life in their environment. THPs have changed their practices and perceptions, and are more conscious of how to improve their livelihoods by adopting the use of more sustainable ways of natural resource management to manage health, nutrition, and welfare. The university researchers have also benefitted from strengthening their understanding of herbal medicine, and, in turn, producing various research outputs and securing research funding. What is most striking, however, is the way that community actors and university actors have been able to integrate their knowledges in ways that are beneficial to both groups. For example, the community has also been able document both scientific and indigenous knowledges in order to pass on for future generations. With that, they have been able to contribute to the longevity of the field, and to contribute to the ecological wellbeing of the area. The research has not simply benefited the THPs and the MAK university actors; it has benefitted the wider community. With these innovations, natural resources can be harvested on a sustainable basis to continue supporting people’s livelihoods. Further, community members have developed more confidence in THPs and in traditional medicine as an alternative to the western based medical care system.

While there have been many positive outcomes, it is also important to note that some community members have benefited to a lesser extent. While many have been motivated to sustain their livelihoods by planting herbal plants near their own homes, others have not been as motivated to

invest in more-sustainable practices. Some have continued to travel long distances in the forests in search of plants.

Enablers and constraints

The following are the conditions that have enabled this interaction:

- The MAK researchers were socially and intellectually invested in the project;
- The MAK researchers' expertise in the field helped to foster the relationship as THPs were motivated to learn scientific knowledge;
- The THPs' expertise in the field has helped foster the relationship as MAK researchers were motivated to learn indigenous knowledges and practices;
- The MAK researchers received various research grants to financially support for their engagement in this interaction;
- The MAK researchers, the THPs, and PROMETRA were willing to work with and learn from one another;
- The long-term relationship, spanning over 20 years, has helped to build trust between the community and the university and to create an interaction that is mutually beneficial;
- The local community leaders helped motivate the THPs to participate in the interaction by endorsing the university researchers;
- Knowledge has been freely exchanged with benefits for the community and for the university;
- Healthcare supports are limited and inadequate in this particular region of Uganda; therefore, community members seek assistance from THPs;
- PROMETRA initiated the interaction, provided assistance along the way, and allowed the THPs and university researchers to use the Forest School.

The following are conditions that have constrained the interaction:

- There are limited/inadequate governmental supports for THPs (e.g., no clear government policy to support THPs);
- There are concerns about intellectual property rights for the knowledge that is exchanged through these interactions;

- There are little to no formal structures for the THPs who were all working independently (and who didn't have formal structures in place to share their indigenous knowledges);
- “The engagement with the communities of THPs may also be a source of financial loss to the university especially where proper funding is readily available”;
- The community is located in a remote and isolated area approximately 40km from Kampala;
- There are limited natural resources as a community of approximately 800 registered THPs in Buyijja depend on the forest covering five square kilometres;
- The community is poor with limited economic opportunities (aside from farming or traditional healing);
- The interaction was interrupted in late 1990s by the war between the Allied Democratic Forces and the Government of Uganda Army (which made the area unsafe for researchers);
- The MAK researchers initially struggled to connect with THPs (as they were suspicious of the research).

Conclusion

This case study has focused on interactions between Makerere University researchers and Traditional Health Practitioners in Buyijja. Prior to the interaction, the Buyijja THPs were dealing with a troubling situation. On the one hand, they needed to extract herbs from the surrounding forest in order to be able to provide healthcare and sustain their livelihoods. On the other hand, they had to do so sustainably to ensure the conservation of the local environment and the continued supply of herbs. Motivated to respond to this challenge, the university offered a research-based response by working with the community to better understand and reform their practices. In turn, these interactions have supported the livelihood of the THPs, the applied research outputs of the university actors, the health of the local community, and the sustainability of the ecological system. With knowledge flowing bi-directionally, to and from the community and the university, the interactions brought about both process and organisational innovations. Quite remarkably, this case is an example of how scientific and traditional knowledges can be integrated to support innovation and respond to the livelihood needs of the community. This case is also an example of a research-based interaction.

Chapter 8. ICT Competence Building and Livelihood Improvement in post-war Northern Uganda: Interactions between the Youth and Gulu University

The DCS [Department of Computer Science] at GU [Gulu University] has played an important role in integrating its academic expertise with the community development initiatives of other actors in the post war northern Uganda. ... The role of the DCS has been to connect with these NGOs and mobilise resources for youth ICT skill development. In addition, the DCS has developed networks with social enterprises such [as] SINFA Uganda in order to facilitate the youth in getting employment and income generation for improved livelihoods⁵². – Gulu District NGO Forum member

This case study focuses on interactions between Gulu University (GU), and community youth actors in post-war rural communities of northern Uganda. The aim of this interaction was to respond to livelihood issues, particularly the lack of economic opportunities for youth in this region of the country, as well as the need for more internet access in the area. The interactions involved academics from GU's Department of Computer Science offering ICT and entrepreneurial skill development training to community youth. The training was further used to develop computer applications, to initiate/secure employment for the youth, to gain access to the larger market, to foster connections between youth (both online and in-person), and to support the livelihood of community members. The interaction also improved and provided access to computer facilities and reliable internet. The case is unique in that it empowered youth—not only to develop technical computer skills that are relevant to the communities in which they live—but also to take on community leadership roles, supporting others in their communities with computers. In this case study, it is also striking that the university actors learned more about the community by implementing the programme. For example, they learned through the interaction (and through trial and error) instead of by first doing research on the community to determine its specific need and then implement the programme.

⁵² From an Interview with Gulu District NGO Forum member

The youth participants in this case were from communities in 12 districts of the Lango Acholi sub region of northern Uganda. They were highly marginalised, poor and unskilled, and had been victims of more than two decades of civil war in northern Uganda (1986 to 2008). The youth participants had limited educational opportunities, and had experienced trauma from the death of their loved ones. They lived in poor and informal rural settlements. Furthermore, they lacked the necessary knowledge and skills to secure employment in an area with limited opportunities (due to economic, social, and institutional structural difficulties). The youth were motivated to improve their livelihoods and engage in alternative income-generating activities beyond subsistence farming or traditional/manual work. It is also important to note that the communities that were home to the youth had some formal structures, but were also quite informal (with rural habitants living in grass thatched isolated settlements) and with few organisational supports.

Overview of the interaction

Initiated in 2009, the interaction between the Gulu University actors and the community actors in northern Uganda started with support from Gulu University, and from SINFA Uganda (a local NGO and social enterprise). The project involved the work of Gulu academics from the Department of Computer Science, who were active in assessing the skills of the youth and in identifying the needs of the market. The project also involved students at Gulu, who worked as interns on the community projects as a part of their required service placements. The interaction was funded by the Government of Uganda, Gulu University, Tulane University (USA), and the Uganda Fund.

The interaction involved the following four distinct phases: (1) setting up ICT infrastructure; (2) providing basic/introductory community training; (3) providing technical ICT and entrepreneurship training (using computer applications for community income generation); and (4) providing employment opportunities.

ICT infrastructure. Starting in 2009, the university actors worked in partnership with Tulane University (USA) to set up ICT infrastructure at GU. Infrastructure included a campus network centre, 50 desktop computers, and bandwidth connections. Reflecting on the process of setting up ICT infrastructure, one academic at GU explained:

We needed to create capacity for ICT training and research at the GU, and so sought support to that effect. We have been involved in collaborations with some foreign universities and through the partnership, for example, Tulane University provided financial and technical support to improve our ICT infrastructure at GU which subsequently enabled us to start more effective training in ICT⁵³

After setting up the ICT infrastructure, the university also provided scholarships in computer science, and conducted a basic/introductory computer workshops on campus.

Introductory ICT training. Starting in 2012, the GU academics introduced an innovative pedagogical programme focused on youth ICT skilling, computer applications, and entrepreneurial development. To implement the program, the university started by engaging the district offices and secondary school teachers who selected 40 students aged 14-18 years to participate in a two-week ICT training course. They also held a course at Kitgum High School about 100 kilometres from GU.⁵⁴ Through the process, the GU academics learned more about the needs of the youth, and realised that the introductory courses did not help the trainees acquire specific computer operation skills or secure meaningful employment. As one academic involved in the interaction explained:

Earlier, we had engaged in ICT training to support the war affected youth. This training was general and focused mainly on introductory aspects to computers. This training helped us to realise that there was need for, a more skill based approach to ICT training in order to meet the employment needs of the youth. Based on this earlier interaction with the youth and their parents, there was a general call from the community leaders and parents that we further develop the ICT training in order to improve the skills of the youth⁵⁵

Another academic involved in the interaction describes this realization of the need to change the programme's focus:

⁵³ From an interview with a GU academic.

⁵⁴ These efforts were also in line with the Ministry of Education of the Republic of Uganda's emphasis on implementing computer training in all secondary schools. That said, the schools were ill-prepared to offer such training as they lacked computer equipment and technical power in computer training and maintenance.

⁵⁵ From an interview with a GU academic.

We considered changing our approach to youth training and instead focus on the development of computer artisans who can work with and be able to maintain computers. Accordingly, we started emphasising the development of technical computer operational skills, entrepreneurship and communication skills. This was achieved through giving the learners practical hands on experience in training with computers⁵⁶.

With that, the DCS academics considered how to support the youth to develop technical skills that could help them to secure an income.

Technical ICT training. Shortly after the initial workshops (and after recognising the need for more advanced training), academics at GU applied for and received a grant of \$215,000 USD from the Uganda Fund to support their acquisition of new computers and training kits to improve computer labs for ICT skills training. The project, *ICT Community Outreach for Empowerment of Youth in Acholi and Lango Sub-Regions*, marked the beginning of a more-structured/formal ICT skill development programme that focused on community outreach and youth empowerment. To initiate the technical training program, the GU academics contacted the Gulu District NGO Forum, who supported them in identifying and selecting youth to participate in the programme through a systematic process. The youth were systematically selected to participate if they met the following criteria: 1) had an interest in ICT skill development; 2) had completed a secondary school education; and 3) demonstrated a socio-economic need. In describing the recruitment process, one youth participant explained:

After doing my Higher School Examinations, and getting poor results in 2009, I saw no opportunity for continuing with education because of not passing well but also lack of money to pay for my tuition. I was doing some low paying work in the community and in 2012 an announcement was made on radio by Gulu District NGO Forum requesting the youth to apply for ICT training at GU. I applied and we were taken through the initial process of screening to determine our level of education, interest in ICT, family background, etc. The local leaders were also involved in verifying our identity and origin before being offered opportunity to enrol for the training program⁵⁷

⁵⁶ From an interview with a GU academic.

⁵⁷ From an interview with a youth participant.

Through this process, 80 youth were recruited from 12 districts in northern Uganda. All of the youth participated in the programme, which involved developing technical skills, entrepreneurship skills, and communication skills that would help them secure employment. The skills were defined as follows:

- Technical skills: ability to develop computer applications, maintain, and repair computers;
- Entrepreneurship skills: ability to think creatively and come up with new business ideas for development into investment projects. This skillset involves proposal writing, financial analysis, and projections;
- Communication skills: capacity to communicate effectively with key stakeholders, peers, business associates, and government agencies using ICT applications such the internet.

Further, the training sought to empower the youth with the vocational skills needed to be able to return to their communities to train other youth, set up some micro enterprises, and improve their livelihoods. As one academic explained:

After teaching them [the youth] the basic introduction to computers, we then emphasised practical skill development and application of the acquired knowledge towards practical problem solving. For example, after introducing them to basic principles of website design, the youth were then left to work on their own and apply the knowledge. It was fascinating to note that they were coming up with very intriguing ideas such as the development of the eco-tourism platform, cultural management system, an agricultural information system platform while others developed an interactive website for teaching children using cartoons⁵⁸

Employment opportunities. In 2013, the project liaised with SINFA Uganda to provide employment to the youth participants, who had graduated from the ICT programme. This collaboration also coincided with the launch of the Internet Now project at Gulu University that was supported by Oxfam. The Internet Now project provided internet to northern Uganda communities, set up micro-centres (that are small computer centres), and created employment opportunities for approximately 90 young people. The micro-centres are small metal containers that house five or six computers, which run on 23W batteries powered by solar energy. At the centres, local, young

⁵⁸ From an interview with a GU academic.

people, aged between 18 to 30 years (who were previously unemployed) perform “microwork,” which involves breaking large cloud-based tasks into several parts.

The interaction between the university and the community has brought about many positive changes as the youth have developed marketable skills in the area of ICT and found employment as technicians and instructors in SINFA Uganda internet centres, local governments, and community-based organisations. Some have also become self-employed, working in ICT maintenance and basic applications. As part of the youth ICT skill development, the academics in the DCS encouraged the youth to form groups and register them so as to meet the requirements for accessing funds from government through the Youth Livelihood Program Fund. For example, a registered youth group can access up to 5,000 USD from the Youth Livelihood Program. The DCS has been able to support youth in accessing funding through other channels. Following the training program, the youth still maintain contact with one another online (through social media and email), where they share ideas and identify opportunities for employment and income generation. The youth have also had the opportunity to develop working relationships with various organisations, including, the GU Department of Computer Sciences, SINFA Uganda, and the Gulu District NGO Forum. The project has also had positive impacts on the households of youth participants. Some youth participants have been able to purchase their own computer equipment and return to university. Others have used their income to support their family members and cover basic household expenses.

While there have been various positive outputs and outcomes, the programme has been limited in scale and reach (as the primary beneficiaries are the youth participants themselves). The programme has also experienced some challenges. For example, some of the participants have had challenges in securing sufficient start-up capital and equipment to engage in productive economic activity. Similarly, others have struggled to secure jobs or to be able to translate their technical knowledge into employment opportunities. While the ICT training programme tried to emphasise entrepreneurialism and creativity, there were some difficulties in this regard as institutional supports were limited. For example, GU academics provided critical ICT support/training, but did not provide high level business support, which to some extent limited the youths’ abilities to learn about and then develop micro and social enterprises. To give an example, community members are

inexperienced when it comes to identifying marketable and profitable ICT applications. Sometimes more support was needed. As one youth participant explained:

Sometimes when you want to consult the lecturers over a matter of new developments in the ICT, they are not readily available. Sometimes things will not work the way you want and the delays frustrate you when there is need to solve an immediate concern over an urgent technical challenge⁵⁹.

That said, the programme has successfully trained youth participants, and has provided internet to the communities. Further, the scale of the operation has also grown over time. It is envisioned that by 2015, 200,000 people will have visited the centres to use the internet. The project is also expected to become an independent, for-profit social enterprise.

Structure of the interaction

The main point of contact between the university and the community lies at the leadership level; between the contact person in Gulu District NGO Forum and the core academic at GU. The interaction began when the GU academics built the ICT infrastructure at GU, which they planned to use to support community members. From there, the GU academics reached out to locals in the community to start the basic/introductory computer training courses. Figure 8.1 below provides a detailed map of the actors involved in the interaction and also illustrates the flow of knowledge and resources between these actors. Table 8.1, which follows the figure, outlines the various actors involved in the interaction and the contributions they made to the interaction.

⁵⁹ From an interview with a youth participant.

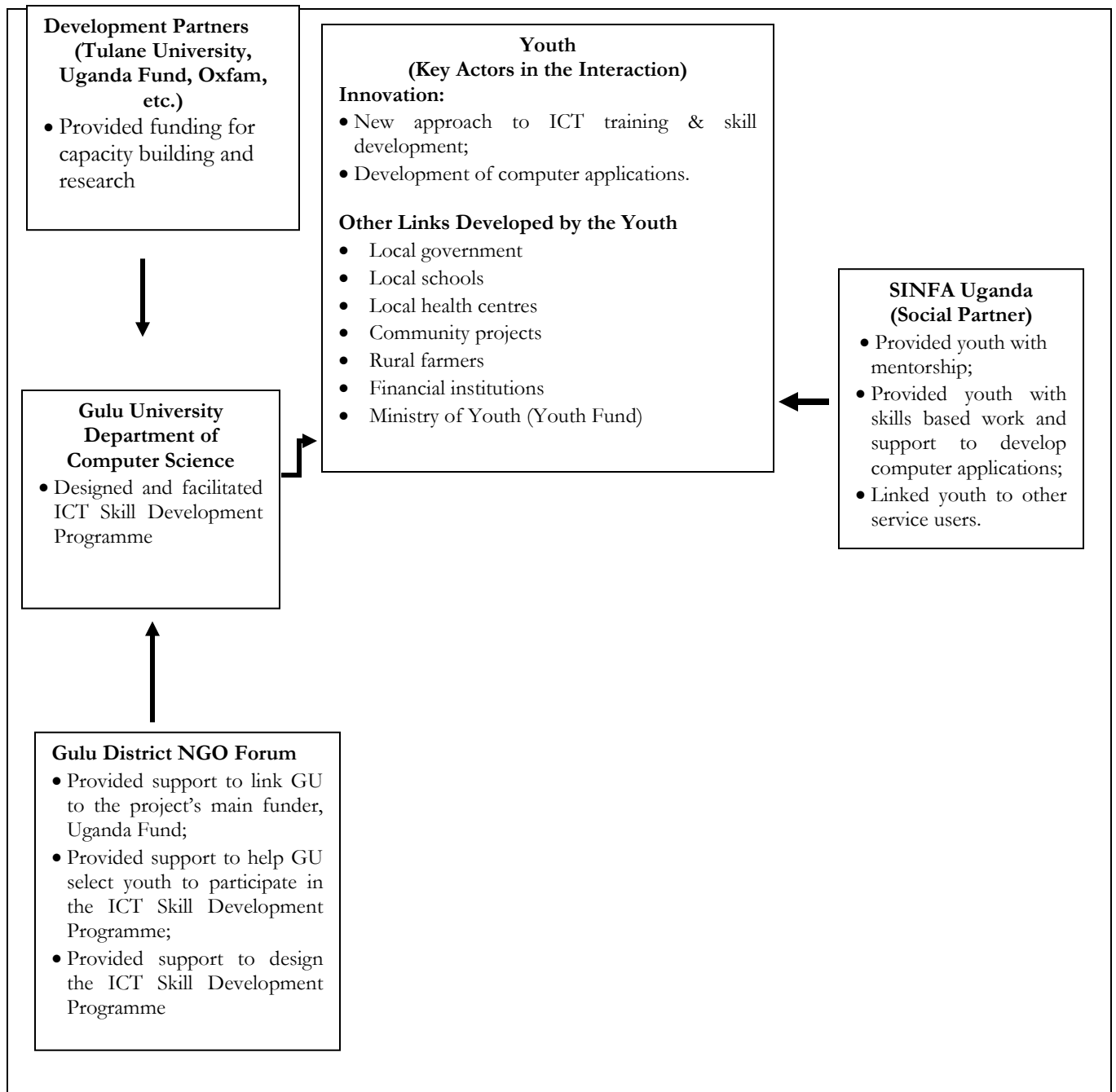


Figure 8.1. *Structure and flow of the interaction*

Table 8.1. *Key actors shaping the interaction*

Actor	
GU Department of Computer Science (DCS)	The DCS secured funding, and provided ICT and entrepreneurial skills training to the youth. The GU academics supported the youth in gaining the needed skills to secure employment. Students from the DCS also worked as student interns (as a part of their required integrated learning projects).
Uganda Fund <i>a US-based public charity</i>	The Uganda Fund provided funding that was channelled through the Gulu District NGO Forum (a local NGO) to support the programme.
Gulu District NGO Forum <i>a local NGO</i>	The Gulu District NGO Forum interfaced with funders, university actors, and community actors. It also recruited, selected, and registered youth for the training through a systematic process (that involved consultations with parents and local community leaders). Prior to the interaction, they had also implemented various post-war recovery projects to support youth livelihoods, leadership, and ICT development.
SINFA Uganda <i>a for-profit social enterprise</i>	SINFA Uganda is an enterprise that organises social/community interventions to involve communities in solving their own problems. SINFA Uganda contributed, quite broadly, by developing commercial services that addressed the livelihood needs of communities in northern Uganda. More particularly, they started a social enterprise, Internet Now (that provides internet access to northern Ugandan communities). They also signed a Memorandum of Understanding with GU, agreeing to provide immediate employment opportunities to youth who successfully completed the ICT skill development programme. At the time of this study, they had provided internet access and created employment for approximately 90 people in northern Uganda. The organisation also hosted the service learning initiative.
Other organisations	The Dutch National Postcode Lottery's Dream Fund provided funding, and involved other external funders, including, the Arid Lands Information Network (ALIN), Inveneo, and Samasource.
Community	The community participants were drawn from 12 districts in northern

youth Uganda. They were active participants in the program, and in liaising with and supporting their communities following the completion of the programme. They also successfully expanded their own professional networks, connecting with one another, and with external organisations during and after the programme.

Organisational arrangements and interface structures

Community. Prior to the ICT developments, other organisations were already working to support ICT skill development in northern Uganda. For example, ACCORD worked to install ICT centres in northern Uganda and ALIN worked to implement a rural ICT innovation (internet connections). While these initiatives lacked ways of teaching youth the ICT skills needed to run the ACCORD centres, it is important to note that the community had already been active in trying to support the livelihoods of local people in this regard.

There is a strong presence of organisations in the community that youth participants have been able to collaborate with. For example, the youth participants have been able to partner with local governments, local schools, health centres, and other projects in their communities. These linkages are mainly in form of providing computer solutions (e.g., computer operations and maintenance). There are also many well-established NGOs in the area that provide additional support and opportunities for engagements that generate income for the youth. For example, partnerships with funders provide community members with resources needed to further develop ideas into fundable and implementable projects. The organisations have also supported youth to attain computer equipment to use in the community projects they have established.

University. There are various interface structures at Gulu University that shaped the interaction between GU actors and community actors. For example, The Gulu Strategic Plan (2010) promotes service to the community and community transformation. More particularly, the plan promotes “undertak[ing] *applied research* towards *community transformation* [emphasis in original]” (2010, p. 2). These priorities are also built into the curriculum as all undergraduate students at the university are required to undertake a two month work integrated learning project in a firm or community. As such, the work of the student interns in the project happened as a part of their educational

requirements. The interaction was also supported by University funding that paid the interns for their community work.

The DCS also has a community outreach mandate that motivated them to connect with funders, firms, and community organisations. One person from the Gulu District Forum remarked:

The DCS at GU has played an important role in integrating its academic expertise with the community development initiatives of other actors in the post war northern Uganda. For example, NGOs such as ACCORD and ALIN were already focusing on providing resources to support the skilling and economic engagement of the youth in northern Uganda. The role of the DCS has been to connect with these NGOs and mobilise resources for youth ICT skill development. In addition, the DCS has developed networks with social enterprises such SINFA Uganda in order to facilitate the youth in getting employment and income generation for improved livelihoods⁶⁰

While there has been a significant amount of support for this initiative, a tension also exists in attempting to sustain the programme as university academics are evaluated for their research publications—not for their community outreach initiatives. Further, one participant highlighted a lack of institutional supports within the university, saying:

There are departments in the university where people do not seem to care about other categories of learners who come to the university. When you come to the university and make inquiries over certain issues, the staff are very reluctant to help you as expected. They seem to pay more attention to the regular full time registered students than some of us who come in once in a while to seek information and knowledge⁶¹

Government. There are a few key government structures that helped to shape this interaction. First, the National Council for Higher Education requires that all undergraduate students undertake an internship or work placement programme (aka the integrated learning project) as a part of their programme. This requirement is intended to promote engagement between universities and communities with a focus on improving the community-based vocational skills of the students. The efforts of the GU academics were in line with Uganda's National Development Plan 2010/11 to

⁶⁰ From an interview with a member of the Gulu District Forum.

⁶¹ From an interview with a community member.

2014/2015 and with the governmental policy on job creation through Business Process Outsourcing. The interaction was also supported by the National Information Technology Authority of Uganda that has been working to complete the National Backbone Infrastructure project to improve internet access to northern Uganda. Further, the government of Uganda also provided funding for the project.

Drivers of the interaction

The academics' desire to contribute to community transformation and to the peace and reconstruction process in northern Uganda helped to drive the interaction. They wanted to improve the livelihood of the youth in the impoverished post war communities of northern Uganda. As one academic in the DCS explained:

The main motivator for us to engage with the youth was the need to help solve the youth unemployment problem in the communities. We therefore thought of how to impart computer knowledge and skills to the youth so as to develop their ability to employ themselves and/or get jobs for which computer professionals are required in the schools, health centres, NGOs, and the local government facilities in northern Uganda⁶²

The interaction between academics at GU and the youth was also supported by the proactive strategy of Gulu District NGO Forum, who had already been engaged in work in the community and were motivated to partner with GU. Further, the project has been supported by the availability of funding from the university and the Uganda Fund.

Innovation

The interaction between the Gulu University actors and the community actors in northern Uganda has brought about various forms of innovation, including market, organisational, pedagogical, process, and product innovations. These innovations have primarily been developed socially with the “doing–using- interacting” mode of innovation. The innovations also involve both technical and social innovations. While the ICT innovations are all derived from the global ICT industry standards and the ICT products and applications, the innovations are new to the communities. They respond to the livelihood needs of marginalised communities in post war northern Uganda.

⁶² From an interview with a GU academic.

Market innovation is evident in the following:

- Youth participants gained a better understanding of the market and of market opportunities (as academics tried to bridge the gap between their skills and the market demands);
- Youth participants gained access to wider social networks and markets, developing sustained relationships with the DCS, the Gulu District NGO Forum and SINFA Uganda;
- Youth participants developed business plans to help them think creatively about the possible markets and about how to develop ICT applications that are relevant local markets;
- Youth participants initiated business ventures (e.g., major and minor enterprises) that responded to the needs of their own communities (following the program);
- Youth developed skills to market their services to the clients in the rural communities (e.g., through developing personal profiles that are placed on the internet to publicise their skills and capabilities);
- Gulu District NGO Forum linked the youth to potential employers and clients in the greater northern Uganda and even beyond;
- SINFA Uganda provided employment to youth participants in the micro-centres.

Organisational innovation is evident in the following:

- The programme introduced a new organisational/interface structure into the community, providing formal vocational training to unemployed youth;
- Youth have moved from being individuals to being members of a collective group with clear leadership roles and professional objectives and with an expansive professional network;
- Youth have developed business plans and proposals to submit to funding agencies (e.g., to the Youth Livelihood Programme microfinance institutions);
- Youth have successfully interfaced with public agencies and funding organisations.

Pedagogical innovation is evident in the following:

- Workshops were offered to teach technical and practical skills to upgrade and create innovations, as well as entrepreneurship skills to start community enterprises;
- The pedagogical/learning approach adopted by the DCS was a new training approach that has not been used by the GU academics before;

- The GU academics’ pedagogical approach responded to the needs of the local market and the youths’ knowledge and skill needs.

Process innovation is evident in the following:

- The GU academics taught the youth how to set up and test computer equipment, e.g., to get the computers in working mode;
- GU academics also supported the youth to improve the quality and productivity of the process. As one academic described, “*We helped the youth to set up their equipment properly to be in line with the current best practice in the ICT field through sensitisation and providing information on what they were not aware of*”⁶³;
- Other process innovations included offering training services to other youth in the rural areas, using the internet to provide information to community members, and servicing/maintaining computer equipment in the rural schools, medical centres, and the local government units.

Product innovation is evident in the following:

- Youth participants (in partnership with academics) developed computer application prototypes ;
- Broadband internet facilities and modern computers were installed at GU and at different villages in northern Uganda;
- Youth participants developed a number of context-specific computer applications. These include:
 - Mobile money transfers, a service that is in high demand in rural areas;
 - Typing services and preparation of typed documents for schools, health centres, and local government units;
 - An agricultural commodity platform (OctionX) designed in partnership with ALIN. This is a web-based platform meant to enhance interaction among key stakeholders in the agricultural value chain. It connects agricultural input suppliers, financiers, middle people, and producers by providing information on agricultural commodity prices, crop production acreage, as well as weather conditions;

⁶³From an interview with a GU academic.

- A website/online platform to network with one another.

All these products have market potential and have helped the youth generate revenue to meet their livelihood needs.

Knowledge and skills

The knowledge and skills flow of this interaction was initially and primarily unidirectional with knowledge and skills flowing from the GU academics to the community members. The skills shortage and knowledge requirements of the northern Ugandan youth were a central driver of their involvement in the GU computer training programme. The primary channel of knowledge exchange was through the ICT Skill Development programme.

Community participants described learning computer programming skills, e.g., how to set up and test computers, how to develop ICT applications, and how to access information; business communication skills, e.g., how to write fundable project proposals, how to apply for placements; and networking skills. e.g., how to build professional networks, and how to work as a part of a team from the interaction. The interaction and training have helped the youth develop technical skills that have enabled them to be able to undertake basic computer operations using the standard MS Office package (typing and data management), website design, trouble shooting, and basic repairs and maintenance. As one participant explained:

I am now able to operate a computer and undertake basic functions like typing, printing, and using the internet. I have also developed more advanced skills such as website design to support our farmers⁶⁴

Another participant described becoming more analytical and organised, saying:

After the training, I am now more time conscious, focused on exploiting my full potential and capable of developing a project work plan. In addition, I am now able to communicate better with my colleagues through different platforms on the internet. I have been able to mobilise my fellow youth in our village to constitute a group through which we discuss ways of engaging in productive economic work, writing fundable project

⁶⁴ From an interview with a youth participant.

proposals. The key issue has been helping the youth to change their attitude and focus their attention on self-employment⁶⁵

Echoing the benefits, another youth participant testified the training helped with developing online networks:

The training I got from the DCS was useful in opening my mind and getting hope in life. The programme coordinator supported me in applying and getting placement in SINFA Uganda. Working in SINFA has been very inspiring in that we have been able to meet both physically and on-line with friends both within and outside Uganda. This friendship has helped me to know other people in the 'youth network' that provide me with social support. I have therefore learnt and developed new approaches to communicating with many people on the internet⁶⁶

Youth participants transitioned from having little or no basic computer skills to being able to perform basic computer repairs/maintenance and to participate in and initiate community enterprises. Youth participants have also extended their knowledge and skills to other community members through further training and practical computer demonstrations.

While the training was initiated to support community members, the interaction also allowed the GU instructors to develop their own knowledges and skills. For example, the GU instructors had to develop ways to link their computer knowledge with the context-specific livelihood needs of the community. They also had to clarify the knowledge needs of the youth, and to organise training that would best respond to their needs and best fit the market demands. The interaction gave them the opportunity to explore the use of knowledge outside of the conventional educational settings and thus enhance their community development initiatives. They also learned from the youth, who were integrating their own cultural experiences and technical knowledge in the development of computer applications.

⁶⁵ From an interview with a youth participant.

⁶⁶ From an interview with a youth participant.

Community participation

We involve community members in the planning and development of outreach programmes. For example, in the case of the Youth ICT Skill Development Program, community members were involved in the identification of the youth. This started with the involvement of the Local Council Leadership at village level and it was carried on up to the district level. At the end of the training, the District Chairman of Gulu was invited to officiate at the closing ceremony⁶⁷

As one academic in the DCS describes above, the community was involved in the ICT Youth Skill Development Project. Community members were active in making decisions and taking on leadership roles. Community leaders were responsible for selecting youth participants. Local community leaders were also involved in speaking engagements. For example, to honour the youth participants' completion of the program, a district political leader presided over the service, and encouraged youth participants to serve the community diligently. Not only were the youth participants active in the process, they were also active in training others afterwards and connecting with and working in their respective communities. Further, with the SINFA project, village committees, involving the youth and other elders, worked to come up with ideas to use this newly attained computer knowledge to improve their livelihoods. In and through the program, youth participants transitioned from being unemployed, to being programme participants, to being community organisers, who were active in supporting others.

Outcomes and benefits

The following table highlights the outputs (e.g., achievable and tangible products) and outcomes (e.g., changes in behaviours, attitudes, practices, capacities, policies, relationships, and technologies) that were brought about in and through the interaction between the community actors and the GU academics.

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Table 8.2. *Outputs and outcomes for community and university actors*

Benefits		
	Community actors	University actors
Outputs	Computer micro-centres were built in communities that included computers and internet access	Computer training facilities were built on campus that included computers and internet access
	Youth participants received ICT training	GU academics implemented a new organisational structure, successfully providing ICT training to students and integrating youth into the workforce
	Youth participants produced business plans, funding proposals, and other documents	GU academics produced various publications
	Youth participants secured employment opportunities in the field, improving their livelihoods	GU students successfully completed their required integrated learning project
	Youth participants developed and participated in community-based social enterprises	GU students received a stipend from university for their community outreach work
	Youth participants developed various computer applications	
Outcomes	Community members developed new computer-based ways to solve problems and connect with others	Gulu University strengthened their reputation for community engagement, applied research, teaching, and community development
	Community members gained access to ICT knowledge and computer technologies	GU academics and students gained community engagement experience, strengthening their capacities to engage with local communities
	Youth participants developed leadership skills, strategic planning	GU students developed leadership skills, computer skills, and civic awareness

skills, and market awareness
Youth participants developed relationships with various external actors (e.g., the GU Department of Computer Sciences, SINFA Uganda and the Gulu District NGO Forum)
Youth participants transitioned from unemployed to being skilled youth with various livelihood opportunities
Youth participants accessed and created professional and economic networks

The programme benefited youth participants and other community members, who are also able to access the internet. The main output of the interaction is that the project improved internet access in rural areas of northern Uganda, developing computer centres and proving internet connection. Youth participants have also benefited from the interaction. They have gained ICT skills, developed their professional and economic networks, and secured employment in the ICT industry. They have also successfully developed innovative products, processes, and new organisational platforms. One participant described:

I use the internet to earn money and support my livelihood. After saving some money I will go back to study. I have always struggled to find enough for survival and pay for my education. Since the age of twelve, I have been working as a farm labourer doing backbreaking work, planting crops and brick-laying, to pay for my education because my family could not afford. But now am earning money, part of which I will save for my education. I work at the Internet Now micro-centre in Awach trading centre in Gulu District. By working Monday to Friday, I earn 270, 000 Ugandan Shillings (\$104) a month and am able to save roughly half for my future education needs⁶⁸.

⁶⁸ From an interview with a youth participant.

While community actors have had several tangible and direct benefits from their involvement in the interaction, the university actors have also benefited. GU students were able to complete their integrated learning projects while academics were able to produce various academic publications. The project also allowed academics and students alike to gain community development experience, and to develop their own community-based approaches. The programme also supported the university's mandate to support local communities and to contribute to Ugandan social innovation and poverty reduction efforts.

Enablers and constraints

The interaction highlighted in this chapter was facilitated and constrained by both enabling and constraining factors. The enabling conditions that helped to facilitate the programming are as follows:

- Funding from the Government of Uganda, Gulu University, Tulane University, and the Uganda Fund. These funds were used to acquire and replace equipment, pay staff and interns, and develop and implement the programmes;
- Gulu University's Mandate promotes service learning and community transformation efforts;
- Gulu University's Policy requires university students to engage in integrated learning programmes;
- Gulu university provided physical infrastructure for the development of standard ICT training facilities;
- Gulu academics' technical/research expertise, ability to work with external organisations and community members, and their ability to identify both the skills needed by youth and the local market needs;
- Gulu District NGO Forum's proactive strategy and willingness to support in identifying appropriate youth participants for the interaction;
- Youth participants' tacit knowledge, understanding of their community needs, and ability to partner with community members to develop programming and respond to community-based needs;
- SINFA Uganda's willingness to hire youth participants, who completed the training;
- Interaction promoted entrepreneurial work in an area with few employment opportunities.

The following are the constraints/challenges that constrained the programme:

- Initial ICT training sessions were offered without doing research to identify the needs of the students or the needs of the local market;
- Gulu University's Policy encourages research and teaching and has Gulu academics promoted for their research and teaching activities not their engagement or service initiatives;
- Gulu academics provided critical ICT support/training but did not provide high level business support, which to some extent limited the youths' abilities to develop micro and social enterprises;
- Gulu University had limited structures and resources to support youth participants (e.g., there is not an outreach department to manage external relations, there is not a specific contact person to facilitate interactions, academics were not always available to help with follow up questions, some youth participants did not feel comfortable on campus);
- Limited resources to facilitate the training of more youth in order to scale up the gains from the ICT skill development and innovations;
- Limited access to markets that match the skill levels of the youth in the region;
- Youth participants' had difficulty securing employment in an area with few employment opportunities;
- Computer training offered was limited in scope and only focused on a few ICT areas;
- Gulu administrative systems/processes constrained/slowed down decision making;
- Initiative relies on the time, energy and technical expertise of Gulu academics—not on community members.

Conclusion

This case illustrates one university's efforts to support the livelihood of communities in northern Uganda. The interaction not only empowered youth participants—equipping them with computer development and business communication skills—it also motivated youth participants to create ICT applications that promote inclusive development, and respond to the needs of other community members. Through this case, university and community actors brought about various forms of innovation, including, market, organisational, pedagogical, process, and product innovations in order to promote inclusive development and enhance the livelihoods of marginalised community

members. It is important to highlight that this case study saw the university actors learning more about the community through trial and error—as opposed to by researching and learning from the community first and then implementing the programming. While the researchers were able to learn more about the community through providing initial training, it is important to note that the youth participants who were involved in the initial training sessions may have had a different experience had the training been more responsive to their needs and to the needs of the market.

Chapter 9. Batwa community and the Institute of Tropical Forest Conservation: an interaction to improve livelihoods and support conservation



Figure 9.1. Batwa peasants tilling land at the fringes of the Bwindi Impenetrable National Park. Source: *Institute of Tropical Forest Conservation*.

This case study examines interactions between the Batwa community, Mbarara University of Science and Technology's Institute of Tropical Forest Conservation (ITFC), and the Uganda Wildlife Association (UWA) in south western Uganda. The Batwa are an incredibly marginalised community, who were forcefully evicted from their homes in the forests of Uganda in the 1930s without any compensation or support. Later, in 1991, they banned from accessing the forest resources they use to maintain their livelihoods. Spanning over 20 years, the interactions between university researchers and the Batwa aimed to support the livelihood of the marginalised community and contribute to the university academics' research on biodiversity and conservation. More particularly, the project aimed to involve the Batwa to develop and implement sustainable conservation efforts. The researchers also acted as intermediaries, connecting with other organisations, and empowering the Batwa community to serve as key change agents in community-based conservation efforts. Altogether, the interaction brought about various innovations, including organisational innovation, process

innovation, and social innovation. This case study highlights a complicated interaction that supports both an endangered, informal community, as well as endangered land. The case study highlights how Mbarara University researchers worked to respond to a troubling situation that threatened the land, as well as the livelihood of the Batwa people, whose survival depended on accessing natural forest resources in an incredibly vulnerable area (that had been designated a UNESCO World Heritage site). Further, the case study details a research-based, action-oriented response that brought about various organisational and social innovations and that supported both the needs of community members and the biodiversity and sustainability of the forests.

This interaction responded to the livelihood needs of the Batwa community in south western Uganda. The Batwa, who are believed to be descendants of the indigenous forest dwelling pygmy people who lived in the forests of Bwindi and Mgahinga (Kidd, 2008; Namara, 2006), are very poor and highly marginalised. As illustrated in the image at the beginning of this chapter, the Batwa people occupy an area with limited natural resources, limited land resources, and difficult terrain. The area has one of the highest human population densities in Africa with 600-700 people per square kilometre (Plumptre, McNeilage, Hall & Williamson as cited in Ndangalasia, Bitarihob & Dovie, 2007). They are an incredibly vulnerable minority in Uganda living outside the forests of Bwindi and Mgahinga in small settlements either on land that is held in trust for them by non-governmental organisations or as squatters on their neighbors' land (Kidd, 2008; Namara, 2006). They have limited or inadequate access to education, healthcare, employment, land for food production, or land for settlement. They also suffer from social marginalisation as their neighbors the Bakiga, Bafumbira, and other communities perceive them as uncivilised because of their former hunter-gatherer lifestyle. They have been discriminated against economically, politically, and socially.

To give the background of this interaction, the marginalisation of the Batwa community dates back to the 1930s when they were evicted from the forests of Bwindi and Mgahinga by the crown of the colonial administration in order to create conservation areas in this particular region of Uganda (Namara, 2006). This eviction meant the Batwa people were forced to move to the fringes of the forests. Living outside of the forest, they continued gathering forest resources, especially wild fruits and honey, game meat, plant materials for making baskets, among others things, to support their livelihoods (Namara, Gray & McNeilage, 2001). However, the government declared these activities illegal in 1991 when Bwindi and Mgahinga were designated as national parks in order to protect

their rich biodiversity and the endangered mountain gorillas. The area was also named a UNESCO World Heritage site as it is home to half of the world's endangered mountain gorillas. This resulted in the Batwa losing unrestricted access to the forests and the resources they used for their economic, social, and cultural sustenance. This loss of access meant their livelihood and existence was threatened as, for the first time in their life history, they were being denied access to their ancestral grounds that they relied on for survival. These changes triggered a series of protests from the Batwa and threatened the very existence of the protected areas created under the new legislation. Frustrated by being denied access to their source of livelihood and survival, the Batwa protested by setting bush fires that destroyed large chunks of the forest land. They also intensified their illegal access to the national park by engaging in the poaching of wildlife for game meat. Researchers at Mbarara University of Science and Technology offered a response to this distressing, complicated situation by seeking to find a way to support both the endangered Batwa people as well as the endangered forest land.

Overview of the interaction

Spanning over 20 years, the interaction between the Batwa community, the UWA, and the ITFC (based at Mbarara University) has addressed the livelihood needs of the Batwa people and the biodiversity conservation needs of the land. The interaction began in 1991 with the establishment of the ITFC in Bwindi. This Centre within the university aimed to support the community after they were banned from accessing their ancestral land. The interaction brought about various research and organisational initiatives, which will be detailed below. It is important to underscore that many of the organisational initiatives emerged from research initiatives; therefore, the research initiatives will be discussed first followed by the organisational initiatives.

Research initiatives

This three-pronged interaction has occurred through various research projects that, over time, have become increasingly collaborative and multi-disciplinary. Particularly encouraging is that as the interaction has progressed, community members from the Bakiga, Bafumbira, and Batwa communities have become more involved in the research process. The research projects are listed as follows:

- In the early 1990s, the ITFC and the UWA collaborated on research to identify, test, and implement conservation efforts in Bwindi, Mgahinga, and other nearby forests.
- In 1994, the UWA approached the ITFC to undertake a study to establish the impact of plant harvest on the sustainability of the natural forests in Bwindi and Mgahinga. This study focused on establishing the biomass of plant species considered to be of economic importance to the communities near the forests. This research on ecology and biodiversity informed UWA policies and helped to accommodate the needs of traditional forest users while at the same time maintaining biodiversity and the ecosystem functions of the forests.
- In approximately 2000, the ITFC and the UWA expanded their research to explore the socio-economic conditions of the communities, focusing on how people were affected by the UWA-sanctioned conservation interventions.
- From there, beginning in 2004, the research expanded to incorporate Indigenous Knowledge Systems (IKS), to promote the co-production of knowledge, and to involve the ITFC researchers, the UWA staff, and the community members. This multi-disciplinary, collaborative research helped to respond to the needs of the communities living near the forests.
- In 2004, Ndangalasia, Bitariho and Dovie (2007) undertook an additional study to assess the use of non-timber forest products that had been going on since 1994 under the Multiple Resource Use (MRU) plan. The study found that communities were using forest resources as medicinal plants, building poles, wood fuel, edible fruits and vegetables tool handles, weaving and basketry, as well as thatch material. The findings of this study suggested that empowering people to manage resources on their own may lead to long-term solutions. The study further led to various agricultural interventions (detailed below) to support communities in planting the most-utilised plants on local farms as an alternative to extracting resources from the forest.
- The ITFC undertook a project, 'Integrating Batwa cultural values into national parks management in Uganda' between 2012 and 2015. The study aimed to identify the most effective means to engage the Batwa in national park management and improve the relations between the Batwa and the UWA. The study assessed the views and cultural values of the Batwa to explore how they can be better integrated with conservation practices.

The ITFC has also been active in sharing the aforementioned research with the UWA and with local administration leaders to inform policies. The research has also been used to support the Batwa in developing various organisational structures to support their livelihoods.

Organisational initiatives

The interaction has brought about various organisational changes. More particularly, it has led to the development of the (1) Multiple Resource Use plan; (2) the Multiple Use Zone (MUZ) programme; (3) the United Organisation for Batwa Development in Uganda (UOBDU); (4) the Village Savings and Loan Association (VSLA); and (5) the Batwa Trail. These initiatives are detailed below:

Multiple Resource Use. The interaction between the University, the Uganda Wildlife Association, and the Batwa people led to the development of the Multiple Resource Use (MRU) plan in 1994. The MRU was a collaborative forest management approach in the Bwindi Impenetrable National Park that involved the ITFC, UWA, and the community members. The approach allowed local communities to access the forest to harvest plant resources without jeopardising the ecological balance of the forests. This project has also mobilised community members to be able to monitor the resource use, report illegal activities, and maintain ecosystem functions. Further, in 1999, nine other community groups were also allowed access to the forest (Bitariho et al., 2006).

Multiple Use Zone. The interactions also brought about the the Multiple Use Zone (MUZ) programme in 1996, which was an innovative community conservation programme that provides concrete recommendations about the amount of plant stock available in protected areas using findings from a 3D mapping study. This programme was introduced after the ITFC carried out a research study to determine the amount of plant stock available in the protected areas. Based on the findings from this investigation, it was able to recommend that the local people can harvest a conservative quota of approximately 1-3% of available stock annually from the protected areas. The recommended annual harvest quotas of the plants is what is included in the Memorandum of Understanding between UWA and the local people resource user groups to begin the harvest of the recommended plants. The MUZ programme allowed selected community members to access the forest to harvest bamboo rhizomes for planting outside the park, to collect water, to keep beehives, and to harvest spear grass and medicinal plants.

United Organisation for Batwa Development in Uganda. In 2000, the university-community interactions led to the development of the United Organisation for Batwa Development in Uganda (UOBDU), which was formed to represent the Batwa community. The UOBDU aims to support the Batwa by empowering them, improving their access to land and education, and helping them develop sustainable alternative livelihood supports. Over the course of the interaction, the UOBDU has been involved in the following activities: supporting formal and informal educational programming; improving Batwa access to government-initiated programmes; integrating Batwa cultural values into the management of the national parks; advocating for Batwa land rights; engaging with the Batwa in the development of the Tourism project; empowering Batwa women; and supporting income-generating activities. Recently, the UOBDU also took the government to court to seek legal redress after being denied access to the forest.

Village Savings and Loan Association. The interaction has brought about the Village Savings and Loan Association (VSLA). This is funded by the Gorilla Organisation and supported by the UOBDU. It is a group savings and investment organisation that helps to create economic opportunities for the Batwa people. The VSLA is responsible for training community members in group management savings and borrowing, and identifying/facilitating sustainable income generating activities (e.g., poultry, animal husbandry, craft making, mushroom growing, bee-keeping). The VSLA is a small grants facility that has provided market advisory services for Batwa community members.

Batwa Trail. The interaction also brought about a new tourism program, the Batwa Trail project, which is based on a partnership between the UWA, the International Gorilla Conservation Programme, ITFC, and other organisations such as USAID. The aim of the project is to support the Batwa to use knowledge of their rich forest-dweller culture to earn an income from tourism related activities without harming the environment. With five and eight kilometre trails, the project centres on guiding tourists along the Batwa trail, entertaining them through dance and drama, sharing knowledge, and selling traditional handicrafts.

Other initiatives

Along the way, the interaction between these three entities have also brought about other initiatives, including: (1) alternative community practices; (2) monitoring units; (3) improved organisational relations; and (4) capacity building training.

Community practices. For example, the interaction has also helped to identify and develop alternative ways of engaging the Batwa community in economic activities, including adopting new farming practices and initiating income generating projects. For example, agricultural practices were adapted and introduced in the local community – an illustration of integrating scientific and traditional knowledges. While the Batwa people have traditionally sustained themselves by gathering wild fruits, vegetables, mushrooms, yams, honey, and bush meat, they have adopted and implemented various farming innovations. These innovations are backed with knowledge on seed selection, cultivation, planting, weeding, spraying, harvesting and post-harvest management, as well as how to protect crops from wild animal raids. Income from the sale of the produce has been used to buy sheep and goats, which are reared to further improve the Batwa people's income levels and livelihoods. Through the interaction, community members have also been able to build latrines to dispose of human waste and protect community water.

Monitoring units. Further, the interaction has helped form the 'forest protection' and monitoring units that collect data about wildlife, relations and park effectiveness, and that bring together Batwa knowledge about traditions, culture, and value systems with UWA knowledge about park management and conservation. As a part of these initiative, the ITFC introduced the 'Monitoring and Evaluation Plan' to train park rangers and the Batwa people in the monitoring protocol.

Organisational relations. The ITFC has served as an intermediary to foster connections with other actors, such as conservation agencies and NGOs, and to improve and repair the relationship between the Batwa people and the UWA. The ITFC has helped to facilitate negotiations and discussions between the Batwa community and the UWA.

Capacity building. The ITFC has also facilitated education and training of both UWA staff and the Batwa community members on various aspects of conservation management, institutional development, and negotiation skills. As part of this capacity building and information sharing role,

the ITFC and UWA host an annual joint ‘Information Sharing Workshop’ in the ITFC training centre to discuss study results, emerging conservation challenges, and their implication for future strategies with community members and other stakeholders. One university researcher described the purpose of this annual workshop in greater detail:

As part of our annual work plan, ITFC organises annual research information sharing workshop in Bwindi. This forum is used to engage with the community and other stakeholders to share knowledge on research that has been completed and also serves as a platform for identifying research priorities that seek to deal with key socio-economic challenges being faced in the communities. This is done in collaboration with UWA and other stakeholders including the community members⁶⁹.

The university has also facilitated various other training sessions, including sessions that focus on reading, writing, numeracy, and business management skills with the Batwa people.

Quite broadly, the interactions have involved the Batwa in the sustainable use of forest resources in order to support their livelihoods and support the ecology of the area. They have also empowered community members to increase their participation in the conservation management programmes. Yet, while the research and organisational initiatives have brought about many positive changes, it is also important to note that there have been challenges throughout the interaction. These are discussed below.

First and foremost, there has been an ongoing tension between supporting the human development of local communities and supporting environmental sustainability of the forests. This has been something the researchers and human rights activists are often mindful of and frequently criticised for. There have also been challenges with working with an incredibly disadvantaged population with few social resources as, while some Batwa community members have been actively involved in the interactions, the programme has not been able to integrate everyone. Further, some Batwa community members are critical of the researchers as they do not feel the researchers are doing enough to offer material and financial support to the Batwa people. In addition, there has also been an ongoing tension between the Batwa community and the UWA officers. This tension has come from the UWA officers being the group that initially banned the Batwa people from accessing the

⁶⁹ From interview with University’s ITFC researcher

forests, which prevented them from attaining natural resources to sustain their livelihoods and visit historical sites that are of traditional and cultural importance to the Batwa people.

Structure of the interaction

The figure below provides an illustration of how the various primary actors are involved in this interaction. Table 9.1, following the figure, provides further information about each of these primary actors and their involvement in the interaction.

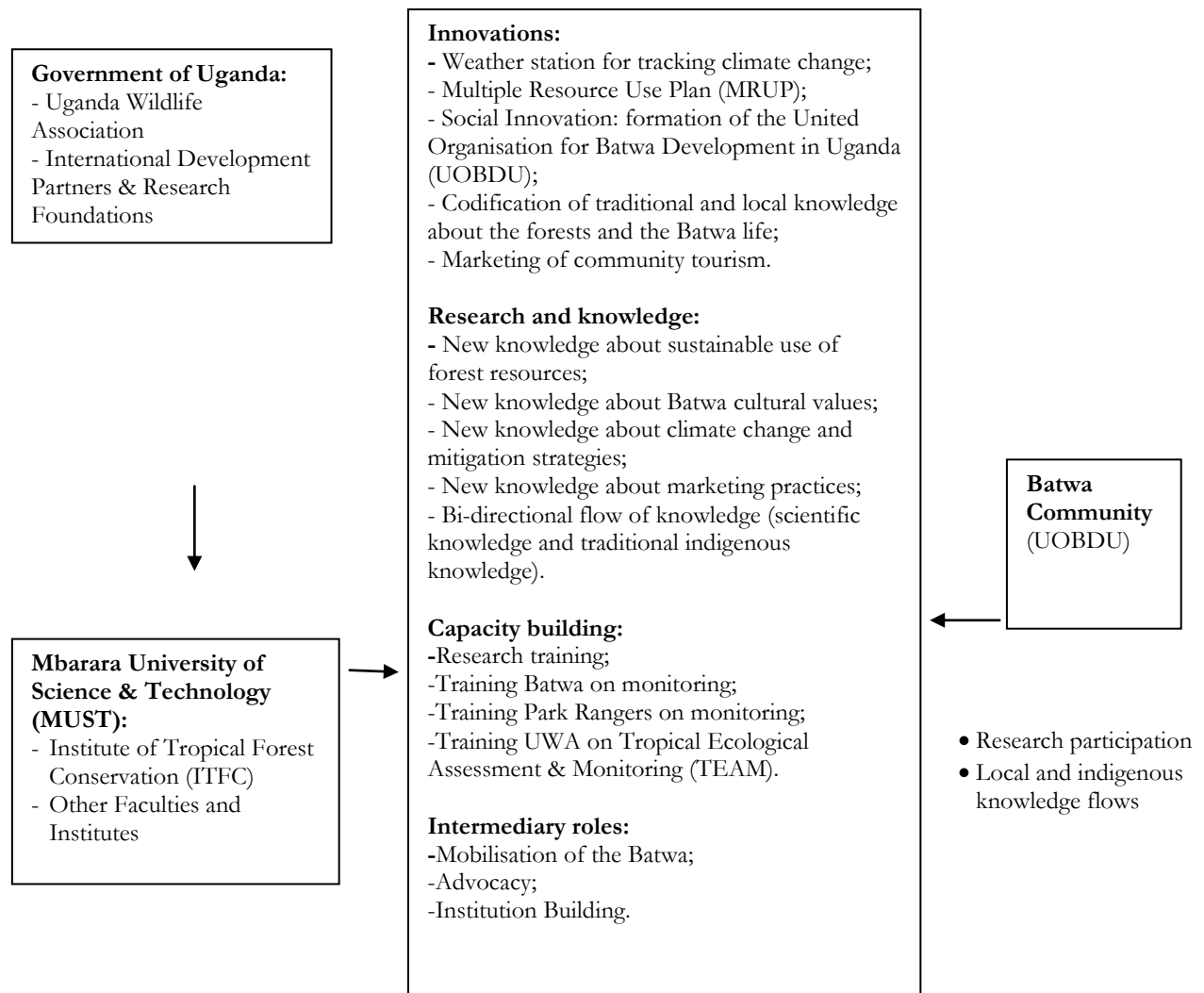


Figure 9.2. Map of primary actors involved in interaction.

Table 9.1. *Key Primary actors and their involvement in the interaction*

Actor	
Batwa Community	The Batwa community is a marginalised community in south western Uganda who were forcefully evicted from their homes by the Ugandan government without any compensation or support. They currently live close to both the Bwindi Impenetrable National Park and Mgahinga Gorilla National Park.
United Organisation for Batwa Development in Uganda (UOBDU)	The interaction between the University's research institute, the ITFC, and the Batwa people led to the development of the UOBDU, which was formed in 2000 to represent the Batwa community. The UOBDU aims to support the Batwa by empowering them, improving their access to land and education, and helping them develop sustainable alternative livelihood supports. With a main office in Kisoro, the UOBDU operates in the districts of Kisoro, Kabale, Kanungu, Mbarara, and Ntungamo. The UOBDU has worked with various development partners to support a number of development initiatives. They have represented the Batwa in the interactions.
Institute of Tropical Forest Conservation (ITFC)	The ITFC is a post-graduate institute that is part of the Faculty of Science at the Mbarara University of Science and Technology (MUST). Founded in 1991, the ITFC focuses on research, training, and monitoring for conservation management. The ITFC is located close to the Bakiga, Bafumbira, and Batwa communities on the edge of Bwindi Impenetrable National Park in South Western Uganda. The ITFC has a reputation for providing management and capacity building support for biodiversity conservation. The ITFC works in partnership with other local and international conservation and development agencies to undertake biological and socio-economic research and monitoring with the aim of addressing the key conservation challenges facing the region. The ITFC has broad professional expertise in forest ecology, social sciences, botany, zoology, resource use and monitoring, biodiversity surveys, vegetation mapping, impact assessment, community surveys, participatory approaches, and conservation planning.
Local Administration	Local administrations, particularly the Kisoro District Local Administration, have been involved in the interaction. The local administrations are comprised

Leaders	of Community Development Officers, who represent the local communities. The community development plans these leaders have implemented have been informed by the ITFC research.
Uganda Wildlife Authority (UWA)	Founded in 1996 by the government, the aim of UWA is to conserve and manage Uganda's wildlife resources. The semi-autonomous government agency is responsible for managing wildlife resources and supervising wildlife activities. UWA has actively engaged with the Batwa and with the ITFC as they are responsible for enforcing the restricted access of both the Bwindi Impenetrable National Park and Mgahinga Gorilla National Park.

Organisational arrangements and interface structures

There are various community, university, and government-level organisational arrangements and interface structures that have helped to shape the interaction. These are described below.

Community. The formation of the UOBDU in 2000 has helped to better represent the Batwa and formalise interactions between the university and the community. It is focused on organising at the village level and introducing more formalised structures to help the Batwa people interact with the UWA and other development partners, particularly in relation to natural resource use and livelihood improvements. As a part of this organisation, committees have also worked with the ITFC to gain scientific knowledge and strategic advice. The UOBDU also recently organised to seek retribution from the government following the eviction from the land.

University. Established in 1989, the Mbarara University of Science and Technology (MUST) is home to the ITFC. As was discussed in chapter 6 of this report, the University's mandate supports community-based research. More particularly, the ITFC's mandate is to help marginalised communities by contributing to local knowledges and developing socio-economic interventions that are environmentally sustainable. As was also discussed earlier, the University's policy requires that university researchers train graduate students through community-based research in the field. As one academic explained:

As a research focused institute of the university, we are mandated to provide an atmosphere for scientific research on matters of ecology and conservation and this requires assessing how people interact with the

*surrounding environment. This therefore offers opportunity for interaction with the community members in the course of doing the research*⁷⁰

Along similar lines, another academic stated:

*The University has an obligation in which it seeks to be an institution that is relevant to the community. In this regard, the training and research programmes of the university have been designed to be responsive and have a strong orientation towards identification of community social and livelihood needs*⁷¹

These statements from the Institute's researchers illustrate how the University's mandate, policy, as well as the university's organisational structures support community-based interactions in relation to research, and have helped support the interaction between the Batwa community and the ITFC. That said, it is important to note that, as was highlighted in the earlier mapping chapter on Mbarara University, the university has not fully developed and adopted a social engagement policy or a strong institutional framework to support its researchers' efforts to engage with communities. This lack of policy and framework development in relation to university-community engagement outside of research activities, means there are few formal structure in place to support this type of engagement. It also means that the University does not have adequate financial resources to fully address the needs of marginalised communities.

Government. There are various governmental agencies and structures in place that have helped to shape this interaction, most particularly the Uganda Wildlife Authority (UWA) and the local administrative leaders. In addition, the Ugandan government has also helped to fund research and conservation activities in this region. Specifically, the UWA has played a key role in shaping this interaction. They were responsible for banning the Batwa people from the forests in 1991 following the enactment of the law that prohibited unauthorised human activity in the forests and national parks. Prior to the involvement of the University in this interaction, in the early 1990s, the UWA tried to develop interventions with the Batwa people, including, community conservation programmes to engage local communities in biodiversity conservation efforts. That said, many challenges arose trying to involve local communities in these programmes. Furthermore, the

⁷⁰ From interview with University's ITFC researcher

⁷¹ From interview with University's ITFC researcher

programmes lacked knowledge about the communities, about biodiversity, and about conservation management. Bringing the ITFC into the interaction, the UWA has been able to learn from the university researchers about how to develop more effective conservation methods, as well as better understand the Batwa community. The UWA has also adopted a more proactive and inclusive approach to conservation by involving the Batwa communities in planning and implementing conservation interventions. They have helped enable the community members to have some access to the protected areas in a more organised way. Further, the UWA conservation managers have also worked with the ITFC to develop research proposals for conservation projects in the Bwindi and Mgahinga Conservation Area. The UWA has also produced the Annual Operations Plan and management plan for the area. Local administration leaders have also helped to shape this interaction. For example, the local administrators have been actively involved in integrating livelihood improvement interventions into their community development action plans and supporting the interactions between the ITFC, UWA, and the Batwa.

Drivers of the interaction

There are a few key factors driving the interaction both on the part of community actors and university actors. At the beginning of the interaction, the Batwa community members were motivated to participate in this interaction in order to sustain their livelihoods and to address their own marginal status as they wanted support from the University to deal with their eviction from the forest and develop innovative knowledge, skills, and resources to survive after having their livelihood threatened by the eviction. As the interaction with the university progressed though, the community actors shifted from wanting to respond to their eviction to wanting to develop sustainable livelihoods, social infrastructure (e.g., health, education), shelter, and income-generating activities.

University actors were motivated to engage in this interaction with community members for primarily intellectual and social reasons. In terms of intellectual reasons, the ITFC researchers were able to produce a large number of research outputs from this interaction that not only made various theoretical and empirical contributions to the researchers' fields of study, specifically conservation and ecology studies, but also helped devise an inter-disciplinary approach to tackling the challenge of conservation and how to balance the human and ecological dimensions of forest conservation. In addition, University researchers were also motivated to train graduate students in and through

research in the field, helping graduate students produce numerous dissertations on issues related to biological and social aspects of conservation. The University was also motivated to participate in this interaction for social conscience reasons, specifically a desire to see the Centre's research have a positive social impact on the community. As was discussed in chapter 6 of this report, Mbarara University has positioned itself as a university seeking to promote interaction between its academics and external social partners. But more importantly, the university emphasises the development of a training and research approach that engages with communities, in the attempt to contribute to socio-economic development in the communities.

Innovation

The innovations that were brought about in and through this interaction were primarily organisational as they led to the development of five different programmes. It is also striking that the innovations drew from indigenous knowledges, bringing about innovations that were new to the community - as they brought about innovative ways of living, and new to the research field - as they brought about new empirical and theoretical research outputs. Although the interaction mainly produced organisational innovations, some process and social innovations also emerged.

Organisational innovation is evident in the following:

- Multiple Resource Use (MRU) plan was initiated to allow community members to access the forest for plant resources;
- The Multiple Use Zone (MUZ) programme was developed to provide concrete recommendations about the amount of plant stock available in protected areas, and to allow selected access to the forest;
- The UOBDOU was formed in 2000 to represent the Batwa community;
- The Village Savings and Loan Association was founded to support community members with income generating activities;
- The Batwa Trail was a tourist project developed to allow the Batwa to use knowledge of their rich forest-dweller culture to earn income without harming the environment.

Social innovation is evident in the following:

- Batwa community strengthened their understanding about conservation and about the potential impact of excessive exploitation of forest resources on the environment and climate change;
- Batwa community have benefitted from increased livelihood activities;
- Batwa community has an increased capacity to engage with the external organisations, including the ITFC, UWA, and other development partners;
- Batwa community has an increased capacity to advocate for their rights and access to resources;
- ITFC academics were able to empower both the UWA park rangers and the community members on how to collectively participate in conservation programmes.

Process innovation is evident in the following:

- Batwa community members adopted more sustainable and often alternative livelihood and lifestyles practices, which prevent them from engaging in illegal activities that previously brought them into conflict with the government;
- Agricultural practices were adapted and introduced in the local community that integrated scientific and traditional knowledges;
- Multi-disciplinary research was conducted collaboratively (e.g., a research project jointly undertaken developed 3D maps showing the cultural landscape of the forests which was later integrated into park management);
- Indigenous knowledges were codified through a community-based project that drew on scientific and traditional knowledges (to create the 3D maps);
- Interactions brought about new empirical and theoretical research outputs through collaborative, multi-disciplinary research.

Knowledge and skills

In this interaction, knowledge and skills flowed in a bi-directional manner, moving both to and from the community and the university actors. Quite remarkably, the knowledge flows have tended to be horizontal in nature as the university actors have worked directly with community members.

Through this interaction, community actors have gained various knowledges and skills. By active engagement, members of the community developed their leadership, organisation, communication, advocacy, and farming skills. In addition, they developed skills that have allowed them to sustain their livelihoods without bringing harm to the environment. Community members also received training in natural resource management and in business ventures. They have further developed skills in initiating income generating projects (e.g., in knitting, sewing, handicraft making) as well as in cultivating herbal medicine and food to improve food security, nutrition, and household income.

University actors have also benefited from the interaction. They have developed their skills in researching, monitoring, and evaluating. They have also gained knowledge about the environment in and through their research, training, and capacity-building initiatives. They also gained an understanding of local and traditional knowledges, which has helped to inform their research. Researchers also learned from the community about plant species, medicinal plants, animals, and birds, and about the values and experiences of the community members. In turn, they applied this knowledge in their efforts to develop the MUZ conservation programmes, to expand their research, and to collaborate with others. University actors also produced various research outputs that they communicated to their academic communities via conference papers and other publications.

Community participation

Community members have been active participants in the process. They initially expressed concerns following their eviction from the forests, advocating for government policies and conservation practices that are more inclusive of Batwa community members. They were active participants in discussions. While most of the strategic advice came from the academic partner, community members were also involved in research-based and organisational initiatives. For example, they helped translate scientific knowledge into context-specific, community-based, income-generating activities that were unique to their communities. Community members actively shared their indigenous knowledges about forest resources to support the ITFC's research, specifically with developing the 3D map and to inform the development of various organisational initiatives, including, the MRU plan, the MUZ programme, the UOBDU, the VSLA, and the Batwa Trail. Community members' cultural and traditional understandings were also used to motivate others to promote conservation, and foster alternative, innovative processes to sustain their livelihoods. The

community was also actively engaged in identifying, evaluating, developing, and implementing concrete solutions to address local livelihood problems. Throughout the interaction, community members increased their participation in the conservation management programmes. That said, while some Batwa community members have been actively involved in the interactions, the programme has not been able to integrate everyone.

Outcomes and benefits

The following table highlights the outputs (e.g., achievable and tangible products) and outcomes (e.g., changes in behaviours, attitudes, practices, capacities, policies, relationships, and technologies) that were brought about in and through the interaction between the Batwa community actors and the ITFC university actors.

Table 9.2. *Outputs and outcomes for community and university actors*

Benefits		
	Community actors	University actors
Outputs	Community members implemented various organisational structures and initiatives in partnership with others, including, the MRU plan, the MUZ programme, the UOBDU, the VSLA, and the Batwa Trail	Researchers implemented various organisational structures and initiatives in partnership with others, including, the MRU plan, the MUZ programme, the UOBDU, the VSLA, and the Batwa Trail
	Community members collaborated with ITFC to produce research, including the 3D map	Researchers developed ecological monitoring protocols
	Community members codified their knowledge	Researchers produced various publications (e.g., conference papers, dissertations, publications, reports)
	Community members improved their ability to generate an income and to support their livelihoods in legal and sustainable ways	

	Community members built latrines to dispose of human waste and to protect their water supply	
Outcomes	Community members improved sustainability of the local area, decreasing the community's environmental impact on the forest	Researchers improved sustainability of the local area, decreasing the community's environmental impact on the forest
	Community members improved their relationship in engaging with the government and other organisations	Researchers' reports contributed theoretically and empirically to research in the fields of ecology, biodiversity, and conservation
	Community members developed alternative and innovative ways to sustain their livelihoods (e.g., agricultural practices)	Postgraduate students developed their research abilities in community-based field research
	Community members improved their capacity to advocate for their land rights	Researchers accessed indigenous, local knowledges
	Community members collaborated with others to codify their indigenous knowledges	Researchers improved their capacity to engage with non-academic and community actors
	Community members have developed skills in initiating income generating projects (e.g., in knitting, sewing, handicraft making) as well as in cultivating herbal medicine and food to improve food security, nutrition, and household income	Researchers developed capacity to undertake applied conservation research, bringing together technical and scientific knowledge about biodiversity conservation, and social knowledge about how the local communities engage with their surroundings
	Community members have become more socially conscious; there has been a decrease in gender violence, and an improved social cohesion among	

families

Community members have made various lifestyle changes and various improvements to their homes and communities (e.g., community members are thought to have improved their health, hygiene, sanitation practices)

Community members increased their participation in the conservation management programmes

The main output brought about through this interaction was that the community actors and the university actors collaborated to form various organisations to address the livelihoods needs to the Batwa people. Through this, they also worked both to support the livelihoods of the Batwa community and to lessen the environmental impact on the area, successfully increasing their conservation efforts. In speaking of the outcomes, one community leader drew attention to various lifestyle changes, saying:

The progressive Batwa now use income from the sale of agricultural products to buy household items like clothing, beddings and mattresses. This has inspired others to show great anxiety for development and has been used by the community and local government leaders to enhance their participation in groups. The community members who embraced change have shown improvement in health, hygiene and sanitation and can now be seen to live comparable lives with their non Batwa neighbours⁷²

The community leader above attributed the university's interaction to various livelihood and lifestyle changes and improvements among the Batwa. The leader also mentions that the interaction has given community leaders leverage to encourage other community members to participate in these initiatives. In the quote below, another local administration leader shared their positive views of the positive outcomes of this three-pronged interaction between the university, government, and Batwa people:

⁷² From interview with a community leader

*We, as members of Kisoro District Local Administration, are impressed with the results of the partnership between ITFC, UWA, the Batwa, and other development partners. This partnership shows that the Batwa can manage their assets and wellbeing if they are involved in planning and the implementation of development interventions from the beginning. We are particularly impressed to see their gardens, homes, and sanitation facilities that are as good as those of other ethnic groups. We need to continue assessing the interventions made by and for the Batwa in order to learn from adaptation and sustainability of the investments made through the partnership*⁷³

The local administration leader points out how the Batwa people's lifestyle changes, by being involved in this interaction from the beginning, have helped them improve their homes and communities.

The university actors primarily benefited from producing research that contributed theoretically and empirically to the field of ecology, biodiversity, and conservation. It is striking that their research—not only benefitted their own research communities—but was also used to support community-based, grassroots efforts. Their involvement in this interaction was grounded in and informed by their research.

With regard to scaling up and diffusion of the innovation(s) from this case, there is some potential to do so. There is desire to scale up the activities of the engagement to other units of the Batwa community that have not yet actively been involved. Many of the projects discussed above were undertaken by a few community members. For example, the MUZ and the farming and income-generating activities were undertaken in a few parishes but could be scaled up to other parishes. Training and education could also be replicated in other communities to empower community members to improve their own livelihoods. Similarly, research could be undertaken in other communities that support these efforts.

Enablers and constraints

The interaction discussed in this chapter was both enabled and constrained by particular factors. The enabling conditions that helped to facilitate the interaction are as follows:

⁷³ From interview with Local Government Administrator

- Mandate of the ITFC which encourages and supports community-based conservation research;
- Researchers' commitment to conservation research and the Batwa community's emancipation;
- Researchers' motivation to undertake research and supervise graduate students in these conservation research projects;
- Funding from the Gorilla Organisation and the government;
- Community's willingness to improve their livelihoods and develop community-based organisational initiatives.

The following are the constraints and challenges that inhibited the interaction:

- Troubling situation with endangered Batwa people and endangered land;
- Concerns that supporting the Batwa or supporting the livelihoods of local communities places human development concerns over conservation concerns and may put environmental sustainability at risk;
- Significant amount of community time and energy went into dealing with their eviction from the forests (e.g., taking the government to court for legal redress);
- Disadvantaged and marginalised state of the Batwa people (e.g., limited access to social resources);
- Select members of the Batwa community participate in the social innovations (e.g., not all members of the Batwa community have participated and benefited from these initiatives);
- Tensions between the Batwa community and the UWA officers (who prevented the Batwa people from accessing the forest for natural resources and visiting historical sites that are of traditional and cultural importance);
- Tensions between the Batwa community and ITFC researchers as some community members feel the researchers are not solving the real livelihood problems as they are not provided with enough material support to help their families;
- Struggles of university researchers because of limited financial resources to help the community;

- Weak or non-existent university social engagement policy or a strong institutional framework to support university efforts to engage with communities;
- Limited and inadequate external funding that has decreased over the years;
- Continued claims from the Batwa people to the forest (e.g., the UOBDU recently took the government to court following the eviction);
- Limited and inadequate natural resources in the area;
- Limited and inadequate land resources as the area is incredibly densely populated (with between 600-700 persons per square kilometer) (Plumptre, McNeilage, Hall, & Williamson, 2002 as cited in Ndangalasi, Bitariho & Dovie, 2007).

Conclusion

This case is an example of the interaction between the Batwa community, the UWA, and the ITFC that aimed to support both the endangered Batwa people and the endangered land. The interactions primarily supported the community in bringing about organisational innovation—implementing organisational structures—to support the people and the land. The interaction also brought about social innovation—empowering community members to make lifestyle changes—and process innovation—introducing new practices to generate incomes. This interaction, again, responded to a troubling situation. Prior to the interaction, the Batwa people’s survival depended on accessing natural forest resources, which undermined the ecology of an incredibly vulnerable area (that had been designated as a UNESCO World Heritage site). This interaction brought about a research-driven, community-based response that successfully supported the livelihoods of the Batwa people while also lessening the environmental impact on the local forests. The case also highlighted the importance of community-based efforts that flow out of research.

Chapter 10. Discussion of Case Studies

The aim of this chapter is to synthesise findings across the three case studies. Specifically, we are attempting to respond to the following research questions outlined in chapter 1 of this report:

How do academics in distinct fields interact *in practice* with external social partners for the specific benefit of marginalised communities?

What are the emerging instances of university-external social partner interactions to promote innovation for inclusive development that can be identified in these institutions – and how do these serve as exemplars to inform what is possible?

By doing so, we hope to determine what can be learned from these interactions between universities and marginalised, informal communities around innovations to address livelihood issues in the context of Uganda.

Table 10.1. *Key findings from case studies*

	Makerere Academics Traditional Practitioners	University and Buyijja Health	Gulu Academics Ugandan Youth	University and Northern Youth	MUST Academics Community Dwellers	University and Batwa Forest Dwellers
Aim	In this interaction, Makerere supported Traditional Practitioners to develop sustainable practices and lessen the environmental impact on the area.	Buyijja Health researchers to develop sustainable practices and lessen the environmental impact on the area.	The aim of this interaction was for Gulu academics to provide training to Ugandan youth and provide internet access to the community.	Gulu University to provide ICT to northern youth and computers and internet access to the community.	The aim of this interaction was for MUST academics to support community to implement sustainable conservation practices, and support environmental conservation.	Batwa Forest Dwellers to support conservation practices, and support environmental conservation.
Nature of	The interactions involved MAK researchers working	The interactions involved MAK researchers working	The interactions involved Gulu academics offering	The interactions involved Gulu academics offering	Spanning over 20 years, the interaction between the	Spanning over 20 years, the interaction between the

Interaction	with THPs to conduct research and to strengthen herbal medicine practices and knowledges. The interaction involved knowledge flowing to and from the community and university. The interaction made a significant contribution to the local community—both to support the health and nutrition of the community and to increase sustainability of the land.	ICT training to community youth. They started by offering basic training, and then shifted to more technical training to meet the needs of the market. The youth developed computer applications, secured employment, accessed the larger market, and fostered connections. They also worked to support the livelihoods of other community members.	Batwa community, the UWA, and the ITFC involved various research initiatives and organisational initiatives. The interactions started with conducting research and exchanging knowledge, and then moved to implementing various practices and structures that supported inclusive, sustainable development.
Community	The Buyijja THP community includes herbalists and spiritualists, who are quite marginalised. They are an informal group, who live in an isolated community, and have limited resources.	The youth participants in this interaction came from 12 different districts of the Lango Acholi sub region of northern Uganda. They were highly marginalised, and had been victims of more than two decades of civil war.	The Batwa are an incredibly marginalised community, who were banned from accessing natural resources on their ancestral lands in 1991 after being evicted from their homes in the 1930s.
Actors	The interaction primarily involved researchers from MAK Department of Botany and the THPs. PROMETRA Uganda also provided the space at their Forest School, which	The case involved Gulu university academics from the Department of Computer Science, and youth participants. SINFA Uganda, a social enterprise, also provided support	The case primarily involved researchers from MUST University's Institute of Tropical Forest Conservation, staff from the Uganda Wildlife Association, and members

	helped to facilitate the exchange of knowledge between researchers and THPs.	through their Internet Now project.	of the Batwa community.
Organisational arrangements and interface structures	Community. At the beginning of the interaction, the THP community of Buyijja was quite unstructured with no registered entities and limited formal supports. Each member worked independently to harvest, prepare and sell herbs.	Youth participants were informal and unstructured. That said, the northern Uganda community had a strong presence of NGOs in the area, including NGOs working to support ICT skill development and provide internet access.	While the community was very informal when the interaction initiated, the founding of the United Organisation for Batwa Development in Uganda in 2000 has helped to formalise interactions with the university.
	University. MAK University has a hands-off approach to community engagement that sees individual departments initiating community interactions without formal support from the university. That said, university administrators promote community engagement, and encourage research that responds to the needs of local communities.	While the Gulu University mandate supports community transformation, it is important to note that academics are evaluated for their research outputs—not for their community engagement work. The university also has limited resources and supports for engaging externally (e.g., there is not a point person for communities to get in touch with).	Both the MUST university mandate and the organisational structures in place support community-based interactions. That said, the university has limited financial resources and incentives for researchers to engage in community development initiatives.
	Government. The THPs are not recognised as a	The project was funded through the government of	The project has been supported by government

	profession nor are they entitled to government supports. It is also worth noting, there are limited health services in the areas, which has helped to create the demand for the 'THPs' services.	Uganda. The National Council for Higher Education, a government organisation, also helped promote engagement between universities and communities.	funding and by the involvement of the UWA. The government also played a role as they banned the Batwa people from the forest without working to introduce more-sustainable alternatives for the community.
Driver of interaction	THPs were motivated to improve their livelihoods by developing sustainable ways of cultivating herbal plants, and ensuring a continued supply of herbal plant materials. MAK researchers were motivated to engage in community-based applied research and to learn more about the local herbal plants.	The youth participants were motivated to sustain their livelihoods and to connect with a larger, professional community. The Gulu academics were motivated to contribute to a community engagement initiative.	Batwa community members were motivated to sustain their livelihoods, address their own marginal status, and respond to their recent restriction from the land. University actors were motivated socially to support the community, and intellectually to produce research outputs.
Innovation	The interactions brought about different innovations for inclusive development. More particularly, the interactions brought about process innovations, introducing alternative and more-sustainable ways of harvesting, extracting,	The interaction brought about several innovations, including, market innovations (e.g., expanding the youth participants' access to wider markets), organisational innovations (e.g., introducing a new	The interactions brought about various innovations, including organisational innovations (e.g., working to initiate several projects and programmes), process innovations (e.g., adapting sustainable/alternative livelihood practices), and

	<p>preserving and packaging herbal plants. The interactions also brought about organisational innovations, helping the THPs to organise with one another.</p>	<p>organisational structure to integrate people into the workforce), pedagogical innovations (e.g., offering training that responded to the needs of youth and needs of the market), process innovations (e.g., introducing new computer processes), and product innovations (e.g., developing computer applications).</p>	<p>social innovations (e.g., improving ability to engage with external partners).</p>
Community participation	<p>While community members were initially suspicious of the project and reluctant to share their indigenous knowledges with the researchers, they became more involved in exchanging knowledge, conducting research, and presenting their own experiences and knowledges to others.</p>	<p>The case empowered youth—not only to develop technical computer skills that are relevant to their communities—but also to take on community leadership roles, supporting others in their communities with computers. Through the process, they became active in educating and supporting others.</p>	<p>Community members were initially motivated to respond to their eviction from the forest and their inability to access natural resources to sustain their livelihoods. Overtime, however, their interactions centred more on them working to develop more-sustainable ways of living.</p>
Knowledge and skills	<p>The knowledge/skills flows in this interaction have been mutually beneficial. The project has helped the community actors and university actors to</p>	<p>Youth participants improved their technical skills and knowledges in computer repairs/maintenance. They also developed their</p>	<p>The knowledge/skills exchanged have been somewhat mutually beneficial. Community members developed their ability to sustain their</p>

	exchange both indigenous and scientific knowledges, and to collaborate on research-centred projects. THPs have also developed skills to make their work more sustainable.	entrepreneurial skills. While Gulu academics have benefited to a lesser extent, they have improved their capacities as project managers and improved their capacity to work with disadvantaged communities.	livelihoods without bringing harm to the environment. They also developed skills in initiating income generating projects and natural resource management ventures. The university actors expanded their local and traditional knowledges about the environment, and produced various research outputs.
Outcomes and benefits	Community actors improved their ability to support their livelihoods, generate an income, and increase their sales while also lessening their environmental impact. University actors have produced various publications, integrating both indigenous and scientific knowledges to make contributions to their field.	Community actors benefitted from receiving training and subsequently developing computer applications, securing employment, and working to support others in their communities. University actors benefitted from learning from an informal community. University students were also able to complete their required integrated learning projects.	Community actors implemented various organisational structures and initiatives, including the MRU plan, the MUZ programme, the UOBDO, the VSLA, and the Batwa Trail. University actors contributed theoretically and empirically to the fields of ecology, biodiversity and conservation. They produced various research outputs.
Enablers and constraints	The interaction was enabled by the fact that both parties benefited from	The project was well-supported through the funding and assistance of	This interaction was supported both by the researchers' commitment

ints integrating and sharing NGOs in the area. One to the area and the their knowledges. The constraint was that the community members' project was constrained by initial workshops were willingness to improve the limited number of offered without conducting their livelihoods. The supports for THPs and by a needs assessment or interaction was constrained the limited natural better understanding how by ongoing tensions resources in the area. to meet the needs of between the Batwa and the community members while researchers and the Batwa also responding to market and the UWA that stem demands. from their marginalisation and from their eviction from their homes.

The three cases above were analysed in detail in order to reveal the extent of interaction, knowledge exchange, and how the innovations developed to address the livelihoods challenges among members of the marginalised communities.

Two of the cases were research centred. In the Batwa case and the Buyijja case, the organisational and community-based developments emerged from concrete research initiatives. For example, in the Batwa community case, the interaction centred on academics and community members conducting research together before implementing community-based livelihood practices. The community-based developments flowed out of the research. Similarly, in the Makerere case, the researchers shared their research with the community to build trust. From there, the researchers exchanged knowledge and conducted research in partnership with the THPs—prior to making recommendations and implementing solutions to particular problems. Having university-community interactions that are grounded in research proved generative. The research not only supported the community, it also contributed to scholarship in the researchers' disciplines. In both cases, the researchers were able to train graduate students, produce research, dissertations, conference papers, and publications in peer reviewed journals, which allowed some of the researchers to secure promotions. These efforts also enabled researchers to secure grants and contribute to the research reputation of the university. Again, the interactions had extensive benefits for the academics and for the universities.

Quite remarkably, both the Batwa case and the Buyijja THP case also started with an alarming dynamic. By supporting their own livelihood needs, the communities were destroying the land. Their survival depended on destroying the local eco-system. This difficult situation required drastic changes in their own livelihood practices. It also required sensitivity on the part of the researchers. For example, the researchers had to find a balance between supporting the communities and sustaining the land. The fact that the interaction was research-centred helped them find a balance. They were not simply human activists—fighting for the rights of the people; they were responding to the needs of both the people and the land. This is important to highlight as it shows the importance of having research interactions with healthy boundaries or that are research-driven (as opposed to directed by a few community leaders or by the needs that a community voices).

While both the Batwa and Buyijja cases were research-driven, the Gulu case started without a needs assessment or without a research mandate. In some ways, the first training session was a pilot programme. Through the initial introductory training sessions, the Gulu researchers learned about the needs of the community and about the demands of the market. While they were able to learn through trial and error, and were able to adapt their programme to better respond to both the needs of the community members and to the demands of the market, when we analyse this case alongside the Batwa and Buyijja cases, it raises the question of whether or not it would have been more effective for the Gulu academics to take a research-centred approach, to conduct a needs assessment and better understand the community before initiating the programme. For universities looking to adapt a community engagement strategy, this could be an area of focus.

It is also striking that all three cases do not simply benefit the community actors and the university actors; they have repercussions for the local area. The Makerere case and Batwa case contribute to the ecological sustainability of the area. Similarly, the Gulu case provides computer centres and internet access locally. While we focused our scholarly attention on how cases were benefiting university and community actors, it is also important to consider how they are bringing about changes in the local context in which they are situated.

Chapter 11. Conclusion

The purpose of this UNIID study was to better understand how university actors in Uganda are interacting with external social partners. Specifically, we wanted to understand how academics interact with marginalised, informal communities to bring about innovations that support inclusive development. We started by examining the national system of innovation, moved to examining patterns of interaction at three higher education institutions in Uganda, and then narrowed our focus to examine particular interactions between university and community actors in three different communities in different regions of the country.

This chapter will summarise our findings on the role Ugandan universities play in the country's national innovation system. Our aim is to answer our two overarching research question, which are the following:

- (1) How do we encourage universities and their academics to extend their scholarship to the benefit of marginalised social partners, in research and teaching networks focused on innovation for inclusive development?
- (2) What facilitates and/or constrains interactions between universities and marginalised communities that promote innovation to enable livelihoods in informal settings and support inclusive development?

Below we summarise our findings on Uganda's national system of innovation, on patterns of interaction in the higher education system, and on university-community interactions. To close, we offer implications for community, university, and government actors as well as implications for the field of innovation for inclusive development.

Uganda's National System of Innovation

In our analysis of Uganda's national system of innovation in Chapter 3, we examined various policies and structures with a view to understand how innovation has tended to be conceptualised and supported in the context of Uganda. From this analysis, we found that, within Uganda,

innovation is seen to be understood as involving formal organisations that are engaging in formal institutional and inter-institutional processes to bring about large-scale national changes. Further, innovation centres on linking private sector industries with research institutes. After examining three particular interactions between university and community actors, however, it is particularly striking that this conceptualisation of innovation does not take into account the individual, on-the-ground efforts at innovation we observed in the local context-specific interactions taking place between informal, marginalised communities and academics based at three of the country's public universities.

Uganda's Higher Education System

In Chapters 4 through 6, we examined patterns of interaction at three different public universities in Uganda. Specifically, we uncovered and analysed what University policies and structures were in place to support interactions with external actors as well as how academics were interacting externally with social actors. By and large, we found that the three Ugandan universities—not only emphasised teaching and research—but also emphasised community outreach. They were active in working to support inclusive development locally as a part of their mandates and as a part of their curriculum. As we explored, this was aided in part by national requirements that see university students participating in community field attachments as a part of their educational programmes. The process of institutional audits mandated by the National Council for Higher Education prompted universities to have stronger formal commitments to community engagement alongside their missions of teaching and research, and provided an impetus for processes of institutional change to formalise 'community engagement'.

While the mandates at all three universities supported community-based work, and there were some structures in place to support these efforts, we also learned there was a need for more resources and supports to encourage such activities. For example, many academics identified institutional challenges as barriers to interactions. These challenges included low salaries, limited funding, heavy teaching loads, and university promotion structures that tend to value and promote academics based on their teaching and research activities as opposed to their community engagement. As we learned, these institutional priorities organise the work and work priorities of academics as academics need to organise their work in ways that respond to institutional requirements.

In examining the academics' actual patterns of interactions with external social partners, we saw that—for the academics we surveyed—most interactions centred on work that was academic or community-based with very few interactions happening with private sector firms. We also learned that funding was a huge driver. Given that academics are poorly paid, they have an incentive to engage with communities in order to secure research grants, receive an additional income, or get promoted for research. Academics are also motivated to contribute academically and to produce various research outputs through their interactions. Thus, they tend to contribute both individually/locally as well as academically. It is also important to note that while the conceptualization of innovation at the national level in Uganda, as was discussed in chapter 3, is focused on formal interactions between universities and firms, very few university academics surveyed at these institutions were engaged in interactions with such social partners. This is a finding that will be further discussed in the policy recommendation sections later in this chapter.

University-community case studies

In Chapter 7, we detailed interactions between Makerere University researchers and Traditional Health Practitioners (THPs) in Buyijja. In this interaction, the MAK academics responded to a difficult situation as the THPs needed to extract herbs from the surrounding forest in order to sustain their livelihoods and provide healthcare to the area; yet, in doing so, they were destroying the environment. The interaction centred on conducting research and exchanging knowledge about herbal medicines. Overtime, it also brought about more sustainable ways of harvesting, extracting, preserving, and packaging herbs. The interaction also led the THPs to organise with one another, finding new ways of exchanging information and supporting one another's work. The interaction was an example of innovation for inclusive development as it brought about both process and organisational innovations while supporting the local community. It was also a prime example of a research-driven interaction.

Chapter 8 provided an overview of an interaction between Gulu University academics in the institution's Department of Computer Science and youth in the post-war rural communities of northern Uganda. The interactions saw Gulu University academics providing ICT training to the youth and working to increase computer and internet access in the area. The training was further used to develop computer applications, to initiate and secure employment for the youth, to gain access to the larger market, to foster connections between youth (both online and in-person), and to

support the livelihood of community members. The case brought about various innovations, including market innovations (e.g., improving access to local markets), organisational innovation (e.g., creating a new structure to provide vocational training), pedagogical innovation (e.g., providing ICT training workshops that responded to needs of community and demands of market), process innovation (e.g., improving quality of computer processes), and product innovation (e.g., developing various computer programmes). The case was a prime example of a teaching interaction.

In Chapter 9, we examined an interaction between MUST University actors and the local Batwa community. This case responded to a difficult situation as the Batwa community had been banned from accessing forest resources and were struggling to survive. The collaboration aimed both to support the livelihoods of the Batwa community while contributing to biodiversity in the area. The academics started by engaging in various research initiatives, and then worked to support the Batwa community in implementing sustainable conservation efforts. The interaction brought about organisational innovation, process innovation, and social innovation to support inclusive development. It is also a key example of a research-based interaction.

Implications for community, university, and government actors

Communities could play a role in influencing universities. In examining the institutional structures at MUST University, it was striking that their mandate was influenced by and responsive to the local community. The community's needs helped to shape the university's focus on community development. Just as MUST University responded to the local needs in the development of their mandate and in the development of their university structures/supports, other universities could also include communities in its planning and organising. Instead of seeing interactions focused on community livelihood problems, community members could also be invited to shape university structures and programmes.

Universities could mobilise students to support innovation for inclusive development. One unexpected observation is that university students can play a significant role in innovation for inclusive development. Entering into this study, we initially focused our attention on the work University administrators and academics were doing in collaboration with informal, marginalised communities. Given this focus, we concentrated our efforts on interviewing various administrators and academics about the work they do to engage externally. We also considered how universities

support academics in engaging externally. In analysing our findings, we were struck by the myriad of ways students are involved in such interactions. At all three universities, students were active in serving in field attachments and in placements. They also played a key role in working for the programmes and in liaising with community members. With that, we want to suggest that universities can work to support students in community development initiatives. This focus is particularly important given that many academics reported not having institutional incentives or supports to engage externally given their high workloads, low pay, and high teaching demands. Mobilising students could be an important tool for universities to invest in, in order to address some of these challenges.

Universities could create platforms for researchers to share advice for connecting with communities. Throughout our study, we saw many similarities between the instances of interaction, which led us to believe University actors could learn a significant amount by connecting with and exchanging information with one another. While most academics reported sharing discipline-specific findings at conferences and workshops, this study led us to believe that University actors could benefit from sharing practical advice for engaging in external partnerships, particularly ones with marginalised, informal communities. To give an example, in both the Batwa case and the Buyijja case, the researchers were tasked with supporting the livelihoods of the people without threatening the eco-system. They both had to find a balance to respond to the troubling situation. While the research outputs they produced and the opportunities they had to share about their experiences were mostly centred on their findings, it may prove generative for academics to have more spaces and outlets to support one another by discussing issues and challenges with community engagement.

Universities could encourage research or teaching-based interactions that support local livelihoods. Interactions can take a variety of different forms. They can be service based, research-centred, or teaching-centred. They can also see researchers volunteering in different social service roles, serving as health professionals or supporting on-the-ground. The MUST University and MAK University interactions centred on research while the Gulu University case centred on teaching. In our view, all three interactions were successful in that they helped to authenticate the university actors' reputations as scholars. Drawing from this, universities could work to provide training that supports these types of interactions.

Universities could support academics in selecting community interactions. While there are limited/inadequate supports in place that allow universities to account for the types of interactions university actors engage in, our study has highlighted the need for more support. University actors could benefit from support in regard to how to bring about and engage in mutually beneficial interactions. For example, in both the Batwa case and the Buyijja case, the researchers were driven to uncover indigenous knowledges in order to contribute to their respective fields. The local and indigenous knowledges supported them in making theoretical and empirical contributions to the field. They did not just learn through the experience of working in community development, they integrated scientific and indigenous knowledges and produced countless publications. Given that it worked well to have something that benefitted both parties, universities could play a role in ensuring that relationships are both mutually beneficial and in line with institutional objectives.

Universities could offer training in research-based community interactions. Our study has really highlighted the need for research-driven approaches that are grounded in and responsive to local situations. Recall, for example, the Batwa and Buyijja cases that took a research-centred approach. All of the initiatives and developments stemmed from the initial research conducted. The Gulu case, on the other hand, saw the researchers offering an initial training session, learning through trial and error, and then changing their direction to better respond to the needs of the community and the demands of the market. While it is expected that community programmes will change shape over time, in some ways, this has highlighted the importance of implementing programming or interventions that are responsive to research. Universities could play a role in training academics to develop their applied research skills.

University researchers could challenge the types of knowledge that is valued in their disciplines. While the researchers in the Batwa and Buyijja cases were motivated to integrate indigenous and technical knowledges, we question whether or not researchers in other fields would have the same incentive to learn from informal communities or to publish about their experiences. Our analysis suggests that Gulu University case had fewer research outputs for the academics. While the researchers in the Department of Computer Science at Gulu learned from engaging with informal communities, their experiences did not translate as easily into research outputs as the other two interactions. Local and indigenous knowledges did not have the same value in their discipline. There was less that they were trying to find out about the local community that could contribute to

research in the field of computer science. Given the ways academics are often evaluated for their research outputs (as is the case at Gulu University), this raises questions about the type of knowledges that are valued in different disciplines, and whether or not there are or could be incentives for researchers in the ICT sector to learn from local communities. We believe University researchers can play a role in ‘shifting the conversations’ in their disciplines to integrate indigenous knowledges.

Government ministries could develop policies and structures to support interactions between universities and communities. Just as the government introduced a policy requiring students to complete a field attachment, other policies could work to increase university-community interactions and support university actors’ capacities to contribute to inclusive development. For example, the Ministries of Education and Finance could improve funding and other supports. The National Council for Higher Education and Curriculum Development could work to promote community-based interactions. Further, the National Council for Science and Technology could work to promote institutional linkages between universities and private sector firms.

Government ministries could develop policies and structures to support local, community-based efforts. While initiatives to support innovation in Uganda have typically focused on formal organisations entering into formal inter-institutional processes and bringing about large-scale, national changes (as we highlighted in Chapter 3), our own study finds value in more-local, community-based efforts. The government could play a role in supporting such community-based efforts at innovation. While social or relationship-based interactions are often viewed as less-technical in the world of STEM innovations, our study has found that social interactions do have the capacity to bring about technical innovations or to bring about innovations that support inclusive development. We encourage government ministries to expand their understanding of innovation, and to implement programmes that, first and foremost, support inclusive development, but that may also bring about innovations in the process.

Implications for studies in innovation for inclusive development

Future studies could examine academics’ motives in order to increase incentives. Throughout our study, we found it difficult to ascertain how (and whether or not) particular

incentives helped to shape academics' engagements with universities. While universities do, of course, offer incentives for academics to engage externally, it was hard for us to ascertain whether or not those incentives were helping to shape interactions or to draw universities and communities together. To give an example, while most cases had concrete research outputs, it was hard to tell whether or not the researchers knew to the extent that the interactions would translate into research outputs prior to engaging in the interaction. In analysing our findings, we also noted that research funding/income seemed to be an incentive for university academics, but, again, it was sometimes hard to tell how much money was exchanged and to what extent that was a factor shaping or encouraging the researcher to participate in the interaction. Thus, future studies could examine the motivations of university actors to participate in such interactions in order to introduce appropriate incentives at the university and even the national level.

Future studies could examine community benefits more broadly. While our focus in this report was on how the interactions benefited the community actors and the university actors, it is important to consider how they benefit the wider community—both in the present and future. Outcomes and benefits to the communities resulting from interactions with university academics are not easy to discern in the short run and are sometimes intertwined with results from other development interventions being pursued by the government and other development partners. For example, it was hard to measure the benefits in the Buyijja case as one of initiatives saw university and community actors recording indigenous knowledges for generations to come. Similarly, the lifestyle changes that the Batwa community made are hard to measure in the present day as they may continue to bring about changes in the future. Future studies could explore more-broadly the ways that communities benefit from such interactions. Similarly, future studies could interview more community members to really learn how the interactions were impacting their livelihoods.

Future studies could examine the role that students play in innovation for inclusive development. While our focus in this study was on administrators and academics, future studies could involve students in the research or look at innovation for inclusive development from the standpoint of students. These studies could explore, for example, how students are engaging with communities, and how universities are equipping students to interact with their communities. Mobilising students could be an important focus for 'innovation for inclusive development' researchers to examine.

Future studies could start in the communities, move to the universities, and then to the national system of innovation. Our study started by examining the national system of innovation, moved to examining patterns of interaction in higher education, and then traced three particular instances of university-community interactions. Our analysis of the national context directed/guided our analysis of the higher education system. Similarly, our analysis of the higher education system led us to identify particular university-community interactions. Our study would have looked much different had we started from the standpoint of community members, examined how they were interacting with the university, and examined how their experiences shaped (or were shaped by) national structures. Future studies in the field could take an institutional ethnographic approach (Smith, 2005), starting from the standpoint of individuals who are traditionally marginalised, and tracing out institutional relations from there.

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Appendices

APPENDIX A: UNIID AFRICA RESEARCH PROJECT - INTERVIEW SCHEDULE FOR SENIOR MANAGEMENT AND LEADERSHIP

Introduction:

This project aims to make visible the involvement of academics and universities in the kinds of innovation that typically remain below the radar. In particular, we are interested in identifying and mapping the kinds of interactions between academics and communities, small scale farmers, cooperatives and local actors – but in the context of the general orientation of your university to teaching, research, innovation and interaction with any actors, such as firms or government or NGOs.

That is, we are interested in finding out how your university is organised to be more accountable to social needs, particularly in the local environment, and how academics extend their knowledge to the benefit of inclusive social and economic development.

1. How does interaction with external social partners fit into the main **mission** of Makerere University?
 - In what ways do the academics at Makerere university balance between teaching and learning, research and innovation, and outreach?
2. What are the main **types** of interactions that academics at Makerere University engage in with external social partners?
3. Have you put in place any **institutional policies** to support interaction to the mutual benefit of external social actors?
 - What are these policies?
 - What are the main concepts used to describe interaction? (eg community engagement, service, extension, technology transfer)
 - To what extent are these policies **aligned** with the strategic goals of the University?

4. What are the **institutional structures and processes** that have been put in place to promote interaction with external social actors, particularly communities and local actors?
 - Internal interface mechanisms (e.g. research and innovation office, engagement office)
 - External interface mechanisms (e.g. technology transfer office, extension office, community forum)
 - Decision making structures (e.g. senate, deans, special committees)

5. What are the specific **incentive mechanisms** that have been put in place by the University to promote interaction with external social actors, particularly communities and local actors? This could include internal mechanisms (e.g. performance criteria, special awards, special funds, newsletters)

6. What are your successes in terms of the **outcomes** of interactive activities? In what ways has interaction resulted in inclusive development?

7. Where have you encountered **bottlenecks**? What are the main **obstacles** to interaction and innovation with communities particularly?

Appendix B: UNIID-AFRICA RESEARCH PROJECT - INDIVIDUAL ACADEMIC INTERACTION INSTRUMENT

Introduce the discussion to the academic as follows:

I am going to ask you six sets of questions, focused on the ways in which you interacted with external social actors through your academic work **over the last two years**.

Each question will have a number of options that cover the experience of different academic disciplines, and they may not all apply to your own field.

Please rate **EACH** of them on the same scale

(Where 1= not at all, 2 = in isolated instances, 3 = on a moderate scale and 4 = on a wide scale).

Name of department:

Academic rank:

Disciplinary field:

Highest qualification:

1. To what extent do you interact through your academic scholarship with any of these **external social actors**?

	External social actors	Not at all	Isolated instances	On a moderate scale	On a wide scale
		1	2	3	4
1	Local government agencies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Provincial/regional government departments or agencies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	National government departments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Clinics and health centers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Schools	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	National regulatory and advisory agencies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	Individuals and households	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	A specific local community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	Welfare agencies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	Non-governmental agencies (NGOs)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	Development agencies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	Trade unions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14	Civic associations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15	Community organizations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

16	Social movements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17	Political organizations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18	Religious organizations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20	Large national firms	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21	Small, medium and micro enterprises	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22	Multi-national companies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23	Small-scale farmers (non-commercial)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24	Commercial farmers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25	Sectoral organisations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26	National universities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27	African universities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28	International universities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29	Science councils	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30	Funding agencies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31a	Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31b	Specify				

2. To what extent does your academic scholarship involve these **types of relationship** with external social actors?

	Types of relationship	Not at all	Isolated instances	On a moderate scale	On a wide scale
		1	2	3	4
1	Alternative modes of delivery to accommodate non-traditional students	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Work-integrated learning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Education of students so that they are socially responsive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Service learning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Student voluntary outreach programmes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Collaborative curriculum design	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	Continuing education or professional development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	Customised training and short courses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	Policy research, analysis and advice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	Expert testimony	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	Clinical services and patient or client care	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14	Design and testing of new interventions or protocols	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15	Design, prototyping and testing of new technologies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17	Monitoring, evaluation and needs assessment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

18	Research consultancy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19	Technology transfer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21	Contract research	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22	Collaborative R&D projects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23	Community-based research projects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24	Participatory research networks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25	Joint commercialization of a new product	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26a	Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26b	Specify				

3. To what extent have you used each of the following **channels of information** to transfer your knowledge to external social actors?

	Channels of information	Not at all	Isolated instances	On a moderate scale	On a wide scale
		1	2	3	4
1	Public conferences, seminars or workshops	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Informal information exchange	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Radio, television or newspapers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Popular publications	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Interactive websites	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Students	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	Reports and policy briefings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	Oral or written testimony or advice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	Training and capacity development or workshops	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	Demonstration projects or units	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	Research contracts and commissions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	Technology incubators or innovation hubs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	Intervention and development programmes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14	Software development or adaptation for social uses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15	Participatory or action research projects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16	Cross-disciplinary networks with social partners	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17	Technology development and application networks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19	Patent applications and registration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20	Spin-off firms from the university (commercial or not for profit)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21a	Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21b	Specify				

4. To what extent has your academic Interaction with external social actors had the following **outputs**?

	Outputs	Not at all	Isolated instances	On a moderate scale	On a wide scale
		1	2	3	4
1	Graduates with relevant skills and values	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Academic publications	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Dissertations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Reports, policy documents and popular publications	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Cultural artefacts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Academic collaboration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	Spin-off companies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	Community infrastructure and facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	New or improved products	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	New or improved processes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	Scientific discoveries	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13a	Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13b	Specify				

5. To what extent has your academic Interaction had the following **outcomes or benefits**?

	Outcomes and benefits	Not at all	Isolated instances	On a moderate scale	On a wide scale
		1	2	3	4
1	Public awareness and advocacy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Improved teaching and learning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Community-based campaigns	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Policy interventions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Intervention plans and guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Training and skills development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	Community employment generation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	Firm employment generation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	Firm productivity and competitiveness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	Novel uses of technology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	Improved livelihoods for individuals and communities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	Improved quality of life for individuals and communities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	Regional development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14	Community empowerment and agency	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15	Incorporation of indigenous knowledge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16	Participatory curriculum development, new academic programmes and materials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17	Relevant research focus and new research projects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18	Academic and institutional reputation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19	Theoretical and methodological development in an academic field	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20	Cross-disciplinary knowledge production to deal with multi-faceted social problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21a	Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21b	Specify				

6. In your experience, how important are the following **obstacles and challenges** to your academic Interaction with external social actors?

	Obstacles and challenges	Not important	Slightly important	Moderately important	Very important
		1	2	3	4
1	Limited financial resources for competing university priorities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Lack of clear university policy and structures to promote Interaction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	University administration and bureaucracy does not support academic Interaction with external social partners	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Competing priorities on time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Too few academic staff	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Institutional recognition systems do not reward academic Interaction activities sufficiently	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	Risks of student involvement in Interaction with external social partners	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	Tensions between traditional and new academic paradigms and methodologies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	Sustainable external funding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	Negotiating access and establishing a dialogue with external social partners	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	Unequal power relations and capabilities in relation to external social partners	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	Legal problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	Lack of mutual knowledge about partners' needs and priorities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14a	Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14b	Specify	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7. Finally, can you describe the best **example** of your academic teaching, research or outreach projects in which you interacted with external social actors over the last two years?

Example of projects
<ul style="list-style-type: none"><li data-bbox="250 436 776 470">• What was the main aim of the project? <li data-bbox="250 613 716 646">• What social actors were involved? <li data-bbox="250 789 818 823">• What kinds of relationship were involved? <li data-bbox="250 966 813 999">• What channels of information were used? <li data-bbox="250 1142 591 1176">• What were the outputs? <li data-bbox="250 1318 776 1352">• What were the outcomes and benefits? <li data-bbox="250 1495 797 1528">• What were the obstacles and challenges?

Thank you very much for your time and insights, and I wish you good luck with your future endeavors!

Appendix CI: UNIID AFRICA RESEARCH PROJECT ACTIVITY TWO - IN-DEPTH CASE STUDIES FIELDWORK GUIDE (ACADEMICS)

1. What is the main **livelihood problem** of the marginalized group that is addressed by the interaction?
 - (a) Describe the community that is involved in the interaction:
 - Who are the community actors involved?
 - How big is the community?
 - How many people are involved in the interaction?
 - How has the history of the community contributed to the problem?
 - How has the history of the community led to engagement with a university?
 - (b) What were the origins of the engagement?
 - (c) What is the main aim of the engagement?
 - (d) What is the main livelihood problem it is supposed to solve?
 - (e) How is this livelihood problem shaped by its location in an informal setting?
 - (f) How is this livelihood problem shaped by marginalization?
 - (g) How is the livelihood opportunity inserted into formal markets, in any way?
2. What are the **organizational arrangements** and the **interface structures** of each actor that supports/constrains their capacity to interact, and in an inclusive manner?
 - How have your university's institutional policy, internal structures and support mechanisms influenced your interaction with the community?
 - How have you encountered the organizational arrangement and interface structures of other actors, including government, NGO, development agencies, etc?
3. What are the main **drivers** of interaction?
 - (a) Why did you get involved in the interaction?
 - Intellectual reasons?
 - Financial reasons?
 - Social conscience reasons?
 - (b) What has been the role of local community demand and capabilities in driving interactions?
4. What has been the role of innovation in addressing this problem through interaction – including aspects technological change, socio-technical change, knowledge intensification, skills, training and capacity development?
 - What new products, processes, or organizational structures are created in the course of this interaction?

- How ‘new’ is this innovation: new to the community, new to the university, new to the country, or even ‘new to the world’?
 - Does this innovation entail the adaptation of technologies that already exist in the community? How has this adaptation taken place?
 - Does this innovation entail transfer or diffusion of technology and how does this transfer or diffusion take place?
 - How and to what extent has the innovation contributed towards addressing livelihood challenges?
5. What have been the flows of **knowledge and skills** through the interaction, including aspects of knowledge intensification, skills transfer, technology diffusion, training and capacity development?
- (a) What kind of learning takes place to support the innovation and the interaction more broadly?
- (b) What is the structure of knowledge flows along the dimensions of:
- Tacit or codified?
 - Uni-directional or bi-directional?
 - Scientific or traditional/indigenous?
 - Intensive or not intensive?
- (c) Do indigenous or traditional knowledge play a role in the engagement? If so, please elaborate. Does the engagement build links between indigenous/traditional and scientific knowledge?
6. What has been the nature and extent of **community participation**?
- (a) How are community participants involved in:
- Problem identification?
 - Idea generation?
 - Evaluation?
 - Design?
 - Other aspects of engagement?
- (b) How wide is the extent of community participation?
- How many community leaders do you interact with?
 - How many community members do you interact with?
 - What is the intensity of these interactions in terms of time and in terms of knowledge content?
 - How many community members are involved overall?
7. What are the **outcomes and benefits** of interaction for the university and for the livelihoods of marginalized groups?

- What have been the outputs and outcomes of the engagement?
- What have been the benefits and risks to you?
- Do you see opportunities for further developing the engagement?
- What is the potential for scaling – up and diffusion?
- Is the engagement satisfactory or unsatisfactory from your point of view?

Appendix CII: UNIID AFRICA RESEARCH PROJECT ACTIVITY TWO - IN-DEPTH CASE STUDIES FIELDWORK GUIDE (COMMUNITY LEADER)

1. What is the main **livelihood problem** of the marginalized group that is addressed by the interaction?
 - (a) Describe the community that is involved in the interaction:
 - Who are the community actors involved?
 - How big is the community?
 - How many people are involved in the interaction?
 - How has the history of the community contributed to the problem?
 - How has the history of the community led to engagement with a university?
 - (b) What were the origins of the engagement?
 - (c) What is the main aim of the engagement?
 - (d) What is the main livelihood problem it is supposed to solve?
 - (e) How is this livelihood problem shaped by its location in an informal setting?
 - (f) How is this livelihood problem shaped by marginalization?
 - (g) How is the livelihood opportunity inserted into formal markets, in any way?

2. What are the **organizational arrangements** and the **interface structures** of each actor that supports/constraints their capacity to interact, and in an inclusive manner?
 - (a) What is your role as a leader in your community?
 - (b) What is your role as a leader in the interaction with the university?
 - (c) How have your community cooperated or formed organizations to engage with the university?
 - (d) What have been your experiences encountering the organizational structures of the university?
 - (e) What other co-operation or organization has taken place in relation to the interaction? These may include actors such as NGOs or government and/or development agencies, etc?

3. What are the **drivers** of interaction?
 - (a) Why did your community get involved in the interaction?

 - (b) Why did you get involved in the interaction?

4. What has been the role of **innovation** in addressing this problem through interaction – including aspects of technological change, socio-technical change, knowledge intensification, skills, training and capacity development?
 - (a) What new products, processes, or organizational structures are created in the course of this interaction?

- (b) How 'new' is this innovation: new to the community, new to the university, new to the country, or even 'new to the world'?
 - (c) Does this innovation entail the adaptation of technologies that already exist in the community? How has this adaptation taken place?
 - (d) Does this innovation entail transfer or diffusion of technology and how does this transfer or diffusion take place?
 - (e) How and to what extent has the innovation contributed towards addressing livelihood challenges?
5. What have been the flows of **knowledge and skills** through the interaction, including aspects of knowledge intensification, skills transfer, technology diffusion, training and capacity development?
- (a) What kind of learning takes place to support the innovation and the interaction more broadly?
 - (b) What is the structure of knowledge flows along the dimensions of:
 - Tacit or codified?
 - Uni-directional or bi-directional?
 - Scientific or traditional/indigenous?
 - Intensive or not intensive?
 - (c) Do indigenous or traditional knowledge play a role in the engagement? If so, please elaborate. Does the engagement build links between indigenous/traditional and scientific knowledge?
6. What has been the nature and extent of **community participation**?
- (a) How are community participants involved in:
 - Problem identification?
 - Idea generation?
 - Evaluation?
 - Design?
 - Other aspects of engagement?
 - (b) How wide is the extent of community participation?
 - How many community leaders interact with university lecturers or researchers?
 - How many community members interact with university lecturers or researchers?
 - What is the intensity of these interactions in terms of time and in terms of knowledge content?
 - How many community members are involved overall?

7. What are the **outcomes and benefits** of interaction for the university and for the livelihoods of marginalized groups?
 - (a) For yourself and for your community:
 - What have been the outputs and outcomes of the engagement?
 - What have been the benefits and risks to you?
 - (b) Do you see opportunities for further developing the engagement?
 - (c) What is the potential for scaling – up and diffusion?
 - (d) Is the engagement satisfactory or unsatisfactory from your point of view?

Appendix CIII: UNIID AFRICA RESEARCH PROJECT ACTIVITY TWO - IN-DEPTH CASE STUDIES FIELDWORK GUIDE (COMMUNITY PARTICIPANTS)

1. What is the main **livelihood problem** of the marginalized group that is addressed by the interaction?
 - (a) How does your interaction with the university help you and your community?
 - (b) What is the main problem that this interaction is meant to solve?
 - (c) How did you become involved in this interaction?

2. What have been the flows of **knowledge and skills** through the interaction, including aspects of knowledge intensification, skills transfer, technology diffusion, training and capacity development?
 - (a) What have you learnt from this interaction?
 - (b) Have you had any training or skills development as part of this interaction?
 - (c) Have people from the university learnt anything from you?
 - (d) Are you using any new technology as a result of the interaction?

3. What has been the nature and extent of **community participation**?
 - (a) Have you been involved in:
 - Identifying the problem that the interaction addresses?
 - Coming up with solutions?
 - Deciding whether the solutions work or not?
 - (b) How wide is the extent of community participation?
 - How many community members are part of the interaction?
 - To what extent do community members participate in the process?

4. What are the **outcomes and benefits** of interaction for the university and for the livelihoods of marginalized groups?
 - (a) How has your life changed because of the interaction? In what way? For example:
 - Has the way you earn money changed?
 - Has your quality of life changed?
 - Has your family's wellbeing changed?
 - Has your life benefited from increased knowledge or technology?
 - (b) How has your community changed because of the interaction? In what way? For example:
 - Are there more jobs in your community?
 - Has there been some social or economic development in your community?
 - Has the community benefited from increased knowledge or technology?

Appendix CIV: UNIID AFRICA RESEARCH PROJECT ACTIVITY TWO - IN-DEPTH CASE STUDIES FIELDWORK GUIDE (OTHER ACTORS)

1. What is the main **livelihood problem** of the marginalized group that is addressed by the interaction?
 - (a) What is the main livelihood problem that the engagement is supposed to solve?
 - (b) How is this livelihood problem shaped by its location in an informal setting?
 - (c) How is this livelihood problem shaped by marginalization?

2. What are the **organizational arrangements** and the **interface structures** of each actor that supports/constrains their capacity to interact, and in an inclusive manner?
 - Through what organizational arrangements and interface structures do you participate in the engagement?

3. What are the **drivers** of interaction?
 - Why did your community get involved in the interaction?
 - ✓ Intellectual reasons?
 - ✓ Financial reasons?
 - ✓ Social conscience reasons?

4. What has been the role of **innovation** in addressing this problem through interaction – including aspects of technological change, socio-technical change, knowledge intensification, skills, training and capacity development?
 - (a) What new products, processes, or organizational structures are created in the course of this interaction?
 - (b) How ‘new’ is this innovation: new to the community, new to the university, new to the country, or even ‘new to the world’?
 - (c) Does this innovation entail the adaptation of technologies that already exist in the community? How has this adaptation taken place?
 - (d) Does this innovation entail transfer or diffusion of technology and how does this transfer or diffusion take place?
 - (e) How and to what extent has the innovation contributed towards addressing livelihood challenges?

5. What have been the flows of **knowledge and skills** through the interaction, including aspects of knowledge intensification, skills transfer, technology diffusion, training and capacity development?

- (a) What kind of learning takes place to support the innovation and the interaction more broadly?
- (b) What is the structure of knowledge flows along the dimensions of:
 - Tacit or codified?
 - Uni-directional or bi-directional?
 - Scientific or traditional/indigenous?
 - Intensive or not intensive?
- (c) Do indigenous or traditional knowledge play a role in the engagement? If so, please elaborate. Does the engagement build links between indigenous/traditional and scientific knowledge?

6. What has been the nature and extent of **community participation**?

- (a) How are community participants involved in:
 - Problem identification?
 - Idea generation?
 - Evaluation?
 - Design?
 - Other aspects of engagement?
- (b) How wide is the extent of community participation?
 - How many community leaders do you interact with?
 - How many community members do you interact with?
 - What is the intensity of these interactions in terms of time and in terms of knowledge content?
 - How many community members are involved overall?

7. What are the **outcomes and benefits** of interaction for the university and for the livelihoods of marginalized groups?

- (a) What have been the outputs and outcomes of the engagement?
- (b) What have been the benefits and risks to you?
- (c) Do you see opportunities for further developing the engagement?
- (d) What is the potential for scaling – up and diffusion?
- (e) Is the engagement satisfactory or unsatisfactory from your point of view?