

UNIID Africa Project

UNIVERSITIES AS AGENTS OF INNOVATION FOR INCLUSIVE DEVELOPMENT: CASE STUDIES OF UNIVERSITY INTERACTION WITH MARGINALISED COMMUNITIES IN NIGERIA

IDRC Project Number: 106652-001

IDRC Project Title: Universities in Innovation for Inclusive Development in Africa (UNIID-Africa): towards a research network

Country/Region: South Africa, Botswana, Nigeria, Uganda, Malawi, Tanzania

Lead Research Institution:

Human Sciences Research Council (HSRC)
Private bag x9182
Cape Town
South Africa

Research Teams:

Glenda Kruss and Michael Gastrow (HSRC-gkruss@hsrc.ac.za)

M.M.M. Bolaane, I.N. Mazonde, A. Neba and M.B.M. Sekhwela (University of Botswana-UB- mazondei@mopipi.ub.bw)

John O. Adeoti, Andrew Onwuemele, Yetunde Aluko, Oluwakemi Okuwa and Augustine Osigwe (Nigerian Institute of Social and Economic Research -NISER- adeotij@yahoo.com)

Timothy Esemu, Samuel Mafabi, Simon Peter Ojok and Peninah Arecho (Makerere University Business School- MUBS- tesemu@mubs.ac.ug)

Patson C. Nalivata, Joseph Uta, Kenneth Wiyo and Fanuel Kapute (Lilongwe University of Agriculture and Natural Resources- LUANAR- patienalivata@yahoo.com)

Astrid Szogs, Lugano Wilson and Ludovick Manege (Tanzania Industrial Research and Development Organisation –TIRDO- luganowilson@yahoo.com)

March 2015

Table of Contents

	<i>Page</i>
List of Tables	vi
List of Figures	vii
List of Boxes	vii
List of Plates	vii
List of Acronyms	viii
Acknowledgements	xi
Executive Summary	xii
CHAPTER 1: INTRODUCTION	1
1: National System of Innovation Framework and Innovation for Inclusive Development	1
1.1: Forms of Interaction between Universities and External Social Partners	2
1.2: Research Questions and Objectives	3
CHAPTER 2: RESEARCH METHODOLOGY	6
2.1: Data Collection	6
2.1.1: Data collection from UI	6
2.1.2: Data collection from FUNAAB	7
2.1.3: Data collection from FUTA	8
2.1.4. Case studies of innovation focused on livelihood in informal settings	8
2.2: Data Analysis	11
CHAPTER 3: ECONOMIC GROWTH PERFORMANCE, HIGHER EDUCATION SYSTEM AND INNOVATION FOR INCLUSIVE DEVELOPMENT	12
3.1: Economic Growth and Inclusive Development in Nigeria	12
3.1.1: Economic growth performance and inclusiveness	12
3.1.2: Contributions of the formal and informal sectors..	14
3.2: Promotion of Science, Technology and Innovation.	16
3.3: Higher Education System and Innovation for Inclusive Development	18
CHAPTER 4: THE NATURE OF INTERACTION IN THE UNIVERSITY OF IBADAN	23
4.1: The Background and Context of the University of Ibadan	23
4.2: University Organisation and Structure	24
4.3: Students Enrolment	25
4.4: Institutional Policies and Community Engagement	28
4.5: Patterns of Interaction	31
4.5.1: Key external social partners	31
4.5.2: Types of relationship with external social partners	33
4.5.3: Channels of information on knowledge transfer to external socialpartners	34
4.5.4: Outputs of interaction with external social partners	35
4.5.5: Outcomes and benefits of interaction with external social partners	37
4.5.6: Obstacles and challenges of interaction with external social partners	38
4.6: Rationales for Lack of Interaction between Academics and External Social Partners	39
4.7: Implications of the Pattern of Interaction for Inclusive Development	41

CHAPTER 5: THE NATURE OF INTERACTION IN THE FEDERAL UNIVERSITY OF AGRICULTURE ABEOKUTA	42
5.1: The Background and Context of the Federal University of Agriculture Abeokuta	42
5.2: University Organisation and Structure	44
5.3: Students Enrolment	45
5.4: Institutional Policies and Community Engagement	48
5.5: Patterns of Interaction	51
5.5.1: Key external social partners	51
5.5.2: Types of relationship with external social partners	53
5.5.3: Channels of information for knowledge transfer to external social partners	54
5.5.4: Outputs of interaction with external social partners	55
5.5.5: Outcomes and benefits of interaction with external social partners	56
5.5.6: Obstacles and challenges of interaction with external social partners	57
5.6: Rationales for Lack of Interaction between Academics and External Social Partners	59
5.7: Implications of the Pattern of Interaction for Inclusive Development	60
CHAPTER 6: THE NATURE OF INTERACTION IN THE FEDERAL UNIVERSITY OF TECHNOLOGY AKURE	62
6.1: The Background and Context of the Federal University of Technology Akure	62
6.2: University Organisation and Structure	64
6.3: Students Enrolment	64
6.4: Institutional Policies and Community Engagement	67
6.5: Patterns of Interaction	69
6.5.1: Key external social partners	69
6.5.2: Types of relationship with external social partners	70
6.5.3: Channels of information for knowledge transfer to external social partners	72
6.5.4: Outputs of interaction with external social partners	74
6.5.5: Outcomes and benefits of interaction with external social partners	75
6.5.6: Obstacles and challenges of interaction with external social partners	77
6.6: Rationales for Lack of Interaction between Academics and External Social Partners	78
6.7: Implications of the Pattern of Interaction for Inclusive Development	80
CHAPTER 7: UNDERSTANDING UNIVERSITY INTERACTION AND THE EVOLUTION OF THE NATIONAL SYSTEM OF INNOVATION	81
7.1: University Types and the Occurrence of Interaction	81
7.2: Types of Relationships with External Social Partners by Institutional Types	82
7.3: Channels of Information on Knowledge Transfer to External Social Partners	84
7.4: Outputs of Academic Interactions with External Social Partners	85
7.5: Outcomes and benefits of Academic Interactions with External Social Partners	86
7.6: Obstacles and Challenges	87
7.7: Rationales for Lack of Interaction between Academics and External Social Partners	88
7.8: Implications of the Pattern of Academic Interaction with External Social Partners for the National System of Innovation	90

CHAPTER 8: UPGRADING TECHNOLOGICAL CAPABILITY OF AUTO-MECHANICS: THE INTERACTION BETWEEN UNIVERSITY OF IBADAN AND A PRIVATE SECTOR LIVELIHOOD ENHANCEMENT PROGRAMME	92
8.1: Introduction	92
8.2: Overview and Structure of the Interaction	95
8.3: Drivers of Interaction	100
8.4: Innovation	102
8.5: Knowledge and Skills	104
8.6: Community Participation	105
8.7: Outcomes, Benefits and Risks	106
8.8: Conclusion	107
CHAPTER 9: INNOVATIVE SOLUTIONS FOR WOMEN EMPOWERMENT: AN INTERACTION BETWEEN UNIVERSITY OF IBADAN AND ILE-OGBO COMMUNITY	109
9.1: Introduction	109
9.2: Overview and Structure of the Interaction	110
9.3: Drivers of Interaction	115
9.4: Innovation	116
9.5: Knowledge and Skills	120
9.6: Community Participation	121
9.7: Outcomes, Benefits and Risks	122
9.8: Conclusion	123
CHAPTER 10: COMMUNITY-BASED FARMING SCHEME: AN INTERACTION BETWEEN A UNIVERSITY OF AGRICULTURE AND RURAL COMMUNITIES	124
10.1: Introduction	124
10.2: Overview and Structure of the Interaction	127
10.3: Drivers of Interaction	131
10.4: Innovation	132
10.5: Knowledge and Skills	133
10.6: Community Participation	134
10.7: Outcomes, Benefits and Risks	134
10.8: Conclusion	136
CHAPTER 11: CONCLUSIONS AND RECOMMENDATIONS	138
11.1: Conclusions	138
11.1.1: Higher education system and the national system of innovation	138
11.1.2: Patterns of university interaction with external social partners	138
11.1.3: Case studies of innovation focused on livelihood in informal settings	139
11.2: Recommendations	143
REFERENCES	146
APPENDICES	150
1: University Information Schedule (Template A)	150
2: Interview Schedule for Senior Management and Leadership (Template C)	153

3: Individual Academic Interaction Instrument (Template E)	154
4: Schedule for Academics with No Interaction (Template F)	159

List of Tables

<i>Table</i>	<i>Page</i>
2.1: Potential case studies of universities' interaction with marginalised communities	9
2.2: Case study selection criteria and the Nigerian cases of universities' interaction with marginalised communities	10
3.1: Percentage distribution of GDP by sectoral groups, 1961-2009	13
3.2: Expansion and ownership of universities 1960-2012	19
4.1: Students enrolment statistics, 2006-2012	26
4.2: Extent of UI academics' interaction with external social partners	32
4.3: Types of UI academics' relationship with external social partners	33
4.4: Channels of information transfer by UI academics to external social partners	34
4.5: Outputs of UI academics' interactions with external social partners	37
4.6: Outcomes and benefits of UI academics' interaction with external social partners	37
4.7: Obsatacles and challenges to UI academics' interaction with external social partners	39
4.8: Reasons why UI academics do not interact	40
5.1: Students enrolment statistics, 2005-2011	46
5.2: Graduate output between 2005/06- 2011/12 sessions	48
5.3: Extent of FUNAAB academics' interaction with external social partners	52
5.4: Types of FUNAAB academics' relationship with external social partners	53
5.5: Channels of information transfer by FUNAAB academics to external social partners	55
5.6: Outputs of FUNAAB academics' interaction with external social partners	55
5.7: Outcomes and benefits of FUNAAB academics' interaction with external social	57
5.8: Obstacles and challenges to FUNAAB academics' interaction with external social partners	58
5.9: Reasons why FUNAAB academics do not interact	59
6.1: Undergraduate student's enrolment by gender (1995-2012)	65
6.2: Student enrolment and distribution by gender 2011/12 session	65
6.3: Postgraduate student enrolment and distribution 2005-2012	66
6.4: Linkages and relationship consummated in 2011/2012	68
6.5: Extent of FUTA academics' interaction with external social partners	70
6.6: Types of FUTA academics' relationship with external social partners	72
6.7: Channels of information transfer by FUTA academics to external social partners	73
6.8: Outputs of FUTA academics' interaction with external social partners	74
6.9: Outcomes and benefits of FUTA academics' interaction with external social partners	75
6.10: Obstacles and challenges to FUTA academics' interaction with external social Partners	77
6.11: Reasons why FUTA academics do not interact	79
7.1: Extent of academics' interaction with main external social partners	82
7.2: Types of relationships with external social partners by institutional types	83
7.3: Types of channels of information with external social partners by institutional types	85
7.4: Outputs of academic interactions with external social partners	86
7.5: Outcomes and benefits of academic interactions with external social partners	87
7.6: Obstacles and challenges for academics interacting with external social partners	88
7.7: Rationales for lack of interaction between academics and external social partners	89
8.1: Trend in students' enrolment and graduates, 2010-2012	100

11.1: Major enablers of innovation in informal settings	140
11.2: Major constraints on innovation in informal settings	140

List of Figures

<i>Figure</i>	<i>Page</i>
1.1: Forms of interaction	3
2.1: Sectoral shares of GDP, 1961-2009	14
4.1: Trend in students' enrolment in the University of Ibadan	27
4.2: Trends in undergraduate and postgraduate admissions	28
5.1: Trends in undergraduate and postgraduate admissions by year	47
5.2: Trends in enrolment by college, 2005/06-2011/12	47
8.1: Map of interaction of partners in the auto-mechanic programme	97
9.1: Map of Ayedire Local Government showing Ile-Ogbo community	109
9.2: CIRDP map of interaction and knowledge flow	114
10.1: Map of Ogun State showing COBFAS locations	125
10.2: COBFAS map of interaction and knowledge flow	129

List of Boxes

<i>Box</i>	<i>Page</i>
3.1: Nigeria STI policy vision, mission and objectives	18
4.1: University of Ibadan vision and mission statements	23
5.1: FUNAAB vision and mission statements	44
6.1: FUTA vision and mission statements	63
8.1: Components of the auto-mechanic training programme	99

List of Plates

<i>Plate</i>	<i>Page</i>
4.1: Rice milling machines	36
4.2: Groundnut grating machines	36
8.1: Auto-mechanic workshop in a mechanic village	94
8.2: Auto-mechanic workshop on a vacant plot	94
8.3: An auto-mechanic displaying his auto scanner	103
8.4: An auto-mechanic with his apprentices and auto scanner	103
9.1: Moringa dryer	117
9.2: Moringa health products	118
9.3: Snail rearing platform	119
10.1: Student farmers at a COBFAS location	125

List of Acronyms

ACPM	Automated Cassava Peeling Machine
AIT	African Independent Television
AMMS	African Mathematical Millennium Science
AMREC	Agricultural Media Resources and Extension Centre
BDC	Business Development Company
BRIC	Brazil, Russia, India and China
CAVA	Cassava Adding Value for Africa
CCE	Centre for Continuing Education
CEGIST	Centre for Entrepreneurship and Gender Issues in Science and Technology
CENIP	Centre for Internationalisation and Partnership
CENTS	Centre for Entrepreneurial Studies
CERAD	Centre for Research and Development
CESRA	Centre for Space Research and Application
COBFAS	Community-Based Farming Scheme
COLAMRUCS	College of Agricultural Management, Rural Development and Consumer Studies
COLAMRUD	College of Agricultural Management and Rural Development
COLANIM	College of Animal Science and Livestock Production
COLENG	College of Engineering
COLERM	College of Environmental Resources Management
COLFHEC	College of Food Science and Human Ecology
COLMAS	College in the University is College of Management Sciences
COLNAS	College of Natural Sciences
COLPLANT	College of Plant Science and Crop Production
COLVET	College of Veterinary Medicine
DFID	Department for International Development
DGM	Directorate of Grant Management
DVC	Deputy Vice Chancellor
EU	European Union
FAOSTAT	Food and Agriculture Organisation Statistics
FGN	Federal Government of Nigeria
FME	Federal Ministry of Education
FMST	Federal Ministry of Science and Technology
FUNAAB	Federal University of Agriculture Abeokuta
FUTA	Federal University of Technology Akure
GRADFES	Graduate Farming Employment Scheme
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome
HND	Higher National Diploma
HQCF	High Quality Cassava Flour
ICT	Information and Communication Technology
IDI	In-Depth Interviews
IFSERAR	Institute of Food Security, Environmental Resources and Agricultural

	Research
IAR&T	Institute of Agricultural Research and Training
IITA	International Institute of Tropical Agriculture
ILO	International Labour Organisation
IP	Intellectual Property
IPR	Intellectual Property Rights
IPTT	Intellectual Property and Technological Transfer
ITU	Industrial Training Unit
JAMB	Joint Admissions and Matriculation Board
MAC BEN	MAC BEN Automobile Technology
MDGs	Millennium Development Goals
MoU	Memorandum of Understanding
NBCE	National Board for Colleges of Education
NBS	National Bureau of Statistics
NBTE	National Board for Technical Education
NCAM	National Centre for Agricultural Mechanisation
ND	National Diploma
NEEDS	National Economic Empowerment and Development Strategy
NEPC	Nigerian Export Promotion Council
NGOs	Non-Governmental Organisations
NIHORT	National Horticultural Research Institute
NISER	Nigeria Institute of Social and Economic Research
NNPC	Nigerian National Petroleum Corporation
NOTAP	National Office for Technology Acquisition and Promotion
NPC	National Planning Commission
NSI	National System of Innovation
NTA	Nigerian Television Authority
NUC	National Universities Commission
NUDPA	Universities Distinguished Professors Award Scheme
NURESDEF	Nigerian Universities Research and Development Fair
NUTIAS	Nigerian Universities Teaching, Innovation Award Scheme
PGD	Post Graduate Diploma
PRESSID	Presidential Scholarship Scheme for Innovation and Development
PYTP	Practical Year Training Programme
R&D	Research and Development
RESDEC	Research and Development Centre
RMO	Research Management Office
S&T	Science and Technology
SOS	School of Sciences
SAAT	School of Agriculture and Agricultural Technology
SAP	Structural Adjustment Programme
SATIC	Skill Acquisition and Technology Incubation Centre
SEET	School of Engineering and Engineering Technology
SEMS	School of Earth and Mineral Sciences
SET	School of Environmental Technology
SMAT	School of Management Technology

SMEs	Small and Medium-sized Enterprises
SMMEs	Small, Medium and Micro Enterprises
SSEs	Small-sized Enterprises
STEP-B	Science and Technology Education at the Post-Basic level
STI	Science, Technology and Innovation
TEFAMAC	Teaching Farm Management Committee
TETFund	Tertiary Education Trust Fund
TRF	Teaching and Research Farm
UBE	Universal Basic Education
UI	University of Ibadan
UN	United Nations
UNCTS	United Nations Commodity Trade Statistics
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNIID	Universities and Innovation for Inclusive Development
UNODC	United Nations Office Drug Control
USAID	United State Agency for International Development
WAI	Weighted Average Index
WASCAL	West Africa Science Service Centre on Climate Change and Adapted Land use
WDI	World Development Indicators

Acknowledgements

We gratefully acknowledge the feedback provided by reviewers and comments received at the UNIID international workshops, institutional and stakeholders' workshops at various stages of the project. The comments of Glenda Kruss on the draft report and the comments received from participants at the UNIID project workshop held at the HSRC from 25th to 29th August, 2014 were particularly very helpful in the preparation of this final report. We thank the International Development Research Centre (IDRC), Ottawa, Canada for funding the study. We also gratefully acknowledge the cooperation of the Vice Chancellors and Senior Management Officers of the University of Ibadan, Federal University of Agriculture Abeokuta, and the Federal University of Technology Akure, the three universities selected for the study. We thank all the respondents that graciously attended to us in the course of the fieldwork. We are also grateful for the secretarial support of Matthew Olagunju of NISER.

EXECUTIVE SUMMARY

Africa's economies have been growing in recent years at rates that have renewed the hope of economic transformation and poverty reduction. Most of the world's fastest growing economies are located in Africa. However, a major challenge of growth in Africa is lack of inclusiveness. According to UNECA (2013), recent economic performance has not generated enough economic diversification, job growth or social development that can lift significant proportion of African population out of poverty. The consequence of inclusive growth is inclusive development. The UNDP¹ defines inclusive development as "development that marginalised groups take part in and benefit from, regardless of their gender, ethnicity, age, sexual orientation, disability or poverty". Thus, the concept of inclusive development seeks to address the deepening inequality across the world that has arisen despite unprecedented economic growth.² From innovation systems perspective, Iizuka (2013) defines innovation for inclusive development (IID) as an emerging concept which describes innovation addressing the poor and marginalised population/communities especially in developing countries.

The *Universities and Innovation for Inclusive Development* in Africa (UNIID Africa) is a research project designed to examine how university types in selected sub-Saharan African countries interact through their teaching, research and community engagement activities with diverse external social partners. The external social partners in this context are regarded as actors that are often characterised by exclusion from formal sector economic activities and are vulnerable to poverty by reason of economic and/or social marginalisation.

As part of the UNIID Africa project, this Nigeria study report presents the empirical evidence on the nature of interactions with external social partners in three case study universities. The implications of the findings for the evolution of the national system of innovation (NSI) and the potential role of universities in inclusive development are also discussed. As indicated in Adeoti et al (2010), Nigerian universities can be broadly categorised into two: *conventional universities* and *specialised universities*. Conventional universities are the majority and offer courses in the pure and applied sciences, the social sciences and humanities. The specialised universities are either universities of agriculture mainly offering course programmes in agricultural sciences or universities of technology with course programmes mainly in engineering and other technology-related fields. Three types of universities were accordingly selected for case studies of mapping interactions between universities and external social partners. University of Ibadan (UI) was selected as a *conventional university*; the Federal University of Agriculture Abeokuta (FUNAAB) was selected as an *agricultural university*; and the Federal University of Technology Akure (FUTA) was selected as a *technology university*.

The main objective of the Nigeria study is to ascertain how different types of Nigerian universities in their pursuit of community engagement interact with external social partners

1

http://www.undp.org/content/undp/en/home/ourwork/povertyreduction/focus_areas/focus_inclusive_development/ (accessed on 05 October 2014).

² UNDP reports that the richest ten per cent of people in the world own 85 per cent of all assets, while the poorest 50 per cent own only one per cent (see the UNDP web document cited in the previous footnote).

with the strategic aim of promoting innovation for inclusive development. The specific objectives of the study are to:

1. review the development of Nigeria's higher education system and its influence on the role of universities in the national system of innovation;
2. ascertain how different types of universities in Nigeria are organised and structured for interaction with external social partners, specifically marginalised communities;
3. highlight the emerging instances of university-external social partner interaction that promote innovation for inclusive development; and
4. identify the possible enablers and constraints on innovation that enhance livelihoods in informal settings.

The purpose of the study is not a performance evaluation of the universities. Rather, the study focuses on each of the universities with a few to ascertain how university interaction with external social partners has engendered innovation in informal settings and what can be learned from specific cases of interaction that have benefitted marginalised communities.

The methodological approach to the study relies on case study analysis using semi-structured questionnaires and in-depth interviews of senior management staff of the three purposively selected universities. For each university case, emerging instances of university-external social partner interaction that promote innovation for inclusive development are identified. From these instances of innovation, three cases with demonstrative impact of improvement in livelihoods in informal setting are presented as in-depth case study analyses.

The results of the study demonstrate that interactions by the sampled academics in conventional and technology universities are mainly traditional and service forms of interaction, while the academics' interaction at the agricultural university provided substantial cases of network forms of interaction that may promote innovation for inclusive development. However, there is lack of entrepreneurship forms of interaction among the respondents from the three university types. This is more pronounced for the conventional and technology universities. The agricultural university has made its community engagement activities to produce commercial gains through farmers-students-lecturers relationships that encourage farming as a business enterprise. Although the small sample size and the apparent lack of representativeness make generalisation from the findings difficult, the results are suggestive of what could be scaled up or replicated to enable universities improve their contributions as important nodes in the interactive web of the national system of innovation. If the trends observed in the research samples become dominant or pervasive, especially the network form of interaction indicated by the agricultural university, it would have positive implications for universities as agent of innovation for inclusive development. The national system of innovation (NSI) would be more engaging for the marginalised communities. Consequently, the NSI would not only impact on the formal sector of the economy, but also influence the activities of the actors in the informal sector and thereby making the NSI to foster innovation for inclusive development.

The three in-depth case study analyses in this study present only anecdotal evidence of university interaction with external social partners that engender innovation for inclusive

development. In each of the three cases, there is at least an innovation that is focused on enhancing the livelihoods of marginalised communities often situated in informal settings. The three case studies illustrate university interactions in different contexts and how the mission of the university influences the nature and scope of interaction that involves social external partners in the informal sector economy. Each of the three cases generated innovation, which are not new to the world, but new to the environment of the relevant actors. The sources of the innovation are different, and the enablers are also remarkably different even for the two cases from the University of Ibadan.

Three types of constraints on interaction and innovation are identified by the study. These include inadequate funding, capacity building gap, and lack of policy on interaction. The funding constraint affects the three case studies in different ways. Mostly at risk appears to be CIRDP currently financed by the MacArthur Foundation. COBFAS funding is constrained by resources available to the agricultural university to fund its projects and programmes, and funding for the auto-mechanic programme depends largely on the ingenuity of the DLC to manage the interface between course fees paid by artisans and the compensation for MAC BEN.

The capacity building gap constraint manifests in the universities' dependent on external agents to provide adequate knowledge required for innovation in informal settings. With the exception of the case of COBFAS, key resource persons are outsourced for critical aspects of the projects that generate innovation for improving the livelihood conditions of marginalised communities. For CIRDP, the Life Builders Ltd provided trainers especially for the training of women groups in skills required for moringa processing and packaging. For the auto-mechanic programme, MAC BEN provided trainers on entrepreneurship and the specialised skills required for operating diagnostic automobile scanners and Launch X431 GDS.

The policy constraint is expressed by the universities' lack of policy on interaction and innovation for inclusive development. This becomes a major constraint when opportunity for interaction and innovation arises in informal settings. In such a situation, lack of policy would normally result in either inaction on the part of relevant actors or inappropriate action resulting in wastage of scarce resources. However, the case of COBFAS is somewhat an exception because the programme is well structured and has fairly defined parameters for monitoring and evaluation.

Policy reform on the educational system and how it affects social and economic transformation should be a dynamic process that keep pace with the changing patterns of knowledge generation and use in the local context and in the broader scope of the global economy. Based on the findings of this study, the following are the policy implications and recommendations for reform action aimed at making universities agents of innovation for inclusive development in Nigeria.

1. *Address the challenge of inadequate funding and poor research infrastructure:* The key policy implication of the findings of the review of the Nigerian higher education system and its role in the NSI is the need to confront the challenge of inadequate funding and poor research infrastructure in the Nigerian universities. Investment in science,

technology and innovation (STI) should be a major priority of government expenditure. A major and effective channel of investment in STI is adequate funding of research and research infrastructure projects in the university system.

2. *Make a national policy on university interaction with external social partners:* A national policy on university interaction with external social partners should be part of a strategy to ensure that community engagement function of the universities deliver innovation that benefits people that are often marginalised or excluded from the formal sector economic activities. Contributions of the universities at the community level are practical ways of promoting development that directly empowers the marginalised communities and thus enhance their livelihood conditions. A national policy on interaction would encourage universities to raise the level of awareness and commitment of academics to interaction with external social partners. Such a policy should aim at recognising interactions through research, teaching and community engagement as a form of scholarship that should be part of the assessment framework for academic career progression. The national strategy for higher education course programmes recognises the importance of entrepreneurship development and innovation. Beyond the course programmes, academics should themselves be encouraged to embark on research and teaching activities that involve interaction with external social partners as an effective means of entrepreneurship development among the actors in the interaction.
3. *COBFAS as a model for practical training in agriculture:* The network form of interaction exemplified by COBFAS should be encouraged as a model for practical training in agriculture in Nigerian universities. The basic principle of COBFAS is the engagement of young people at the locations where actual professional practice is carried out with active participation of all the agents critical to agricultural production, storage and marketing.
4. *Make university level policy on interaction with external social partners:* Two of the three case studies demonstrated that innovation in informal settings are associated with learning enabled by capacity building activities often involving third party actors. There is however no evidence of extant policy on university engagement of third parties in its interaction with communities. A policy framework at the university level is required for guiding university interaction with external social partners. This policy should have adequate incentive to attract the participation of third parties in capacity building activities among the marginalised groups. The university level policy may draw from the national policy earlier recommended, but must adapt the elements of the national policy to suit its specific context.
5. *Encourage non-pecuniary contribution by communities:* Where feasible, communities may be encouraged to make non pecuniary contribution to projects involving university interaction. The three case studies demonstrated in different ways that when the incentives are appropriate, communities would willingly make non-monetary contributions.
6. *Make provision for adequate and sustainable funding of interaction activities:* The most important risk to identified cases of innovation in informal setting is inadequate and unsustainable funding. Organisation of university interaction with external social partners should include a guaranteed source of or framework for adequate and sustainable funding. The uncertainty associated with inadequate funding may otherwise hinder the

effectiveness and eventual success of the interaction and its capacity to generate innovation for inclusive development.

These recommendations are somewhat general but can be tailored for reform actions in each of the university types. Effective action will require ownership of reform by the universities, and hence, the recommendations as adapted for each university should be subject to widespread discussions among the relevant stakeholders.

Chapter 1

INTRODUCTION

1.1. National System of Innovation Framework and Innovation for Inclusive Development

The role of knowledge and innovation as drivers of social and economic development has been well established. Malerba and Nelson (2012) demonstrated this across sectors and drew examples from Africa and other continents to show that economic and social progress are determined by how knowledge resources are harnessed for innovation aimed addressing development challenges. The educational system, especially tertiary education, is a critical element of the national system of innovation (NSI) framework, which has gained prominence in the analyses of the interactive and learning processes underpinning economic competitiveness. The NSI is a network of institutions and economic agents whose interaction generates the innovations required for realising the national growth and development objectives. While Lundvall (1992) identified the main elements of the NSI framework to include internal organisation of firms, inter-firm relationships, role of the public sector, institutional set-up of the financial sector, R&D intensity and R&D organisation; Adeoti (2002) added ‘education and training’ as an element of the NSI when analysing the role of NSI in building technological capability in developing countries. This emphasis on the role of education subsystem in the NSI has been further amplified by several authors and from different perspectives in recent years. For example, Kruss et al (2012) and other previous studies (e.g. Sutz, 2000; Kruss, 2005; Juma, 2006) provide evidence of growing concern that universities in developing countries should be innovative in making their teaching, research and community engagement activities relevant to the needs of society.

For the formal sector economy, university’s community engagement has laid emphasis on university-industry linkages, and there is often a mismatch between universities’ and firms’ perception of the imperatives of interaction (Etzkowitz and Zhou, 2008; Kruss et al, 2012). However, the predominance of the informal sector economy in developing countries and the recent attempts at re-thinking development for inclusiveness have created the need to draw universities into examining how their teaching, research and community engagement can benefit marginalised communities (Cozzens and Sutz, 2012; Kruss, 2012).

Africa’s economies have been growing in recent years at rates that have renewed the hope of economic transformation and poverty reduction. Most of the world’s fastest growing economies are located in Africa. However, a major challenge of growth in Africa is lack of inclusiveness. According to UNECA (2013), recent economic performance has not generated enough economic diversification, job growth or social development that can lift significant proportion of African population out of poverty. The consequence of inclusive growth is inclusive development. The UNDP³ defines inclusive development as “development that marginalised groups take part in and benefit from, regardless of their gender, ethnicity, age, sexual orientation, disability or poverty”. Thus, the concept of inclusive development seeks to address the deepening inequality across the

³ http://www.undp.org/content/undp/en/home/ourwork/povertyreduction/focus_areas/focus_inclusive_development/ (accessed on 05 October 2014).

world that has arisen despite unprecedented economic growth.⁴ From innovation systems perspective, Iizuka (2013) defines innovation for inclusive development (IID) as an emerging concept which describes innovation addressing the poor and marginalised population/communities especially in developing countries. Typologies of IID presented by several authors include: ‘grassroots innovation’ (Gupta et al, 2003), ‘innovation for bottom (base) of pyramid’ (Prahalad, 2005; Prahalad and Hart, 2002), ‘below the radar innovation’ (Kaplinsky, 2011), and ‘frugal innovation’ (Tiwari and Herstatt, 2012; Zeschky et al, 2011). Cozzens and Sutz (2012) disclosed that descriptions of IID agree that applying IID requires local knowledge and capability, and IID addresses the poor more directly by focusing on innovation in informal settings. IID is often initiated by strong demand from users to acquire improved welfare or quality of life. It also pays attention to knowledge flow, and may aim at improving ‘non-economic’ aspects, which are initiated by users or communities of users that are not directly linked to the market.

1.2. Forms of Interaction between Universities and External Social Partners

The *Universities and Innovation for Inclusive Development* in Africa (UNIID Africa) is a research project designed to examine how university types in selected sub-Saharan African countries interact through their teaching, research and community engagement activities with diverse external social partners. The external social partners in this context are regarded as actors that are often characterised by exclusion from formal sector economic activities and are vulnerable to poverty by reason of economic and/or social marginalisation. In the analysis of Cozzens and Sutz (2012), universities in innovation for inclusive development should thus focus on innovation in informal settings, such that innovation results in economic empowerment of the actors in marginalised communities. The interactions between these actors can take different forms. The four possible modes of interactions between higher educational institutions (e.g., universities) and industry (in formal and informal sectors) are aptly represented in Figure 1.1. As explained by Kruss (2012), the drivers of interaction is either primarily financial with the aim of mobilising resources for higher educational institution or industry, or primarily intellectual with the aim of improving knowledge resources of the higher educational institution or industry. The different forms of interaction are:

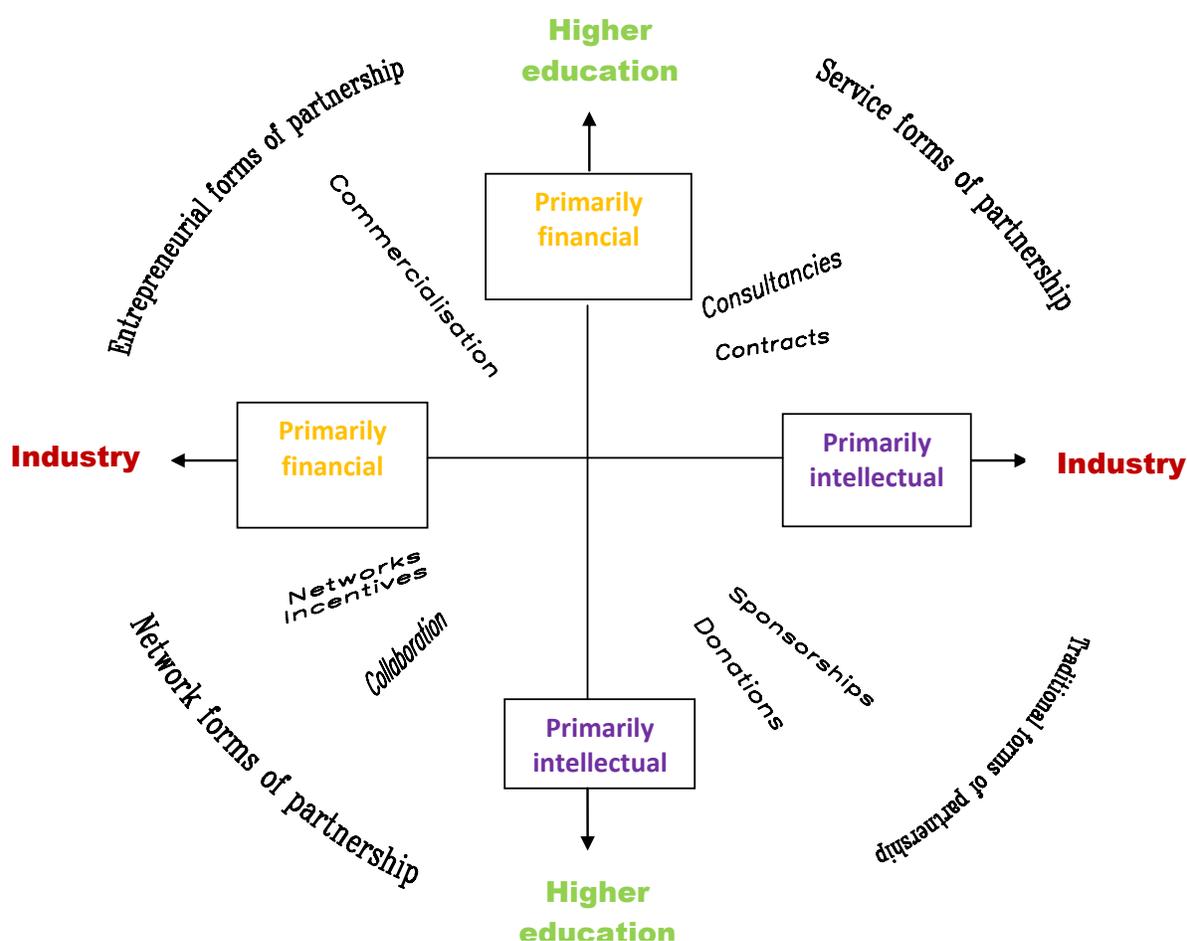
1. Entrepreneurial forms of partnership with a focus on commercialisation of research results/outputs. This is primarily motivated by desire to create value and improvement in the finances of industry and higher educational institutions.
2. Service forms of partnership comprising of consultancies and contractual engagements between universities and industry. This is motivated by both financial and intellectual reasons, and often involves a consultant-client relationship where industry collaborates with academia to address industrial challenges.
3. Traditional forms of partnership comprising of sponsorships and donations by industry to universities. This is primarily motivated by intellectual concerns aimed at increasing basic and applied knowledge.
4. Network forms of partnership involving multi-stakeholder relationships and collaborations with a view of addressing perceived economic and/or social challenges. There are economic and/or social incentives for agents’ participation in the networks. The primary

⁴ UNDP reports that the richest 10 per cent of people in the world own 85 per cent of all assets, while the poorest 50 per cent own only one per cent (see the UNDP web document cited in the previous footnote).

motivation for the participation of higher educational institutions is intellectual while the motivation for industry participation is primarily financial.

Though all the four forms of interactions can generate innovation, Cozzens and Sutz (2012) and Kruss (2012) indicate that the network forms of partnership are known to be relatively more potent in generating innovation that improves the livelihood conditions of marginalised communities. Livelihood can simply be referred to as a source of income in its most narrow definition. It is however a broader concept as defined within the sustainable livelihoods framework where it comprises capabilities, assets (including both material and social resources), and activities required for a means of living (Chambers and Conway, 1992).

Figure: 1.1: Forms of interaction



Source: Kruss (2012)

1.3. Research Questions and Objectives

As part of the UNIID Africa project, this Nigeria study report presents the empirical evidence on the nature of interactions with external social partners in three case study universities. The

implications of the findings for the evolution of the national system of innovation (NSI) and the potential role of universities in inclusive development are also discussed. As indicated in Adeoti et al (2010), Nigerian universities can be broadly categorised into two: *conventional universities* and *specialised universities*. Conventional universities are the majority and offer courses in the pure and applied sciences, the social sciences and humanities. The specialised universities are either universities of agriculture mainly offering course programmes in agricultural sciences or universities of technology with course programmes mainly in engineering and other technology-related fields. Three types of universities were accordingly selected for case studies of mapping interactions between universities and external social partners. University of Ibadan (UI) was selected as a *conventional university*; the Federal University of Agriculture Abeokuta (FUNAAB) was selected as an *agricultural university*; and the Federal University of Technology Akure (FUTA) was selected as a *technology university*.

Drawing from the UNIID Africa study proposal, the main research question for this study is: How do different types of universities interact with external social partners with the strategic aim of promoting innovation for inclusive development? For the Nigeria study, the following are the specific research questions:

1. How has Nigeria's development experience impacted on the higher education system and the role of universities in the national system of innovation?
2. How are different types of universities organised and structured to interact with external social partners, specifically marginalised communities?
3. What are the emerging instances of university-external social partner interaction to promote innovation for inclusive development that can be identified in these institutions?
4. What are the main enablers and constraints on the instances of innovation that enhance livelihoods in informal settings?

From the foregoing, the main objective of the Nigeria study is to ascertain how different types of Nigerian universities in their pursuit of community engagement interact with external social partners with the strategic aim of promoting innovation for inclusive development. The specific objectives of the study are to:

1. review the development of Nigeria's higher education system and its influence on the role of universities in the national system of innovation;
2. ascertain how different types of universities in Nigeria are organised and structured for interaction with external social partners, specifically marginalised communities;
3. highlight the emerging instances of university-external social partner interaction that promote innovation for inclusive development; and
4. identify the possible enablers and constraints on innovation that enhance livelihoods in informal setting.

The agriculture and industrial manufacturing are the main strategic sectors for economic diversification and improvement of social welfare in Nigeria. The knowledge requirements for these two sectors are concentrated in the sciences and engineering for addressing technical issues, and in the social sciences for addressing issues of organisation and management of production activities. Thus, the foci of the analysis in the Nigerian context are university research, teaching and community engagement that involve interactions with external social partners in the faculties

of agricultural sciences, pure and applied sciences, engineering/technology, and the social sciences.

At this juncture, it is important to state that though this report is based on data collected from the three selected universities, the purpose of the study is not a performance evaluation of the universities. The study focuses on each of the universities with a few to ascertain how university interaction with external social partners has engendered innovation in informal settings and what can be learned from specific cases of interaction that have benefitted marginalised communities.

The rest of the report is organised into ten chapters. Chapter two presents the research methodology. The first research objective is addressed in chapter three which discusses the nexus between the developments in Nigeria's higher education system and the evolution of the national system of innovation. Chapters four, five and six analyse the mapping of university interaction with external social partners respectively in UI, FUNAAB and FUTA with the aim of ascertaining how different types of universities in Nigeria are organised and structured for interaction with external social partners, specifically marginalised communities. Chapter seven presents a comparative analysis of the results of the mapping of interaction in the three university types. For each university case, emerging instances of university-external social partner interaction that promote innovation for inclusive development are identified. From these instances of innovation, three cases with demonstrative impact of improvement in livelihoods in informal settings are presented as in-depth case studies in chapters eight, nine and ten. The implications of the findings of the study for university community engagement, the development of the national system of innovation, the enablers and constraints on innovation that enhance livelihoods in informal settings are discussed in the final chapter.

Chapter 2

RESEARCH METHODOLOGY

This Chapter presents the main research methods for the study. It describes the data collection process and the data analysis techniques employed.

2.1. Data Collection

As mentioned in Chapter One, three universities were purposively selected for the study. One university is a *conventional university* where almost every academic course of study is offered; the second university is a specialised *agricultural university* with bias for academic programmes in agriculture; and the third university is a specialised *technology university* with bias for academic programmes in engineering and technology fields. The University of Ibadan (UI) was selected as a conventional university; Federal University of Agriculture Abeokuta (FUNAAB) as an agricultural university; and Federal University of Technology Akure (FUTA) as a technology university. The selection of these universities was also based on convenience as determined by limited funding for the study, proximity to the research team, and building on existing relationships.

Identical research instruments were used for eliciting data/information in each of the three universities. The research instruments include four templates which were centrally designed for the UNIID Africa project but customised where necessary to suit each country⁵ context. These templates are:

1. University information schedule for collecting data/information on the university background (*Template A*);
2. Interview guide for university senior management and principal officers (*Template C*);
3. Questionnaire for academics with evident interaction with external partners (*Template E*); and
4. Questionnaire for academics with no evident interaction with external partners (*Template F*).

The details of questions raised by these research instruments are shown in Appendices 1 to 4.

2.1.1. Data collection from UI

In-depth interviews (IDI) of senior management and leadership of the University of Ibadan were conducted. The interviews involved the following 15 senior management staff of the university.

- The Deputy Vice Chancellor (Academics).
- Director of the Academic Planning Unit.
- Research Management Office (RMO).
- Deans of faculties of Agriculture, Technology, Sciences, and Social Sciences.
- Ten heads of departments (agricultural engineering, mechanical engineering, civil engineering, petroleum engineering, food technology, agricultural economics, wildlife and fishery, agricultural extension and rural development, crop protection and environmental biology, forest resources and management).

⁵There are six countries and 16 university case studies involved in UNIID Africa project. The six countries and number of universities are: Bostwana – 2, Malawi – 2, Nigeria – 3, South Africa – 3, Tanzania – 3, and Uganda – 3.

In addition to the IDIs conducted among senior management staff, data on academics' interaction with external social partners and data on academics with no interaction were collected using the respective questionnaires designed as Templates E and F respectively. 50 copies of Template E questionnaire were distributed among individual academic staffs that are interacting with external partners. Out of these 50 questionnaires, 41 copies were satisfactorily completed and retrieved. For the academic staff that are not interacting, 20 copies of Template F questionnaire were distributed, out of which only 16 copies were satisfactorily completed and retrieved. The secondary data on the university were collected from the Academic Planning Unit and other relevant organs of the university using the university information schedule (Template A).

The focus of the study in UI is restricted to four faculties (agriculture and forestry, sciences, technology, and the social sciences) due to the outcome of the analysis of the Nigerian educational system and the national system of innovation. The analysis, which is presented in chapter three of this report, stresses the strategic importance of knowledge in the agricultural sciences, engineering, pure sciences, and the social sciences in the advancement of technological learning and the interactive processes that facilitate the development of the national system of innovation.

2.1.2. Data collection from FUNAAB

In-depth interviews (IDI) of senior management and leadership of the Federal University of Agriculture, Abeokuta were conducted. The interviews involved the following 17 senior management staff of the university.

- Two Deputy Vice Chancellors (DVC Academics and DVC Development).
- One Director of Academic Planning Unit.
- Four Deans of Colleges [College of Plant Science and Crop Production (COLPLANT), College of Agricultural Management and Rural Development (COLAMRUD), College of Environmental Resources Management (COLERM), College of Veterinary Medicine (COLVET)].
- Five Directors of Centres [Agricultural Media Resources and Extension Centre (AMREC), Institute of Food Security, Environmental Resources and Agricultural research (IFSERAR), Centre for Community-Based Farming Scheme (COBFAS), Centre for Internalisation and Partnership (CENIP), Centre for Entrepreneurial Studies (CENTS)].
- Two Heads of Departments (Food Science and Technology, Horticulture).
- Two Heads of Units [Chairman of Graduate Farming Employment Scheme (GRADFES), Head of Industrial Pact Unit].
- One former Head of Department of Food Science and Technology.

In addition to the IDIs conducted among senior management staff, data on academics' interaction with external social partners and data on academics with no interaction were collected using the respective questionnaires designed as Templates E and F respectively. 50 copies of Template E questionnaire were distributed among individual academic staff that are interacting with external partners. Out of these 50 questionnaires, 35 copies were satisfactorily completed and retrieved. For the academic staff that are not interacting, 20 copies of Template F questionnaire were distributed, out of which only 16 copies were satisfactorily completed and retrieved. The secondary data on the university were collected from the Academic Planning Unit and other relevant organs of the university using the university information schedule (Template A).

2.1.3. Data collection from FUTA

In-depth interviews (IDI) of senior management and leadership of the Federal University of Technology Akure were conducted. The interviews involved the following 16 senior management staff of the university.

- Two Deputy Vice Chancellors (DVC Academics and DVC Development).
- Six Deans of Schools [School of Agriculture and Agricultural Technology (SAAT), School of Engineering and Engineering Technology (SEET), School of Earth and Mineral Sciences (SEMS), School of Environmental Technology (SET), School of Management Technology (SMAT), School of Sciences (SOS)].
- Six Directors of Centres [Centre for Research and Development (CERAD), Centre for Space Research and Application (CESRA), Centre for Entrepreneurship and Gender Issues in Science and Technology (CEGIST), Centre for Skills Acquisition and Technology Incubation (SATIS), Business Development Company (BDC), Intellectual Property and Technological Transfer Centre (IPTT)].
- One former Director of Business Development Company/Dean School of Environmental Technology.
- Head of Department of Fishery.

In addition to the IDIs conducted among senior management staff, data on academics' interaction with external social partners and data on academics with no interaction were collected using the questionnaires designed as Templates E and F respectively. 50 copies of Template E questionnaire were distributed among individual academic staffs that are interacting with external partners. Out of these 50 questionnaires, 40 copies were retrieved, while 35 copies were satisfactorily completed. For the academic staff that are not interacting, 20 copies of Template F questionnaire were distributed, out of which only 15 copies were satisfactorily completed and retrieved. The secondary data were generated from the University annual report and calendar (2003-2005, 2008-2010), University Bulletin, Faculties handbooks, Brochure and Memoirs of Centres, and the compendium of Made in FUTA products. The university information schedule (Template A) served as guide for the secondary data collection. The template was completed by senior staff of Academic Planning office using data from the University publications and records available in the office of the Director of Academic Planning.

2.1.4. Case studies of innovation focused on livelihood in informal settings

From the mapping of the patterns of university interactions with external social partners in Chapters four to six, ten potential case studies of university interaction with external social partners were identified in the three Nigerian universities selected for the study. Table 2.1 shows the universities and the potential case studies out of which three were selected for in-depth study. A 'best fit' approach based on the data/information obtained from interviews of academics involved in the case studies was adopted for the case study selection. The case that best fits for the Federal University of Technology Akure (FUTA) is the groundwater remediation project. However, the Nigerian study was planned to include two cases with appreciable involvement of communities in urban or semi-urban informal settings. In this respect, the University of Ibadan had two cases that were better fits than the FUTA case. Consequently, the Nigerian case studies include two cases involving the University of Ibadan and one case involving the Federal University of Agriculture Abeokuta. The criteria for the case study selection and the three selected cases are presented in Table 2.2. The selected cases are: the Auto-mechanic Training Programme of the University of Ibadan, the Community Integrated Rural Development Project (CIRDP) of

the University of Ibadan, and the Community-Based Farming Scheme (COBFAS) of the Federal University of Agriculture Abeokuta.

The methodology for the case studies employed documentary analysis and in-depth interview of key informants from the universities, the communities and any other relevant actor(s) identified through a snow-balling process. Seven interviews were done for the case of auto-mechanic training programme; nine interviews were done for the case of CIRDP; and nine interviews were done for the case of COBFAS. The interviews employed semi-structured interview guide/templates designed for the UNIID Africa project and adapted for the country case studies.

Table 2.1: Potential case studies of universities' interaction with marginalised communities

University	Potential case studies
University of Ibadan (UI)	<ol style="list-style-type: none"> 1. Auto-mechanic Training Programme 2. Community Integrated Rural Development Project (CIRDP), Ile-Ogbo 3. The Research Alliance to Combat HIV/AIDS (REACH)
Federal University of Agriculture Abeokuta (FUNAAB)	<ol style="list-style-type: none"> 1. Community-Based Farming Scheme (COBFAS) 2. Cassava Adding Value for Africa project (C:AVA) 3. Tomato Wilt Project 4. The Good Neighbour Project
Federal University of Technology Akure (FUTA)	<ol style="list-style-type: none"> 1. Ground water remediation project 2. Automated cassava peeling machine 3. Bean weevil killer

Source: Fieldwork data, 2013.

Table 2.2: Case study selection criteria and the Nigerian cases of universities' interaction with marginalised communities

S/N	Selection criteria	Case 1: Auto-mechanic Programme (UI)	Case 2: Community Integrated Rural Development Project (CIRDP) (UI)	Case 3: Community based farming Scheme (FUNAAB)
1	Livelihood problem	Problem of repair of high technology vehicles	Problem of limited alternative in income generating activities by vulnerable women groups (petty traders, agricultural cooperatives)	1. Problem of agricultural poor yield, 2. Practical agriculture training for students
2	Structure of Interaction	University, auto-mechanics, private sector agent	University/NGO/students/extension agents and local communities	university/community/students
3	Drivers of interaction	University policy, local auto-mechanics and individuals with problems of maintenance of high tech vehicles	University extension policy/ local community identification of the problem through provision of land	University extension policy/ local community identification of it.
4	Role of Innovation	Technology transfers and acquisition of high tech skills for maintenance of high tech vehicles	Farming and business system improvement	Farming system improvement
5	Flow of knowledge and skills	university auto-mechanics, community	University to communities and vice-visa	University-community
6	Community participation	Active participation of local auto-mechanics through enrolment and payment of fees	Active participation of local communities (project design, networking opportunities, training & feedback mechanisms)	Active Farmers participation (problem identification and training)
7	Outcome and benefits	Skills development for trouble shooting of high tech vehicles, improved relevance of university research activities , enhance income for locals auto-mechanics	Skills development for low income earners; new livelihood and income generating alternatives, enhanced income and food security	Skills development for students; new farming methods for rural farmers/ enhanced income and food security

2.2. Data Analysis

The data analysis for this study is largely descriptive and focused on case study analysis. The descriptive statistics employ 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. As done in the computation of WAI by Adeoti *et al* (2010), 4 is assigned to the highest level of perception on the likert scale while 1 is assigned to the lowest level. 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.

The Likert scale used for the study thus 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 effect, 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”).

Data analysis for the selected three in-depth case studies is also mainly descriptive and guided by the analytical framework of the national system of innovation with a focus on how innovation in informal settings can be an outcome of university interactions with external social partners in a network form of interaction.

Chapter 3

ECONOMIC GROWTH PERFORMANCE, HIGHER EDUCATION SYSTEM AND INNOVATION FOR INCLUSIVE DEVELOPMENT

3.1. Economic Growth and Inclusive Development in Nigeria

3.1.1. Economic growth performance and inclusiveness

Global competition has continued to make the imperative of building knowledge based and innovation driven economies a major issue in African development policy dialogue. In Nigeria, the economy has grown at an average of about 6.6 per cent from 2004 to 2011, and forecasts indicate that this growth trajectory will be sustained in the medium term. (NPC, 2011; IMF, 2012; Ogbu et al, 2012). The inclusiveness of this growth is however doubtful. Available data on Nigeria shows that several efforts to alleviate poverty have mostly ended with no significant reduction in poverty incidence. Relative poverty and absolute poverty rates increased to 69 per cent and 60.9 per cent in 2010 respectively from 54.4 per cent and 54.7 per cent in 2004. This implies that the population in relative poverty grew by a compound annual growth rate of 8.56 per cent above the average growth rate of 6.6 per cent per annum since 2004 (NPC, 2011). For growth to be inclusive and poverty reducing, the human capital component should be a major contributor to and beneficiary of growth. Skilled manpower are required inputs while the distributive impact of growth should be fair or equitable to further encourage skills upgrading and job creation. It has thus become increasingly important that the return on productive factors should be shared not only among the privileged but also among the economically weak and vulnerable. For this to be achieved, the economy should be innovation driven (see for example, Conway and Waage 2010). In this respect, the innovation system framework is important because it emphasises that innovation is not a linear process whereby research and development (R&D) leads to invention, and commercialisation of inventions results in innovation that drives economic competitiveness and growth. Instead, it illustrates that the dynamic linkages and interactions that take place among actors such as firms, government departments, universities, and science councils are the most important factors engendering systemic learning and the distribution of knowledge required for the strengthening of innovation capabilities of the economy. (Lundvall et al, 2009).

At independent in 1960, agriculture was the mainstay of the economy providing food and employment for the populace and raw materials for the industrial sector. The agricultural sector generated the bulk of government revenue and foreign exchange earnings. With the discovery of oil⁶ and its exploration and exportation in large quantities in the 1970s, the development of the agricultural sector was relatively abandoned. Its fortune consequently declined, and crude petroleum replaced agricultural commodity as the dominant source of revenue and export earnings. Table 3.1 shows the structure of the real Gross Domestic Product (GDP) in Nigeria by sectoral groups, while Figure 3.1 shows the relative sectoral shares of the GDP for selected years from 1961 to 2009. The primary sector takes the largest share of the GDP in the immediate post-independence period, and has remained the dominant sector of the economy contributing 58.44 per cent of the GDP in 2009. The tertiary sector was the second sector in terms of share of GDP in the immediate post-independence period, and has maintained this position but with increasing share in recent years. The secondary sector has lagged behind the other sectors over the years,

⁶ Oil was first discovered in commercial quantity in 1956 at Oloibiri in the present day Bayelsa State.

apparently signifying the persistently weak manufacturing capability and low investment in R&D.

Though economic production in Nigeria was dominated by the agricultural sector in the 1960s, the oil economy of the 1970s supported an import substituting industrialisation strategy and provided a boost for wholesale and retail trade activities. This however did not lead to any significant structural transformation because of the attending ‘dutch disease’ whereby the boost in oil revenue resulted in rent-seeking by economic agents that would normally have engaged in agricultural production activities (see for example, Corden and Neary, 1982; Sachs and Warner, 1995).

Table 3.1: Percentage distribution of GDP by sectoral groups, 1961-2009

Sectoral Group	1961	1966	1970	1977	1981	1987	1990	2003	2007	2009
Primary Sector	70.54	69.68	66.99	62.10	58.40	60.25	55.68	68.36	61.92	58.44
Agriculture	68.88	66.95	49.45	30.10	28.37	29.24	22.99	34.62	42.02	41.69
Mining & Quarrying	1.66	2.73	17.54	32.00	30.03	31.02	32.69	33.74	19.90	16.75
Secondary Sector	9.67	12.55	16.15	13.05	12.14	12.60	9.04	10.51	9.24	9.05
Manufacturing	4.73	7.00	7.66	6.30	5.60	5.95	5.12	4.32	4.03	3.72
Building and construction	3.30	4.95	7.77	2.90	2.83	2.87	1.78	2.70	1.72	2.01
Utilities	1.63	0.63	0.60	3.85	3.71	3.78	2.14	3.49	3.49	3.32
Tertiary Sector	19.79	17.77	16.86	24.85	29.46	27.16	35.28	21.13	28.84	32.51
Wholesale and Retail	19.36	15.40	13.56	14.64	14.17	14.19	8.68	12.92	16.16	18.14
Other Service activities	0.43	2.37	3.29	14.64	15.29	14.97	26.60	8.21	12.68	14.37
Total (GDP)	100									

Source: NBS (2010) and IMF (2010).

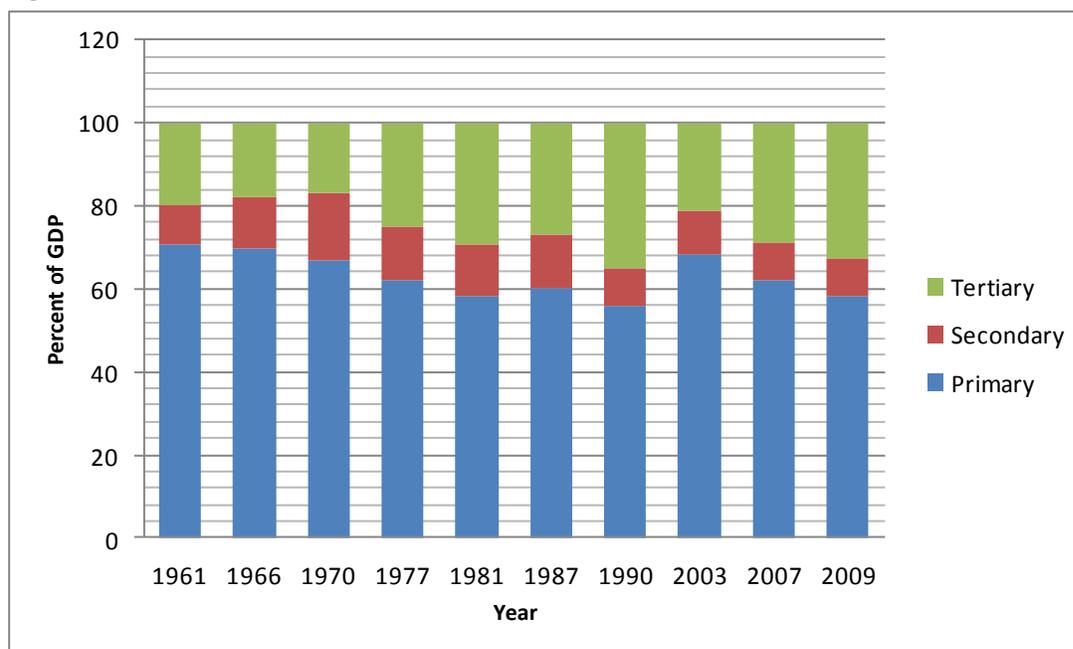
The tertiary sector has grown in recent years mainly because of the deregulation of the telecommunication sector,⁷ resulting in widespread adoption of mobile telephony and the attendant commercial activities. This notwithstanding, the petroleum sub-sector continues to dictate the public sector finances because it contributes more than 70 per cent of foreign exchange earnings. However, given its enclave nature, the oil sub-sector⁸ employs relatively small number of Nigerians directly in production and has weak linkage with the rest of the economy. Outside of transportation and a trivial section of the industrial sector, the petroleum economy has very little connection with Nigerian production. The sub-sector buys little or nothing from the agricultural or manufacturing sub-sectors, transfers little or no technology to either of the sub-sectors. Agricultural and trading activities provide the bulk of the employment

⁷ See Adeoti and Adeoti (2008) for details of the impact of the deregulation of the telecommunication sector on the tertiary sector.

⁸The oil sub-sector is replete of multinational companies that are highly technologically driven and requires skilled workers that are often hired from abroad.

to Nigerians. Agriculture also provides the bulk of the needs of the household sector but supplies only a small part of the needs of manufacturing. Basically, the primary sector comprising of agriculture and mining; and the manufacturing sector have no significant inter-linkages in production. Thus, each of these critical economic subsectors operates practically like an island to itself.

Figure 3.1: Sectoral shares of GDP, 1961-2009



Source: Analysis of data from NBS (2010) and IMF (2010)

It is pertinent to note that the approaches to growth and economic development in Nigeria have not emphasised the role of innovation. The deficit that ensues largely explains the relatively slow pace of the application of new technologies to address pertinent economic and social challenges. Fostering innovation driven economies depend on the education and skills development strategies, particularly the higher education structure and performance (Kruss et al, 2009; Gregersen et al, 2009). The changing role of higher education in social and economic development is accordingly beginning to manifest in Nigeria. Besides, Nigeria has begun to focus development policy debate on how to build technological capability, foster national system of innovation, and ensure that innovations required for economic competitiveness are delivered. But current reality portends a long road to travel in terms of achieving a strong national system of innovation that would drive inclusive development in Nigeria.

3.1.2. Contributions of the formal and informal sectors

As reported by Adeoti (1997), the term '*informal sector*' was apparently first used by the British anthropologist Keith Hart in a 1971 study (published in 1973) as a way of organising his field work among the poor city dwellers in Accra, Ghana. The dichotomy between a formal and an informal sector has since been brought into the mainstream of development policy formulations and can be viewed as a series of dualistic conceptualisations. The dualistic concepts stress the

contrast between two sets of economic activities; one acknowledged as relatively profitable and privileged, the other relatively disadvantaged (Peattie, 1987; Neitzert and Horton, 1992). According to Peattie (1987), the economic dualistic scenarios depicted by the formal and the informal sectors of an economy exist both in the developed and the developing economies, and are characterised by dimensions of scale and history.

For the developed economies, it may be easy to assume that over the years the economy has tended towards formalisation, and hence the informal sector has to a large extent been swallowed up in the overwhelming influence of industrialisation. However, as noted by Swaminathan (1991) in a discourse on *Understanding the Informal Sector*, researchers of the formal-informal dichotomy have not assumed a steady decline of the informal sector over time and in the course of development. This is largely because economic crisis in the less developed countries often bring about the realisation of the economic importance of the developmental possibilities of the informal sector. For example, Meagher and Yunusa (1991) reported that the growing failure of state-led capitalism to generate sufficient employment to absorb a rapidly expanding informal sector in the 1980s turned the attention of development policy experts to the capacity of the informal sector itself for labour absorption and increased income generation. The persistent poverty of the informal sector was no longer seen as intrinsic to the unproductive nature of informal sector activities, but as the fault of inappropriate state policy that has failed to provide an environment conducive to informal sector growth. Informal activities themselves were seen in a new light, as economically efficient, technologically adaptable, and socially useful in the provision of goods and services to the large proportion of the urban population excluded from the benefits of formal sector development.

Typical of a developing economy, the formal and the informal sectors dichotomy in Nigeria fits into the picture described in the foregoing. Like the case of the pioneering study of Hart in Accra, the informal sector in Nigeria is largely recognised as an urban phenomenon with the rural population predominantly engaged in subsistence agriculture. According to Mustapha (1991), it has been claimed that the informal sector occupies between 50 and 70 per cent of the urban working population in many developing societies. From more recent reports by Nwaka (2004) and Osalor (2011), the informal sector in Nigeria refers to economic activities in all sectors of the economy that are operated outside the purview of government regulation.⁹ Osalor (2011) states that though the informal sector in Nigeria is difficult to measure, it has been estimated to contribute about 65 per cent of national output.

The dichotomy concept presented so far does not reflect the complete view of the relationship between the formal and the informal sectors. The two are not only competitive and divergent but can also be complementary. This is exemplified by the subcontracting interrelationships between formal and informal sectors in a number of countries especially in Asia and Latin America. It should nevertheless be noted that the observed patterns of subcontracting are often complex, proceeding from large enterprises (or even multinational firms) to relatively well established smaller firms or backyard informal sector enterprises or family household workers or combinations of any of these (Lubell, 1991).

⁹ According to Osalor (2011), the sector may be invisible, irregular, parallel, non-structured, backyard, underground, subterranean, unobserved or residual. Informal economic activities in Nigeria encompass a wide range of small-scale, largely self-employment activities. Most of them are traditional occupations and methods of production. Others include such financial and economic endeavours of subsistence nature as: retail trade, transport, restaurant, repair services, financial inter-mediation and household or other personal services.

In Nigeria indications of subcontracting are manifest in cases of large enterprises or government agencies giving printing works to informal sector printers, subletting of vehicle repairs to informal sector auto-mechanic workshops, formal education institutions subletting the sewing of school uniforms and academic gowns to informal sector tailors/fashion design institutes (same is true of large enterprises subletting of factory uniforms), giving of furniture supply contracts to informal sector furniture makers, using of informal sector electricians for minor electrical repairs in industries and government establishments, etc. These, and almost all other possible illustrations of subcontracting in Nigeria, appear to be relatively undeveloped. There is however a high potential for further development of the present situation with improvements in the quality of the informal sector products. Moreover, the current economic transformation agenda of Nigeria Vision 20:2020¹⁰ encourages formal enterprises to as much as possible source their inputs locally. Apart from subcontracting, other areas where the formal and the informal sectors exhibit forward/backward linkages include products of informal sector SSEs serving as raw materials for formal sector large enterprises or vice-versa, informal sector SSEs engaging in retail trade distribution of formal sector products, small-sized transport operators serving the formal sector firms, etc.

3.2. Promotion of Science, Technology and Innovation

In Nigeria, various strategies for development have been tried with little or no significant impact on technological learning and innovation required for a knowledge-based economy. Among these were the Structural Adjustment Programme (SAP), Vision 2010, National Economic Empowerment and Development Strategy (NEEDS), the Seven Points Agenda, and Nigeria Vision 2020. The NEEDS document and the Nigeria Vision 2020 are well-articulated strategies for rapid economic development and poverty alleviation. However, the strategies are deficient in the prioritisation of science, technology and innovation (STI) as important drivers of economic and social development. For example, using R&D expenditure as an indicator of the prioritisation of STI investment, Nigeria ranks amongst the lowest in R&D expenditure as proportion of GDP. Nigeria spends only 0.01 per cent of GDP on R&D while India, Germany, USA, and Russia spend 2.5 per cent, 2.8 per cent, 2.8 per cent and 5 per cent of GDP on R&D respectively.

Prior to Nigeria's independence in 1960, existing technology-related policies and programmes were primarily geared towards ensuring production of raw materials (predominantly agricultural) which were then exported to Europe and North America. As earlier mentioned, the post-independence years subsequently followed with a technology drive based on import-substitution, and the promotion of private light consumer goods industries through foreign direct investment and joint ventures. The industrialisation effort was characterized by promotion of large scale publicly owned projects; promotion of private small and medium scale enterprises employing considerable labour; importation of foreign technologies, materials and personnel; and a heavy dependence on external R&D efforts.

Attempts to provide a scientific and technological base for the industrialisation efforts made various administrations in Nigeria to show interest in the development of science and technology

¹⁰ The 'Nigeria Vision 20:2020' is the national economic transformation document/blueprint which has the central objective of making Nigeria one of the 20 largest economies by the year 2020.

(S&T). However, commitment to the development of S&T varied from government to government and across the states of the Nigerian Federation. Noteworthy is the establishment of the Federal Ministry of Science and Technology (FMST) as a separate entity in 1985. Since then, Nigeria has expended a great deal of efforts on S&T policy development. The first National Science and Technology Policy for Nigeria was produced in 1986. The aim was to use S&T knowledge to ensure a better quality of life for the people. The policy was reviewed in 1997 to lay more emphasis on coordination and management of S&T system, sectoral developments, collaboration and funding. In 2003, the S&T policy underwent yet another review to take account of lapses observed in the implementation of the 1997 policy, especially on the need to address the institutional frameworks that should foster interaction among the various elements of the National System of Innovation (NSI). (Adeoti *et al*, 2010). The review also incorporated a programmatic approach to policy formulation. It emphasised the need for a coherent, systematic and comprehensive approach to the determination of technological programmes. The policy gave prominence to the flagship programmes of Government of the day such as Biotechnology, Information and Communication Technology (ICT), Space Science & Technology, Energy and Engineering Materials. The selection of these fields by government was however neither preceded by a technology foresight programme nor any systematic analysis that provided empirical evidence on the technological needs of the economy. It was therefore difficult to link efforts at promoting these fields with university curricula and training activities in the higher education system.

In 2005, a system-wide reform was implemented under the Nigeria/UNESCO Science, Technology and Innovation (STI) reform initiative (UNESCO, 2006). It adopted the NSI approach as a framework for STI system reform. The approach highlights the challenges of economic development initiatives and their relationship to institutional governance, R&D agenda for the country, funding mechanisms, Intellectual Property (IP), and STI Infrastructure development. Thus, the need to design a new policy that will address these challenges became indispensable. The preparation of the new policy was a long process which resulted in the launch of a new National Policy of STI in 2012.

Taking advantage of the experiences in the design and implementation of S&T policy in the last 25 years, the new STI policy is a product of a novel, all-inclusive, participatory policy making. It involved consultative meetings with various stakeholders across the length and breadth of the country as well as International Development Partners. The participatory approach to the design of policy has heightened awareness and provided opportunities for various actors to articulate their views and make inputs into the new policy. The approach also promoted collective ownership of the policy by all stakeholders. A remarkable feature of the policy is the emphasis on *innovation*, which has become widely recognised as the fundamental and key strategic element of development policies. Nigeria Vision 20:2020 is the current economic transformation blueprint of Nigeria. The new National STI policy is apparently designed to fit into the framework of the Nigeria Vision 2020, and its emphasis on innovation is aimed at providing the missing strategic element of the vision. The general policy objective of the National STI Policy is to '*build a strong STI capability and capacity needed to evolve a modern economy*'. Box 3.1 presents the vision, mission and specific objectives of the STI policy.

Box 3.1: Nigeria STI policy vision, mission and objectives

STI policy vision: 'By 2020, it is hoped that Nigeria will have a large, strong, diversified, sustainable and competitive economy that effectively harnesses the talents and energies of its people and responsibly exploits its natural endowments to guarantee a high standard of living and quality of life to its citizens'.

STI policy mission: 'Evolving a nation that harnesses, develops and utilises STI to build a large, strong, diversified, sustainable and competitive economy that guarantees a high standard of living and quality of life to its citizens'.

The *specific objectives* are to:

1. Facilitate the acquisition of knowledge to adapt, utilise, replicate and diffuse technologies for the growth of SMEs, agricultural development, food security, power generation and poverty reduction;
2. Support the establishment and strengthening of organisations, institutions and structures for effective coordination and management of STI activities within a virile national innovation system;
3. Encourage and promote creation of innovative enterprises utilizing Nigeria's indigenous knowledge and technology to produce marketable goods and services;
4. Support mechanisms to harness, promote, commercialise and diffuse locally developed technologies for the production of globally competitive goods and service that intensively utilises Nigeria's raw materials;
5. Facilitate and support the creation and maintenance of up-to-date, reliable and accessible database on Nigeria's STI resources and activities;
6. Promote activities for effective STI communication and inculcation of STI culture in Nigerians;
7. Create and sustain reliable mechanisms for adequate funding of STI activities in Nigeria;
8. Initiate, support and strengthen strategic bilateral and multilateral co-operations in scientific, technological and innovation activities across all sectors of the economy.

Source: FMST (2012)

3.3. Higher Education System and Innovation for Inclusive Development

Apart from defence R&D activities, the private sector plays critical roles in the R&D activities for the generation of innovation in industrialised countries. However, in a developing economy, the public sector plays the dominant role especially through the network of higher education institutions and public sector research institutes. Large firms which are better placed (by their apparent resource advantage) to carry out R&D in the private sector, in many cases are subsidiaries of multinational enterprises which concentrate R&D activities either in their home countries or other industrial countries. For a developing country, the higher education system is therefore an important element of the NSI that determines the nature, quality and extent of R&D capabilities that exist for generating innovation.

The higher education sector is the fastest growing segment of the Nigerian educational system in recent years. Higher educational institutions in Nigeria include universities, polytechnics and

colleges of technology, colleges of education, and monotronics such as colleges of agriculture, nursing, administration, etc. (Adesina, 2005).

Until recently, the vast majority universities in Nigeria are owned by state and Federal Governments. In 1932, the British Government established Yaba Higher College in Lagos as the first higher educational institution in Nigeria. The University College Ibadan (i.e., University of Ibadan) was established in 1948 based on the recommendation of the Asquith and Elliot Commission in 1945. This was followed by the establishment of University of Nigeria, Nsukka in October 1960 as the first regional university. As a result of Ashby Commission report, three more universities were established in Lagos, Zaria and Ife. University of Lagos was a federal university, while Zaria and Ife were regional government institutions. By 1962 the Nigerian higher education consisted of three regional universities and two federal universities. The number of universities in Nigeria increased to six in 1972 with the establishment of the University of Benin by the Mid-Western State.

In 1975, the drive for more investment in higher education and the opportunities created by the boom in oil revenue led to the taking over of the four regional universities by the Federal Government, and the establishment of seven more universities at Jos, Maiduguri, Sokoto, Kano, Ilorin, Calabar and Port Harcourt. Between 1979 and 1983, there were a new orientation towards the establishment of specialised universities that would focus on research and training in the critical sectors of the economy. In this respect, seven specialised universities were established, two universities of agriculture and five universities of technology. During the same period, because of political consideration, eight more state universities were established mostly in states not controlled by the ruling political party.

Due to the economic recession from the mid-1980s to the 1990s, the Federal Government could not establish additional universities but a few state governments that had higher education as top priorities still invested in the establishment of new universities. Besides, the Federal Government liberalised ownership of universities by allowing private sector participation. The first private university was established in 1999, and by 2012, Nigeria has 50 privately owned universities. Overall, as shown in Table 3.2, the number of universities in Nigeria has risen from one in 1960 to 52 in 1999 and 124 by 2012. The 124 universities comprise of 37 owned and controlled by the Federal Government, 37 owned by State Governments, and 50 owned by private sector agents that include faith-based organisations, communities, corporations, and private individuals.

Table 3.2: Expansion and ownership of universities 1960-2012

Year	Type of ownership			Total
	Federal	State	Private	
1960	1	1	-	2
1965	2	3	-	5
1975	5	-	-	5
1999	24	25	3	52
2009	27	30	36	93
2012	37	37	50	124

Source: National Universities Commission (2012)

There are three national agencies responsible for the management, regulation and control of the higher educational institutions in Nigeria. These agencies are National Universities Commission (NUC), National Board for Technical Education (NBTE), and the National Board for Colleges of Education (NBCE). They control quality and standardize operational mechanisms which include the admission procedure, supervision of course contents and curriculum, and any other matter relating to the process leading to the award of degrees and diplomas. The state governments have no regulatory power in the higher education system. They however finance and organise the management of their higher educational institutions. A major source of federal financial support for the state higher educational institutions is the Tertiary Education Trust Fund (TETFund) established as an intervention agency in 1993 to provide funding support to higher educational institutions. TETFund is statutorily empowered to receive one per cent of federally collected company tax for the support of higher education projects and programmes.

The National Universities Commission (NUC) was specifically established in 1974 for the coordination, development and financing of Nigerian federal universities. The specific functions of the NUC include:

1. Inquire into and advise the Federal Government on the financial needs of university education in Nigeria, investigate the financial needs of university research and ensure that adequate provision is made for this in the universities.
2. Receive block grant from the Federal Government and allocate them to the universities in accordance to such forms as may be laid down by the Federal Executive Council.
3. Take into account in advising the Federal Government on university finances, such grants as may be made to the universities by state governments and by persons and institutions in and outside Nigeria.
4. Act as the agency for channeling all external aids to the universities.

In realisation of the important role of research in the generation of innovation required for social and economic development, the NUC created a department of research and innovation in 2007. Though it is doubtful if the department of research and innovation has been able to make any significant impact, its establishment underscores the fact that the NUC is beginning to appreciate the imperative of making universities critical agents of innovation. In addition, the establishment of the research and innovation department in the NUC suggests that there is a new commitment to the research function of the universities and research should not be carried out only for academic purpose, but rather with an overarching goal of generating innovation for the benefit of the society.

Furthermore, research and innovation programmes recently assume an international partnership dimension under the current government's 'economic transformation agenda', which is a framework for implementing Nigeria Vision 2020. There are two important initiatives involved in this international partnership: 1) the Bilateral Education Agreement between Nigeria and two partner countries (China and Russia) where 70 students were recently sent to China and Russia for postgraduate education; and 2) the Presidential Scholarship Scheme for Innovation and Development (PRESSID) where 101 beneficiaries have been selected to be sent to the top 25 universities in the world for postgraduate studies (NUC, 2012). This partnership programmes for innovation, if properly managed, could serve as important mechanisms for technology transfer, and can help build the critical mass of skills required for technological learning, adaptation and

assimilation of foreign technologies. The national system of innovation can thus reap immense benefits that may help remove current constraints to its powering economic growth and structural transformation. Moreover, with the increasing graduate unemployment in Nigeria which has now assumed a worrisome dimension, the NUC has accordingly mandated the introduction of entrepreneurship development programme in every university as a component of its strategy of making Nigerian universities responsive to societal needs (Adeoti et al, 2010). The entrepreneurship development programmes are aimed at promoting creativity and equipping students with the requisite skills needed to manage businesses and embark on self-employment initiatives after graduation.

As at 2012, Nigeria has 83 polytechnics and colleges of technology most of which are government owned. About 90 per cent of the federal polytechnics and 80 per cent of the state polytechnics were established between 1973 and 1982. According to Okuwa (2010), two reasons accounted for this. Firstly, there was acute shortage of intermediate technical manpower, which constituted a major hindrance to the execution of projects in the three national development plans prior to 1981. Secondly, there was oil wealth which provided unprecedented financial resources for new and sundry investments, most of which were not well planned or thought out. The Polytechnics offer a variety of technical and business programmes for the award of National Diploma (ND) and Higher National Diploma (HND), and sometimes a post HND certificate in diverse engineering and other technology related fields. As an important component of the higher education system, especially with respect to science and technology education, the polytechnics and colleges of technology are strategic as sources of critical skills that enhance technological learning and the building of local technological capability in various sectors of the economy. In this respect, the polytechnics were originally established to serve as institutions for effective delivery of technical and vocational education and training (TVET). Making the polytechnics to accept and transform to achieve the status of main provider of TVET has however been a major policy challenge.

Universities in Nigeria are structured to achieve the main functions of teaching, research and community service. The rapid expansion of higher education system in Nigeria over the last three decades, compounded by the more recent global economic crisis and fiscal stringency due to over dependence on oil has left many research and higher educational institutions in Nigeria short of funds in relation to the implementation of their core mandates. Beyond the apparent funding constraints, a recent study by Adeoti et al (2010) identified three categories of constraints that pose challenges to research in Nigerian universities. These constraints are infrastructure-related challenges; policy-related challenges; and attitude-related challenges.

The main infrastructure challenges are poor research facilities and equipment, poor electric power supply, inadequate laboratory or research space, poor access roads to research farms and industrial estates, lack of communication equipment in laboratories and research farms, lack of food halls to display research findings and scale-up facilities, and lack of demonstrative pilot plants to help expose research findings. Policy related challenges are primarily due to lack of coherent institutional guidelines for organising university interactions with actors that are required to transform research outputs into innovation. Consequently, incentives and government support for R&D partnerships between universities, firms/farms, communities and other relevant stakeholders are grossly inadequate for generating innovation. Added to this, policy or guidelines for the protection of intellectual property of scientists are at best weak and ineffective. Attitudinal issues that constitute challenge to research in universities include lack of political will

to address R&D challenges, entrepreneurship culture that lack support for R&D, research done mainly for academic publication, and divergent views emanating from the mind-sets of scientists and industrialists. Divergent mind-sets of scientists and industrialists often results in ego-centric attitudes on the side of industry and academics. For example, academics in the universities generally believe that academia is superior to industry in terms of knowledge, while industrialists consider themselves better in terms of turning knowledge into pecuniary gains. These contradictory attitudes result in unhealthy posturing that erroneously signify that the two parties do not need each other.

The challenges identified above constrain innovation capability of university interactions with external social partners. However, since there are limited resources for addressing these challenges, it is useful to identify areas of strength that can inform pragmatic actions aimed at surmounting the challenges, and thereby promoting university research as a critical aspect of the national system of innovation.

From the discourse so far, there are several areas of strength that can promote innovation for inclusive development if appropriately harnessed. First, the increasing number of universities in Nigeria is an opportunity for knowledge generation necessary for the evolution of the NSI which can support innovation for inclusive development. Secondly, the growing awareness on the importance of innovation and entrepreneurship for inclusive growth and development as demonstrated by the establishment of department of research and innovation in the NUC, and changes in the curriculum at the universities are important steps in promoting research and innovation in the country. In addition, the new National STI Policy which aims to *'build a strong science, technology and innovation capability and capacity needed to evolve a modern economy'* provides an appropriate framework for the development of an innovation platform that could strengthened the NSI in Nigeria.

Concluding this chapter, it is vital to state that the political, economic and social developments as experienced by Nigeria have greatly impacted on the organisation of its higher education in many respects especially in the areas of increasing number of universities and the liberalisation of the sector to ensure private sector participation. The establishment of institutional frameworks for quality control of higher education has also been helpful. However, the policy and institutions for university education have no direct focus on how universities can address the social and economic challenges of the marginalised communities, and hence, issues of innovation for inclusive development is absent from the national strategies for the development of the university system. Moreover, government responses so far have been deficient in the prioritisation of science, technology and innovation as important drivers of economic and social development. This greatly manifests itself in poor funding of higher education, and the attendant constraints on university research capacity and ability to generate knowledge needed for the evolution of the national system of innovation. How the current organisational system of higher education impacts on the pattern of interaction with external social partners is the central focus of the next three chapters of this report.

Chapter 4

THE NATURE OF INTERACTION IN THE UNIVERSITY OF IBADAN

4.1. The Background and Context of the University of Ibadan

The University of Ibadan is the oldest Nigerian university. The university was established as a university College of the University of London in November 1948, and rose to the attainment of full university status in 1962. According to Adewoye (2000), the British colonial government set up the university as part of the broader framework for the promotion of of higher ducation, learning and research in the colonies. The university is notably a major contributor to the emergent of new leadership that eventually took over the public adminstration, and to a reasonable extent, the private sector economy after the country's political indepence in 1960.

In recent years, the university of Ibadan has developed a new vision and mission statetments aimed at improving performance and raising the standard of the university. The new vision and mission statements are presented in Box 4.1. It is noteworthy that the order of the mission statements changed in 2012 indicating that the university's emphasis is increasingly placed on being a research and knowledge centre. The mission of *expanding frontiers of knowledge* was re-ordered from the third to the first position, while the mission of *societal transformation through creativity and innovation* was re-ordered from second to the third position.

Box 4.1: University of Ibadan vision and mission statements

Vision statement

To be a world-class institution for academic excellence geared towards meeting societal needs.

Mission statement (2011)

1. To serve as a dynamic custodian of society's salutary values and thus sustain its integrity.
2. To contribute to the transformation of society through creativity and innovation.
3. To expand the frontiers of knowledge through provision of excellent conditions for learning and research.
4. To produce graduates who are worthy in character and sound judgement.

Mission statement (2012)

1. To expand the frontiers of knowledge through provision of excellent conditions for learning and research.
2. To produce graduates who are worthy in character and sound judgement.
3. To contribute to the transformation of society through creativity and innovation.
4. To serve as a dynamic custodian of society's salutary values and thus sustain its integrity.

Source: University of Ibadan Annual Reports (2011, 2012).

The university's vision to be a world-class institution for academic excellence geared towards meeting societal needs definitely requires interaction with external social partners. The mission statements appear adequate for the realisation of the vision if strategies for implementing each of the mission statements are well articulated. Each of the mission statement is potent in contributing to the university capacity for innovation. The emphasis of the first mission statement on knowledge, learning and research is a core fundamental of a national system of innovation. Production of graduates worthy in character and sound judgement are important requirement for new skills and entrepreneurship culture that can enable development to be truly inclusive. The third mission directly focuses on making innovation to drive societal transformation, while the fourth mission recognises the need to harness societal values for positive change in every area of human endeavour.

From the foregoing, it is evident that the University of Ibadan was not intended to specialise in any subject or discipline since its foundation. The university has kept the tradition of teaching and fostering knowledge in any human endeavour within the limits of its academic faculties. The university is thus a conventional university with faculties, research and training centres in diverse disciplines. As reported in the University 2012 Annual Report, the university has a college of medicine, thirteen faculties,¹¹ and a postgraduate school. It also has four institutes¹² and several research centres located within its faculties.

4.2. University Organisation and Structure

The University of Ibadan has a Governing Council responsible for policy making. The council members and its chairman are appointed by the President of Nigeria who is the Visitor. The governing council is made up of sixteen members including the pro-chancellor, vice chancellor, deputy vice chancellor (administration), deputy vice chancellor academic, three appointees of the Federal Government, one representative of the Federal Ministry of Education, six representatives of the national Assembly (four from the Senate and two from the House of Representatives), one representative of the university congregation, and the university registrar who serves as the secretary to the council. The current governing council is made up of nine professors in various disciplines and three PhD holders. However, the current member of the council has only one female while the remaining fifteen members are males.

The university is managed by the Vice Chancellor and other principal officers of the university which include the Deputy Vice Chancellor (Administration), the Deputy Vice Chancellor (Academic), the Registrar, the Bursar, and the University Librarian. A second level management comprises of the provost of the college of medicine and deans of faculties and postgraduate school. The University Senate also exists as an important management committee or forum with wide representation that include the principal officers of the university, the provost of the college of medicine, deans of faculties and postgraduate school, heads of departments, professors, and directors of academic and non-academic centres or departments. The university senate takes major decision in the general administration and academic planning of the university.

¹¹The faculties are Arts, Science, Basic Medical Sciences, Clinical Sciences, Agriculture and Forestry, The Social Sciences, Education, Veterinary Medicine, Technology, Law, Pharmacy, Public Health, and Dentistry.

¹²The institutes are the Institute of African Studies, Institute of Education, Institute for Advanced Medical Research and Training, and the Institute for Child Health.

The above management structure of the university is typical of the colonial era university administration. From the interviews conducted with the university management staff, there is no evidence of reform of the organisational structure of the university in the past years. The changes mentioned by a few of the respondents relate to the re-positioning of the university as a research university and the tendency to focus more on postgraduate training. While this may foster interactions in traditional and service forms of partnership, it is unlikely to generate network form of partnership required for innovation for inclusive development. Entrepreneurship form of partnership would also be limited because it largely requires a supply-demand nexus that is often market determined.

4.3. Students Enrolment

Table 4.1 shows total students' enrolment by gender, level of programme (undergraduate or postgraduate), and by faculty for the period 2006-2012. The plan for making the university a research university is driven by an official policy of ratio 60:40 postgraduate to undergraduate admission. Though the university is yet to achieve this target, interviews of the senior management of the university revealed a growing tendency towards reduction of students' intake as a result of a recent emphasis on admitting only the number of students that existing human and physical infrastructure for learning can adequately cater for. This is a major shift for the university and an important strategy for achieving the goal of a research and world class university. In effect, the student population in various faculties has only increased marginally in the last six academic sessions as demonstrated in Figure 4.1. With the possible exception of enrolments in the humanities, law and pure sciences, student population in 2012 is not substantially increased above the 2006 levels. For this study, the faculties of agricultural sciences, technology, pure sciences, and the social sciences are of particular interest because of their relative importance for the national system of innovation. The increase in student enrolments in these areas should enhance improved quality of teaching. It however remained uncertain how lack of growth in enrolment in these critical disciplines would limit the university's contribution to building skills required for the national system of innovation.

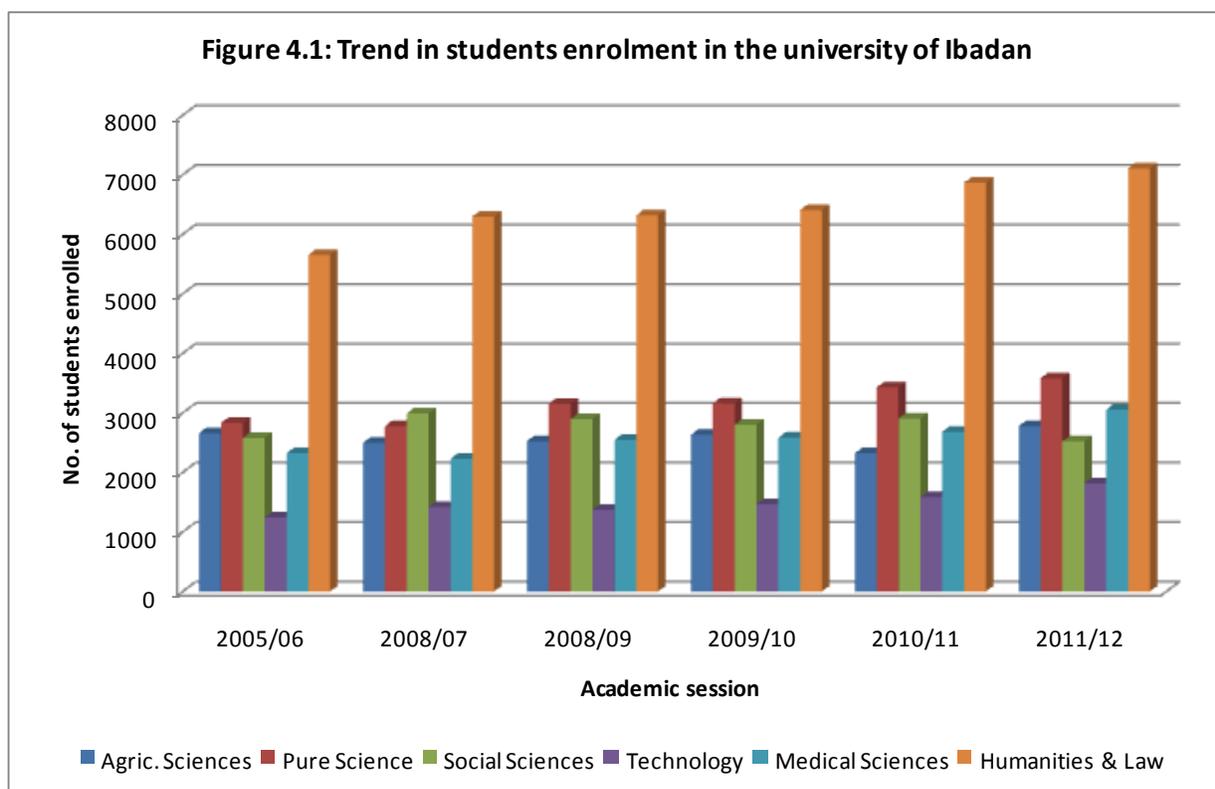
Meanwhile, the physical environment of the university (e.g, lecture rooms, laboratories, library, teaching and research farm, roads, students' hostels, etc.) has been substantially transformed by rehabilitation of existing facilities and the building of new facilities. It was reported that the university spent about ₦6 billion (\$38,709,677) on infrastructure rehabilitation and development between 2006 and 2010 (Bamiro, 2012). This new trend is helpful for the training of a new generation of highly skilled young people that may form the critical core of entrepreneurs required for an innovation driven economy.

Table 4.1: Students enrolment statistics, 2006-2012

Full time	2005/06	2007/08	2008/09	2009/10	2010/11	2011/12
Total enrolment	17891	18843	19521	19787	20623	21636
By Gender						
Male	10951	11387	11767	11781	11888	12223
Female	6940	7456	7754	8006	8735	9413
New Entrance						
Total	6293	6204	6320	6881	7210	7174
Postgraduate	3418	3794	2983	3071	3680	4335
Undergraduate	2875	2410	3337	3810	3530	2839
By level of Programmes						
Postgraduate	6196	7078	7382	7280	7688	7812
Undergraduate	11695	11765	12139	12507	12935	13824
By Faculty						
Agriculture and Forestry	2035	1909	1932	2026	1756	2210
Arts	2406	2405	2535	2452	2811	2788
Law	619	510	549	638	657	672
Pharmacy	301	322	321	367	454	464
Science	2832	2777	3154	3162	3429	3582
The Social Sciences	2579	2991	2898	2802	2906	2520
Technology	1243	1421	1372	1467	1583	1818
Veterinary Medicine	625	587	593	607	567	567
Basic Medical Sciences	494	448	498	588	612	890
Clinical Sciences	1277	1229	1392	1357	1391	1364
Public health	368	346	434	420	438	563
Education	2497	2996	2835	3178	3259	3383
Dentistry	183	205	221	218	244	239
Institute of African Studies	134	388	401	141	141	266

Note: 2006/07 data does not exist because the university did not admit students for 2006/07 session in a bid to regularise academic calendar to fit into the regular rhythm of September to June academic year. The 2006/07 session was actually cancelled and every student consequently lost one academic session.

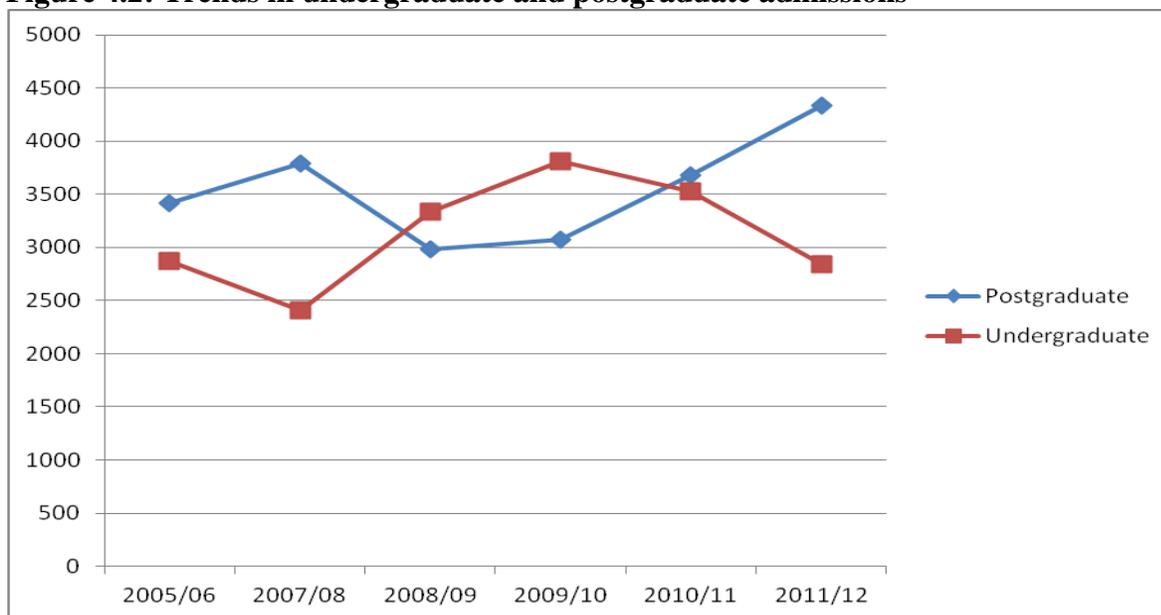
Source: University of Ibadan Annual Report, 2012



Note: Agric. Sciences include faculties of agric & forestry, and veterinary medicine; medical sciences include faculties of basic medical sciences, clinical sciences, dentistry, pharmacy, and public health; humanities include faculties of arts, and education.

Source: Data from University of Ibadan Annual Report, 2012.

Table 4.1 also reveals that the postgraduate admission exceeded the undergraduate admission in recent years. A total of 21,281 postgraduate admission and 18,801 undergraduate admissions respectively were recorded in six academic years, 2005/06 to 2011/12. The university policy of giving more admissions to postgraduate students apparently accounts for these differences in admission between the postgraduate and undergraduate candidates. The trend shown in Figure 4.2 reveals that postgraduate admissions were highest during the 2005/06 and 2007/08 academic sessions and fell during the 2008/09 and 2009/10 academic sessions. It however rose above the undergraduate admissions in 2010/11 and 2011/12 academic sessions. This trend confirms the university's new emphasis on postgraduate admissions, and if this is sustained, there is likelihood that the university would eventually be transformed into a research university. As a research university, the University of Ibadan can be transformed into an effective instrument for building local technological capability and thereby strengthening the national system of innovation.

Figure 4.2: Trends in undergraduate and postgraduate admissions

Source: University of Ibadan Annual Report, 2012

4.4. Institutional Policies and Community Engagement

To guide the process of becoming a world class university, the University of Ibadan has developed and published a Research Policy (2011)¹³, a Research Ethics Policy (2011), and an Intellectual Property Policy (2012). These policies are expected to guide interaction of academics with external social partners. One of the senior management interviews provided an insight into the state and operation of these policies as follows:

There are several institutional policies to support interaction within the university. We have a research policy document. We have a research management committee and there is also a draft research ethics policy. The research ethics policy was approved by senate last year and we are currently working on the possibility of expanding the research ethics committee of the university. There is also intellectual property policy. With the existence of the ethical policy, academics cannot conduct research within the university without securing ethical approval. The policy educates the researchers on the kind of things they can do in a research project. This is particularly important in medical research. The intellectual property policy specifies the university stand on patent ownership. The research policy sets the guidelines for the conducts of research both within and outside the university. For the ethics policy, there is the ethic review committee that ensures that ethical issues are complied with in all research.In terms of structure, the research policy is being supported by the research management office and the intellectual property policy is supported by centre for entrepreneurship and innovation (UI Management Interview No. 6).

¹³ This is a composite document which also contains the structure and functions of the Research Management Office. The document is accordingly titled, 'Research Policy and Research Management Office (2011)'.

From the quote above, the interaction as envisaged by the various policies and related institution is unlikely to foster interaction with external social partners. The interactions are mainly within the university and across disciplines. The interviews with senior management repeatedly indicated that interaction within the university is encouraged, and greater opportunities are given to multidisciplinary research teams in terms of grant allocation. For example, the senate research grant committee processes and approves applications for research grants in three categories A, B, and C. Category A is individual research project with a maximum funding of N400,000; category B is team research with maximum funding of N700,000; and category C is multidisciplinary research involving academics from different faculties and attracting a minimum funding of N1,000,000. Moreover, neither the research policy nor the intellectual policy makes community engagement or service a requirement for the grant. The goal of research policy is to promote research for scholarship and learning with emphasis on the university's first two mission statements. The third mission statement on innovation is recognised by the intellectual property policy but only within the context of formal sector inventions and opportunities for patents, and how to organise intellectual property benefit sharing between the inventor and the university. The following responses from the interviews further demonstrate that network form of interaction that engender university interaction with external social partners are lacking from the policies and their implementation.

We have consulted far and wide with groups like National Association of Traders (NAT). We've also consulted for Federal Ministry of Trade and Investment. In fact, we are involved in the drafting of trade policy that is currently being processed. I also joined them to do trade policy review of Nigeria. So, you are likely to get more information about formal than informal engagements. Informal engagements with external stakeholders are often unreported. For example, when a microfinance bank called me to help look into their books, am not likely to report to anybody, am likely to create one or two days to go there and see what is happening. Outside there, people see the university as a source of knowledge. I think we are doing well but the problem is that they are not documented in most cases (UI Management Interview No. 2)

... The policies are not actually encouraging the type of interaction that benefits local communities. We are not talking about consulting with big formal organisation but the marginalised in our respective communities. The policies have not done much in this respect. Yes, the policies are well coordinated by units set up by the university. Generally, we use the concept community service in this university, but to me the community there actually refers to university community not necessarily local communities Like I said interaction here is limited to serving in committees set up within the university, not like working with any community outside the university. Although people may go to different communities to get data from them for the purposes of journal publication, I will not call that interaction because in most cases, the publication only benefits the academics involved when they are promoted on the basis of the publication but the communities gets nothing out of it. This is our current situation. (UI Management Interview No. 8).

Another important aspect of interaction highlighted above is informal interactions, which are often not documented because the university has not made provision for it. This type of informal interaction may involve network relationships that encourage innovation in informal settings. It may thus be inferred that though the University of Ibadan has no institutional policy on interaction with external social partners, there is evidence that academics within the university have informal relationships with external social partners. Such informal relationship may occasionally gain recognition and become formalised. A good example is the case of the auto-mechanic training programme in the department of mechanical engineering. It has benefitted from informal relationships between academics and their roadside auto repairers seeking solution to the problem of handling high technology automobiles. At the start of the programme, the informal relationship was critical to the selection of the first set of auto-mechanic trainees.

It is also important to note that the institutional policies have little or no incentive mechanisms to promote or support interaction. While patented inventions are relatively highly rewarded in promotion assessment of academics,¹⁴ there is currently no institutional reward for research that leads to innovation. Since a patent may not necessarily lead to innovation, depending on whether or not it eventually has a debut in the market, an additional reward for a patent that becomes innovation is a missing gap in the university reward system. Most importantly, the promotion criteria do not reward interaction with external partners, and there are no specialised funds for promoting interaction with communities and firms. The following responses to interviews of senior management staff of the university are apt illustrations of the lack of recognition for interactions with external social partners in the university reward system:

What do you mean by incentives? There is nothing like that. Performance criteria are based on your number of publication. There are no special awards of any sort for working or interacting with local communities. I know that there are specialised funds for research like the senate research grants but it is not specifically dedicated to interaction with local communities (UI Management Interview No. 8).

I think in the course of research for their own development researchers may find that a community is lacking or suffering from a particular problem. And so they go ahead and do the interaction. If an academic developed a patent or has a journal article, there are scores awarded for the purpose of promotion. If an academic carries out community service and no publication comes out of it, the university does not reward such effort. And that is where the people feel that the promotion guideline is poor because there is no reward for community service. (UI Management Interview No. 6).

Despite the plethora of research centres and emphasis on building a world class academic institutions there is no formal policy on time allocation to teaching, research and community service. The following responses to the senior management interviews amply demonstrate this.

¹⁴In the university promotion assessment criteria, a patent or an authored book may score as much as 10 points, while any other object of assessment (journals, book chapters, monographs, etc) scores not more than 5 points.

Teaching, research and community service are the core of the mission statements of this university. In terms of balancing the three activities within the university there is no law on specification of time allocated in the three. I know that in some universities, they say 25 per cent to teaching, 70 per cent to research and 5 per cent to community service. There is nothing like that here. The primary responsibility is teaching. But there is argument that teaching should be part of promotion criteria. This is because teaching is the main business of the university (UI Management Interview No. 5).

...Teaching and research take the bulk of the time while community service takes nothing... I will give teaching 60 per cent and research 40 per cent. However, this varies among individual lecturers. But I know that teaching takes much of the time and of course you have to publish or perish (UI Management Interview No. 8).

4.5. Patterns of Interaction

In this section, we map the scale and patterns of interactions within the university and with external social partners taking into consideration the features of the University of Ibadan as a conventional and research oriented university.

4.5.1. Key external social partners

The study identifies the main external social partners involved in interaction with academics in the research sample. The results of the Weighted Average Index (WAI) shown in Table 4.2 revealed that the most important external social partner with whom academics interact at the university of Ibadan are individual households with a WAI of 3.0. The next important partner with whom academics interact are national universities with a WAI of 2.71. The least important external social partners include political organisations, social movements, trade union and sectoral organisations. Of the first seven ranked main external social partners, three of them relate to academics in national universities, international universities and African universities. It thus appears that educational institutions are important external social partners for academics with interaction in the selected four faculties. This finding is supported by some of the remarks of senior management staff interviewed. For example, three of the senior management staff interviewed stated that:

... We receive many letters of staff development from different universities. In the department of economics, I remember that we took a decision that if there is any applicant for any of our programme who has a letter of support or request for training from a recognised university, we have no choice than to train that person (UI Management Interview No. 8).

There are many types of interaction and they are mainly institutional collaboration with research institutions like IITA, NIHORT, and IIART. Foreign collaboration is not as many as local collaboration (UI Management Interview No. 7).

The relationship we have is mostly with companies in our domain. I mean engineering consulting firms and construction firms. For some of

our programmes, our friends that are in the consulting and construction firms actually give us money. So they sponsor some of the things we do. We have quite a number of these people who are close to us, and our alumni also relate very well with us (UI Management Interview No. 9).

The main external social partners that are community based and that are able to directly interact with academics for innovations tailored to the needs of the marginalised and vulnerable groups are only involved in occasional interaction with academics in the research sample. This is an indication that the academics interviewed lack interactions that are genuinely potent for innovation for inclusive development.

Table 4.2: Extent of UI academics' interaction with external social partners

External social partners	No. of Respondents	Sum of Responses	WAI
Individuals and households	40	120	3.0
National universities	39	106	2.71
Primary/secondary schools	38	100	2.6
Funding agencies	37	96	2.6
International universities	39	99	2.5
Development agencies	39	95	2.43
African universities	38	92	2.42
National regulatory and advisory agencies	38	93	2.4
Multi-national companies	39	93	2.4
Science councils	38	90	2.4
National government departments	38	88	2.3
Clinics and health centres	39	90	2.3
A specific local community	38	88	2.3
Religious organisations	39	85	2.17
Small, medium and micro enterprises	39	85	2.17
Provincial, regional government departments or agencies	39	84	2.15
Non-governmental agencies (NGOs)	40	86	2.15
Small-scale farmers (non-commercial)	40	85	2.13
Large national firms	39	83	2.12
Local government agencies	40	82	2.05
Community organisations	39	78	2.0
Commercial farmers	39	75	1.92
Welfare agencies	35	69	1.9
Civic associations	38	71	1.9
Sectoral organisations	40	75	1.9
Trade unions	39	70	1.8
Social movements	39	69	1.8
Political organisations	39	54	1.4

Source: Analysis of survey data, 2012

4.5.2. Types of relationship with external social partners

The results of the WAI analysis of the type of UI academics' relationship with external social partners shows that the most frequently reported relationship is 'education of students so that they are socially responsive' with a WAI of 3.1 suggesting interaction only on a moderate scale. This is closely followed by research consultancy and customised training and short courses with WAI of 3.0 and 2.90 respectively. This is also supported by repeated emphasis on the significance of teaching by respondents in the senior management interviews, and the predominance of the service form of interaction in the university. In fact, as reported in the University Annual Report (2012), the university has a consultancy outfit registered as University of Ibadan Venture Limited. The UI Venture Office is responsible for research consultancy activities that are based on request from firms and other agencies consulting with the academic faculties. This further strengthens the position of the university as an emerging research university and a potential source of knowledge that is useful for the evolution of the national system of innovation. The type of relationship with the least WAI is 'clinical services and patient/client care'. This is expected since College of Medicine was not involved in the study. From the evidence so far, we can infer that the academics interviewed have some interaction with external social partners and the form of interaction is biased towards service form of interaction and traditional forms of partnership.

Table 4.3: Types of UI academics' relationship with external social partners

Types of Relationship	No. of Respondents	Sum of Responses	WAI
Education of students so that they are socially responsive	40	124	3.10
Research consultancy	40	120	3.00
Customised training and short courses	41	118	2.90
Participatory research networks	40	112	2.80
Continuing education or professional Development	37	103	2.78
Collaborative R&D projects	41	111	2.71
Service learning	38	102	2.70
Collaborative curriculum design	40	105	2.63
Technology transfer	38	100	2.63
Policy research, analysis and advice	40	104	2.60
Monitoring, evaluation and needs Assessment	40	103	2.57
Community-based research projects	39	99	2.54
Work-integrated learning	40	100	2.50
Student voluntary outreach programmes	40	95	2.40
Design, prototyping and testing of new technologies	39	88	2.25
Design and testing of new interventions or protocols	38	84	2.21
Contract research	41	90	2.19
Expert testimony	39	84	2.15
Alternative modes of delivery to accommodate non-traditional students	40	76	1.90
Joint commercialisation of a new product	39	67	1.80
Clinical services and patient or client care	39	60	1.54

Source: Analysis of survey data, 2012.

4.5.3. Channels of information on knowledge transfer to external social partners

Table 4.4 shows the results of WAI analysis for the channels of information for knowledge transfer from UI academics to external social partners. The three most important channels of information in order of importance are students; public conferences, seminars or workshops; and popular publications with WAI of 3.50, 3.41 and 3.30 respectively. This reveals that the most dominant channel of communication with the external social partners is students. This was reported on a moderate to wide scale as academics' main channel of knowledge and information exchange with external social partners. This is closely followed by public conferences, seminars or workshops with a WAI of 3.41 and popular publication with WAI of 3.30. The above channels of communication as identified by the academics are a reflection of the academics conception of community service at the University of Ibadan. With the strong emphasis of the first mission statement of the university on learning and research, the primary motive of academics is to produce graduates which will contribute to the development of the society. In doing this, one major criterion for measuring performance is academic publications. These would normally pass through academic conferences, seminars and workshops, and subsequently be published as journal articles or research paper/monographs. The 'popular publication' was interpreted in this study to include non-academic publications (e.g. magazines, newspapers, flyers, etc.) that may not be recognised by the university for the purpose of career progression. Formalised channels of transfer of technological information such as technology incubation or innovation hubs, spin-off firms, and patent applications are least considered as channels of transfer of information from academics to external social partners. It is important to note that these channels are critical for societal transformation through innovation. Research benefits sharing and the achievement of the university's third mission statement on societal transformation through creativity and innovation are the main thrusts of the new intellectual property policy of the university. This result thus suggests that the academics that were interviewed are either yet to understand the goals of the university's new Intellectual Property Policy (2012) or are inhibited from exploiting these channels by constraints to research and innovation.

Table 4.4: Channels of information transfer by UI academics to external social partners

Channel of information	No. of Respondents	Sum of Responses	WAI
Students	41	145	3.50
Public conferences, seminars or workshops	41	141	3.41
Popular publications	39	130	3.30
Training and capacity development or workshops	39	122	3.12
Informal information exchange	40	122	3.05
Interactive websites	40	115	2.90
Oral or written testimony or advice	40	110	2.80
Participatory or action research projects	40	110	2.75
Reports and policy briefings	41	111	2.70
Research contracts and commissions	39	98	2.50
Cross-disciplinary networks with social partners	40	99	2.48
Demonstration projects or units	40	96	2.40
Intervention and development programmes	39	86	2.20
Technology development and application networks	39	82	2.10
Radio, television or newspapers	40	81	2.02

Software development or adaptation for social uses	40	80	2.00
Technology incubators or innovation hubs	39	72	1.85
Spin-off firms from the university (commercial or not for profit)	40	70	1.75
Patent applications and registration	40	68	1.70

Source: Analysis of survey data, 2012

4.5.4. Outputs of interaction with external social partners

Academic interactions with external social partners are aimed at generating outputs that are beneficial to the university and the external partners. It is the quality and quantity of the outputs that can result to inclusive growth and development. Table 4.5 presents the results of the WAI analysis for the outputs of academics interaction with external social partners. The results suggest that the most frequently reported outputs were academic publications, graduates with relevant skills and values, dissertations and reports with WAI of 3.60, 3.50 and 3.40 respectively. While academic publications and graduates with relevant skills may be considered to be outputs on a wide scale, dissertations may be considered to be an output only on a moderate scale. This is apparently because dissertations with definite impacts on inclusive development would most likely be at the postgraduate level. The above types of outputs are quite understandable since academic publication is the major criterion for career advancement among the academia. This was further clarified during the interviews with senior management of the university where it was emphasised that:

...Journal articles are needed for the purpose of promotion. Academics that interact with external social partners without journal publication may not be promoted. Apart from journal articles, patent right granted to an academic is also highly rated for the purpose of promotion (UI Management Interview No. 3).

Outputs that occur only on isolated instances are new or improved processes; new or improved products; and community infrastructure and facilities. This suggests that most of the academics interviewed are not likely interacting with communities of marginalised persons. Some of the responses to the interviews of senior management earlier cited also confirmed this. Spin-offs and cultural artefacts are the least recognised outputs of interactions between academics and external social partners. The lack of spin-offs is an indication of lack of entrepreneurial forms of partnership, while the lack of cultural artefact suggests that the university may need to pay more attention to the methods and means of achieving its fourth mission statement which focuses on the university as a ‘dynamic custodian of society’s salutary values’.

From the types of outputs identified by UI academics, it appears that the pattern of interaction is more within the university and for the university’s benefit. There is only a limited, if any, benefit for the wider society. Academic publications normally end in the shelves in most cases after they have been used for promotion, and thus will contribute little in terms of inclusive growth and development. In the same vein, graduating students with relevant skills and values will in the long run promote national development which may not necessarily lead to inclusive development. Most of the graduates of the university may favour working in the formal sector which is more organised than the informal sector where a large number of marginalised people are domiciled. For instance, a field visit to Department of Agricultural

Engineering in the Faculty of Technology shows plethora of fabricated machines (see Plates 4.1 and 4.2) including rice milling machines, block moulding machines, incubators among others. These locally fabricated equipment, which might be useful for local communities, were left idle as prototypes yet to be adopted. An interview with the head of the department indicates that most of the machines were fabricated by students. Though the machines could be very useful as appropriate means of academic interation with external social partners, they are often abandoned in the store after the students have been graded for their degree programmes.

Furthermore, outputs which can make direct impact on the marginalised (e.g., scientific discoveries, new or improved products, community infrastructure and facilities and spin-off companies) are the least frequent outputs. The above pattern of outputs undoubtedly has negative implication for inclusive growth and development in Nigeria as most of the outputs are mainly related to academic benefits.

Plate 4.1: Rice milling machines



Plate 4.2: Groundnut grating machines



Table 4.5: Outputs of UI academics' interactions with external social partners

Outputs	No. of Respondents	Sum of Responses	WAI
Academic publications	41	146	3.60
Graduates with relevant skills and values	41	143	3.50
Dissertations	41	139	3.40
Reports, policy documents and popular publications	41	129	3.10
Academic collaboration	41	119	2.90
Scientific discoveries	40	98	2.50
New or improved processes	40	95	2.40
New or improved products	40	90	2.30
Community infrastructure and facilities	40	83	2.08
Spin-off companies	39	74	1.90
Cultural artefacts	41	63	1.60

Source: Analysis of survey data, 2012

4.5.5. Outcomes and benefits of interaction with external social partners

Table 4.6 presents the results of the WAI analysis of the outcomes and benefits of UI academics' interaction with external social partners. It reveals that the most frequently reported outcomes and benefits in order of importance are improved teaching and learning, academic and institutional reputation, and relevant research focus and new research projects with WAI of 3.40, 3.30 and 3.24 respectively. Like in the case of outputs, these outcomes are related to academic benefits. The three least reported outcomes/benefits are community employment generation, community-based campaigns, and firm employment generation with WAI of 2.16, 2.23 and 2.30 respectively. It is important to note that each of the outcomes/benefits has a WAI greater than 2.0. This indicates that the interaction of academics with external social partners has outcomes/benefits that are on a range between "isolated instances" and "on a moderate scale". However, like in the case of outputs, the outcomes and benefits of interactions accrue more to the university and the academics than to local communities. The exceptions to this are three examples: the Auto-mechanic Training Programme; Community Integrated Rural Development Project (CIRDP), Ile-Ogbo; and the REACH Project. The auto-mechanic training programme and the CIRDP are respectively analysed as detailed case studies in chapters eight and nine of this report.

Table 4.6: Outcomes and benefits of UI academics' interaction with external social partners

Outcomes and Benefits	No. of Respondents	Sum of Responses	WAI
Improved teaching and learning	40	137	3.40
Academic and institutional reputation	37	122	3.30
Relevant research focus and new research projects	37	102	3.24
Theoretical and methodological development in an academic field	37	118	3.20
Training and skills development	38	115	3.02
Public awareness and advocacy	40	116	2.90

Participatory curriculum development, new academic programmes and materials	37	106	2.90
Improved livelihoods for individuals and communities	37	104	2.80
Improved quality of life for individuals and communities	37	103	2.80
Cross-disciplinary knowledge production to deal with multi-faceted social problems	37	105	2.80
Incorporation of indigenous knowledge	37	98	2.60
Firm productivity and competitiveness	37	91	2.50
Regional development	37	92	2.50
Community empowerment and agency	37	91	2.45
Novel uses of technology	37	89	2.41
Policy interventions	39	92	2.40
Intervention plans and guidelines	38	93	2.40
Firm employment generation	37	84	2.30
Community-based campaigns	38	85	2.23
Community employment generation	37	80	2.16

Source: Analysis of survey data, 2012.

4.5.6. Obstacles and challenges of interaction with external social partners

The study further examined the challenges and obstacles faced by UI academics that do engage with external social partners. The academics were asked to rate the importance of thirteen possible obstacles on a scale of 1 to 4, from ‘not important’ to ‘very important’. As shown in the WAI analysis results presented in Table 4.7, five obstacles are rated as ‘important’ to ‘very important’, with WAI scores above 3. It is noteworthy that all of them are related to resources of time and money. These obstacles in order of importance are limited financial resources, unsustainable external funding, inadequate institutional recognition or reward for interaction with external social partners, too few academic staff, and negotiating access and establishing a dialogue with external social partners. The least obstacles/challenges are legal problems, risks of students involvement in interaction with external social partners, and tensions between traditional and new academic paradigms and methodologies. It is also important to note that each of the obstacles/challenges has a WAI greater than 2.0. This indicates that the interaction of academics with external social partners is hindered by obstacles/challenges that are on a range between “slightly important” and “moderately important”. It can be inferred from the above identified challenges and obstacles that inadequate access to resources of time and money constrained UI academics’ interaction with external social partners especially external partners in the informal sector and local communities. This conclusion was buttressed by one of the senior management respondents who noted that:

There is limited time and financial resources to actively engage the external social partners. The work load for lecturers is too high, and lecturers are often overburdened with student related activities. The result is that little time is left for community engagement. Even when the time is available, finance becomes a major impediment (UI Management Interview No. 5).

Table 4.7: Obsatacles and challenges to UI academics' interaction with external social partners

Obstacles and Challenges	No. of Respondents	Sum of Responses	WAI
Limited financial resources for competing university priorities	41	149	3.60
Unsustainable external funding	41	145	3.50
Institutional recognition systems do not reward academic interaction activities sufficiently	41	132	3.30
Too few academic staff	40	126	3.15
Negotiating access and establishing a dialogue with external social partners	41	127	3.09
Competing priorities on time	41	120	2.90
Unequal power relations and capabilities in relation to external social partners	41	121	2.90
University admin. and bureaucracy does not support academic interaction with external social partners	41	114	2.80
Lack of mutual knowledge about partners' needs and priorities	39	104	2.7
Lack of clear university policy and structures to promote interaction	39	106	2.70
Tensions between traditional and new academic paradigms and methodologies	41	111	2.70
Risks of student involvement in interaction with external social partners	41	99	2.41
Legal problems	41	95	2.30

Source: Analysis of survey data, 2012

4.6. Rationales for Lack of Interaction between Academics and External Social Partners

Table 4.8 presents the results of the WAI analysis of the rationales for non-interactions between UI academics and external social partners using a sample of academics that do not interact with external social partners. The three reasons that ranked highest are “pressures of teaching and research on my time are too great”, “institutional recognition systems do not reward interaction activities sufficiently”, and “lack of recognition of interaction as a valid type of scholarship in my university”. Each of these reasons has a WAI score of 3.6. This indicates that respondents rate them as very important reasons for lack of interaction with external social partners. Thus, if interactions with external social partners should be encouraged in a conventional university such as the University of Ibadan, it is very important to have a policy that deliberately assign or allocate part of the academics' time for activities that involve interactions with external social partners. From the interview carried out with the university senior management, there is currently no official policy on time allocation. However, the Academic Planning Unit of the university suggested a time allocation for academic staff as follows: teaching should take priority with 60 per cent of the time, research 30 per cent, private activity for individual gain 2 per cent, interaction with external social partners 3 per cent, while administration takes 5 per cent. This suggestion might be helpful, possibly with an upgrading of time for interactions with external social partners to a minimum of 5 per cent. Besides, interaction may not necessarily be a separate activity, but integrated with teaching and research. More importantly, research and teaching activities should aim at

incorporating interaction, especially network forms of interaction, which are more likely to promote innovation for inclusive development.

The reasons for no interaction that ranked lowest in the perception of the academic staff interviewed are “university administration systems do not support interaction”, “interaction is not appropriate given the nature of my academic field or discipline”, and “interaction is not central to my academic role” with WAI scores of 2.4, 2.3 and 2.3 respectively. None of the thirteen reasons listed in Table 4.8 was reported as very important. It is also necessary to state that the above obstacles to interaction are internal to the university. The only reported obstacle that is related to the external partner is the social partners’ poor knowledge about research activities and priorities in universities which has a WAI of 2.9. It is also interesting to note from these results that lack of fund is not one of the three most crucial reasons for lack of interaction. Differences in priorities between the university and external social partners are also not major deterrent to interaction. These suggest that within the current funding levels or resources available to the university, academic staff can be made to overcome the perceived obstacles to interaction with external social partners.

Table 4.8: Reasons why UI academics do not interact

Reasons for no interaction	No. of Respondents	Sum of Responses	WAI
Pressures of teaching and research on my time are too great	16	58	3.6
Institutional recognition systems do not reward interaction activities sufficiently	16	57	3.6
Lack of recognition of interaction as a valid type of scholarship in my university	16	58	3.6
Limited financial resources are available	16	54	3.4
Differences between university and social partner priorities and needs are too great	16	55	3.4
Lack of clarity on the concept of external interaction in my university	16	52	3.2
Lack of clear university structures to promote interaction activities	16	51	3.2
Lack of clear university policy on interaction	16	49	3.1
Lack of social partners’ knowledge about research activities and priorities in universities	16	46	2.9
My department or faculty does not promote interaction	16	41	2.5
University administration systems do not support interaction	16	38	2.4
Interaction is not appropriate given the nature of my academic field or discipline	16	36	2.3
Interaction is not central to my academic role	16	37	2.3

Source: Analysis of survey data, 2012

4.7. Implications of the Pattern of Interaction for Inclusive Development

The current university policy of giving more admissions to postgraduate students may in the long run help to transform the University of Ibadan into a full-fledged research university. This can be a vital instrument for building local technological capability which is a main object of the national system of innovation. Beyond this, the findings indicate that the main external social partners, types of relationship with external social partners, and channels of communications with external social partners are all university based. In addition, the outputs, benefits and outcomes are more tailored to the university than to local communities. The exceptions identified by the academics interviewed are the auto-mechanic training programme of the Department of Mechanical Engineering; Community Integrated Rural Development Project (CIRDP) of the Department of Agricultural Extension and Rural Development; and the *REACH project* of the Faculty of the Social Sciences. This is an indication of paucity of interactions that are genuinely aimed at promoting innovation for inclusive development. While one of the mission statements of the university is to contribute to the transformation of society through creativity and innovation, the pattern of interaction with external social partners as revealed in the analysis may not lead to the attainment of this mission statement, especially among marginalised communities. Most of the benefits of interaction accrue to the university only. This may be due to the fact that the university currently lacks appropriate incentive mechanisms that promote interaction with the marginalised in the society. Moreover, there is no university policy that is specifically targeted at promoting academics' interaction with marginalised communities. To promote interaction that leads to inclusive development, it is vital that appropriate policies and incentive mechanisms are instituted for making interaction important component of teaching and research. It is also important to deliberately make supportive structures within the university to promote academics' interaction with both formal and informal external social partners within the university spheres of influence. This will enable the university address various obstacles to interaction for both academics that are already interacting and others not interacting with external social partners.

Chapter 5

THE NATURE OF INTERACTION IN THE FEDERAL UNIVERSITY OF AGRICULTURE ABEOKUTA

5.1. The Background and Context of the Federal University of Agriculture Abeokuta

The Federal University of Agriculture, Abeokuta (FUNAAB) is one of the three specialised Universities of Agriculture in Nigeria.¹⁵ It was established by the Federal Government in 1988 with a mandate of teaching, research and extension services in agriculture and related fields (FUNAAB, 2012).¹⁶ The economic crisis of the early 1980s led to the introduction of World Bank/IMF led economic structural adjustment programme (SAP) in 1987. The role of accelerated agricultural development as a means of addressing the economic crisis became prominent. While other sectors were in rapid decline, the agricultural sector benefitted fairly from SAP, and the new universities of agriculture were primarily aimed at training new generation of farmers with knowledge of modern agricultural practices that can help improve agricultural productivity and food security. (Moser et al, 1997).

The University operates a collegiate system in which governing authority and functions are divided between a central administration and a number of constituent colleges. The colleges have substantial autonomy in the implementation of their teaching and research programmes. At the initial stage, five Colleges were established in the University in October 1988. These colleges are:

- College of Agricultural Management, Rural Development and Consumer Studies (COLAMRUCS);
- College of Animal Science and Livestock Production (COLANIM);
- College of Environmental Resources Management (COLERM);
- College of Natural Sciences (COLNAS); and
- College of Plant Science and Crop Production (COLPLANT).

Two additional Colleges, College of Engineering (COLENG) and College of Veterinary Medicine (COLVET), were introduced in March 2002. During 2008/2009 session, the College of Agricultural Management, Rural Development and Consumer Studies was split into two new Colleges: College of Food Science and Human Ecology (COLFHEC) and College of Agricultural Management and Rural Development (COLAMRUD).

The newest College in the University is College of Management Sciences (COLMAS) established in October 2011 as a result of a directive by the National Universities Commission. The directive advised specialised universities to diversify their academic programmes to increase access to higher education by Nigerians. At the time of this study, the University has a total of nine colleges with both undergraduate and postgraduate programmes.

While the colleges were aimed at achieving the mandate of teaching; research and extension functions of the university are organised by two other segments of the university. The

¹⁵The other two universities of agriculture are Federal University of Agriculture Makurdi, Benue State, and Michael Okpara University of Agriculture, Umudike, Abia State.

¹⁶ FUNAAB Agricultural Media Resources and Extension Centre (AMREC), Annual Report, January – December 2011.

research function is managed by the Institute of Food Security, Environmental Resources and Agricultural Research (IFSERAR) established in 2009 as an offshoot of the former Research and Development Centre (RESDEC);¹⁷ while the extension services are carried out by the Agricultural Media Resources and Extension Centre (AMREC). Extension and outreach activities of the university began in earnest in 1990 and AMREC was formerly established in November 1991 (FUNAAB). RESDEC has since inception been acting as change-agent for the transformation of Nigerian Agriculture through scientific research and the development of improved agricultural technologies, while AMREC is saddled with the tasks and responsibilities of transferring and disseminating appropriate agricultural technologies to rural farmers. This is an indication of the strong importance placed on extension services right from inception of the university. From the interviews of senior management staff of the university, it appears that this tradition of strong extension and outreach services has been maintained in the quarter of a century history of the university. For example, a former director of RESDEC stated that:

...interactions with external social partners fit well into the university. Unlike conventional universities, FUNAAB at the inception was designed to be a land grant university. And by reason of that commission, it's more or less obligatory that there should be that kind of synergy between the end user and the university.... What we call AMREC is a centre that specialises in interacting with the farmers, so AMREC takes innovations that have been developed on research stations to farmers. The farmers try them out, gives their impressions as feedbacks to researchers for fine-tuning innovations (FUNAAB Management Interview No.14).

The current deputy vice chancellor (development) also stressed the importance of AMREC in the following remarks:

Of course the conventional thing any university will do is to teach students, and any university worth its sort must carry out research because you can only prove your academic worth through research. But the extension aspect is probably what is not conventional in any university. So we are expected as we ordinarily have our colleges for teaching and research to also have an extension arm in the university, a centre whose job is to focus mainly on extension. Also recently we had a centre meant for research which transforms into an institute in 2009, i.e., IFSERAR. Thus, we struck that balance by ensuring that we have our colleges for teaching and research, our centre or institute for research, and AMREC as our centre for extension activities (FUNAAB Management Interview No.2).

¹⁷ As pointed out by one of the respondents to the senior management interviews, RESDEC was established in April 1990 to manage the research function at FUNAAB but was transformed to IFSERAR in 2009 to enable a separation between research fund administration and research project implementation, monitoring and evaluation. Subsequently, Directorate of Grant Management (DGM) and Centre for Internationalisation and Partnership (CENIP) was created from IFSERAR in 2012. CENIP takes charge of linkages and partnerships activities; while DGM facilitates research efforts of FUNAAB staff through applications for grants and fellowships, negotiation of grant contracts, and the administration of research funds.

In practice, the colleges are devoted to teaching with strong research links with IFSERAR, while AMREC is devoted to extension services with participation of academics based in the colleges.

The formal vision and mission statements of the university also emphasised the importance of reaching out to the society. As shown in Box 5.1, the university envisions itself as a centre of excellence with a global view on knowledge generation and attainment of a key dimension of sustainable development (viz., environmental sustainability). However, the two other dimensions of sustainable development (economic and social) are imperatives which the extension functions are aimed at achieving. It thus appears that the vision statement is more teaching and research centric, teaching or training people to be environmentally friendly and accordingly encouraging research that has significant environmentally friendly dimension. Though teaching and research feature prominently in the mission statement, the mission statement more appropriately captures the economic and social dimensions of sustainable development as important targets of the university's extension activities.

Box 5.1: FUNAAB vision and mission statements

Vision statement

To be a centre of excellence in knowledge generation for global development and the sustenance of an environmentally friendly society.

Mission statement

To build great future leaders and generate knowledge through research and intellectually stimulating environment for teaching, learning and community outreach towards sustainable development.

5.2. University Organisation and Structure

FUNAAB has a Governing Council responsible for policy making on university management. The Council has 20 members including the University Pro-Chancellor that serves as the Chairman of Council, and nineteen other members out of whom nine are external people (representatives from Federal Ministry of Education, Federal Ministry of Agriculture and Natural Resources, Alumni Association, etc.), and the other ten are internal (including the VC, DVCs, Registrar, Bursar, Librarian and representatives from the Senate and the Congregation). The council members and its chairman are appointed by the President of Nigeria who is the Visitor to the University. The university is managed by the Vice Chancellor and other principal officers of the university which include the Deputy Vice Chancellor (Academic), the Deputy Vice Chancellor (Development), the Registrar, the Bursar, and the University Librarian. The Vice Chancellor with the principal officers forms the core of the management structure, and they interact with the University Senate and members of the University Congregation. A second level management comprises the deans of colleges and postgraduate school; and directors of directorates. The University Senate serves as an important management committee or forum with wide representation that include the principal officers of the university, deans of colleges and postgraduate school, heads of departments, professors, and directors of academic and non-academic centres or departments.

The University Senate takes major decision in the general administration and academic planning of the university.

The university organisational structure is essentially modelled after the conventional universities exemplified by the relatively older University of Ibadan. The only difference is the designation of a deputy vice chancellor (DVC) for “development” instead of administration. From the set-up of the university as a developmental university, i.e., university primarily for agricultural development, the designation of a DVC for development is strategic. The interviews with the DVC (Development) and a few other senior management staff indicate that the aim of this designation is to ensure that the university maintains a major focus on community development mandate. In this respect, the director of AMREC and IFSERAR reports directly to the DVC (Development), and the current DVC (Development) was a former director of AMREC. In effect, the university is structured in such a way that the extension services mandate is kept in focus at the high management level. This should have positive impact on the promotion of interaction in the mould of ‘networked’ forms of partnership since the extension services are community based. One of the respondents to the senior management interviews pointed this out as follows:

....community outreach has been part of our mission. We always have it as part of our mission to impact positively on our community and when we say our community we mean our immediate community. It also includes even the ordinary or rural communities that many conventional universities do not consider. As part of the extension activities, we recently established the community based farming scheme, which is basically teaching and extension in the sense that students are out in the communities to learn and also to impact knowledge. The students also serve as conduits for information on what the communities will need for development and feedbacks that will stimulate ideas for research (FUNAAB Management Interview No.2).

5.3. Students Enrolment

Table 5.1 shows the total enrolment and graduate output of the university by gender, level of programme and colleges. The total student population has increased steadily from 2005 to 2012, and undergraduate admission dominated the postgraduate admission in the same period. This indicates that FUNAAB trains mostly undergraduates; and as illustrated in Figure 5.1, the gap between the number of undergraduates and postgraduates is wide.

As illustrated by Figure 5.2, the highest number of enrolment was recorded by COLNAS, COLANIM and COLPLANT in 2011/2012 academic session with total enrolment of 3011, 2161 and 2057 respectively, while the lowest was COLVET. The three colleges (COLNAS, COLANIM and COLPLANT) were the pioneer colleges of the university, and thus possibly have inherent advantages in enrolment. This could be due to growth or capacity built over the years. For example, COLNAS, which has the highest number of enrolment, is housing eight departments. This represents the highest among the colleges. It is also mandatory that every student of the university pass through COLNAS for basic courses in the natural sciences especially at the 100 and 200 Levels. However, the relatively low admission into COLVET can be traced to the fact that COLVET is one of the two Colleges established in the second phase of

development of the University. It took off with the admission of the first set of 100 level students into the six-year Doctor of Veterinary Medicine (DVM) degree programme in the 2001/2002 session and the first sets of graduates' turnout took place in 2009/2010 and 2011/2012 academic sessions.

From 2005/2006 to 2011/2012 sessions, the University produced 10545 graduates, out of which 8957 were undergraduates while 1588 were postgraduates. Table 5.2 shows the progression in the university output at both graduate and post graduate levels from 2005/2006 to 2011/2012 sessions.

Table 5.1: Students enrolment statistics, 2005-2012

	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
Total Enrolment	6000	6372	7559	8149	9774	11226	13727
Male	4131	4474	4930	5338	6372	7122	8530
Female	1869	1898	2629	2811	3402	4104	5197
By level of programme							
Undergraduate	5711	6372	7559	8149	8888	10229	12626
Postgraduate	289	0	0	0	886	997	1101
By Colleges							
COLAMRUD	898	797	1543	785	893	1040	1193
COLANIM	1109	1196	1334	1450	1748	1857	2161
COLENG	174	255	319	399	541	651	763
COLERM	1033	1035	1003	1015	1206	1307	1534
COLFHEC	0	0	0	807	970	1133	1313
COLNAS	1703	1826	1906	2196	2552	2739	3011
COLPLANT	982	1140	1305	1419	1698	1817	2057
COLMAS	0	0	0	0	0	504	1506
COLVET	101	123	149	78	166	178	189
Total Graduate Output	943	1174	1372	1624	1792	1660	1980
Undergraduate	873	1022	1162	1414	1522	1355	1609
Postgraduate	70	152	210	210	270	305	371
By Colleges							
COLAMRUD	282	276	393	219	197	220	179
COLANIM	162	159	212	270	312	248	313
COLENG	0	31	36	33	54	64	79
COLERM	161	196	178	215	229	203	202
COLFHEC	0	0	0	182	227	197	246
COLNAS	261	403	382	433	465	468	622
COLPLANT	77	109	157	247	285	232	325
COLMAS	0	0	0	0	0	0	0
COLVET	0	0	14	25	23	28	14

Source: FUNAAB Annual Report 2011-2012

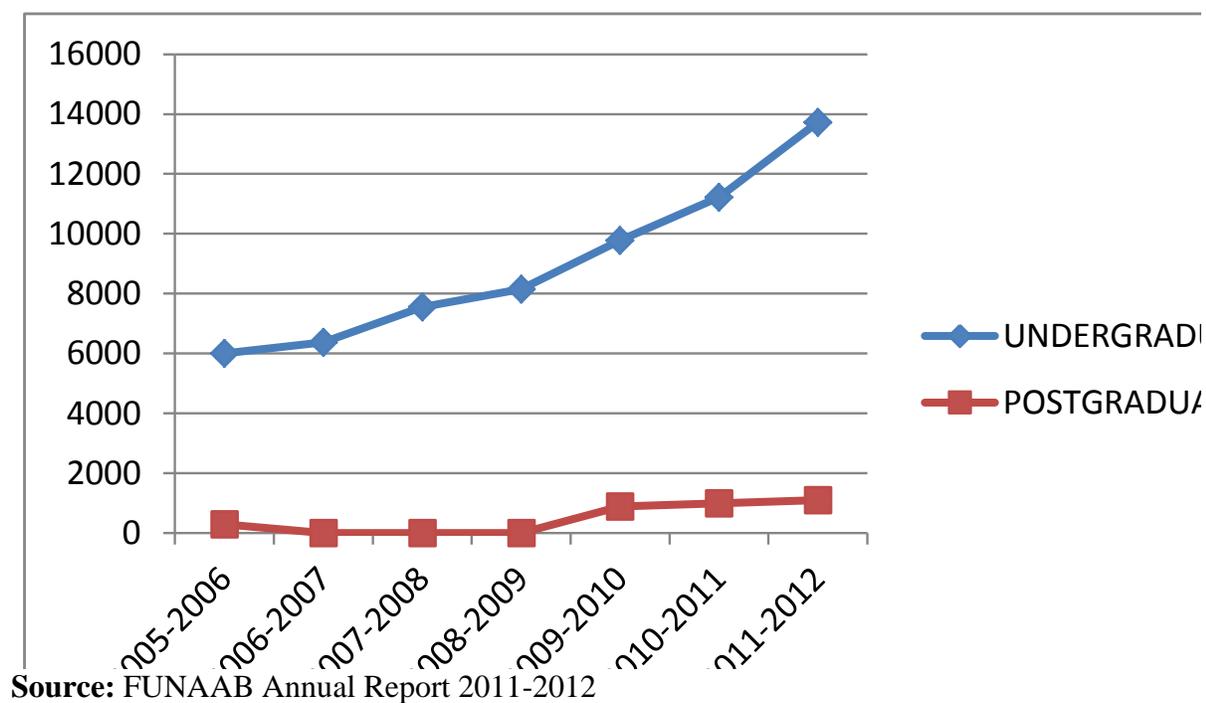
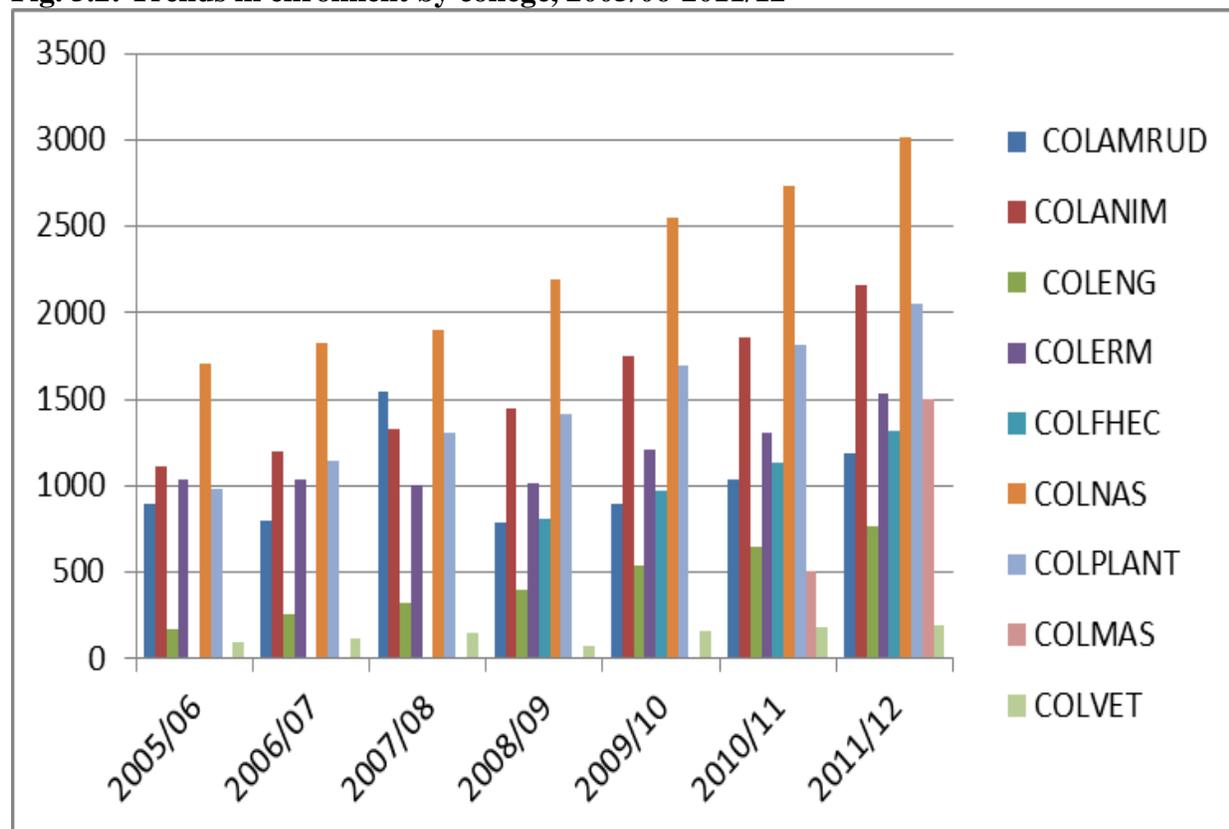
Fig.5.1: Trends in undergraduate and postgraduate admissions, 2005 to 2012**Fig. 5.2: Trends in enrolment by college, 2005/06-2011/12**

Table 5.2: Graduate output between 2005/06- 2011/12 sessions

Session	Level of programme		Total
	Undergraduate	Postgraduate	
2005/06	873	70	943
2006/07	1022	152	1174
2007/08	1162	210	1372
2008/09	1414	210	1624
2009/10	1522	270	1792
2010/11	1355	305	1660
2011/12	1609	371	1980
Total	8957	1588	10545

Source: FUNAAB Annual Report 2011-2012.

5.4. Institutional Policies and Community Engagement

With respect to institutional policies, excerpts from management interviews show conflicting results. For instance, one of senior management staff interviewed about the existence of institutional policies that support interaction remarked as follows:

The university council has put in place policy that is making it mandatory that the mandates of the university are respected by any administration that comes in, more especially the outreach and extension aspects that emphasises interaction (FUNAAB Management Interview No.2).

Expressing a somewhat similar view, yet another said:

We have some institutional policies but some are just being developed. We just approved research policy for the university, we have linkages and partnership policy in place, even though we are also modifying them and this dovetailed into community engagement (FUNAAB Management Interview No.17).

One other senior management staff however expressed a contrary view on the existence of institutional policies thus:

... as far as my memory can carry me, I am not aware of any written policy concerning this type of interaction but what I know is that, in some instances, the university signs MoU with some organisations concerning specific things. For example, some years ago a MoU was signed with a particular individual who has plantation of oil palm to the extent that this university will be harvesting the palm fruit to make palm oil for some years. Therefore, besides MoU that the university signs from time to time with specific organisations, I am not aware of any institutional policy supporting interaction with external social partners (FUNAAB Management Interview No.3).

From the foregoing, it can be deduced that until recent research policy of 2012, the university institutional policies that support interaction are either unpublished or not available in the public domain. The first institutional policy which though not codified, but was strategic for a specialised university, was the policy establishing Research and Development Centre (RESDEC) and Agricultural Media Resources and Extension Centre (AMREC) in 1990 and 1991 respectively. The establishment of these two centres was a major decision in the organisation of research and extension services for achieving the mission of making the university a centre of excellence in *knowledge generation* and *community outreach*. While AMREC has remained a centre for extension services coordinating the university community engagement activities, RESDEC has been transformed into three major units comprising 1) Institute of Food Security, Environmental Resources and Agricultural Research (IFSERAR); 2) Directorate of Grant Management (DGM); and 3) Centre for Internationalization and Partnership (CENIP), which coordinates linkage and partnership activities especially with formal sector institutions. There is a general perception among respondents to the senior management interviews that the establishment of these new units was aimed at making the university more effective and societal relevant as a research institution. Though the objective of academic staff interaction with external social partners was not directly in focus, researchers were expected to make their research to be impactful especially among rural communities. One of the respondents to the senior management interviews captured this in the following remarks:

I expect the academics to understand that of necessity by the mandate and the charter of this university, the interaction with the end users and with the private sector is obligatory. The way I expect them to approach it is that all teaching activities will enable graduates to effectively learn how to be engaged in the society. When formulating research, academics should use the demand driven ideas to set their priorities and of course, they need to know that it doesn't just end with discovery. There has to be an aspect of dissemination and so that is how I expect the academics to go about it. You see there is a continuum and every face of the continuum, the aspect of interaction should be proven (FUNAAB Management Interview No.14).

Another respondent confirmed this with the following remarks:

...right from the beginning, the law establishing the university had already put in place social interaction. So they are within the mission statement of the university. And the way we expect academics to address this, we gave them equal weighting. We emphasise equal priority for teaching, research, innovation and outreach. That has been the trend in this university since inception (FUNAAB Management Interview No.17).

Furthermore, it is important to state that AMREC is an organisational innovation that is not found in older and conventional universities. The strong community orientation of its extension services has made AMREC to feature prominently as an institutional mechanism for interactions between academics and marginalised communities of rural farmers. A vivid example which also involved a government agent was reported as follows by a senior management staff:

....the chairman of Odeda Local Government walked up to AMREC and said they needed our support in establishing farms in some of the communities in Odeda Local Government Area and that we should come up with a proposal. Why did he do that? He was lamenting the fact that the agricultural unit of the local government was a financial drain pipe. They were investing in Agriculture but they were not seeing results. But he wanted to leave a legacy whereby the communities will have a feel of the local government and be able to continue with whatever project we help them to establish. So he asked us to establish some plantations on some farms and we did. He gave us money, and we established plantations in two communities. We handed over the plantations to the communities after about a year. So we did that, our extension activities are basically services (FUNAAB Management interview No.2).

It is also important to state that FUNAAB is organised such that the level of involvement of academic staff in community engagement activities would depend on their location within the university structure. The following remarks by a senior management staff on the balance of time allocated to teaching, research and extension services by academic staff aptly illustrates this:

The details on the balance will depend on the sphere within where you work in the university. For instance, if you are in the teaching sector (colleges), certainly more of your time and resources is given to teaching and research and the balance to extension. If you are an extension personnel, then the bulk of your work is based on extension and less on research and teaching. And then if you are into research like those in IFSERAR, they do most of their work in research and then the residue is spent in teaching and extension. So it depends on where your main activity is because in this university we have those that their primary assignment is teaching, we have those that their primary assignment is research, and we have those whose primary assignment is extension (FUNAAB Management Interview No.14).

Besides academic interactions with local communities, FUNAAB also has remarkable linkages with formal sector agents locally and internationally. The partnership activities involved are presently coordinated by CENIP which was established in 2012. The type of interaction is often traditional forms of partnership or service forms of partnership. This notwithstanding, the interaction sometimes incorporates elements of 'networked' forms of partnership especially when the partnership project involves local communities. The engagement with formal sector agents was illustrated as follows by the Director of CENIP:

The main objective of my centre is to search for linkages with research institutes and universities all over the world with a view to access skills and knowledge that are either too scarce or not readily available in Nigeria. Specifically, we search for opportunities for our staff and students to update their knowledge and be able to make use of this knowledge in the development of our dear country. This is the basic thrust of our centre (FUNAAB Management interview No.11).

The above remarks were further corroborated in the words of another senior management staff:

We also have industrial interactions: we interact with multinational industries like Nestle PLC and Cadbury. We also interact with small and medium-sized enterprises (SMEs) in the country. We are also very lucky and happy to be involved in some USAID, DFID, FGN sponsored projects with International Institute of Tropical Agriculture (IITA). Some of our academic staff have interaction with most of the SMEs and we are also part of the FGN agricultural transformation project where we audited 153 small and medium enterprises in the country. We facilitated and coordinated this from this university. At the industrial level, we structure interaction so that most of our students at 400 Level move into those industries for their 3 months or 6 months industrial training during which our staff monitor them. There is no way we can monitor them without interacting with at least quality control or production manager or marketing manager of the companies involved. So we cover the three spheres of interaction: the farm level, the industrial level and also town and gown activities (FUNAAB Management Interview No.17).

On the whole, it appears that FUNAAB has strong institutional framework that supports interaction with external social partners. In term of policies, except the newly published research policy, there is however no evidence of written norms or statutory statements that ensure the sustenance of the structures that currently support interaction between academics and external social partners. It is also noteworthy that respondents to the senior management interviews often confirm academic staff's interaction with external social partners, especially rural farming communities. This appears to be a major feature of the university's 25 years of existence.

5.5. Patterns of Interaction

As demonstrated in section 5.4, there is evidence of substantial interaction between academic staff and external social partners. In this section, we map the scale and patterns of interactions within the university and with external social partners taking into consideration the features of FUNAAB as a specialised university organised and structured to appreciably support academics interaction with rural communities.

5.5.1. Key external social partners

Table 5.3 presents the results of WAI analysis of the main external social partners that have interacted with the academic staff interviewed in FUNAAB. The results indicate that the most frequently mentioned external social partners identified by the academics is primary and secondary schools with a WAI of 3.4, followed by individuals and households having WAI of 3.3, National Universities having WAI of 3.1, and small-scale farmers (non-commercial) and community organisations having WAI of 3.0. Since WAI for these external social partners ranges between 3.0 and 3.4, it appears that schools, individuals and households, national universities, and small-scale farmers (non-commercial) and community organisations are partners with academics mostly on a moderate scale. While interaction with communities and households is severally mentioned by respondents in the senior management interviews, the importance of academic staff's interaction with schools was also reported as an important aspect of community engagement. One of the senior management staff interviewed captured this as follows:

We have given boreholes; we have given a lot of incentives to the farming communities.....Some of those villages we provided with boreholes have never had water and the boreholes drilled for them by government have never worked. But our own is working, and people in one of the villages made an interesting confession in May 2012. They eat only melon during dry season because there are no other vegetables. However, since our students are in that community in the last two years, our students have been able to produce dry season vegetables. So there are diverse vegetables during the dry season. The kabiyesi (king) came and thanked our university for this. Our students are there now practicing farming and producing dry season vegetables. In addition, our students in those villages are now mentoring the children from those villages because these villages (Odogbolu and the three others) are very rural. Those villages have only one primary school and one secondary school. They now see university undergraduates in their community and our students there now coach the local children in extra lesson classes and mentor them. The children of the local community are now benefitting a lot from this. This is an important interaction (FUNAAB Management Interview No.2).

The results also demonstrate that external social partners with low WAI are strongly associated with trade unions and political organisations. This is not unexpected because academics are mostly apolitical in their teaching and research engagements.

Table 5.3: Extent of FUNAAB academics' interaction with external social partners

External social partners	No. of Respondents	Sum of Responses	WAI
Primary/secondary Schools	31	104	3.4
Individuals and households	32	107	3.3
National universities	34	107	3.1
Small-scale farmers (non-commercial)	32	97	3.0
Community organisations	30	89	3.0
African universities	32	93	2.9
Non-governmental agencies (NGOs)	31	91	2.9
Small, medium and micro enterprises	31	91	2.9
Funding agencies	30	88	2.9
A specific local community	30	86	2.9
Development agencies	29	85	2.9
International universities	33	94	2.8
National government departments	30	83	2.8
Science councils	29	88	2.8
Commercial farmers	32	84	2.6
Large national firms	32	84	2.6
Welfare agencies	28	72	2.6
Provincial/regional government departments or agencies	28	68	2.3
National regulatory and advisory agencies	28	71	2.5
Multi-national companies	33	79	2.4
Local government agencies	30	68	2.3
Clinics and health centres	28	65	2.3
Religious organisations	28	64	2.3

Social movements	30	67	2.2
Sectoral organisations	29	64	2.2
Civic associations	27	56	2.1
Trade unions	31	55	1.8
Political organisations	27	44	1.6

Source: Analysis of survey data, 2012

5.5.2. Types of relationship with external social partners

Table 5.4 presents the results of the WAI analysis of the type of relationship FUNAAB academic staff have with external social partners. The results revealed that the most frequently reported relationship is ‘education of students so that they are socially responsive’. Besides ‘education of students so that they are socially responsive’, 12 other types of relationship has a WAI of between 3.0 and 3.5. These types of relationship may be considered to be on a moderate to wide scale. Among these, relationships with features of ‘networked’ forms of partnership include participatory research networks, community-based research projects, and students voluntary outreach programmes. Other relationships on a ‘moderate to wide scale’ are either interactions that are service forms of partnership or traditional forms of partnership. The least WAI score of types of relationship with external partners is clinical services and patient care. This is expected since FUNAAB does not have a college of medicine.

Table 5.4: Types of FUNAAB academics’ relationship with external social partners

Types of Relationship	No. of Respondents	Sum of Responses	WAI
Education of students so that they are socially responsive	34	118	3.5
Participatory research networks	34	110	3.2
Monitoring, evaluation and needs assessment	34	108	3.2
Service learning	33	106	3.2
Policy research, analysis and advice	32	101	3.2
Research consultancy	34	106	3.1
Collaborative R&D projects	34	105	3.1
Work-integrated learning	33	102	3.1
Community-based research projects	32	100	3.1
Continuing education or professional development	35	103	3.0
Customised training and short courses	34	102	3.0
Collaborative curriculum design	34	101	3.0
Student voluntary outreach programmes	31	92	3.0
Technology transfer	32	93	2.9
Contract research	32	83	2.6
Design and testing of new interventions or protocols	32	83	2.6
Design, prototyping and testing of new technologies	31	82	2.6
Joint commercialisation of a new product	30	75	2.5
Expert testimony	33	82	2.5
Alternative modes of delivery to accommodate	30	71	2.4

non-traditional students			
Clinical services and patient or client care	29	61	2.1

Source: Analysis of survey data, 2012

5.5.3. Channels of Information for Knowledge Transfer to External Social Partners

The results of the WAI analysis of the channels of information used for knowledge transfer by FUNAAB academics to external social partners are presented in Table 5.5. As may be expected from the predominant types of relationships in Table 5.4, the most important channels of information are ‘public conferences, seminars or workshops’ and ‘students’ with WAI of 3.5. The WAI result is an indication that these two channels are being employed by academics on a moderate to wide scale as channels of knowledge and information exchange with external social partners. To a lesser extent, seven other channels of information with WAI of between 3.0 and 3.3 in Table 5.4 may also be regarded as being used by academics on a moderate to wide scale. Among these, ‘informal information exchange’ and ‘participatory or action research projects’ are more likely to involve community engagement that may result in interaction promoting inclusive development. Though the WAI for these two factors are not among the highest two, the informal information exchange plays an important role in the university’s interaction with the external social partners. The university has an annual *yam festival* termed ‘Town and Gown day’. This is usually organised by the Teaching and Research Farms Directorate (TREFAD). The yam festival is a meeting of the people in the private sectors, community residents and members of the academia in a relaxed ‘farm atmosphere’ created within the university environment. In the words of one of the management staff interviewed:

It is a forum where yam as one of the popular arable crops extensively cultivated in FUNAAB for research purposes is roasted as snacks for the festival. Guests come for social networking and to see how well we have done on our farms. We do exhibition of yam products and other things produced from our farms (e.g., honey, moringa, etc.). People socialise and discuss issues on development, as well as proffer innovative ideas that will improve the university and the wellbeing of society at large. The medium is also used to solicit for the support of the private sector through collaboration in research and extension (FUNAAB Management Interview No.2).

Each of the other channels of information listed in Table 5.5 has WAI of between 2.1 and 2.9 indicating that academics use them on isolated instances’ and ‘on a moderate scale’. The least frequently used channels of knowledge transfer are patent applications and registration, and software development or adaptation for social uses. These are highly knowledge intensive, require formal contracts and direct interpersonal interaction and knowledge exchange. All these indicate that the academics interviewed are weak in entrepreneurial forms of partnership which are important instruments of economic and social development.

Table 5.5: Channels of information transfer by FUNAAB academics to external social partners

Channel of information	No. of Respondents	Sum of Responses	WAI
Public conferences, seminars or workshops	35	124	3.5
Students	34	120	3.5
Popular publications	35	116	3.3
Training and capacity development or workshops	34	114	3.3
Informal information exchange	33	108	3.3
Interactive websites	34	107	3.1
Demonstration projects or units	34	103	3.0
Reports and policy briefings	33	98	3.0
Participatory or action research projects	33	98	3.0
Cross-disciplinary networks with social partners	31	90	2.9
Oral or written testimony or advice	33	93	2.8
Radio, television or newspapers	32	89	2.8
Technology development and application networks	32	82	2.6
Research contracts and commissions	30	79	2.6
Intervention and development programmes	30	77	2.6
Spin-off firms from the university (commercial or not for profit)	32	79	2.5
Technology incubators or innovation hubs	32	76	2.4
Software development or adaptation for social uses	32	82	2.2
Patent applications and registration	28	79	2.1

Source: Analysis of survey data, 2012

5.5.4. Outputs of interaction with external social partners

This section focuses on the types of outputs that have emerged as a result of FUNAAB academic staff interactions with external social partners. The results of the WAI analysis of outputs shown in Table 5.6 indicate that the most frequently reported outputs are academic publications, dissertations, and graduates with relevant skills and values with WAI of 3.7, 3.6 and 3.6 respectively. Cultural artefacts were amongst the least frequent outputs, as were economic benefits in the form of spin off companies. These results further confirm the finding that public conferences, seminars/workshops and students are the most important channels of knowledge transfer from academics in FUNAAB to external social partners.

Table 5.6: Outputs of FUNAAB academics' interaction with external social partners

Outputs	No. of Respondents	Sum of Responses	WAI
Academic publications	35	129	3.7
Dissertations	35	127	3.6
Graduates with relevant skills and values	35	126	3.6
Academic collaboration	35	118	3.4
Reports, policy documents and popular publications	35	115	3.4
Community infrastructure and facilities	31	87	2.8
New or improved processes	33	90	2.7

New or improved products	33	89	2.7
Scientific discoveries	31	80	2.6
Spin-off companies	31	72	2.3
Cultural artefacts	31	68	2.2

Source: Analysis of survey data, 2012

5.5.5. Outcomes and benefits of interaction with external social partners

Table 5.7 presents the results of the WAI analysis of outcomes and benefits associated with FUNAAB academic staff interaction with external social partners. The two most important types of outcome are “improved teaching and learning” and “training and skills development” with WAI of 3.8 and 3.4 respectively, which indicate that the outcomes/benefits are on a moderate to wide scale. Other outcomes/benefits with WAI of 3.3 can also be classified into this category. These include “academic and institutional reputation”, “relevant research focus and new research projects”, and “public awareness and advocacy”. It is important to note that the two most widely acknowledged outcomes/benefits are related to academic functions. Thus, in spite of the strong evidence of community engagement activities by the university, the academics interviewed perceived the outcomes of interaction with external social partners as more beneficial to the achievement of teaching and research functions. However, the livelihoods of individuals and communities that have benefitted from FUNAAB research activities have been improved appreciably. Some of the senior management staff interviewed cited in section 5.4 confirmed this. The director of AMREC provided a clear description of the success of the university community engagement activities in the following remarks:

...Our successes start from the communities. We have been able to educate vulnerable persons especially women and children. We have been able to educate them not only on how to improve farm productivity, but also on how to improve the health of the family. We have been able to train them on how to improve the nutrition of the family. We also engaged in adult literacy classes. So we have been able to train people who on their own are now able to even write their names and do some little records in their businesses. Besides that, in area of income generation, we have been able to let them diversify their activities to bring in more activities that will give them greater access to income. We have also done seed extension, and the cost of seed is quite different from the cost of grain. The price of seed is higher than the price of grain. Those people that we have been able to train for the production of seed, they now have better source of income. An example is the soya bean popularisation scheme. We have been able to let them see that soya bean is a golden crop. They are now cultivating it and it has become a significant source of their income (FUNAAB Management Interview No. 8).

Specific projects or programmes that involve academic staff interactions with marginalised rural communities as identified by the academic staff interviewed include Community-Based Farming Scheme (COBFAS), Cassava Adding Value for Africa project (C:AVA), Tomato Wilt Project, and the Good Neighbour Project.

COBFAS is analysed in a detailed case study presented in chapter ten of this report. C:AVA is an innovative project which develops value chains for High Quality Cassava Flour (HQCF), and has improved the livelihoods and incomes of smallholder households. The Tomato Wilt Project applies molecular marker technique to breed wilt-resistant tomato lines for farmers,

and thereby helped rural farmers to achieve 50 per cent increase in tomato yield. The Good Neighbour Project involves collaboration between a senior academic staff at FUNAAB, a church in Germany, and a church in Nigeria. The project encourages interaction with villagers, and its main objective is to train farmers in basic agricultural skills that can help improve their productivity and income.

Table 5.7: Outcomes and benefits of FUNAAB academics' interaction with external social partners

Outcomes and Benefits	No. of Respondents	Sum of Responses	WAI
Improved teaching and learning	35	132	3.8
Training and skills development	35	118	3.4
Improved livelihoods for individuals and communities	35	115	3.3
Academic and institutional reputation	35	115	3.3
Relevant research focus and new research projects	35	114	3.3
Public awareness and advocacy	34	113	3.3
Theoretical and methodological development in an academic field	34	109	3.2
Cross-disciplinary knowledge production to deal with multi-faceted social problems	35	109	3.1
Improved quality of life for individuals and communities	34	105	3.1
Participatory curriculum development, new academic programmes and materials	34	101	3.0
Community-based campaigns	33	99	3.0
Firm productivity and competitiveness	32	95	3.0
Community empowerment and agency	35	102	2.9
Policy interventions	32	93	2.9
Incorporation of indigenous knowledge	34	95	2.8
Community employment generation	34	98	2.9
Firm employment generation	34	95	2.8
Novel uses of technology	32	90	2.8
Intervention plans and guidelines	32	88	2.8
Regional development	33	87	2.6

Source: Analysis of survey data, 2012

5.5.6. Obstacles and challenges of interaction with external social partners

Table 5.8 presents the results of the WAI analysis of the obstacles and challenges to FUNAAB academics' interaction with external social partners. The three obstacles/challenges with highest ratings are "limited financial resources for competing university priorities", "unsustainable external funding", and "competing priorities on time" with WAI of 3.8, 3.7 and 3.6 respectively. With the exception of these three obstacles/challenges with WAI of between 3.6 and 3.8, which can be rated to be mainly on the scale of "very important", all other obstacles/challenges can be rated to be on a scale of "moderately important" issues.

Overall, the results indicate that financial limitations or funding constraints (whether locally or externally) are the dominant obstacles to the interaction between academics and external

social partners. Responses to senior management interviews also confirm the importance of funding constraints as obstacle to interaction. Two of the respondents stated this as follows:

One major bottleneck is funding. The so called funds from the Federal Government had shown that they are not placing priority on development of agriculture or university education as far as I am concerned. If we did not have international fund, research activities would have been paralised and infrastructure development would have been very slow. However I still need to commend TETFund, the Tertiary Education Trust Fund, which in the last four-five years has been very helpful to us. Go round this university, most of the building you will see (laboratories, computer labs) are funded by TETFund. (FUNAAB Management Interview No. 17).

The number one obstacle to interaction is funding. You want to plan things but the funds are not there for you. Sometimes a lot of our colleagues use personal money to fund research projects (FUNAAB Management Interview No. 5).

Table 5.8: Obstacles and challenges to FUNAAB academics' interaction with external social partners

Obstacles and challenges	No. of Respondents	Sum of Responses	WAI
Limited financial resources for competing university priorities	35	133	3.8
Unsustainable external funding	34	127	3.7
Competing priorities on time	35	125	3.6
Institutional recognition systems do not reward academic Interaction activities sufficiently	34	113	3.3
Too few academic staff	33	109	3.3
Negotiating access and establishing a dialogue with external social partners	33	108	3.3
Unequal power relations and capabilities in relation to external social partners	33	104	3.2
Lack of mutual knowledge about partners' needs and priorities	34	105	3.1
Tensions between traditional and new academic paradigms and methodologies	34	105	3.1
Lack of clear university policy and structures to promote interaction	35	109	3.1
University administration and bureaucracy does not support academic Interaction with external social partners	35	106	3.0
Legal problems	33	96	2.9
Risks of student involvement in interaction with external social partners	32	86	2.7

Source: Analysis of survey data, 2012

5.6. Rationales for Lack of Interaction between Academics and External Social Partners

Table 5.9 presents the results of the WAI analysis of the rationales for non-interaction between FUNAAB academics and external social partners. The four reasons that ranked highest are “pressures of teaching and research”, “lack of clear university policy on interaction”, “limited financial resources”, and “lack of clear university structures to promote interaction activities”. Each of these reasons has a WAI score of 3.4, indicating that respondents rate them between “moderately important” and “very important” reasons for lack of interaction with external social partners. This suggests that if interactions with external social partners should be further encouraged in FUNAAB, it is very important to have a policy that deliberately assign or allocate part of the academics’ time for activities that involve interactions with external social partners.

The reasons for no interaction that ranked lowest in the perception of the academic staff are “the fact that departments or faculties do not promote interaction”, “interaction is not central to my academic role”, and “interaction is not appropriate given the nature of academic field or discipline” with WAI scores of 2.3, 2.2 and 2.1 respectively. The WAI scores indicates that the importance attached to these reasons by the respondents are relatively low. Other reasons listed in Table 5.9 scored between 2.6 and 3.3. This can plausibly be taken as an indication that all the other reasons are between “slightly important” and “moderately important” as hindrances to interaction.

It is important to note that of the 13 reasons listed, none of them was reported as very important. It is also necessary to state that the above obstacles to interaction are internal to the university. The only reported obstacle that is related to the external partner is the social partners’ poor knowledge about research activities and priorities in universities which reported a WAI of 3.0.

Table 5.9: Reasons why FUNAAB academics do not interact

Reasons for no interaction	No. of Respondents	Sum of Responses	WAI
Pressures of teaching and research on my time are too great	16	55	3.4
Lack of clear university policy on interaction	16	55	3.4
Limited financial resources are available	16	54	3.4
Lack of clear university structures to promote interaction activities	16	54	3.4
Lack of recognition of interaction as a valid type of scholarship in my university	16	52	3.3
Differences between university and social partner priorities and needs are too great	16	52	3.3
Lack of social partners’ knowledge about research activities and priorities in universities	16	48	3.0
Institutional recognition systems do not reward interaction activities sufficiently	16	47	2.9
Lack of clarity on the concept of external interaction in my university	16	42	2.6
University administration systems do not support interaction	16	42	2.6

My department or faculty does not promote interaction	16	36	2.3
Interaction is not central to my academic role	16	35	2.2
Interaction is not appropriate given the nature of my academic field or discipline	16	33	2.1

Source: Analysis of survey data, 2012

5.7. Implications of the Pattern of Interaction for Inclusive Development

From the analysis of the pattern of interaction between FUNAAB academic staff and external social partners there appears to be a high degree of interaction largely driven by the institutional commitment to community engagement through extension services. It is amply demonstrated that interaction with external social partners commonly involves institutional level projects, and types of interaction includes network forms of partnership, service forms of partnership, and traditional forms of partnership. Entrepreneurship forms of partnership are rare among the academics interviewed; indicating that commercialisation of research findings within the context of the formal sector economy is not common among the academics with interaction.

The general pattern across the interviewed academic staff is a strong orientation towards teaching/learning and outreach forms of interaction between academics, students, and communities of rural farmers as partners. This suggests a growing alignment between teaching and research at FUNAAB, and the labour market, in terms of the production of graduates with high level skills adapted to addressing the challenges of the rural economy. This relatively new trend is an innovative integration of service, teaching, learning and research that can engender innovation for inclusive development.

The long history of community service in the university informed the practice and mind-sets of many of the academics interviewed. The strong institutional promotion of responsiveness, the public good and development, and a devolved strategy that acknowledged the dominant institutional culture and reputational priorities of academics accounted for the acceptance of community engagement activities by academics in FUNAAB. The potential for generating innovation at the rural community level is thus strong if the academic staffs continue to see it as part of their role to extend their knowledge for the benefit of external social partners. The impact of this trend on the national system of innovation would generate agricultural innovation required for increased productivity and competitiveness of the agricultural economy.

There are some academics that do not interact at all because of pressures of teaching and research on their time, lack of clear university policy on interaction, and limited financial resources for research. An institutional strategic policy framework that provides a broad and encompassing core organising concept to guide substantive policy and procedure is essential. To further promote interaction that leads to inclusive growth and development, it is vital that appropriate and improved incentive mechanisms are instituted for the academics. Greater attention to building capabilities for teaching, research, innovation and community engagement is a necessary condition.

The university also needs to take into account disciplinary differences and different forms of interaction. Alignment and integration between structures to promote teaching, research, innovation and outreach is critical. FUNAAB may require a focus on new external interface structures and mechanisms to ensure that knowledge is not locked into the university, and to promote boundary spanning activities. A focus on new forms of internal organisation may be needed to promote and incentivise socially engaged scholarship. It is also important to reinvigorate existing interactive structures within the university. This will strengthen academics' interaction with both formal and informal external social partners within the university spheres of influence. It is important that the various obstacles to interaction for both academics that are already interacting and others not interacting are adequately addressed by the university to improve the university's capacity for innovation for inclusive development.

Chapter 6

THE NATURE OF INTERACTION IN THE FEDERAL UNIVERSITY OF TECHNOLOGY, AKURE

6.1. The Background and Context of the Federal University of Technology, Akure

The Federal University of Technology, Akure (FUTA) was established in 1981, along with four other universities of technology for the purpose of human capital development and the building of local technological capability that would accelerate technological and industrial development.¹⁸ As stated in the University Hand Book (FUTA, 2011),¹⁹ the following are the primary objectives of establishing the university:

- Develop and offer academic and professional programmes leading to the award of certificates, diplomas, first degrees, postgraduate and higher degrees which emphasise planning, adaptive, technical, maintenance, development, horizontal, and productive skills in the engineering, scientific, agricultural, environmental, management, medical and allied professional disciplines;
- Act as agents and catalysts, through post-graduate research and training, for the most efficient, effective and economic utilisation, exploitation and conservation of the country's natural, economic and human resources;
- Offer to the general population, as a form of public service, the results of research and foster the practical application of these results;
- Identify technological problems and needs of the society relevant to the immediate localities of the university and solve them within the context of national needs; and
- Provide and promote sound basic scientific training reflecting indigenous culture and enhancing national unity, while at the same time ensuring the production of society matured citizens.

From these objectives, it is apparent that the university was established as an institution devoted to scientific and technological education and research. Emphases are placed on professional orientation of training and practical application of research outputs. The decade preceding the establishment of the university was a period when Nigeria experienced relative economic progress due to oil boom (Moser et al, 1997; Adeoti et al, 2010), and hence the objectives set for the university were stated without cognizance of the economic decline of the 1980s and the attendant austerity measures. The university's objectives appear to have the technological needs of an expanding formal sector economy as the main target of its training and research activities. Community engagement is defined only in terms of solving "technological problems and needs of society". The context of FUTA at its inception was therefore an institution designed for providing human resources and local technological capability required for making the formal sector industrial establishment an important instrument of economic transformation. The motto of the university is '*Technology for Self-Reliance*', and it is emphasised in almost all university documents and emblems.

¹⁸ Other universities of technology established around the same time were the Federal University of Technology Owerri, the Federal University of Technology Minna, the Federal University of Technology Yola, and the Federal University of Technology Bauchi (now Abubakar Tafawa Balewa University).

¹⁹ Federal University of Technology Akure Handbook 2011.

The university defined its tripartite mandate as teaching, research, and community development and has statements on philosophy or guiding principles for its operations. Box 5.1 presents the vision and mission statements of the university which were apparently carved out of the objectives of establishing the university. The Box also presents the statements on the university's philosophy. The statements portray the university as a specialised university of technology aspiring to becoming a centre of excellence for promoting technological self-reliance in the production of goods and services in Nigeria.

Box 6.1: FUTA vision and mission statements

Vision statement

The Federal University of Technology Akure aims to be one of the best Universities of Technology in the world, committed to carving out an enviable niche for itself as a centre of excellence, epitomized by high quality programmes, products, and contribution to the society.

Mission statement

The Federal University of Technology, Akure will ceaselessly promote technological advancement through motivated skilled staff dedicated to teaching and research geared towards global needs and production of self-reliant high level manpower, goods and services.

Philosophy

The philosophy of the university is premised on the strong desire to:

- Solve real life problems, which require the knowledge of more than one subject area;
- Undertake a thorough identification of indigenous technologies;
- Identify those that can be upgraded and modernised, and harness technological resources (equipment and technical know-how) in servicing them; and
- Provide leadership to industrial and technological development in the country.

Source: FUTA Annual Report (2012)

The university has six schools (or faculties) and a postgraduate school. The schools are:

- Schools of Agriculture and Agricultural Technology (SAAT);
- Schools of Engineering and Engineering Technology (SEET);
- School of Earth and Minerals Sciences (SEMS);
- School of Environmental Technology (SET);
- School of Management Technology (SMAT); and
- School of Sciences (SOS).

While these faculties are mainly for teaching as in conventional universities, the university in 2003 established a Centre for Research and Development (CERAD) as a University-Industry Linkage mechanism specially positioned to partner with industry, commerce and society in general; and to serve as a bridge between the largely theoretical, knowledge-driven approach of the university environment and the more practical need-driven and business character of

industry (FUTA, 2012). Other notable centres set up by the university to facilitate the achievement of its mandate include:

1. Centre for Entrepreneurship and Gender Issues in Science and Technology (CEGIST)
2. Centre for Space Research and Application (CESRA)
3. Skill Acquisition and Technology Incubation Centre (SATIC)
4. West Africa Science Service Centre on Climate Change and Adapted Land use (WASCAL)
5. Teaching and Research Farm (TRF)
6. Industrial Training Unit (ITU)
7. Business Development Company (BDC)
8. Advancement Centre (AC)
9. Computer Resource Centre (CRC)
10. Centre for Continuing Education (CCE)

6.2. University Organisation and Structure

FUTA has a Governing Council responsible for policy and the highest level of decision making. The Governing Council has 17 members including the University Pro-Chancellor who serves as the Chairman of Council. The sixteen other members of the council include four external, four representatives of the university senate, two representatives of congregation, one convocation representative, one representative of minister of education, Vice Chancellor, two deputy Vice Chancellors, and the University Registrar as secretary to the council. At the time of this study, the council has only two female members, the registrar and one external person.

The management of the University is carried out by the Vice Chancellor and other principal officers of the University which include the Deputy Vice Chancellor (Academics), Deputy Vice Chancellor (Development), the Registrar, the Bursar, and the University Librarian. The Vice Chancellor and the principal officers form the core of the management structure, and they interact with the University Senate and members of the University Congregation. The University Senate is chaired by the Vice-Chancellor, and it comprises of Deans of Schools, Dean of the Postgraduate School, Directors of Centres and Units, Heads of Departments, principal officers of the university and professors. The schools are managed by deans while the units and centres are managed by the directors. The University Senate takes major decision in the general administration and academic planning of the university.

As in the case of FUNAAB, FUTA also has a deputy vice chancellor for development. CERAD and other centres that involve external actor relationships are supervised by the DVC (Development). Thus, the university pays attention to interaction at the very high management.

6.3. Students Enrolment

Table 6.1 shows that the total enrolment of students in the University has been growing with the female enrolment progressing faster than male enrolment. In the past decade, total undergraduate students enrolment more than doubled from 5,002 during 2001/2002 academic session to 13,285 in 2011/2012 session.

Table 6.1: Undergraduate student enrolment by gender (1995-2012)

Year	Male	Female	Total
1995/96	3360	716	4076
1996/97	3819	868	4687
1997/98	3872	871	4743
1998/99	4198	932	5130
1999/00	3997	847	4844
2000/01	3870	811	4681
2001/02	4066	936	5002
2002/03	4829	1253	6082
2003/04	5220	1535	6755
2005/06	5750	1806	7556
2006/07	6025	2000	8025
2007/08	6764	2274	9038
2008/09	7491	2508	9999
2009/10	8282	2690	10972
2010/11	9158	2923	12081
2011/12	10,057	3,228	13285

Source: FUTA's Giant Strides Vol. IV Annual Report Nov 2011-Oct 2012

Table 6.2 shows the breakdown of the undergraduate student's enrolment for 2011/2012 academic session by faculties (schools). The school of sciences and other science related courses dominated the enrolment of undergraduate in FUTA. This is apparently due to the national policy on education, which stipulated that Universities of Technology in the country should allocate 80 per cent of their admission space to science and science related courses to encourage science and technology education.

Table 6.2: Student enrolment and distribution by gender 2011/12 Session

School	Male	Female	Total	% of Total
SAAT	1159	1029	2188	16.4
SEET	2907	189	3096	23.3
SEMS	1101	143	1244	9.4
SET	1993	468	2461	18.5
SMAT	506	140	646	4.8
SOS	2391	1259	3650	27.5
TOTAL	10,057	3228	13285	100

Source: FUTA's Giant Strides Vol. IV Annual Report Nov 2011-Oct 2012

As shown in Table 6.3, the trend in total enrolment of postgraduate candidates has also been on the increase since 2005. The enrolment rose from 352 during the 2005/2006 academic

session to 1589 in 2011/2012 session. However, the observed increase is largely in the professional Post Graduate Diploma (PGD) programme which does not qualify a candidate for academic research or PhD. While the training of professionals satisfies a major aspect of the first objective of the university, enrolment in the academic research component represented by PhD training programmes has declined in recent years. From the interview with senior management staff, PhD training programmes have been constrained mainly by dearth of qualified academics to supervise PhD research and lack of research infrastructure. One of the senior management staff interviewed expressed the frustration encountered in training PhDs as follows:

Lack of fund is a constraint on teaching and research. Budgetary allocation is not released as at when due. This is the only University based research centre for space research in Nigeria. If the university did not receive fund then it will affect the research work and equipment for high level training especially at PhD level. Because of lack of laboratory and equipment facilities, we have to scale down the research work. For people to understand what we are doing, we need fund to recruit highly skilled experts. Lack of expertise in so many areas of specialisation is a major constraint on research especially at the PhD level (FUTA Management Interview No.10).

FUTA has been devoted to the training of undergraduates and professionals. From the responses obtained from the interviews of senior management staff, it appears that the training of professionals has so far reached out to mainly public sector agents. One of the senior management staff captured this in the following remarks:

Our success in training professionals includes training at CESRA of the first set of 18 students from all parts of Africa. We have also trained officers from Ondo and Ekiti States in Urban regional development. Pre-degree courses have been on-going for 6 years, and the courses have been helpful to communities with poor access to higher education. Local and state government agencies have benefited from the certificate programmes (FUTA Management Interview No.10).

Table 6.3: Postgraduate student enrolment and distribution 2005-2012

Degree	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
PGD	127	232	387	556	604	819	904
M.Eng	48		60	48	110	78	89
M.Tech	125		291	242	375	460	537
M.Phil.					19	2	11
PhD.	52	5	68	36	87	65	57
Total	352	237	806	882	1195	1424	1598

Source: FUTA's Giant Strides Vol. IV Annual Report Nov 2011-Oct 2012

6.4. Institutional Policies and Community Engagement

In order to realise the vision of being one of the best universities of technology in the world, there are claims by few of the senior management staff interviewed that FUTA has policies which could facilitate interaction within the university and between the university and external actors. These policies include the research policy, strategic institutional policy, community engagement policy, and the teaching and learning policy. Besides CERAD which functions as the agency for university-industry linkage and centre for the coordination of the university institutional research activities, there three other notable bureaus, which were established to play important role as facilitators of interactions with external actors. These bureaus are the Intellectual Property Rights (IPR) office, Technology Transfer Office (TTO), and the Teaching and Research Farm (TRF). According to FUTA (2012), the TRF serves as the field laboratory of the School of Agriculture and Agricultural Technology. It also serves as a teaching and demonstration centre for modern technologies of farming to students and farmers in the neighbourhood communities.

When interaction results in invention or innovation, there is often the challenge of benefit sharing or appropriation of returns to innovation. The intellectual property policy approved by the university council in December 2010 provides a framework for the management of copyright, patenting and other related issues. Apart from the intellectual property policy, other policy documents of the university are not readily available in the public domain. This constitutes substantial hindrance to understanding the circumstances and institutional framework under which an academic staff can interact within the university and with external social partners.

Furthermore, community engagement is perceived in FUTA as ‘community development’. The notion of development in this context is not about interaction of agents but rather activities or engagements that results in technological development or ‘*technology for self-reliance*’. Institutional policies for community engagement are thus mainly aimed at formal sector (public and private) interactions with the university. As already indicated in section 6.3, CERAD and BDC are organised for interaction with private and public sector agents interested in partnership with the university through collaborative research, consultancy or contracts. Apart from the TRF, other potential community engagement organs (e.g., CEGIST and SATIC) are relatively new and there is currently no evidence of institutional policies guiding their operations. This notwithstanding, some measure of success in traditional forms of interaction involving donors and sponsorships were recorded in recent times as stated in the following remarks by one of the senior management staff interviewed:

Research fund comes from internal and external sources. The main internal sources of fund for research activities are government allocation, TETFund, and internally generated revenue from a few places (e.g., TRF). We have also received research grants from World Bank STEP-B, Nigerian Air force, Banks (First Bank, UBA), MTN, Etisalat, United Nations Office for Drug Control (UNODC), ILO, Association of Commonwealth Universities, International Foundation for Science (IFS), African Mathematical Millennium Science (AMMS), and Africa Academy of Science (AAS) (FUTA Management Interview No.10).

It is noteworthy that one of these donor types of partnership was reported by FUTA (2012)²⁰ to have produced considerable interaction involving local communities. In 2009, FUTA won \$700,000 grant from the World Bank under Step-B-Project as the centre of excellence in food production and food security research. The grant is being used for research activities, procurement of equipment, renovation or buildings as well as providing sponsorship for researchers to attend conferences. The research supported by this fund not only involved researchers in FUTA, but also other stakeholders (farmers, governments, communities, etc.) interacting especially at community level in the area of food production.

Table 6.4 presents some partnership and linkage activities reported by FUTA Annual Report (2012). These partnership activities also include traditional forms of interaction as exemplified by academic exchanges and scholarly collaborations sometimes sponsored by a third party agent such as development cooperation partners. A good example of third party involvement is the World Bank Step-B project which has a component of sponsorship of university exchange programmes. One of the respondents to the senior management interviews confirmed the existence of Memorandum of Understanding (MoU) on academic exchange and research collaborations as follows:

We have MoUs with other academic institutions within and outside the country. This enables research collaboration and exchange of staff and students (FUTA Management Interview No.5).

Table 6.4: Linkages and relationship consummated in 2011/2012

Institutions	Date MoU was Signed	Scope of Coverage
University of Namibia, Windhoek	8th Dec. 2011	Academic exchange and scholarly linkages and collaboration
Universita Trieste, Italy	21st Oct. 2011	Academic exchange and scholarly linkages and collaboration
KARMA Food Industries	n.a.	Research and Industrial Production of Soya Beans
MIDATCO Group	n.a.	Teaching and Research in Renewable energy
Havilah Merchants Nig. Ltd	31st Oct. 2012	Joint Operation of Bookshop on campus
Nigerian Air force	2012	Training and Research

Note: n.a. = not available

Source: FUTA Report Nov 2011-Oct 2012

Service forms of interactions were also reported as shown in Table 6.4 by the cases of KARMA, MIDATCO, Havilah and the Nigerian Air force. The collaboration of the university with these organisations especially KARMA Food and MIDATCO Group is viewed by some of the senior management staff interviewed as having improved the quality of research in the university and interaction with external social partners. In this respect, the Managing Director of BDC made the following remarks:

²⁰FUTA Annual Report 2012

The University signed several MoUs with faith based organisations, international organisations, State and Federal Government agencies, business organisations, etc. Such MoUs are carried out not within the university environment alone but also outside the campus thus encouraging interactions with the society. Also the collaboration especially with KARMA food put the university on her toes in terms of providing technical assistant to the organisation by testing the varieties of soya beans which the organisation can use in Nigeria to process Soya Milk (FUTA Management Interview No.7).

6.5. Patterns of Interaction

In this section, we map the scale and patterns of interactions within the university and with external social partners taking into consideration the features of FUTA as a specialised university organised and structured to promote technological development for self-reliance and industrial production.

6.5.1. Key external social partners

Table 6.5 shows the results of the WAI analysis of the main external social partners that interact with FUTA academics in the research sample. The main external social partners that relate with academics in FUTA are “individuals and household” and “primary/secondary schools” with WAI values of 3.3 and 3.0 respectively. This is followed by small, medium and micro enterprises (SMMEs) and national universities with WAI value of 2.9. These results indicate that individual households, schools, SMMEs and national universities are partners with the academics interviewed on a moderate scale. 23 other external social partners have WAI values of 2.0 and above. It thus appears that the external social partners listed in Table 6.5 interact with academics in the research sample only on isolated to moderate scale. Three of the four frequently mention external social partners are educational institutions while one is SMMEs. Educational institutions involved included primary and secondary schools, and national universities. The involvement of secondary schools is further confirmed by one of the senior management interviews as follows:

Types of interaction depend on the way you want to look at it. I look at it in the area of direct interaction with people. During the convocation last week sixty secondary schools were represented in “career talk”, i.e., catching them young; it is an avenue to expose the courses in the university to them at early stage. Lecturers in the 36 departments in the university spoke on the importance of each course. We talk about the potentials of each department, and the students ask questions that will affect their academic and career choices (FUTA Management Interview No.1).

The least engaged external social partner by the academics interviewed is political organisation with WAI of 1.7. This is apparently due to the apolitical disposition of the academia.

Table 6.5: Extent of FUTA academics' interaction with external social partners

External social partners	No. of Respondents	Sum of Responses	WAI
Individuals and households	31	101	3.3
Primary/secondary schools	33	100	3.0
Small, medium and micro enterprises	32	92	2.9
National universities	32	94	2.9
National government departments	31	86	2.8
Non-governmental agencies (NGOs)	33	89	2.7
Development agencies	33	89	2.7
Community organisations	31	84	2.7
International universities	32	86	2.7
A specific local community	31	81	2.6
Funding agencies	32	83	2.6
Provincial/regional government departments or agencies	32	80	2.5
Religious organisations	32	79	2.5
Small-scale farmers (non-commercial)	34	85	2.5
African universities	32	79	2.5
Science councils	30	74	2.5
National regulatory and advisory agencies	32	76	2.4
Commercial farmers	31	73	2.4
Local government agencies	29	64	2.2
Welfare agencies	32	69	2.2
Civic associations	29	65	2.2
Multi-national companies	31	69	2.2
Trade unions	31	64	2.1
Social movements	31	64	2.1
Large national firms	31	66	2.1
Clinics and health centres	31	63	2.0
Sectoral organisations	29	59	2.0
Political organisations	32	55	1.7

Source: Analysis of survey data, 2012

6.5.2. Types of relationship with external social partners

Table 6.6 presents the results of the WAI analysis for the types of relationships between the respondents in the research sample and external social partners. The most frequently reported relationship is education of student so that they can be socially responsive with a WAI of 3.2. Other relatively frequently mentioned types of relationship are “continuing education or professional education”, “service learning”, and “participatory research networks”. Continuing education and service learning (or learning on the job) fit into the university’s objective of promoting professional education.

The interview of senior management staff did not provide convincing evidence of preponderance of “participatory research networks”. The only mention of this is one of the community based World Bank STEP-B project. The students’ practical farming year that could have provided opportunity for participatory research networks is campus based at the TRF, and there is no evidence of individual research projects that are participatory network

based. Besides ‘education of student so that can be socially responsive’, 12 other types of relationship has WAI of between 2.5 and 3.2. These twelve types of relationship may be considered to be on a moderate scale. Other types of relationship listed in Table 6.6 have WAI score ranging from 1.5 to 2.4 and may be regarded to be relationship on ‘isolated instances’. The least WAI score of type of relationship with external social partner is clinical services and patient or client care with WAI value of 1.5. The reason for this is that FUTA does not have medical school and hence, no teaching hospital. The university health centre staffs also were not part of the respondents.

As shown in the preceding sections, interviews with senior management staff demonstrated that interactions are mainly traditional and service forms of interaction. A further insight into this is provided by the following response by a senior management staff:

Interaction in FUTA is mainly through programmes such as public lectures and seminar presentations that always attract stakeholders from the community and private sector. The university has FUTA-Akure community partnership programme where the community discusses some of their challenges with the university representatives. The university often proffers solutions in form of service, research, etc. FUTA also collaborates with Local, State and Federal Governments in the areas of research and consultancy services. Examples are the Urban Renewal Projects, which are government policy-specific (FUTA Management Interview No.4).

The foregoing notwithstanding, it is necessary to note that few cases of community based projects that fit into network form of interaction were identified by the respondents. An example is succinctly described by one of the senior management staff as follows:

FUTA interact with communities through the town-gown programme called FUTA-Akure partnership programme. This helps to showcase the scientific inventions and products of FUTA. The programme also provides the university the idea of what the people in the communities are going through especially in their businesses (farming in particular). An example is the problems of agro processing industry. This informed the university research in cassava peeling machine which some farmers in the state are using presently. The university also formulated local feed for fish farmers which are of good quality and at affordable price to many farmers. Other fora of communicating with the external partners are the media (e.g., NTA, AIT, FUTA Radio) and FUTA publication aimed at disseminating the products of the university (FUTA Management Interview No.11).

Table 6.6: Types of FUTA academics' relationship with external social partners

Types of Relationship	No. of Respondents	Sum of Responses	WAI
Education of students so that they are socially responsive	34	108	3.2
Continuing education or professional development	33	96	2.9
Service learning	31	88	2.8
Participatory research networks	32	91	2.8
Work-integrated learning	31	85	2.7
Research consultancy	35	96	2.7
Community-based research projects	32	85	2.7
Policy research, analysis and advice	32	84	2.6
Monitoring, evaluation and needs assessment	33	87	2.6
Collaborative R&D projects	34	89	2.6
Collaborative curriculum design	33	83	2.5
Customised training and short courses	33	84	2.5
Design, prototyping and testing of new technologies	33	81	2.5
Technology transfer	32	76	2.4
Contract research	32	76	2.4
Student voluntary outreach programmes	32	74	2.3
Design and testing of new interventions or protocols	32	72	2.3
Alternative modes of delivery to accommodate non-traditional students	29	65	2.2
Expert testimony	31	68	2.2
Joint commercialisation of a new product	32	63	1.9
Clinical services and patient or client care	30	45	1.5

Source: Analysis of survey data, 2012

6.5.3. Channels of information for knowledge transfer to external social partners

Table 6.7 shows the results of the WAI analysis of the channels of information for knowledge transfer to external social partners by academics in the research sample. The dominant channel of information for knowledge transfer is 'public conferences, seminar and workshops', 'interactive websites', and 'students' with WAI of 3.5 indicating a moderate to wide scale use of the channels. Apart from these channels of information transfers, two other channels of information, 'popular publications' and 'training and capacity development workshop' with WAI value of 3.3 respectively may also be regarded as being used by academics on a moderate to wide scale for knowledge transfer. 'Popular publications', 'training and capacity development workshops' and 'informal information exchanges' though not listed as one of the most frequently mentioned channel of information for knowledge transfer, the three play very important role in the university interactions with external social partners.

Table 6.7: Channels of information transfer by FUTA academics to external social partners

Channel of communication	No. of Respondents	Sum of Responses	WAI
Public conferences, seminars or workshops	35	124	3.5
Interactive websites	35	121	3.5
Students	35	121	3.5
Popular publications	31	102	3.3
Training and capacity development or workshops	33	109	3.3
Informal information exchange	31	90	2.9
Oral or written testimony or advice	30	82	2.7
Reports and policy briefings	30	82	2.6
Demonstration projects or units	34	88	2.6
Radio, television or newspapers	35	83	2.4
Research contracts and commissions	32	78	2.4
Intervention and development programmes	32	76	2.4
Participatory or action research projects	32	76	2.4
Cross-disciplinary networks with social partners	33	79	2.4
Technology incubators or innovation hubs	31	67	2.2
Technology development and application networks	31	64	2.1
Software development or adaptation for social uses	32	56	1.8
Spin-off firms from the university (commercial or not for profit)	32	58	1.8
Patent applications and registration	31	46	1.5

Source: Analysis of survey data, 2012

Eleven other channels of information have WAI between 2.1 and 2.9, indicating that academics use them on a range between 'isolated instances' and 'on a moderate scale'. The least frequently used channels of knowledge transfer are patent applications and registration, spin-off firms from the university (commercial or not for profit), software development or adaptation for social uses. These involve high level research and knowledge application that can improve interactions with external social partners. This indicates that FUTA need to improve in these areas of knowledge transfer especially the patent application and registration. Results reveal that there was no patent awarded to FUTA internationally; neither is there any patent application and licensed patent to the institution abroad. However, as at the time of this study, domestic patent awarded to FUTA as an institution is only one. The institution received one new application for processing, while six applications were being processed for award. The long process of patent application may hinder interactions because it will discourage researchers investing their time in research that can result in innovation for inclusive development. One of the senior management staff interviewed corroborated this as follows:

The process of patent award starts after a research effort has created an invention. NOTAP helps facilitate the process, while the Ministry of Commerce and Industry does the patenting. It takes a long process, and the long process discourages researchers from applying for the patenting of their inventions. But the university from next year will begin to sensitise researchers on the benefit of patenting inventions (FUTA Management Interview No.11).

Furthermore, FUTA radio and FUTA-Akure partnership programme are also means of information and knowledge transfer to external social partners by academics. They are avenues through which the research findings are disseminated to the public especially the findings of the Schools of Agriculture and Agricultural Technology, Engineering and Engineering Technology, and Environmental Technology.

6.5.4. Outputs of interaction with external social partners

The ultimate purpose of engagement with the external partners is to impact the people, communities and university environment positively and thereby improve the livelihood of the people. The results of the WAI analysis of output shown in Table 6.8 indicate that the most frequently reported outputs are academic publications, dissertations, and graduates with relevant skills and values with WAI of 3.6, 3.4, and 3.3 respectively. Spin-off companies, cultural artefacts were among the least frequent output of interactions with external social actor. This is an indication of lack of entrepreneurship form of interaction. The results agree with the findings that conferences, seminar/workshop and students are the most important channel of knowledge transfer for the academics in the research sample.

The most frequently reported outputs for interacting with the external social partners are the outputs that affect academics and the prestige of the university as an academic institution. The outputs may not have effect on the immediate university environment except the graduate turn outs, which may possess relevant skills for the labour market. FUTA Annual Report 2012 and interview with one of the senior management staff indicated that the university prides itself in claiming that the products of the university are doing well in the labour market. The senior management staff remarked as follows:

Feedbacks from industries and government agencies show that FUTA graduates are good in contributing to the development of their different organisations and workplace. They serve as good ambassadors of the university. FUTA students have also done well by receiving awards at several competitions within and outside Nigeria. Some of these awards include Zain Africa challenge competition held in Uganda in 2009, National Microsoft Imagine competition held in Nigeria in 2010, and FUTA students have represented Nigeria at an International competition in the USA. FUTA students won the National Mathematics competition for University in 2012 and came 4th among the 18 University that took part in Imperial Barrel Award Competition (Africa Region) 2012 (FUTA Management Interview No.8).

Table 6.8: Outputs of FUTA academics' interaction with external social partners

Outputs	No. of Respondents	Sum of Responses	WAI
Academic publications	34	123	3.6
Dissertations	33	111	3.4
Graduates with relevant skills and values	34	112	3.3
Academic collaboration	32	98	3.1
Reports, policy documents and popular publications	32	97	3.0
New or improved processes	33	75	2.3
Community infrastructure and facilities	31	68	2.2
New or improved products	33	72	2.2

Scientific discoveries	33	73	2.2
Cultural artefacts	31	56	1.8
Spin-off companies	31	50	1.6

Source: Analysis of survey data, 2012

6.5.5. Outcomes and benefits of interaction with external social partners

Table 6.9 shows the results of the WAI analysis of the outcomes and benefits of interactions between FUTA academics and external social partners. The results reveal that the most frequently reported outcomes and benefits of academics' interaction with external social partners are improved teaching and learning, academic and institutional reputation, training and skills development, cross disciplinary knowledge production to deal with multi-faceted social problem, having WAI of 3.5, 3.1, 3.0 respectively. The WAI scores indicate that the outcome and benefit are on a moderate to wide scale. Since the two most important widely acknowledged outcomes and benefits of interactions are related to academic functions, it may imply that when academics in the research sample perform their core duties of teaching and research it serves as avenue to interact with external social actor. This may give rise to opportunities in terms of linkages, collaboration, publications, new ideas and innovative research that will affect the livelihood of the people and possibly improve the National System of Innovation in the country. Other outcomes/benefits listed in Table 6.9 with WAI between 2.1 and 2.9 signify that their incidence is between 'moderate scale' and 'isolated scale'.

Table 6.9: Outcomes and benefits of FUTA academics' interaction with external social partners

Outcomes and Benefits	No. of Respondents	Sum of Responses	WAI
Improved teaching and learning	33	114	3.5
Academic and institutional reputation	32	98	3.1
Training and skills development	33	99	3
Cross-disciplinary knowledge production to deal with multi-faceted social problems	32	95	3
Public awareness and advocacy	34	97	2.9
Relevant research focus and new research projects	32	92	2.9
Theoretical and methodological development in an academic field	31	92	2.9
Improved livelihoods for individuals and communities	33	92	2.8
Improved quality of life for individuals and communities	31	88	2.8
Participatory curriculum development, new academic programmes and materials	31	81	2.6
Community-based campaigns	32	79	2.5
Intervention plans and guidelines	31	76	2.5
Incorporation of indigenous knowledge	33	82	2.5
Policy interventions	33	79	2.4
Community employment generation	33	74	2.4

Novel uses of technology	31	72	2.3
Community empowerment and agency	30	70	2.3
Regional development	32	71	2.2
Firm employment generation	32	66	2.1
Firm productivity and competitiveness	32	66	2.1

Source: Analysis of survey data, 2012

One of the respondents to the interviews of senior management staff identified the academic, social and economic benefits of interacting with external social partners as follows:

We can see the benefits in the form of capacity building of the people in the community at low and high levels. New research is being extended to people in the communities especially in the areas of agriculture. Another key success story of interaction is the rating of the university as first among the universities of technology in Nigeria and seventh among all universities in the country by the NUC in 2004 till date. The university also received the award of centre of excellence for climate change and adaptation in West Africa in 2011. Accreditation of all programmes and courses by NUC was achieved in 2007, and institutional accreditation by NUC in 2012 for a period of 8 years. FUTA rated the second best governing council among Nigerian Universities in 2004 and won \$700,000 grant of the World Bank Step-B project to establish centre of excellence in rice production (FUTA Management Interview No.2).

Three specific outcomes identified by academic staff interviewed have relevance for network forms of interaction with potential for stimulating innovation for inclusive development among marginalised communities. These outcomes include automated cassava peeling machine, ground water remediation project, and bean weevil killer.

Automated cassava peeling machine

The automated cassava peeling machine (ACPM) was invented by the School of Engineering and Engineering Technology. It is a great improvement on the manual peeling machine which small scale and cottage industries commonly use in cassava processing. The ACPM is more efficient, and has been adopted for use by Ondo state farmers and the National Centre for Agricultural Mechanisation (NCAM).

Groundwater remediation project

This involves the remediation of groundwater contamination in Baruwa community in the suburb of Lagos. This is an application of the outputs of research work in the School of Engineering and Engineering Technology. The groundwater in Baruwa was contaminated by hydrocarbon fuel leakages into over 200 wells of community water with wells containing up to 6 feet of hydrocarbon. The project is an intervention in water treatment in a community where the government has not adequately intervened.

Bean weevil killer

This is botanical insecticide dusts made from Eugenia aromatic bail dry buds, piper guineanse schum and thonn dry seeds. The efficacy of this powder as a grain preservative has been proven by the application of the powder to cowpea (beans) and maize that were stored by some farmers in the local communities. After three month there was no insect puncture in protected seeds and

only minimal weight loss. The bean weevil killer is adjudged by the university as an innovative preservative that could benefit millions of poor rural farmers and agricultural commodity suppliers.

6.5.6. Obstacles and challenges of interaction with external social partners

Table 6.10 presents the results of the WAI analysis of the obstacles and challenges to FUTA academics' interaction with external social partners. Seven obstacles/challenges have high rating, with WAI scores of 3.0 and above, and all related to resources of time and money. Limited financial resources for competing university priorities, sustainable external funding, and competing priorities on time are the three obstacles/challenges most frequently mentioned with WAI of 3.8, 3.5 and 3.4 respectively. These can be rated on a range of 'very important' while the obstacle/challenges of 'lack of clear university policy and structures to promote interaction' with WAI of 3.0 indicates a rating of moderately important issues. Other obstacles/challenges listed in Table 6.10 with WAI between 2.2 and 2.9 signify that their incidence is between 'slightly important' and 'moderately important' on the likert scale. The critical state of inadequate funding and competing priorities for time is repeatedly corroborated by the responses of the senior management staff interviewed. Funding challenges are particularly stressed as the most important obstacle. The following are a few of the responses received from the interviews:

Funding is a major challenge to research in Nigeria. There should be national science foundation like in the USA where funds are allocated to research projects with potential for innovation. Research funds in Nigeria should be allocated to innovative research that will affect the community (FUTA Management Interview, No.3).

...lack of funds is the major obstacle to interaction. There is also poor internet connectivity. One other obstacle which is peculiar to developing countries is reluctance to provide information for research. University education is very expensive, and if we must compete with other universities that have source of funding, we must find ways of improving funding for universities (FUTA Management Interview, No.7).

Adoption of technology is still challenging either because people cannot afford or basically because of their poor technological capacity. Funding is the major obstacle to all these. Innovation costs money (FUTA Management Interview No.11).

Table 6.10: Obstacles and challenges to FUTA academics' interaction with external social partners

Challenges and Obstacles	No. of Respondents	Sum of Responses	WAI
Limited financial resources for competing university priorities	32	121	3.8
Sustainable external funding	31	107	3.5
Competing priorities on time	31	106	3.4
Too few academic staff	32	101	3.2
Institutional recognition systems do not reward academic Interaction activities sufficiently	33	103	3.1

Negotiating access and establishing a dialogue with external social partners	32	100	3.1
Lack of clear university policy and structures to promote Interaction	33	100	3.0
University administration and bureaucracy does not support academic Interaction with external social partners	32	93	2.9
Lack of mutual knowledge about partners' needs and priorities	34	98	2.9
Unequal power relations and capabilities in relation to external social partners	30	81	2.7
Tensions between traditional and new academic paradigms and methodologies	32	78	2.4
Risks of student involvement in Interaction with external social partners	32	75	2.3
Legal problems	32	70	2.2

Source: Analysis of survey data, 2012.

6.6. Rationales for Lack of Interaction between Academics and External Social Partners

Table 6.11 presents the results of the WAI analysis of the rationales for non-interaction between academics and external social partners. The most important reasons given by the academics for not interacting with the external social partners are “interaction is not appropriate given the nature of my academic field and discipline”, “lack of recognition of interaction as a valid type of scholarship in my university”, “pressures of teaching and research on my time are too great”, “limited financial resources available”, and “differences between university and social partners’ priorities and needs are too great”. These factors respectively have WAI values of 3.4, 3.3, 3.1, 3.1, and 3.0. This is an indication that these reasons are rated between ‘moderately important’ and ‘very important’ for lack of interaction with the external social partners. The first two reasons suggest that the academics without interaction have no incentive to interact both from the nature of their teaching and research and from the incentive structure of the university. The third reason for lack of interaction emphasises the constraints of time allocation and prioritising of interaction. There is currently no official policy on time allocation in FUTA. However, the university schedule template that was filled by a senior staff in the academic planning office suggested the following time allocation: teaching 40 per cent, research 30 per cent, private activities for individual gain 5 per cent, interaction with external actors 5 per cent, and administration 20 per cent. Based on this suggestion and the fact that no policy on time allocation is entrenched, the academics cannot be forced to follow the suggested allocation. Thus, different expectations on time allocation exist across the schools and other segments of the university. This view was supported by the comment of one of the senior management staff interviewed:

The main mission of FUTA is to contribute to technological advancement that will affect the society especially the community around FUTA. If FUTA will fulfil this, the research must meet the needs of the environment. In academics, major goals are teaching, research and community development. The gain of research will assist in teaching, and research output will affect the community. There is currently no policy on how a staff should share his time between various functions. My suggestion for time allocation is as follows: Teaching 50

per cent, Research 30 per cent, and Community engagement 20 per cent (FUTA Management Interview No.4).

‘Limited financial resources’ is the fourth most crucial reason for lack of interaction among the research sample of academics with no interaction. As discussed in the previous section on obstacles to interaction, inadequate funding is a major hindrance to interaction. The reasons for no interaction that ranked lowest are the perception of the academic staff that “university administration systems do not support interaction”, “my department or faculty does not promote interaction”, and “lack of social partners knowledge about research activities and priorities in universities” with WAI scores of 2.4, 2.5 and 2.7 respectively. The WAI scores indicate that the importance attached to these reasons by the respondents are relatively low, and may therefore not be considered strong as hindrances to interaction among the sample of academics with no interaction.

Out of the 13 factors stated in Table 6.11 as reasons for lack of interaction, only one deal directly with external social partner, while majority of the obstacles are internal to the university. Lack of external social partners’ knowledge about research activities and priorities in university is the factor that captures the obstacles to interaction with respect to the external social partners. It has a WAI score of 2.7 suggesting the factor is ‘moderately important’.

Table 6.11: Reasons why FUTA academics do not interact

Reasons for no interaction	No. of Respondents	Sum of Responses	WAI
Interaction is not appropriate given the nature of my academic field and discipline.	17	57	3.4
Lack of recognition of interaction as a valid type of scholarship in my university	17	56	3.3
Pressures of teaching and research on my time are too great	17	53	3.1
Limited financial resources are available	17	52	3.1
Differences between university and social partner priorities and needs are too great	17	51	3.0
Lack of clarity on the concept of external interaction in my university	17	50	2.9
Institutional recognition systems do not reward interaction activities sufficiently	16	47	2.9
Interaction is not central to my academic role	17	48	2.8
Lack of clear university structures to promote interaction activities	17	47	2.8
Lack of clear university policy on interaction	17	46	2.7
Lack of social partners knowledge about research activities and priorities in universities	17	46	2.7
My department or faculty does not promote interaction.	17	42	2.5
University administration systems do not support interaction	17	41	2.4

Source: Analysis of survey data, 2012

6.7. Implications of the Pattern of Interaction for Inclusive Development

From the analysis of the pattern of interaction between FUTA academic staff and external social partners, interaction is driven by the passion for technology self-reliance and the pursuit of making the university a source of technological knowledge for the formal sector economy. Patterns of innovation from interviews of academics with interaction and interviews of senior management staff are largely traditional forms of interaction and service forms of interaction. These forms of interaction have been limited in their capacity to transform the formal sector economy because the university either remains a recipient of donor funds or provider of services which have so far been unable to generate significant revenue for the university. The entrepreneurship forms of interaction, which can enable commercialisation of research outputs, are rare among the sample of academics interviewed. The interview of senior management staff also confirmed that there has been no appreciable success in the promotion of partnerships that foster entrepreneurship.

There is also no profound evidence of network forms of interaction that may engender innovation for inclusive development. The existence of interaction that has the feature of network forms is anecdotal. Thus, the institutional structure and policies driving interaction at FUTA have been unable to generate projects that deeply and consistently affect the marginalised communities to the extent of producing innovation for inclusive development in a reasonable measure. The design and organisation of the university to promote technological development and industrialisation are not necessarily about marginalised communities, but cut across all sectors where technological adaption and innovation can help advance economic development and empowerment.

Obviously, the university's emphasis on the formal sector economy in its technological drive has capacity to contribute positively to the evolution of the national system of innovation. However, the apparent neglect of the informal sector economy that host the majority of the Nigerian working population is an impediment to inclusive development. Furthermore, the practical year programme in agriculture training programme, which could provide opportunity for service learning among marginalised communities, is campus based. It is thus yet to be exploited for interaction with the marginalised communities in the university's catchment area.

Chapter 7

UNDERSTANDING UNIVERSITY TYPES INTERACTION AND THE EVOLUTION OF THE NATIONAL SYSTEM OF INNOVATION IN NIGERIA

As earlier explained in chapter one, universities are important agents of knowledge generation and they are critical to the interactive activities that drive the National System of Innovation (NSI). Understanding university interactions is therefore important in order to ascertain how universities can improve performance and make teaching, research and community engagement contribute to the evolution of the NSI. Though evidence presented by the small research samples in chapters four, five and six of this report is not sufficient to draw firm and wide ranging implications of the results, they however provide indications on the forms of interaction that prevail in each of the university types and their tendency (or otherwise) to promote innovation among marginalised communities. This chapter carries out a comparative analysis of the findings of the patterns of interaction in the three university types, and provides insights on their potential impacts on the evolution of the NSI should current findings in each university become dominant.

7.1. University Types and the Occurrence of Interaction

Table 7.1 shows the first three main external social partners across the three university types as mentioned by academics with interaction in the research samples. The results reveal similar types of main external social partners with respect to individuals, households, schools, and national universities. This may be a reflection of teaching as the main function of the universities. The interviews of senior management staff of the three universities indicated that irrespective of university type, teaching is seen as the main function that takes precedence over research and community engagement. For example, in spite of the fact that the University of Ibadan is tending towards becoming a research university, the deputy vice chancellor (academic) emphasised the importance of teachings as follows:

Teaching, research and community service are the core mission of the university and this is in line with interaction with external social partners. In terms of balancing the three activities, within the university there is no law on specification of time allocated to them. But I must confess, the primary responsibility is teaching. This is because teaching is the fundamental business of the university (UI Management Interview No.5).

SMMEs appear as main external social partner only among the sample of academics with interaction at FUTA. As the premier university and an emerging research university, many local universities look toward UI for staff training as shown in chapter four. FUNAAB is also fostering collaboration with local and foreign universities through the newly established CENIP. However, there is no specific mentioning of strategies for collaborations with local universities from the evidence of interviews with FUTA senior management. It is also noteworthy that FUTA (2012) reported collaborations with local private universities.²¹ It is

²¹These collaborations involve mentoring newly established private higher educational institutions. These institutions include Oduduwa University, Ipetu-Modu, Osun State; Elizade University, Ilara-Mokin, Ondo State; and Crown Polytechnic, Ado-Ekiti, Ekiti State.

highly pronounced that FUTA is in pursuit of making teaching and research enhance technological self-reliance especially through industrialisation. This apparently explains why it is only in FUTA that interaction with SMMEs gained prominence as one of the three main external social partners. The least engaged external social partner by the sample of academics with interaction in each of the universities is political organisations. This demonstrates that irrespective of university types, the sample of academics with interaction is apolitical.

Table 7.1: Extent of academics' interaction with external social partners

University	Main external social partners (WAI scores in parenthesis)		
	First	Second	Third
UI	Individuals and households (3.0)	National universities (2.71)	Primary/secondary schools (2.6)
FUNAAB	Primary/secondary schools (3.4)	Individuals and households (3.3)	National universities (3.1)
FUTA	Individuals and households (3.3)	Primary/secondary schools (3.0)	Small, medium and micro enterprises (SMMEs) (2.91)/National Universities (2.91)
The least three main external social partners			
UI	Trade unions (1.8)	Social movements (1.8)	Political organisations (1.4)
FUNAAB	Civic associations (2.1)	Trade unions (1.8)	Political organisations (1.6)
FUTA	Clinics and health centres (2.0)	Sectoral organisations (2.0)	Political organisations (1.7)

Note: WAI scores are reported in parenthesis

Source: Analysis of survey data, 2012

7.2. Types of Relationships with External Social Partners by Institutional Types

As shown in chapters four, five and six, the academic interaction with external social partners results in various types of relationship. Table 7.2 presents the type of relationships by institutional types as reported by the WAI analysis in the previous chapters. Table 7.2 indicates that 'education of students so that they become socially responsive' is the dominant type of relationship among the sample of academics with interaction in the three university types. This also signifies the importance attached to teaching by the sample of academics with interaction in each of the university types. However, the second type of relationship across the institutional type varies. While it is research consultancy at UI, it is participatory research networks at FUNAAB, and continuing education or professional development at FUTA. These differences are apparently the results of the forms of interaction in each of the universities as driven by their respective missions. For UI, a conventional and research oriented university, interaction in the mould of service forms of partnership is typified by research consultancy. FUNAAB, a specialised university of agriculture with a strong mission of community based extension services, has network forms of interaction typified by participatory research networks. FUTA, a technology university with a commitment to development of technology for self-reliance, also has service forms of partnership typified by

continuing education or professional development services. Similarly, the third set of types of relationship reinforces the trends observed in the second set. It thus appears that only the research sample from FUNAAB provided evidence of interaction that affect communities that may be considered as marginalised. As earlier shown in chapter five, community engagement at FUNAAB is seen as extension services, and interactions with rural agricultural communities is a major feature of the university's community engagement functions.

From the results in Table 7.2, it is important to note that "joint commercialisation of a new product" is ranked among the least types of relationship among the sample of academics with interaction in both UI and FUTA. This suggests a lack of entrepreneurship form of interaction. Though the sample of FUNAAB academics with interaction indicate no apparent evidence of the existence of entrepreneurship form of interaction, "joint commercialisation of a new product" was not rated among the least types of relationship with external social partners. This may be as a result of community engagement activities producing some commercial gains through farmer-students-lecturers relationships that encourage farming as a business enterprise.

Table 7.2: Types of relationships with external social partners by institutional types

University	Types of relationship (WAI scores in parenthesis)		
	First	Second	Third
UI	Education of students so that they are socially responsive (3.1)	Research consultancy (3.0)	Customised training and short courses (2.9)
FUNAAB	Education of students so that they are socially responsive (3.5)	Participatory research networks (3.5)	Monitoring, evaluation and needs assessment (3.2)
FUTA	Education of students so that they are socially responsive (3.2)	Continuing education or professional development (2.9)	Service learning (2.8)
The least three types of relationships			
UI	Alternative modes of delivery to accommodate non-traditional students (1.9)	Joint commercialisation of a new product (1.8)	Clinical services and patient or client care (1.54)
FUNAAB	Expert testimony (2.5)	Alternative modes of delivery to accommodate non-traditional students (2.4)	Clinical services and patient or client care (2.1)
FUTA	Expert testimony (2.2)	Joint commercialisation of a new product (1.9)	Clinical services and patient or client care (1.5)

Note: WAI scores are reported in parenthesis

Source: Analysis of survey data, 2012

7.3. Channels of Information and Knowledge Transfer to External Social Partners

Table 7.3 presents the first three frequently mentioned channels of information and knowledge transfer to external social partners as shown by the results of WAI analysis in chapters four to six of this report. Students, public conferences, seminars and workshops featured prominently as channels of information transfer frequently mentioned by the sample of academics with interaction in each of the three university types. All these channels are academic modes of information or knowledge transfer, and hence may not be very effective as means of knowledge transfer for innovation among marginalised communities who often lack tertiary level education required for deep understanding of information passed through academic modes. It is however important to note that results in chapter five demonstrated that FUNAAB has made significant exception to this through its community based farming scheme (COBFAS) where students as channels of information to farmers work and live in the farming community during their practical year at 400 Level.

It is also shown in Table 7.3 that popular publications are important channels of information transfer by the sample of academics with interaction in UI and FUNAAB, while interactive website is seen as important channel of information transfer only by the sample of academics with interaction at FUTA. Popular publications such as newspapers, newsmagazines, flyers, etc. are important means of social engagement and communication. For FUNAAB, this provides important means of reaching out to rural communities that are targets of the university extension activities. For UI as a research university, interviews of senior management did not provide sufficient clue on the relevance of popular publications for community service. However, academics with interaction in a research oriented university might consider popular publications as important due to their potency in facilitating networking with partners. The importance placed on websites as channels of information transfer by the sample of academics with interaction at FUTA may be explained by the technology emphasis of the university. As reported by FUTA (2012), FUTA ranked among the best universities in ICT application in Nigeria, and aims at developing its ICT facilities and content management to the stage that FUTA's webometric ranking would be within the top twenty in Africa.

The least channels of information transfer by the sample of academics with interaction in each of the three universities relate to factors that are critical for entrepreneurship forms of partnership. Patenting, firm spin-offs, and technology incubation are main features of commercialisation process of research outputs. The mentioning of 'software development or adaptation for social uses' by academics at FUNAAB and FUTA is an indication that for FUNAAB, computer software is not viewed by the respondents as critical for interaction, while for FUTA, the emphasis on technology for self-reliance appears to focus more on technological artefacts or hardware.

Table 7.3: Types of channels of information with external social partners by institutional types

University	Types of channels of information (WAI scores in parenthesis)		
	First	Second	Third
UI	Students (3.5)	Public conferences, seminars or workshop (3.4)	Popular publications (3.3)
FUNAAB	Public conferences, seminars or workshops (3.5)	Students (3.5)	Popular publications (3.3)
FUTA	Public conferences, seminars or workshops (3.5)	Interactive websites (3.5)	Students (3.5)
The least three types of channels of information			
UI	Technology incubators or innovation hubs (1.8)	Spin-off firms from the university (commercial or not for profit) (1.8)	Patent applications and registration (1.7)
FUNAAB	Technology incubators or innovation hubs (2.4)	Software development or adaptation for social uses (2.2)	Patent applications and registration (2.1)
FUTA	Software development or adaptation for social uses (1.8)	Spin-off firms from the university (commercial or not for profit) (1.8)	Patent applications and registration (1.5)

Note: WAI scores are reported in parenthesis.

Source: Analysis of survey data, 2012.

7.4. Outputs of Academic Interactions with External Social Partners

The outputs of academic interaction with external social partners as reported by the research sample of academics with interaction across the three university types are shown in Table 7.4. The outputs are remarkably similar, suggesting that university types have little or no influence on the nature of outputs by the sample of academics with interaction. Academic related publications dominate, and this is followed by graduate with relevant skills and values. It is however necessary to point out that these responses are from the perspective of the academic staff for whom these issues are priority as reasons for interaction. The benefit of interaction to other partners such as rural farmers in the case of FUNAAB would most likely be viewed otherwise. The case studies of interaction planned for the second stage of this study would provide empirical evidence on this.

Graduates with relevant skills feature so prominently because all the three universities regarded teaching and skills development as the most important function of the university. Thus, achieving the objective of producing graduates with skills and values relevant to societal needs is expectedly the focus of academics with interaction.

The list of the least types of outputs are also fairly similar except that the respondent academics at the university of Ibadan mentioned ‘community infrastructure and facilities’ instead of ‘scientific discoveries’ as one of the least mentioned output of interaction. This result corroborates other findings indicating the tendency of UI towards becoming a research

university, while the specialised universities, especially FUNAAB, are relatively more community focused.

Table 7.4: Outputs of academic interactions with external social partners

University	Outputs of interaction (WAI scores in parenthesis)		
	First	Second	Third
UI	Academic publications (3.6)	Graduates with relevant skills and values (3.5)	Dissertations (3.4)
FUNAAB	Academic publications (3.7)	Dissertations (3.6)	Graduates with relevant skills and values (3.6)
FUTA	Academic publications (3.6)	Dissertations (3.4)	Graduates with relevant skills and values (3.3)
The least three types of outputs of academic interactions with external social partners			
UI	Community infrastructure and facilities (2.0)	Spin-off companies (1.9)	Cultural artefacts (1.6)
FUNAAB	Scientific discoveries (2.2)	Spin-off companies (2.3)	Cultural artefacts (2.2)
FUTA	Scientific discoveries (2.2)	Cultural artefacts (1.8)	Spin-off companies (1.6)

Note: WAI scores are reported in parenthesis.

Source: Analysis of survey data, 2012

7.5. Outcomes and Benefits of Academic Interactions with External Social Partners

Table 7.5 shows the outcomes and benefits of academics interaction with external social partners from the results of WAI analysis in chapters four to six. For UI and FUTA, ‘improved teaching and learning’, and ‘academic and institutional reputation’ are perceived as the main outcomes of interaction by the sample of academics with interaction. The research focus of UI however distinguishes the responses from those of FUTA where ‘training and skills development’ is rated among the most frequently mentioned outcomes. While all the three universities engage in training and skills development, FUTA’s emphasis on professional and continuing education as reported in chapter six may have accounted for the responses from academics with interaction. Outcomes and benefits of interaction by FUNAAB academics agree with UI only with respect to ‘improved teaching and learning’, but agree with FUTA on both ‘improved teaching and learning’ and ‘training and skills development’. ‘Improved livelihoods for individuals and communities’ is a third outcome/benefit which is not among the three most frequently mentioned outcomes by the research sample in UI and FUTA. Thus, while the outcomes/benefits of interaction as perceived by the respondents in UI and FUTA focused on the outcomes that directly affect the university reputation and performance, the results from the respondents at FUNAAB focused on the benefits derived by rural communities.

The least mentioned outcomes and benefits are more diverse compared to the most frequently mentioned. For UI, community employment generation is least mentioned; for FUNAAB, regional development is least mentioned; and for FUTA, firm productivity and competitiveness is least mentioned. These are particularly indicative (though not exclusively) of what the universities should be achieving as benefits of interaction if forms of interaction are dominated by network form of partnerships and entrepreneurship form of partnership.

Table 7.5: Outcomes and benefits of academic interactions with external social partners

University	Outcomes and benefits of interaction (WAI scores in parenthesis)		
	First	Second	Third
UI	Improved teaching and learning (3.4)	Academic and institutional reputation (3.3)	Relevant research focus and new research projects (3.24)
FUNAAB	Improved teaching and learning (3.8)	Training and skills development (3.4)	Improved livelihoods for individuals and communities (3.3)
FUTA	Improved teaching and learning (3.5)	Academic and institutional reputation (3.1)	Training and skills development (3.0)
The least outcomes and benefits of academic interaction with external social partners			
UI	Firm employment generation (2.3)	Community-based campaigns (2.23)	Community employment generation (2.16)
FUNAAB	Novel uses of technology (2.8)	Intervention plans and guidelines (2.8)	Regional development (2.6)
FUTA	Regional development (2.2)	Firm employment generation (2.1)	Firm productivity and competitiveness (2.1)

Note: WAI scores are reported in parenthesis.

Source: Analysis of survey data, 2012.

7.6. Obstacles and Challenges

Table 7.6 presents the obstacles and challenges of interaction as perceived by the sample of academics with interaction in the three universities. The most frequently mentioned obstacles are strikingly similar for the respondents from the three university types. Financial related obstacles are the most important for the three universities. After this, the next important obstacle for respondents at FUNAAB and FUTA is ‘competing priorities on time’; while for UI, it is ‘institutional recognition systems that do not reward academic interaction activities sufficiently’. However, the results of the senior management interviews reported in chapters four to six indicated that these obstacles are also appreciably challenging for academics in each of the university types.

The least mentioned obstacles as shown in Table 7.6 are also strikingly similar. The only exception is made by the respondents from FUNAAB, which indicated ‘university administration and bureaucracy does not support academic interaction with external social partners’ as one of the least mentioned obstacle to interaction.

Table 7.6: Obstacles and challenges for academics interacting with external social partners

University	Obstacles and challenges (WAI scores in parenthesis)		
	First	Second	Third
UI	Limited financial resources for competing university priorities (3.6)	Unsustainable external funding (3.5)	Institutional recognition systems do not reward academic interaction activities sufficiently (3.3)
FUNAAB	Limited financial resources for competing university priorities (3.8)	Unsustainable external funding (3.7)	Competing priorities on time (3.6)
FUTA	Limited financial resources for competing university priorities (3.8)	Unsustainable external funding (3.5)	Competing priorities on time (3.4)
The least obstacles and challenges for academics interacting with external social partners			
UI	Tensions between traditional and new academic paradigms and methodologies (2.7)	Risks of student involvement in Interaction with external social partners (2.41)	Legal problems (2.3)
FUNAAB	University administration and bureaucracy does not support academic Interaction with external social partners (3.0)	Legal problems (2.9)	Risks of student involvement in Interaction with external social partners (2.7)
FUTA	Tensions between traditional and new academic paradigms and methodologies (2.4)	Risks of student involvement in Interaction with external social partners (2.3)	Legal problems (2.2)

Note: WAI scores are reported in parenthesis.

Source: Analysis of survey data, 2012.

7.7. Rationales for Lack of Interaction between Academics and External Social Partners

For the sample of academics with no interaction, the rationales for non-interaction with external social partners in the three selected universities are presented in Table 7.7. ‘Pressures of teaching and research on my time are too great’ is common to all the respondents from the three university types as reason for lack of interaction. ‘Lack of recognition of interaction as a valid type of scholarship’ features as additional reason for lack of interaction in UI and FUTA. However, this did not feature prominently in FUNAAB though FUNAAB does not also recognise interaction as a form of scholarship. It thus appears that the emphasis on community based interaction at FUTA might have been assimilated by academics as reasonably a compulsory form of scholarship that is not assessed in the university reward system. It is only in UI that ‘limited financial resources are available’ does not appear as important rationale for lack of interaction. This may be explained by the fact that there is no evidence in the findings in chapter four that investment in interaction is a priority for UI. It is also noteworthy that it is only in FUTA that ‘interaction is not appropriate given the nature of

my academic field and discipline' appears as one of the most frequently mentioned reason for lack of interaction. In UI and FUNAAB, it is one of the least reasons for lack of interaction. Added to this, in UI and FUNAAB, 'interaction is not central to my academic role' is viewed by the respondents as one of the least reasons for lack of interaction. This suggests that academics without interaction at FUTA view interaction to be an institutional level activity. Thus, at the individual level, there is comparatively no consciousness of making teaching and research to involve interaction with external social partners.

Table 7.7: Rationales for lack of interaction between academics and external social partners

University	Reasons for lack of interaction (WAI scores in parenthesis)		
	First	Second	Third
UI	Pressures of teaching and research on my time are too great (3.6)	Institutional recognition systems do not reward Interaction activities sufficiently (3.6)	Lack of recognition of interaction as a valid type of scholarship in my university (3.6)
FUNAAB	Pressures of teaching and research on my time are too great (3.4)	Lack of clear university policy on interaction (3.4)	Limited financial resources are available (3.4)/ Lack of clear university structures to promote interaction activities (3.4)
FUTA	Interaction is not appropriate given the nature of my academic field and discipline. (3.4)	Lack of recognition of interaction as a valid type of scholarship in my university (3.3)	Pressures of teaching and research on my time are too great (3.1)/ Limited financial resources are available (3.1)
The least rationales for lack of interaction between academics and external social partners			
UI	University administration systems do not support Interaction (2.4)	Interaction is not appropriate given the nature of my academic field or discipline (2.3)	Interaction is not central to my academic role (2.3)
FUNAAB	My department or faculty does not promote Interaction (2.3)	Interaction is not central to my academic role (2.2)	Interaction is not appropriate given the nature of my academic field or discipline (2.1)
FUTA	Lack of social partners knowledge about research activities and priorities in universities (2.7) / Lack of clear university policy on interaction (2.7)	My department or faculty does not promote interaction (2.5)	University administration systems do not support interaction (2.4)

Note: WAI scores are reported in parenthesis.

Source: Analysis of survey data, 2012.

7.8. Implications of the Pattern of Academic Interaction for the National System of Innovation

The comparative analysis presented in this chapter demonstrates that the pattern of interactions varies by university types. If the trends observed in the research samples become dominant or pervasive, it would have important implications for Nigerian universities as agents of innovation for inclusive development. The emerging pattern of university interaction with external social partners would either constrain or advance the pace and extent of the development of the national system of innovation (NSI).

Academics in all three university types interact with individuals, households, schools, and national universities as main external social partners. SMMEs appeared among the three most frequently mentioned external social partners only in FUTA. In the NSI framework, the firm is the centre of innovation, and hence the tendency to interact with SMMEs by FUTA portends a likelihood of strengthening the NSI through innovation activities by SMMEs. However, this may not necessarily result in innovation for inclusive development because the findings of this study have provided no evidence for strong interaction between FUTA and marginalised communities. The partnerships with schools and national universities would provide opportunities for improving the quality of education in high schools and learning among the interacting universities. It is also doubtful if this would translate into improvement in knowledge required for innovation in informal settings.

At the University of Ibadan, a conventional university, the findings revealed that there has been a paradigm shift in the university's mission from mere production of elite leaders and civil servants to that of a research university. Attempts aimed at linking the aspirations of the university to the national system of innovation have been focused on the NSI and its formal sector relationships. It is indicative that the tendency towards becoming a research university may not involve substantial interactions at the community level except teaching and research are deliberately made to be community based.

For FUNAAB, there is ample evidence of community based interaction through the university extension services and practical year training in the rural farming communities. While interactions by the sample academics in UI and FUTA are mainly traditional and service forms of interaction, the academics interaction at FUNAAB provided substantial cases of network forms of interaction that may promote innovation for inclusive development. If these interactions are sustained and widely replicated, the NSI would most likely respond by shifting attention of innovative activities to favour innovation in informal settings. This could enable the NSI make significant impact on innovation for inclusive development.

Entrepreneurship fosters innovation at the firm level and consequently promotes the NSI. The results of the study however demonstrate the lack of entrepreneurship forms of interaction among the respondents from the three university types. This is more pronounced for UI and FUTA, while FUNAAB appears to have somewhat made its community engagement activities to produce commercial gains through farmer-students-lecturers relationships that encourage farming as a business enterprise.

The outputs of interaction by the sample of academics from each of the three university types are remarkably similar. This suggests that university types have little or no influence on the

nature of outputs by the sample of academics with interaction. The main outputs of interactions are academic related publications and graduates with relevant skills and values. Graduates with relevant skills feature so prominently because all the three universities regarded teaching and skills development as the most important function of the university. Skills development is crucial for human capital requirement of the NSI, and improved quality of graduate turnouts will therefore enhance the strengthening of the NSI.

On the whole, while the small sample size and the apparent lack of representativeness make generalisation from the findings of the mapping of university interactions difficult, the observed pattern of interaction across the university types is a product of a higher education system that is deficient in the prioritisation of science, technology and innovation as important drivers of economic and social development. Policy reform that provides incentives for university interactions with community and recognises the accompanying innovation in informal settings as an indicator of scholarship would be helpful in encouraging universities' contribution to innovation for inclusive development.

While the report so far demonstrates that the pattern of interactions varies by university types, how this affects the nature of the university interaction with marginalised communities requires further examination. The next three chapters of this report therefore present selected in-depth case studies of university interaction with marginalised communities.

Chapter 8

UPGRADING TECHNOLOGICAL CAPABILITY OF AUTO-MECHANICS: THE INTERACTION BETWEEN UNIVERSITY OF IBADAN AND A PRIVATE SECTOR LIVELIHOOD ENHANCEMENT PROGRAMME

8.1. Introduction

The Nigerian automobile industry had a good start in the 1970s with the establishment of automobile assembly plants as a major component of the import substitution industrialisation strategy. In addition to producing vehicles for the local market, the assembly plants were expected to provide opportunities for building technological capability in automobile manufacturing (Adubifa, 1990). The Nigerian government accordingly established six automobile assembly plants between 1973 and 1980.²² This effort promoted technology transfer and skill acquisition by local artisans because these companies engaged their services. However, the Nigerian economic recession in the mid-1980s led to the shut down of most of the automobile assembly plants. The purchasing power and the per capita income of Nigeria declined rapidly and an average Nigerian could not afford to buy a new vehicle. Private individuals, most public agencies and private sector firms became dependent on second hand (i.e., used) vehicles popularly called *tokunbo*.²³ *Tokunbo* vehicles are mainly imported from Europe, North America and Asia. Automobile marketing companies or agents of foreign manufacturers of popular auto brands flooded the Nigerian market with *tokunbo* vehicles. In spite of economic recovery in recent years, Nigeria still largely depends on these second hand vehicles. As reported by Chamberlain and Ede (2013), about 80 per cent of automobiles used in Nigeria are imported used cars. This implies that most automobiles in Nigeria are prone to develop faults of different sorts due to old age. The servicing and auto-repair industry in Nigeria is dominated by informal sector artisans called auto-mechanics. The training of the auto-mechanics is often carried out under the traditional apprenticeship scheme characterised by obsolete technology and inadequate technical skills for the repair of modern vehicles.

In addition to the imported second hand modern vehicles, the improvement in the Nigerian economy has empowered some private individuals, public and private sector agencies to resume the purchase of new vehicles. It is also noteworthy that most of the imported second hand vehicles in recent years are modern vehicles. Modern vehicles, either purchased new or as *tokunbo*, are high technology vehicles. They are *de facto* mechatronics, a mechanical system with substantial electronic components. The technical features of modern vehicles have rendered traditional apprenticeship system incapable of training a new generation of auto-mechanics that can handle the servicing and repairs of modern vehicles. Consequently, a livelihood challenge was created for the informal sector auto-mechanics because many of them could not handle the technical challenges of modern vehicles which currently dominate Nigerian roads.

²²These vehicle assembly plants are Peugeot Automobile Nigeria Limited (PANL), Kaduna; Volkswagen of Nigeria Limited (VWONL), Lagos; Anambra Motor Manufacturing Limited (ANAMMCO), Emene-Enugu; Steyr Nigeria Limited, Bauchi; National Truck Manufacturers (NTM), Kano; Fiat Production and LeyLand Nigeria Limited (LNL), Ibadan.

²³ 'Tokunbo' is a Yoruba name for second hand or used goods (particularly vehicles) imported for use in Nigeria. The word literally means 'born abroad and returned home'.

In Nigeria, auto-mechanic is a major livelihood activity and a source of employment for many individuals. It is generally associated with people of low educational attainments and poor family background. The traditional or informal apprenticeship scheme for auto-mechanics is a minimum of three years training under a master-trainer. The certification is usually informal because no formal assessment of skills is done after training. Once the specified learning period is completed, the apprentice is encouraged to start on his own or given an informal certificate which normally reads that the apprentice has successfully completed his apprenticeship under his master-trainer for the stipulated period. On one hand, the informal apprenticeship training is largely unrecognised by government for formal sector employment. On the other hand, the government approved technical colleges or centres for vocational education/training which provides training in technical skills are often inaccessible for informal sector workers due to high costs of training or lack of the pre-requisite formal education required for admission. From the foregoing, auto-mechanics in Nigeria are apparently a marginalised group. A typical auto-mechanic workshop in Nigeria is operated along the roadsides, on vacant plots, in open air, under tree shades or in a cluster called 'mechanics village' (See Plate 1 and 2).

The interaction between the University of Ibadan (UI) and MAC BEN Automobile Technology²⁴ (hereafter, MAC BEN) is a case of skills and technology upgrading aimed at addressing the livelihood challenge of auto-mechanics in the informal sector of the economy. The interaction is supported by the Department of Mechanical Engineering and the Distance Learning Centre (DLC) of the University of Ibadan. The DLC is one of the interface structures established by the university in the pursuit of her new vision and mission statements. The mandate of DLC is to provide lifelong education for individuals that do not have the opportunity for full time academic programme. In the process of fulfilling this mandate the DLC also generates substantial income for the university through the fees charged for its academic programmes.

MAC BEN was registered by the Corporate Affairs Commission (CAC) of Nigeria as a limited liability company in 2009. As a business enterprise, the company has a profit motive in its engagement with the University of Ibadan. MAC BEN is owned by two persons. One of them has a Diploma in Automobile Engineering while the other partner has a Masters in Business administration. The father of one of the partners was an informal sector auto-mechanic. He claimed to have a passion for contributing to the improvement of the livelihood conditions of the community of artisans among whom he grew up. This introduced a social conscience dimension to the motivation of MAC BEN in the initiation and operation of the auto-mechanic programme. The focus on community development by MAC BEN creates an intersection with the vision of the University of Ibadan which seeks to make societal impact through community service. This overlap is a major factor that has reinforced and sustained the partnership between UI and MAC BEN.

²⁴ MAC BEN Automobile Technology is a private sector organisation established in 2009 and specialises in the training of local auto-mechanics in the repairs of high-tech vehicles.

Plate 8.1: Auto-mechanic workshop in a mechanic village



Plate 8.2: Auto-mechanic workshop on a vacant plot



The main location of MAC BEN is Lagos where the first training workshop was established in 2009. The two persons that established MAC BEN were the initial tutors. After a while, more tutors were recruited from among the graduates from the programme. This was explicitly stated in one of the interviews as follows:

When we started, it was my colleague and I that were doing the teaching. When we did the first one, we observed that some of the students were very intelligent and well educated. One of them has an M.Sc. So we called a few of the graduates of the programme and gave them special training on the content of the programme and how they will deliver the course to the students (Auto-mechanic Interview No.4).

8.2. Overview and Structure of the Interaction

The interaction between MAC BEN and the University of Ibadan began in 2010 while the initial ground works were done in the previous year. Before the partnership with UI started, certificates were usually issued by MAC BEN to participants at the end of the training programme. In order to formalise and provide credibility to the certificates issued by MAC BEN, the idea of engagement with a formal institution of higher learning was seriously considered. MAC BEN therefore decided to enter into a partnership with the University of Ibadan which was identified as having a strong institutional commitment towards societal development. The university provides the administrative and theoretical support for the interaction while MAC BEN provides the practical aspects of the training programme.

It was anticipated by MAC BEN that a partnership with a renowned academic institution such as the University of Ibadan will reinforce its capacity to help upgrade the skills of auto-mechanics and thereby contribute to the process of bridging the technological gap created by the existence of modern vehicles and informal sector auto-mechanics. The interaction involves the training of auto-mechanics in the use of scanners for automobile diagnosis and detection of faults, workshop management and entrepreneurial skill development. This is indicated as follows in the interview with MAC BEN:

There has been a great improvement in auto engine in the automotive industry. When a new auto engine comes in for repairs, the mechanic will condemn it because he has no knowledge of how to use scanner to diagnose the vehicles. My mechanic sometimes told me to convert my auto vehicles to manual control system simply because he cannot repair it when there is fault. Because of how these mechanics damage people's car, we decided to establish a centre to train them on how to repair the new high tech vehicles so that some of them will not go out of job. And more so, we thought of university with a name and the right policy for the entry. Thereafter, we approached the University of Ibadan, which already had a framework for training adult professionals through its Distance Learning Centre (Auto-mechanic Interview No.4).

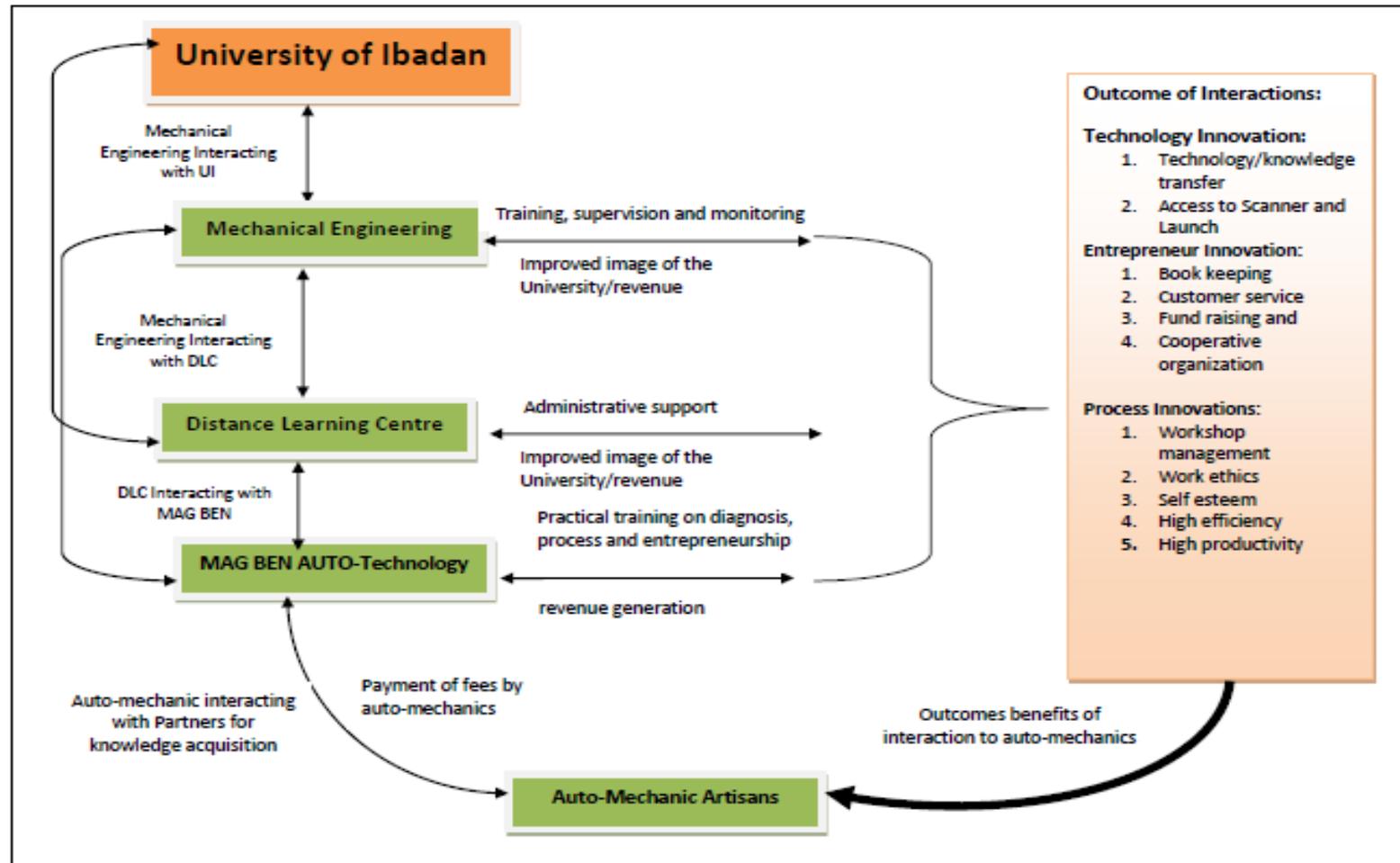
As a starting point, MAC BEN visited the university to discuss the idea of establishing an auto-mechanic programme with the university. The university appreciated the idea and mandated MAC BEN to come up with a proposal. MAC BEN then developed the proposal on the automobile training programme. MAC BEN was able to achieve this because of the literacy level of the two partners that established MAC BEN. One of the partners has a background in science but his counterpart has background in automobile maintenance and repairs. It is also noteworthy that the family background of the scientist also informed the interest of MAC BEN in the auto-mechanic training. The responses of one of the MAC BEN partners provide these insights.

I am not an auto-mechanic. I actually have my background in science but my father was an auto-mechanic. I understand the challenges of the auto-mechanics due to my family background, but my MAC BEN partner is directly into the auto-mechanic trade. He is auto-technical by training, i.e. people they call rewire (auto-electrician). He trained under a Diploma course in London School of Automotive Trades. We came together to plan for the establishment of this programme since he has the skills and I have the business idea. We decided to help educate people, especially the

informal sector artisans. Before we started this business in UI, we had few people who came for the training. We trained them on how to use latest auto diagnosis equipment because today's cars are intelligent cars. So we trained few people before we went to UI to formalise the certificates we issue to participants. MAC BEN Automotive Technology was actually established to train people to have knowledge of modern automotive garage operations (Auto-mechanic Interview No.4).

The proposal was presented to the Senate of the University for review, and it was subsequently approved by the university. A formal Memorandum of Understanding (MoU) was signed in 2009 for the final commencement of the programme in 2010/2011 academic session. At this point, the university brought in the DLC as its interface structure whose mandate fits into the proposed programme of auto-mechanic training. The Department of Mechanical Engineering whose mandate is to provide mechanical engineering training through its teaching and research was also integrated into the programme. These two organs represent the university in the interaction. The DLC provides the administrative backup for the programme such as advertisement of the programme in different media as well as the screening of candidates for admission. The DLC is also responsible for issuing of certificates to graduates from the programme. The Department of Mechanical Engineering of the University of Ibadan provides support for teaching the theoretical aspect of the programme and helps in the moderation of the course content and assessment of the students to promote quality control in the programme. Figure 8.1 shows the relationship among the partners involved in the interaction.

Figure 8.1: Map of interaction of partners in the auto-mechanic programme



After the signing of the MoU between the partners, the modalities for the admission of students were collectively worked out by all the partners. In view of the calibre of target participants, the general requirements for admission into the programme include at least a First School Leaving Certificate (six years of basic school education) or West African School Certificate (eleven years of schooling). Auto-mechanics apprentices and professionals with at least one year working experience are also accepted for admission into the programme.

The training programme is a three months full time course with three components. The first part is the theoretical background of the automotive industry; the second is the technological trend of the automobile industry; and the third is the business and entrepreneurship component. The Department of Mechanical Engineering of the University of Ibadan is involved in the first part, while MAC BEN handles the second and third components of the training. MAC BEN is particularly responsible for the practical aspects which include use of the launch and auto scanners in the diagnosis and detection of faults, assemblage and disassemblage of automobiles, workshop management and customer relations. The launch²⁵ and auto scanners are the new technologies in the automobile industry for analysis, diagnosis and detection of faults in modern auto vehicles.

At the time of this case study, there were eight training centres for the programme. Training in all the three components takes place simultaneously across the established centres. The first component takes place in a classroom environment established in each of the centres while the other components take place at designated workshops in each of the centres. The course objectives, programme contents and mode of delivery are shown in Box 8.1.

The Auto-mechanic programme has eight main objectives. Two major highlights of the objectives are the creation of self-esteem for young people willing to venture into the automobile repairs and the teaching of the business side of auto workshop management. These are necessary skills for effective job performance of the auto-mechanics. Without self-esteem, individuals are not likely to derive job satisfaction. When there is lack of job satisfaction, low productivity, low income, poor livelihood conditions and high job turnover rates may be unavoidable. The high turnover rates are already a problem among the auto-mechanics who often quit their jobs for commercial motorcycle transport (Okada riding) or tricycle driving (Keke NAPEP) as reported in these excerpts from the field interview:

Many of our colleagues have left this job because of low patronage and they cannot repair the modern cars before the coming of the MAC BEN automobile programme. Many of them are now driving Okada or Keke NAPEP. But this programme is good and will help many of us now to remain in the business for a long time to come since we now have the skill and technology to repair any brand of car (Auto-mechanic Interview No. 7).

²⁵ Launch X431 GDS is an auto diagnostic tool like the scanner but with higher diagnostic sensitivity than the ordinary scanner.

Box 8.1: Components of the automechanic training programme**COURSE OBJECTIVES**

1. To upgrade the knowledge base of technicians in automobile repairs especially in the informal sector
2. To promote good working ethics among the automobile repairs technicians
3. To provide a data/information centre for the maintenance of today's auto engines
4. To provide opportunities for young school leavers and other Nigerians interested in taking up a career in modern automotive care
5. To promote skill up-grade for auto technicians
6. To empower individuals willing to start up a business in auto maintenance
7. To create self esteem for young people willing to venture into the auto industry
8. To learn the business side of auto workshop management.

COURSE COMPONENTS**Part 1****1. History of Automobile****2. Component and functioning of Automobiles**

- a) Continuous variable transmission (CVT)
- b) Transponder key programming
- c) Understanding electronically controlled transmission
- d) Hybrid system

Part 2: Workshop Practical**Part 3: Business and Entrepreneurial Training**

1. Book keeping
2. Customer service
3. How to raise fund
4. How to form cooperative Societies

TRAINING DELIVERY

1. Power Point
2. Graphics
3. Component identification
4. Practical demonstrations
5. Language of Training
 - a) English
 - b) Pidgin English
 - c) Yoruba

The programme commenced in Lagos centre with about 50 students in 2010. By 2013, the student population has risen to over a thousand with eight centres enabled by the collaboration with the University of Ibadan. Table 8.1 shows the trends in students' enrolment and graduates from 2010 to 2012. Ilorin and Ibadan centres were established in 2011. Five more centres were established in 2012 at Akure, Abeokuta, Osogbo, Omiaro and Ilesha. This trend apparently indicates that the programme has gained increased recognition and awareness among community of artisans.

Table 8.1: Trend in students' enrolment and graduates, 2010-2012

Academic Session	No. of Students Admitted	No. of Students Graduated	No. of Centres
2010	50	35	1
2011	102	80	2
2012	1, 235	988	5
Total	1387	1103	8

Source: Fieldwork, 2014

The proceeds derived from the training fees are shared among the three partners, which include UI, DLC and MAC BEN. The programme has enhanced DLC's capacity to provide lifelong training opportunities for individuals with little or no access to formal education. Though MAC BEN has so far claimed no financial profit from the programme, the acceptance of the programme as revealed by the rapid increase in the number of training centres and students' enrolment is an encouragement that the programme would eventually be financially profitable. Thus, all the partners are satisfied with the programme as can be seen in the following interview excerpts:

From my part, I am very satisfied with the programme so far because it is a good beginning (Auto-mechanic Interview No.2).

With respect to risk, I do not see any risk in the whole process of the programme. The programme can be further developed with more funds available. I am highly satisfied with the programme. (Auto-mechanic Interview No.3)

MAC BEN's future plan is to expand the training centres to other zones in Nigeria so that all the auto-mechanics in Nigeria will benefit from the programme while at the same time enhancing the potentials of the engagement to make profits.

8.3. Drivers of Interaction

There are several drivers of the interaction among the three partners. For all the partners, financial motive is a major driver of interaction. At the university level, the main driver of the interaction is the university's desire to realise the new vision and mission statements. The university acknowledged that technological innovations and the development of entrepreneurial capacity are central to the success of most modern economies and the university must assume leadership position in this respect by fostering partnerships with other actors in the society (University of Ibadan, 2009). The university's vision statement is to be a world-class institution for academic excellence geared towards meeting societal needs. The university alone cannot achieve this vision without interactions with the external social partners. The university's first mission statement harps on knowledge, learning and research as core to national system of innovation. The second mission statement focuses on the production of graduates worthy in character and sound judgement. This is one of the important prerequisites for new skills and entrepreneurship culture that can enable development to be truly inclusive. The third mission of the university directly focuses on making innovation to drive societal transformation. Generally, the new vision is in consonance with the imperative of making the universities a major actor in innovation for inclusive development in Nigeria. As can be seen from the above, the urge to fulfil its new

vision and mission statement is the major driver of the university's engagement in the auto-mechanic programme. It can thus be concluded that the drivers are intellectual, financial and social conscience reasons.

According to Aderoba (2000), roadside artisans including auto-mechanics account for more than 80 per cent of the engineering family in Nigeria. They have indeed been the saving grace for preventing the total collapse of many engineering infrastructure and facilities. According to him, governments must institute a programme of continuing education for these groups of artisans in league with the guilds and craft associations. This realisation among the engineering professional has also motivated the participation of the Department of Mechanical Engineering in the interaction. This realisation among the engineering professional has also motivated the participation of the department in the interaction. The following responses from the former Head of Department of Mechanical Engineering helps to elucidate the above facts:

The main driver of the programme is the desire to make good impact on the community. The University has through the programme empowered artisans in the auto-mechanics trade because if they cannot handle new cars when old cars are gone, they will be out of jobs. It is part of creating employment. Yes, there is local demand for the programme on the part of the auto-mechanics and the society. It is a fact that the artisans cannot repair the modern vehicles and the society is also facing the new challenges arising from the inability of artisans to repair their vehicles. This gap must be filled, and it is another major driver of the interaction. It is also true that there is an urgent need to certify most of the auto-mechanics to boost their morale and credibility (Auto-mechanic Interview No.2).

On the part of the DLC, the zeal to fulfil its mandate and desire to improve revenue generation are the major drivers of the interaction. It can be argued that the drivers are intellectual, financial and social conscience reasons on the part of the DLC. This is clear from the following interview excerpts:

We just want to use it to help the masses especially the artisans. We want them to have the feeling of education. At least most of them are primary 6 school leavers. We want to encourage them to have the certificate. When they have the certificate, they proceed to the diploma level and become graduates (Auto-mechanic Interview No.2).

The centre is fulfilling its own mandate of providing access to quality education and equity in educational opportunities for those who otherwise would have been denied. This mandate is core to whatsoever we do in the centre, and this programme greatly contributes to achieving this mandate (Auto-mechanic Interview No.2).

There is no significant financial gain from the programme as we speak. Each student pays N25,000, which is shared between the Department of Mechanical Engineering, MAC BEN and DLC. The course fee is not enough considering what goes into the programme for three months (Auto-mechanic Interview No.2).

On the part of MAC BEN as the private sector partner, the drivers could be seen as financial motive and social conscience. This is illustrated by the following interview excerpt:

We have not made profit since we started. We have been spending our money. What actually motivated me was my experience when I was young. My father was an auto-mechanic and I know what I went through because he couldn't cope. He was not able to meet up because we didn't have the knowledge. It motivated me to train this road side auto-mechanics because they have the skills but do not understand the practical aspect of these new auto cars (Auto-mechanic Interview No.4).

8.4. Innovation

The products of the interaction between the University of Ibadan, MAC BEN and the local artisans (auto-mechanics) are innovations which take several forms, but most distinct are technological, process, business and organisational innovations. These innovations are new to the artisans' community but not new to the world. The interaction has contributed to the auto-mechanics' understanding of the technological dynamics of modern automobiles. Their capacity to repair modern high-tech vehicles improved and thereby enhancing their income and livelihood conditions. The technological innovation has brought about knowledge transfer, acquisition and utilisation of new equipment such as the launch and auto scanner which are the major diagnostic equipment for modern automobiles. The use of the auto scanners is essentially a process innovation that has significantly changed the operations of the auto-mechanic trade. Before learning how to use auto scanners, the diagnosis of cars was done by the auto-mechanics using trier and error methods and common sense. This often introduced new faults and damage into the automobiles. In this respect, the following interview excerpts are insightful:

I don't know how to scan a car. Now, I can scan very well. I only knew how to repair Mercedes Benz cars. But when we went for the training, we told our master that we can only repair Mercedes and he said we will learn all cars. As I speak with you now, I can repair any type of car in this workshop and you can see different types of cars here. I am the one repairing them (Auto-mechanic Interview No.3).

I am now applying the technology in my work. I used the scanner for all types of vehicles. How much is the scanner that I cannot buy it? The scanner is just N15,000, and I bought it myself. If you come through somebody, I will take N2, 000 for auto-scanning. If you come on your own, I can take N3, 000. I don't charge too much. I will scan the car to verify the problem before I will proffer solution. I don't know how to scan cars before I attended the DLC/MAC BEN programme. But now I can scan any car in this my workshop. Also, before now, I don't know how to charge customers and even relate with them as a professional. But now, all these have changed after the programme. I can manage my income properly because they also taught us all these during the training. Yes, I am using the new scanning machine on a daily basis (Auto-mechanic Interview No.5).

Plates 8.3 and 8.4 show the auto-mechanics in their workshop displaying their auto scanners.

Plate 8.3: An auto-mechanic displaying his auto scanner



Plate 8.4: An auto-mechanic with his apprentices and auto scanner



The manifestat
this excerpt:

MAC BEN in

Secondly, we have impacted the knowledge on how to manage their business in the automobile industry. We encouraged them to form cooperatives and limited liability companies in order to take their business to higher levels that can be helped by banks especially microfinance banks. We have also introduced them to how they can have dignity of labour by right assessment of their charges for services (Auto-mechanic Interview No.4).

The auto-mechanics that have participated in the training also agreed to have learnt business innovation as demonstrated by their new skills of customer relations and financial management. This can be seen in the following interview excerpts:

I don't know how to scan cars but now I can scan any car in this my workshop. Also, before now, I don't know how to charge customers and

even relate with them as a professional. But now, all these have changed after the programme. I can manage my income properly because they also taught us all these during the training. Yes I am using the new scanning machine on a daily basis (Auto-mechanic Interview No.6).

I have launch (computer scanner) scanner and use it to diagnose the problem of cars. I have been hearing about the launch. Ten of us gathered money to buy the equipment and it cost four hundred and fifty thousand Naira (\$2,903) (Auto-mechanic Interview No.7).

The business innovation was achieved through the course on entrepreneurship which incorporates aspects of book keeping, customer relation, how to raise funds, and formation of cooperative societies. The introduction of this component into the training programme was based on earlier feedbacks from trainees of the programme. The feedback from the auto-mechanics revealed their inability to keep proper financial records, inability to raise funds through microfinance banks, and poor customer relations. The business innovation component of the training programme addressed these challenges, and thus broadens the benefits of the programme to the participants.

The organisational innovation aspect covers areas of workshop management, work ethics, self-esteem, high efficiency and productivity. In this respect, participants were trained on workshop management such as hiring employees with experience, cultivating good relationship with customers as well as auto spare parts dealers. This has really helped the programme participants in the management of their workshop. The training on work ethics introduced the participants to the importance of wearing overalls once at the workshop and the need for self-esteem in the profession. The organisational innovation aspect generally enabled learning by doing, and impacted on efficiency and productivity of the auto-mechanics. The following excerpts explain this lucidly:

The type of learning is mainly on the job and leads to technology transfer. These artisans have vast experiences in the practical aspect of vehicle maintenance but lack knowledge of modern vehicles. This new knowledge of high tech vehicles is being transferred to them by the programme. We teach them the theoretical aspect and the practical aspect. We also teach them how to serve customers. For instance, if you go to some workshop, some of them wear anything but those that trained here wear uniforms. We taught them how to arrange their shop tools, and to be courteous in approach when dealing with customers (Auto-mechanic Interview No.1).

8.5. Knowledge and Skills

The knowledge and skills emanating from the auto-mechanic programme occur in three domains. The first relates to technical knowledge, the second relates to entrepreneurial skills, and the third deals with workshop process skills. Through the interaction among the partners in the auto-mechanic programme, auto-mechanics have learnt technical skills in the use of the launch and auto scanners for the diagnosis of automobiles. They have also learnt entrepreneurial skills in the areas of bookkeeping, customer relation and fund raising from microfinance institutions. The knowledge of workshop process skills offered by the programme incorporates workshop management, work ethics, self-esteem, efficiency and productivity. These knowledge and skills flow is uni-directional with scientific knowledge and entrepreneurial knowledge being passed from the university to the auto-mechanic

participants. While the auto-mechanics had some practical knowledge of automobiles, the knowledge was not shared with the tutors during the programme as can be seen in this excerpt:

Sincerely, when they were teaching us, I discovered some places where they were wrong but I didn't know how to correct them. I was only able to correct myself (Auto-mechanic Interview No.5).

With respect to the level of knowledge and skills intensity, the training programme may be considered as being non-intensive. It is simply learning to use new diagnostic technology in the diagnosis of automobiles by the auto-mechanics. Other aspects of the training programme such as the entrepreneurial skills module are relatively simple knowledge transfer mechanisms. In terms of the hierarchy of knowledge exchanges, the exchanges are largely horizontal with the academics and MAC BEN relating directly with the auto-mechanics without acting through vertical structures. This is due to the fact that the auto-mechanics come directly to the programme without any intermediary like association or cooperatives.

Indigenous knowledge plays a minor role in the interaction. Indigenous knowledge is sometimes incorporated when the teaching is done using the Yoruba language. The following interview excerpt illustrates this:

Knowledge generation is both scientific and traditional knowledge. It is scientific knowledge in the sense of introducing to them new technology, but traditional in the sense that when teaching them we use not just English but we use Yoruba language to explain to them (Auto-mechanic Interview No.4).

8.6. Community Participation

Community participation has not been a central feature in the auto-mechanic programme at the University of Ibadan. The auto-mechanic participants did not play any role in problem identification, coming up with solutions or deciding whether the solution works or not. In terms of idea generation, evaluation and design, it was largely the function of the partners including MAC BEN and the University of Ibadan represented by the DLC and the Department of Mechanical Engineering. The following interview excerpt attests to this:

Yes, I will say that the participants did not play any role in the identification of the livelihood problem. We thought of it on our own because we have these modern tech vehicles. Even though the participants experience these challenges on a daily basis, they did not come with the idea of the programme. I think credits should go to MAC BEN for the initiation of the programme from where the university picks it up. Also, they are not involved in evaluation and design of the programme (Auto-mechanic Interview No.2).

The involvement of the participants is largely a standard customer of educational services relationship. The following interview excerpts suggest that the participants did not engage in the auto-mechanic programme as a community of artisans. Rather, individual auto-mechanics got involved in the programme by personal persuasion or conviction. They pay their training fees and attend the lectures and practical sessions. Thus, community participation is lacking in the programme design and implementation.

We have the problem but we don't know how to address it. I think the university saw it as a problem to us and so they wanted to help us. The university did not consult us when they were planning the programme. They only came to inform us to come and buy form to enrol for the programme and we all went (Auto-mechanic Interview No.5)

The auto-mechanics that have participated in the programme are many. During my time in 2010, there were about 100 auto-mechanics in my class. Since then, many people have graduated from the programme (Auto-mechanic Interview No.5)

I think our contribution to the programme is paying our training fees and attending the lectures. Apart from these, we don't do any other thing in the programme (Auto-mechanic Interview No.5).

We were not involved at that stage. It was when the programme was about to start that they contacted us as participants. We did not participate in any other stage of the programme. It was the university and MAC BEN that did the initial ground work. But I don't know how it was done (Auto-mechanic Interview No.6).

8.7. Outcomes, Benefits and Risks

The interaction has identifiable benefits which tends to vary from partner to partner. The direct benefits to the auto-mechanics include increased income, new and more scientific approach to automobile diagnosis. Outcomes for auto-mechanics include improved sustainability of their livelihood, enhanced entrepreneurial skills, improved customer relations, and better workshop management strategies. The following interview excerpts support this:

Since the training ended and certificate awarded to me, I have many customers and I made more money on a daily basis especially from scanning of cars. I scan up to five cars per day at three thousand naira per car. I also do other petty jobs on other cars. So it is a whole lot of money. Well to the glory of God, three of my children are now in school which I was unable to do before, and I am now able to feed my family well. I just thank God for the programme. My family's wellbeing is good because everybody is feeding well. (Auto-mechanic Interview No.6).

There are actually more jobs now in this workshop as you can even see now. Sometimes, there are no parking spaces again and we have to start arranging the cars to give more spaces..... I know many mechanics with whom I attended the programme. We are all doing well. It is really a good programme. In this coming session, I know of a number of mechanics who are now ready to register for the programme. Some are interested but they don't have money to register. (Auto-mechanic Interview No.6).

The direct benefits to the university are more of image laundering for the university. It has contributed immensely to the attainments of the university's vision and mission statements. The university can make reference to the auto-mechanic programme as an important contribution signifying the impact of the university on the informal sector economy. On the part of MAC BEN, there is a sense of fulfilment and satisfaction with the success of the programme even though no profit has been made so far.

The major risk currently associated with the auto-mechanic programme is the inability of MAC BEN to make profit from the programme. As a limited liability company, not making profit could serve as a disincentive for continuous participation in the programme. There is also likelihood of conflict arising among the partners with respect to sharing of revenue accruing from the programme.

The relatively low training fees charged for the programme as reported by all the partners involved in the interaction poses another major risk most especially in the absence of any financial support from government or development partners. From programme design and implementation, it is apparent that the partners are not expecting funding from donors or government. The low fees charged participants is to ensure that they are able to pay their fees and also to encourage mass participation in the programme. It is uncertain whether this regime of low fees and mass participation is sustainable and able to guarantee high quality programme delivery.

8.8. Conclusion

The University of Ibadan auto-mechanic programme is an example of public-private partnership aimed at addressing the livelihood challenges of local artisans in the informal setting. The interaction among partners enabled process innovation in the handling of the maintenance and repairs of modern high technology automobiles, business innovation in workshop practices, customer relations and entrepreneurship.

The core activities of the engagement have been capacity building through knowledge and skills upgrading and entrepreneurship development. On one hand, the DLC and the Department of Mechanical Engineering have been complementing one another respectively in the area of general administration and quality control of the programme. On the other hand, the private sector partner (MAC BEN) has demonstrated strong commitment to the training component comprising the lectureship and practical instruction sessions. The main drivers of the interaction are the potential for financial reward and the commitment of the partners to make impact in their communities by helping to address societal challenges.

The university of Ibadan and MAC BEN are the two partners that played the role of major actors in the programme design and implementation. The auto-mechanics have no participation in programme design and initiation but only presented themselves for training. Though the community of artisans (auto-mechanics) were aware of their livelihood challenges, they do not know where to seek help until the University of Ibadan auto-mechanic programme began. Thus, the debut of the programme was a major relief for many of them as demonstrated by the increasing number of candidates for the programme. The major innovation associated with the training programme is the application of auto scanner and launch for diagnosing vehicular faults. This innovation is undoubtedly new to the community of artisans and knowledge flow has been mostly 'uni-directional' with knowledge generated by the partners being transferred to local auto-mechanics.

Several conditions can be identified as enablers of the interaction and conditions that facilitate the transfer of auto scanning technology to the informal sector auto-mechanics. The enablers of the interaction include:

1. The necessity to achieve the university's new vision and mission statements most especially that of contributing to societal development.
2. The availability of interface structure within the university (i.e., DLC) provided a spring-board for the effective implementation of the auto-mechanic programme.

3. The problem of technological gap created by the emergence of the high tech vehicles.
4. The inability of the local auto-mechanics to repair modern automobiles created a major challenge for the auto-mechanics and the society in general. Since the cars must be repaired and the livelihood of the auto-mechanics must be sustained, it became mandatory to develop strategies for addressing the challenge. This actually drove the establishment of the auto-mechanic programme by the University of Ibadan.
5. The social conscience exhibited by the two persons that established MAC BEN.
6. The financial motivations on the part of MAC BEN and the university which view the programme as a potential profit making venture.
7. The enthusiasm exhibited by the auto-mechanics themselves in participating in the programme. This is evident from the increase in participants' enrolment as shown in the previous sections.

The foregoing notwithstanding, the interaction has notable constraints. From the framework presented on forms of interaction in chapter one (see Figure 1.1), the auto-mechanics case study does not fit into the network form of interaction that is expected to generate innovation for inclusive development. The absence of active community participation in the programme design and initiation, and the uni-directional flow of knowledge from the university/MAC BEN to the auto-mechanics make the interaction to be akin to the traditional forms of interaction where university acts as consultant and industry acts as client. It is however noteworthy that the auto-mechanic programme involves university relationship with the informal sector where innovation generated has direct benefits for marginalised communities. The involvement of automechanics of the informal sector thus makes the interaction capable of promoting innovation for inclusive development. Another major constraint is funding. It is obvious that the fees paid by the programme participants cannot sustain the programme. At the time of this study, the partners in the programme have so far been unable to break even. This makes programme sustainability and the maintenance of programme quality uncertain. On the whole, the auto-mechanic programme provides a new opportunity for advancing university-society interactions on a platform with potential impact for inclusive development. The constraints on the interactions suggest that the University of Ibadan requires a re-orientation that would enable it overcome the tendency to reduce relationships with external social partners to the traditional or accustomed forms of interaction of the type 'consultant-client' or 'doctor-patient' relationships.

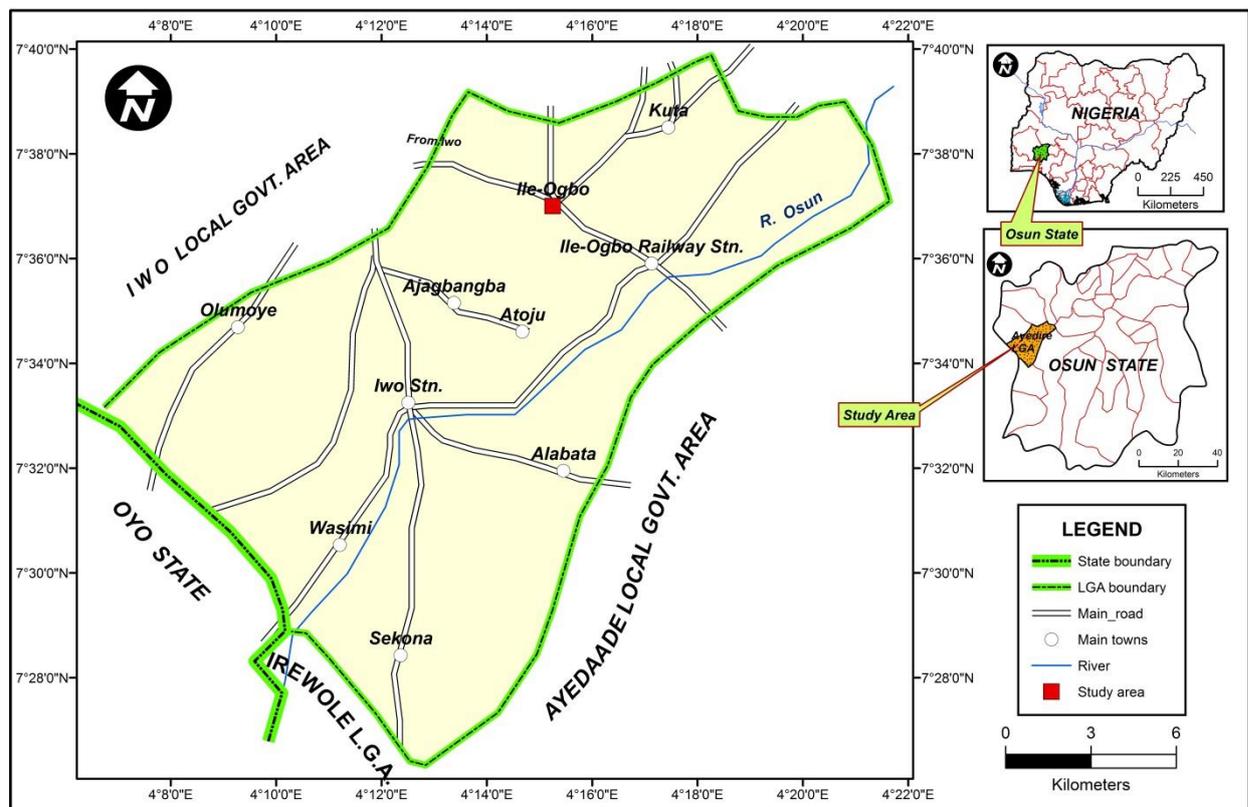
Chapter 9

INNOVATIVE SOLUTIONS FOR WOMEN EMPOWERMENT: AN INTERACTION BETWEEN UNIVERSITY OF IBADAN AND ILE-OGBO COMMUNITY

9.1. Introduction

The interaction between University of Ibadan and Ile-Ogbo community is a case of innovation and skills upgrading aimed at improving the livelihood conditions of women in a semi-urban community. Ile-Ogbo has a population of 40,000 residents and is the headquarters of Aiyedire Local Government Area (LGA) of Osun State, Nigeria. Nigeria has 774 LGAs out of which Osun State has 15. Ile-Ogbo is 5km from Iwo, one of the highly urbanised townships in Southwest Nigeria. Figure 9.1 shows the geographical location of Ile-Ogbo and its close proximity to Iwo Township. Ile-Ogbo community has a Town Hall, secondary schools, paved roads, water supply, grid electricity, railway station and other social amenities/infrastructure that are not commonly found in typical rural communities or villages in Nigeria. Ile-Ogbo is thus officially considered as a town or peri-urban community. Apart from formal sector employment in the local government agencies, the major occupation of the local population is farming. Agricultural processing and marketing activities are also common especially among the women population.

Figure 9.1: Map of Aiyedire Local Government showing Ile-Ogbo community



Ile-Ogbo is located 44km northwards from Ibadan City, and the University of Ibadan regards the town as a comparatively rural community. This is not unexpected because the university is located in Ibadan, a major Nigerian city, renowned for having the first skyscraper and the

first television station in Africa. The interaction between the University of Ibadan and Ile-Ogbo community is accordingly termed “Community Integrated Rural Development Project” (CIRDP). It is a community based development project tailored to the needs of the marginalised and vulnerable groups in Ile-Ogbo community. It also provides learning opportunities for the university and its students especially during the agricultural training programme’s practical year. The project is anchored by Department of Agricultural Extension and Rural Development in the University’s Faculty of Agriculture and Forestry. After identifying Ile-Ogbo community as a potential partner for projects that can foster improved livelihood conditions of marginalised communities, the university developed a proposal requesting for funding from MacArthur Foundation to engage in community development activities at Ile-Ogbo community. The funding request was targeted at empowerment of women groups who are engaged in agro-processing and animal husbandry. This was approved and funds were accordingly made available for community development activities at Ile-Ogbo.

9.2. Overview and Structure of the Interaction

The interaction between the University of Ibadan and Ile-Ogbo community started over twenty years ago when the community gave the university about 270 acres of land on the request of the university for teaching and research purpose because the existing Teaching and Research Farm of the university could not provide enough space for the university’s practical training programme. As revealed by the interview of the community leaders, about eighteen families donated their land to the university with the belief that a unit of the university will be established in their community. They expected that the university’s presence in their community will promote the economic empowerment of the rural population.

Majority of the people in the community are involved in donating land to the university at the inception of the CIRDP project. About 17-18 compounds donated their land to the University of Ibadan for the practical agricultural activities with the hope that a campus of the university will be established later, and the people will be economically empowered (CIRDP Interview No.2).

However, interviews of the university officials involved in the project revealed that the expectations of the community could not be realised because of inadequate funding of research activities by the Federal Government of Nigeria. The CIRDP project fund is project-specific and limited in the scope of what it can finance.

Due to lack of funds, the university could not do much in terms of activities that will affect the livelihood of the people in the community. The concern for the marginalised women in the community motivated a proposal written by Prof. Olawoye to MacArthur Foundation to fund community integrated rural development programme in Ile-Ogbo. The proposal was eventually approved for funding (CIRDP Interview No.10).

In Nigerian universities, agricultural science and agricultural related courses take five years to complete. At the University of Ibadan, the fourth year of the training programme is a compulsory “Practical Year Training Programme (PYTP)” for all students of the faculty of agriculture. Ile-Ogbo community is one of the communities where students are posted for the PYTP. So far, the university could only build a hostel in the community to accommodate PYTP students.

The university has a liaison officer who resides in Ile-Ogbo. The liaison officer regularly interacts with the Secretary to the Ile-Ogbo Council of Chiefs. The secretary to the council of chiefs keeps the record of all meetings on community development issues. He is also the community's mouthpiece and the channel through which the university communicates with the community. In the CIRDP project arrangement, the CIRDP project leaders and officers also interact directly with the community and the council of chiefs. In other to provide high level feedbacks on project performance, the CIRDP project team sometimes interacts directly with the king of Ile-Ogbo (Olu of Ile-Ogbo) who is the chairman of the council of chiefs. The willingness of the king and the council of chiefs to listen to people on community development issues encouraged interaction between the University of Ibadan and Ile-Ogbo community. The following interview excerpts provide insights on the critical role of the king in the interaction:

The role of the community and UI is determined by that of the Oba (i.e., King) of the town because anything he says applies to everybody. The Oba will tell the university if there is anything to be changed. The Oba has the final say about the interaction with the University. His word is final even though God used me to bring the university to Ile-Ogbo. The structure is the Oba/chiefs relates with the University representative, who will then relate with the university concerning the request of the community. Sometimes the university management goes to the king directly but the people in the community relate with the university liaison officer on ground (CIRDP Interview No.1).

The coming together of UI and Ile-Ogbo community on this project has been a harmonious relationship. At least three Vice-Chancellors have visited Ile-Ogbo. Apart from this project, the university has also contributed to the development project of the palace. The project has to some extent solved the problem of unemployment in the community. The project sponsored by Mac Arthur Foundation brought people from different countries to the community to look at the project, and this opened the community to the world (CIRDP Interview No.2).

The 400 Level agriculture students cultivate and plant crops such as maize and cassava during the PTYP. They interact with members of the community, and their interaction cuts across all categories of farmers including subsistence farmers, commercial farmers and agro processors.

Besides the university's faculty of Agriculture and the MacArthur Foundation, another main actor in the CIRDP project is Life Builders/VISDA Multi Ventures Ltd. The Life Builders/VISDA Multi Ventures Ltd is a non-governmental organisation (NGO) with a mission to encourage skills acquisition among rural women and promotion of herbal medicine. The NGO provided trainers who serve as resource persons in training women on the planting, processing and marketing of moringa. The MacArthur Foundation provided the funding support because of its keen interest in community development programme with substantial women empowerment component.

The Community Integrated Rural Development Project (CIRDP) was thus designed as an outreach project capable of bringing the influence of the university to the rural/semi-urban community. Specifically, it is to develop agricultural innovations and improve livelihood activities that can enhance the income and quality of life of the people in Ile-Ogbo. The engagement centred on income generating activities around agricultural products with new ideas and processes to improve the livelihood of the marginalised women in the community.

Free medical service is also rendered by the university through outreaches organised by the faculty of agriculture in collaboration with medical personnel in the university and Life Builders. Reduction of poverty and unemployment in Ile-Ogbo community is a major objective of the interaction. In this respect, CIRDP focuses on the adoption of new technologies by women who are considered marginalised in agriculture and the processing farm produce especially palm kernel and garri processing. The academics introduced innovative ideas in agro processing and animal husbandry to the marginalised women groups through training workshops. The university benefited in the interaction because the community serves as a laboratory for students in the Faculty of Agriculture to practice what they learnt in the classroom, and academics receive feedbacks and indigenous knowledge that help improve their research and teaching. The following interview excerpts are insightful on the purpose of the interaction:

The interaction tries to solve the problem of scarcity of land for practical purposes for the student of agriculture in the university. It also empowers women in the community. It involves teaching farmers on how to plant crops that will be profitable especially introducing new seedlings (moringa, coconuts, oil palm, citrus, etc.). Free medical service is also rendered by the university to the people in the community (CIRDP Interview No.1).

They are not worse off but there is improvement especially those people selling Moringa, Garri and Palm oil. They make a lot of money which has contributed to their financial empowerment. This has helped improve the livelihood of the people especially women. You know my wife is part of them, she can tell you everything but she may not tell me (CIRDP Interview No.2)

One of the most successful projects is the moringa project because of packaging. The processed moringa is packed inside plastic bottles which the university provided for the women group. Sometimes when we go there to look at them, we realise that some of the women have gone to hospitals to market the moringa product. I think it is selling very well and it is one of the most successful one (CIRDP Interview No.1)

Before now, I was selling petty goods in a kiosk. But when they brought this idea of moringa processing, it gave me an opportunity to go around. I travel as far as Ladoke Akintola University (LAUTECH) to sell moringa products. Moringa cultivation and processing does not involve much work. We just get people to clear the weeds on our farm and after production we sell it in the market. On a full tin, we gain about N100 which is for us a reasonable profit. It gives us opportunity to take care of ourselves and household. Those who buy and use our moringa products testify that it is also good for them. It is especially good for their health (CIRDP Interview No.3).

The CIRDP project also introduced improved seedlings (e.g., moringa seed, citrus, palm tree) to the community in order to improve their productivity. Crops grown in Ile-Ogbo include both arable crops such as cassava, maize, yams and melon and tree crops such as oil palm, cocoa, kolanut, cashew, citrus and banana. Most of the tree crops are owned by men, while women are mostly involved in producing vegetables, tomato, okro and pepper. This accounts for why women are the people involved in the planting and processing of moringa seed which is one of the most successful income generating activities introduced under the CIRDP in Ile-Ogbo. This case study therefore emphasises three out of the income generating activities. These are:

- Palm oil/kernel processing,
- Production of snail, and

- Production, processing, utilisation and marketing of *moringa oleifera*.²⁶

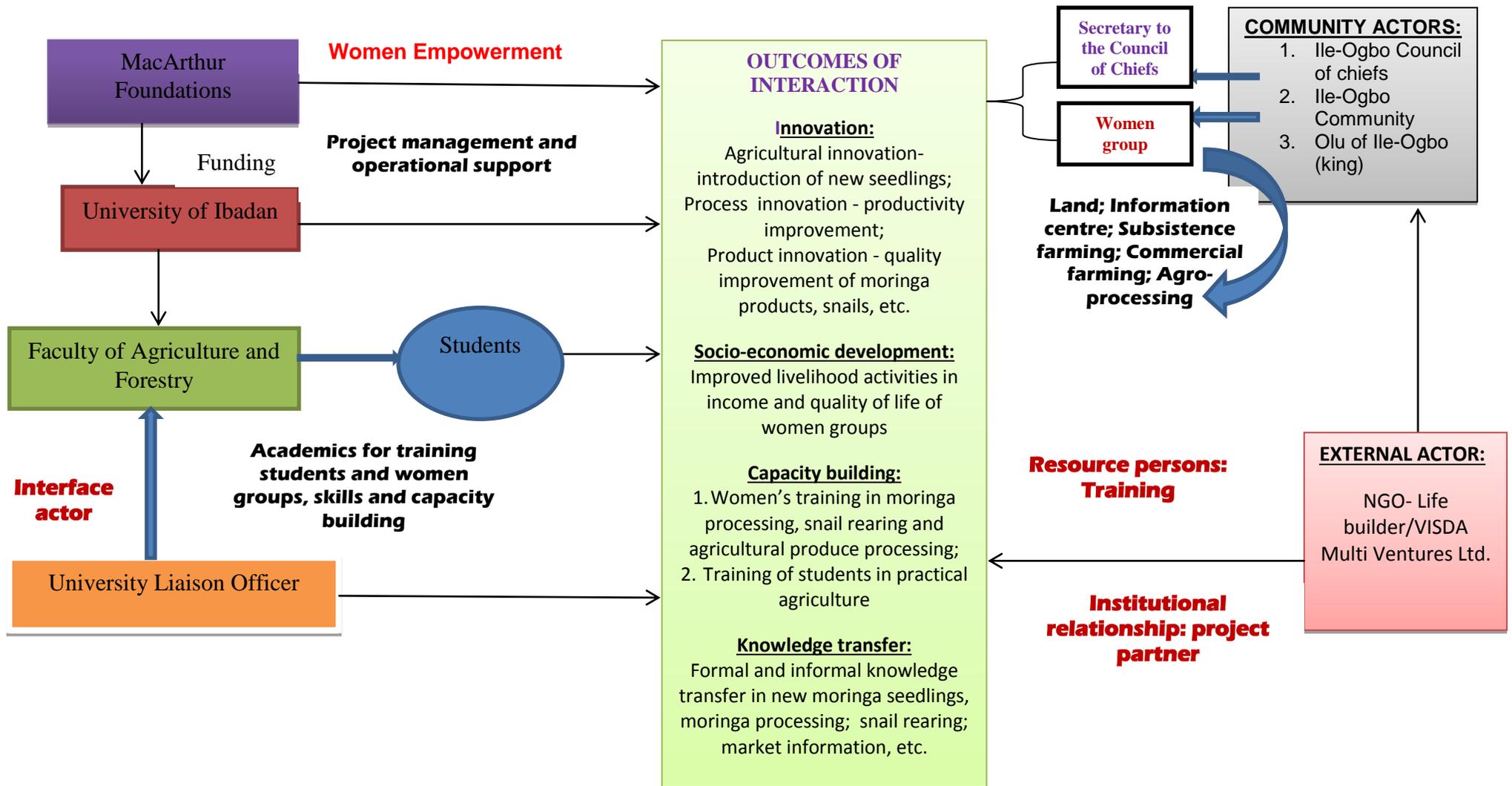
MacArthur connects directly with the university by providing funds for the project while the faculty through the Head of department of agricultural and rural extension have direct access to the Life Builders for capacity building during the training workshops. As expected, the university provides up-to-date report of progress in project implementation to MacArthur Foundation. Figure 9.2 provides a map of the actors involved in the interaction, and the flows of knowledge and resources.

There is no direct involvement of government agencies in the interaction. At the time of this study, the university was trying to negotiate collaboration with the International Institute of Tropical Agriculture (IITA) and a few other organisations with interest in rural community development. This is expected to improve project performance and probably provide sustainability since the project is externally funded and time bound. One of the interviews excerpts captured the collaboration plan as follows:

There is one NGO that is collaborating with the university on the project in the training of communities. Early this year discussion was made with International Institute of Tropical Agriculture (IITA) to collaborate with the university to fast track the project, the university is still discussing on the modalities of collaboration (CIRDIP Interview No.8).

²⁶ *Moringa oleifera* is a popular plant which has been widely praised for its medicinal, commercial and industrial use.

Figure 9.2: CIRDP map of interaction and knowledge flow



9.3. Drivers of Interaction

The initial motivation for the interaction was the need for more field based training and the need to secure land outside the university when it was realised that the university teaching and research farm could not provide enough space for the practical year training programme. The Faculty of Agriculture and Forestry believed that the Ile-Ogbo community could serve as 'Farm Laboratory' for practical application of research methods, communication strategies, and extension principles. The university also views the interaction with Ile-Ogbo community as a way of giving something back to the community for the purpose of improving their welfare as well as appreciating the kind gesture of the community in the provision of land for practical agricultural training. The women empowerment component of the interactions was motivated by the involvement of MacArthur Foundation grant which was focussed on empowerment programmes for marginalised women groups. The interaction between the University of Ibadan and Ile-Ogbo community can thus be reckoned as being driven by the need for community engagement by the university, practical experience for agricultural students, and the empowerment of marginalised women groups. The following responses of some of the key informants interviewed supported the above assertion:

UI is known for academic excellence, and the main goal of coming down is to do research for the development of the community. The other sectors of the community will also be affected. There is no way a university is set up that it won't affect the community positively (CIRDP Interview No.6).

I think basically the involvement of UI is to impact the community and to help in eradicating poverty. The innovations that were introduced to the community as an empowerment project help in generating income especially for women. It could also be intellectual because the interaction also helps the extension workers on ways of relating with people to get information about their problem. It is only when you interact with community that you will know how to help them with their needs and how to improve on their technology. UI seeks knowledge from the community in order to know the technology needed (CIRDP Interview No.7).

From the perspective of the Ile-Ogbo community, the driver of the interaction is the need to develop the community especially through improvements in social infrastructure (i.e., the establishment of a campus of University of Ibadan). The following excerpts help to buttress this fact:

We welcomed the university and students mostly for development and empowerment purpose and the thought that the university will establish a campus at Ile-Ogbo (CIRDP Interview No.1).

No, we thought if there is a university in our community, many other things will come with it (CIRDP Interview No.2).

To compensate for the inability to establish a campus in Ile Ogbo, the university through the faculty of agriculture collaborated with the community to build an information technology (IT) centre for the community. The centre has been completed but yet to be launched at the time of this study. The centre is to help the community, especially youths, to be computer literate and upgrade their knowledge of IT.

9.4. Innovation

Innovation in the context of this case study include nouveau production processes, goods and services that are aimed at improving the livelihood conditions of the marginalised women in Ile-Ogbo community. The innovation, though new to the Ile-Ogbo community, are not new to the world. Response of one of the academics interviewed provided insights into the concept of innovation adopted during the interaction.

Well, the term innovation is actually relative because every slight improvement in the activity that is toward some positive ends should be seen as innovation. Innovation does not have to be a machine. It could be some software that can actually help us to do the things we have to do in a new way or better. If you test some new process in a community, it could be an innovation but what we are actually targeting is to ensure we empower the community toward a better livelihood. I mean to know how to do better the things they have known before (CIRDP Interview No.8).

The innovations that were introduced in the course of the interaction have led to activities which generated alternative incomes for the economic empowerment of marginalised women in Ile-Ogbo community. These activities include the rearing of snails domestically rather than spending several hours in the bush looking for snails; the production, processing and utilisation of moringa oleifera; and palm kernel and oil palm processing.

Moringa oleifera processing

The production, processing, utilisation and marketing of moringa oleifera were introduced to women in Ile-Ogbo community as activities that can improve the income of the women and thereby enhance their livelihood conditions. In recent times ‘moringa’ has become very popular among a very large population in Nigeria, and its use has been widely advocated for its *medicinal, commercial and industrial* value. The women were trained during a workshop on the production (planting, trimming and harvesting), processing and marketing of moringa. The training workshop led to the establishment of an association called Moringa Women’s Association of Ile-Ogbo with a chairperson (Mrs Adegoke) who is also the chairperson of the snail rearing association. Moringa product is new at Ile-Ogbo. The women in the community started with the plantation of 2000 stands of moringa. The profitability of moringa processing activities has resulted in the increase of moringa planted by Ile-Ogbo community to over 5000 stands within the last two years.

The university through the CIRDP supplied the initial 2000 stands and gave 1000 small plastics bottles with labels to sell the moringa powder derived from the leaves. The women were taught how to process the moringa leaves into powder. The women claimed that they were able to generate high profits from the sales of moringa powder. They were therefore able to buy more bottles and label after they have exhausted the initial one. Out of all the income generating activities introduced by CIRDP in the community, moringa processing is the most profitable for the women groups. Responses from the people interviewed affirm the remarkable impacts of moringa production, processing and utilisation on women groups at Ile-Ogbo.

Moringa is good as cure for high blood pressure, diabetics and other related disease. I usually have high blood pressure. Whenever I use it, the high blood pressure subsides. Our gratitude goes to Prof. Olawoye that brought this innovative idea to us. It has given us money and good health. We are about 12 to 13 women in the moringa group and we are happy about this work. We all

meet at the farm together. The product also makes our skin fresh/shining and makes us healthy and beautiful. Before, we find it hard to spend N100 but now we can afford to spend more on ourselves via this new business. We spend little amount on our labourers (CIRDP Interview No.3).

Several things are new since the interaction that occurred through the project of mama Oyinbo (Prof Olawoye). New seedling (moringa seed), new knowledge in terms of doing things (snail rearing, moringa planting, grass cutter rearing, etc.) are brought to the community. The project also brought new thing in the area of local medicine through indigenous knowledge of what moringa leaf can do..... Starting with the product, I believe we have some changes already taking place in the way certain things are done in the community. For instance, the MacArthur Foundation project supported the community with some machines for cassava and oil palm processing. The machines have made the activities easier for the people in the community. They have also increased the production level which will later improve the income they generate from the sales of the products. Although we have not done an empirical study on the impact of this project on this community, but very soon we will do the impact analysis of the project in order to really check how far the community members have benefited..... The other thing I can say is that snail produce is a product which is always in the bush, but now they are keeping it at home from egg stage to adult..... Moringa processing is another innovation in the community. We had the testimony of community members using this moringa. It is actually helping them to cure some ailments (CIRDP Interview No.1).

A dryer was given by the Department of Agricultural Extension and Rural Development to the moringa women group to facilitate the processing of moringa leaves especially during raining season when sun drying is usually difficult. The moringa dryer and health products are shown respectively in Plate 9.1 and Plate 9.2. The moringa processing equipment is locally fabricated, and hence, its maintenance and repairs are carried out by local technicians.

Plate 9.1: Moringa dryer



Plate 9.2: Moringa health products***Snail production***

Snails are not reared traditionally in enclosure but collected in the forest areas as one of the non-timber forest products (NTFPs). Its importance as a source of animal protein and as a delicacy which is in high demand in many parts of Africa makes snail rearing a viable economic activity. The deforestation and environmental degradation have contributed to the decreasing population of snails in the forest. This creates new opportunity for domestication and rearing of snails in enclosures not only to increase the number of snails for consumption but also to provide the snail farmers with additional income that improves their livelihood conditions. CIRDP introduced domestication of snail production in enclosures as a new process that produces bigger snails than commonly found in the forests. Plate 9.3 shows the domestic snail rearing platform. The process is relatively simple and women groups were trained on how to efficiently manage the domestic snail production process. The women were organised into five groups. Each group comprises of five members trained on the basics of snail farming. The women are taught from modules on growth and reproduction of snails, environmental requirement and benefits of snail farming.

The species of snails are very important in domestication and rearing of snails in enclosures. The three most common species of snail in Ile-Ogbo environment are *Achatina fulica*, *Achachatina anachatina*, and *Achachatina marginata*. Since these species are readily available at Ile-Ogbo, they were used for snail rearing by the women groups in order to reduce production costs. The snail production process, though simple and low cost, takes relatively more time compared to the moringa processing. This is aptly captured by one of the key informants interviewed:

Snail production is another knowledge we gained. We have especially learned how snail hatch by itself and grow to adult. By May 15, it will be two years that we acquired both the snail and moringa production knowledge. The profit from snail production is small compared to moringa because it will take long time for the young snail to develop before they can fetch sufficient money (CIRDP Interview No.3).

Plate 9.3: Snail rearing platform***Palm oil and kernel processing***

Palm oil and kernel processing was a major agro-processing that received technical upgrading through the CIRDP. New processes were introduced into the community to replace the old manual and strenuous production process. The old process involves women threshing cooked oil palm and hot palm kernel with bare foot. Processing equipment for oil palm processors was fabricated and given to the women group by the Department of Agricultural Extension and Rural Development. One of the processing equipment that was introduced was the equipment for cracking palm kernel. Before the advent of CIRDP at Ile-Ogbo, cracking of palm kernel by women was very tedious. Cracking a kilogramme of palm kernel by a woman normally takes about 5-6 hours. With the introduction of the palm kernel cracking equipment, it takes about five minutes to crack a kilogramme of palm kernel.

The greatest problem we faced was the local way of crushing the palm kernel to remove the nuts we need for palm kernel oil. Manual cracking was very crude. We used stone to break the kernel and hand picked the nuts from the shaft. Processing the palm fruit to get the palm kernel was also dangerous to health because we used our legs to crush very hot palm fruits to thresh out palm oil (CIRDP Interview No.5).

The process used to be difficult because we usually use our legs to extract oil to make palm oil. If you do it for three years, it may possibly lead to untimely death because the person will be sick of pain in the legs. We use our hands to break the nut before the machine came, and it was always a difficult task for us. The machine brought ease to us. Before now, we cannot afford our children school fees. But with a bucket of nut, we can make ₦5, 000 on it or even more (CIRDP Interview No.4).

Innovation types

The interactions between the actors involved in CIRDP produced product, process and market innovations. The product innovations identified include a variety of moringa

medicinal products, and bigger and higher quality snails. The most important product innovation is moringa powder because of its usefulness for addressing diverse health challenges. The process innovations are machine upgraded processes resulting in a more efficient extraction of oil from palm fruit and palm kernel. A notable process innovation is the mechanical cracking of palm kernel. The market innovation involved the taking of the products of the women groups to workshops within and outside Oyo State for exhibition. This linked the women groups to individuals, organisations, hospitals and households who may need their products. The following interview excerpt illustrates the gains from market innovation:

I was selling petty goods in kiosk. But when they brought the idea of going for exhibitions, it gave me an opportunity to go around, like going to Ladoké Akintola University (LAUTECH) to sell moringa products. Before now, our goods have only little profit of N5/N10 per unit of goods sold. But the moringa does not involve much cost. We get people to clear the weeds on our farm, and after production and processing moringa, we sell it in the market for good profits (CIRDP Interview No.3).

9.5. Knowledge and Skills

The direction of the flow of knowledge in the course of the interaction between the University of Ibadan and Ile-Ogbo community is bi-directional. It involves linkages and interaction through which ideas circulate freely from the university environment to the community and vice versa. The university taught the community new ways of planting, processing and utilising the products that were introduced, while the community also taught the university community about the types of crops especially tubers that can grow with high yields in their community. The women groups under the CIRDP were trained by the University of Ibadan lecturers and Life Builders on the new products and processes that were introduced for the income generating activities by marginalised women groups. The lecturers also obtain feedbacks from the women groups on how the project can best thrive in their community. The students also learn the traditional ways of planting and processing of agricultural products. Marketing of the products also provide opportunities for learning and knowledge transfer. The women learns more on the potency of their moringa health products through marketing of the products in university environments, and the lecturers too have opportunity to learn from the women how they have been able to adapt new knowledge gained from workshops to shape moringa processing and develop new applications, packaging and marketing. The important role of training workshops in knowledge flow is captured as follows by some of the key informants interviewed.

Yes, we had four days training on snail and moringa (powder) production at Ile-Ogbo Town Hall. They taught us how to preserve the snail. Our leader also taught us how to nurse the moringa tree to bring out leaves profusely, how to take care of it properly, and how to sell moringa products. (CIRDP Interview No.3)

Well, like I said for the agricultural processing, the flow of knowledge and skills was mainly through demonstrations. For snails rearing and moringa processing it was through training workshops either in lecture format or field demonstrations (CIRDP Interview No.9).

I think learning is mutual in both directions. When we go to the community we learn of what the people's aspirations are, and we set about how we can address the issues raised. So we are benefiting

because we learn from them, we are also assisting them to do things they want to do in a better way that will actually grant more return to their investments. So it is not uni-directional but mutually beneficial relationship (CIRDP Interview No.9).

9.6. Community Participation

The CIRDP has active community participation with capable leaders (Ile-Ogbo Council of Chiefs) led by the king (the Olu of Ile-Ogbo). The community participation was preceded by needs assessment survey conducted by the university to harvest information on the livelihood problems in the community. The outcome of the assessment informed the income generating activities introduced into the community.

Yes, we did needs assessment with men groups, women groups and youth groups. What came out really as their priority is that they want the university to establish more of its presence in Ile-Ogbo. I must however say that in terms of the kind of projects that we had, to a large extent they were determined by us. The projects were more driven by donor support, and along the line some project came up to meet the needs of the women in the community and to improve their income generating activities. Example is moringa planting and processing (CIRDP Interview No.9).

Depending on the situation at hand, I may not be able to say these are the numbers. But talking about the community members, I know that we interacted with some of the chiefs depending on what we want. Sometimes, we interacted with some policy makers in the community like the chairman of the community development association, the Oba (King) and some of his chiefs. We also interacted with different groups in the community especially their leaders (CIRDP Interview No.8).

The community chose the participants for each training workshop that was conducted in the community to alleviate poverty and solve unemployment problems. Another factor that facilitated the community participation in this project was the existing relationship between the university and the community. During the course of the project the interaction was mainly with the secretary to the council of chiefs, the king and his chiefs. The secretary to the council of chiefs relates directly with the liaison officer on the project issues that affect the community. Also about 20 to 25 different activity groups involving marginalised women interacted with the academics from the university.

The advantage that we really had was that there was a good relationship established between UI and Ile-Ogbo community before the introduction of CIRDP sponsored by MacArthur Foundation. The community participated effectively, and needs assessment was done among men and women group in the community. The result shows what they want the university to do for them in terms of intervention. However, because the project is donor driven, much of the programmes and projects were developed by the university with adjustment to meet the needs of the community especially the marginalised women. The community was the one that choose participants in collaboration with the university liaison officer (CIRDP Interview No.9).

The whole community is involved but majorly it is the king of the community and his chiefs that interact with the university for development purposes (CIRDP Interview No.2).

9.7. Outcomes, Benefits and Risk

The interaction has identifiable benefits for the parties involved in the interaction. For the Ile-Ogbo community, the benefits of the interaction include:

1. New moringa seedlings to plant.
2. Medical treatment through indigenous knowledge of moringa leaf.
3. New idea and improved technology especially palm oil and kernel processing, and snail production and business.
4. Economic empowerment for women through sales of products of moringa processing, palm oil/kernel production and snail production business. The project gave the women groups machine for palm oil/kernel processing free of charge. A women group leader claimed that snail and moringa projects have benefited them so much through free training and start-up stock, and materials to start the rearing of snail and moringa processing were also provided.
5. Since the time the community gave land to UI, any Ile-Ogbo son/daughter that satisfy the minimum university entry requirement (e.g., passed JAMB exam) is admitted into UI. A key informant interviewed claimed that five of his children and grandchildren are in the university presently.
6. An information technology centre has been established by UI at Ile-Ogbo to encourage the Ile-Ogbo youths to be computer literate.
7. Improved health of the community: one informant claimed that when her husband was ill, he went to the hospital and the doctor recommended that he should use a moringa product. After using it, he became healed of his swollen legs. She also claimed to have had ulcer and for two days could not stand until when she used moringa products. She noted that when she took the powder form of moringa to the hospital the doctor and nurses do not complain of it. They encourage people to use it.

For the university, the outcomes and benefits are manifest in the fact that the interaction has been helpful for the realisation of the university's vision and mission statements. The interaction has also provided opportunity for the university to provide community level experience for its students as shown in the interview excerpts below:

The university has a place for students to learn the practical of what they were taught in the classroom. The students also by interacting with the Ile-Ogbo community learn the art of practical farming and processing of agricultural products (CIRDP Interview No.1).

On our own side, I think the community has offered us a kind of social laboratory for us to learn/test some of our research findings and also to validate our findings in order to scale them up (CIRDP Interview No.8).

However, the project has risks as shown in this interview excerpt:

The major risk is making promises in the community that the university has been unable to fulfil. This causes strain in the relationship. The other risk is promptness in handling project by moving in quickly and making your relevance known. There is

danger in delaying because if you delay your good intension may be misunderstood (CIRDP Interview No.8).

9.8. Conclusion

The interaction between the University of Ibadan and Ile-Ogbo community is a case of innovation and skills upgrading to economically empower marginalised women groups in an informal setting located in a semi-urban environment. The interaction involves four partners comprising the University of Ibadan, Ile-Ogbo community, Life Builders/VISDA Multi Ventures Ltd, and MacArthur Foundation. The two main partners are the University of Ibadan and the Ile-Ogbo community. The partnership with MacArthur Foundation is a contractual relationship for funding and the partnership with Life Builders is another contractual relationship for training and skills acquisition.

In the entire programme design and implementation, community participation has been limited to contribution of land, selection of participants in training programmes, knowledge exchange on indigenous farming methods and plant species. The Council of Chiefs led by the king actively participates in the decision making processes of the CIRDP. Though the community actors were aware of their livelihood challenges, they did not know where to seek help until the University of Ibadan initiated the interaction. The interaction generates three types of innovation. These are process, products, and market innovations. The innovations are new to the community and not new to the world. Knowledge flow is mostly 'bi-directional', with knowledge being transferred to the community by lecturers and students, and feedbacks received by lecturers and students.

Finally, the findings show that this is a case of interaction that improves the livelihoods of marginalised women, and can thus lead to inclusive development. The enablers of the interaction that can be identified from the case study analysis include:

- The necessity to achieve the university's new vision and mission statements, especially that of contributing to societal development;
- The role of MacArthur Foundation in the provision of grants can be seen as strategic in facilitating interaction;
- The need for more field based training and the need to secure land outside the university when it was realised that the university farm could not provide enough space for the practical training of the students; and
- The community's willingness to donate land to support the interaction.

However, the interaction has two major constraints. The first is inadequate budgetary allocation for the project. The MacArthur Foundation grant for the University is for only three years. In the absence of another financial grant after the expiration of the current support, it is obvious that the engagement cannot be continued. The second constraint is inability of the university to establish a campus in the community. This can generate mistrust in future since this was one of the expectations of the community when giving out their land to the university.

Chapter 10

COMMUNITY-BASED FARMING SCHEME: AN INTERACTION BETWEEN A UNIVERSITY OF AGRICULTURE AND RURAL COMMUNITIES

10.1. Introduction

The Federal University of Agriculture, Abeokuta (FUNAAB) established the Community-Based Farming Scheme (COBFAS) in December 2010 as a new framework for the practical year training programme (PYTP) of 400 Level students. Under COBFAS, agricultural students at the penultimate year of the academic degree programme live and train in selected rural and semi-urban communities in Ogun State. The students reside in the communities for one year to acquire practical experience in agricultural production, processing and marketing. Plate 10.1 shows a cross-section of the student farmers in one of the rural communities. During the PYTP they are expected to learn how to overcome the challenges of practical farming and utilise the experience in starting an agricultural enterprise. This was aptly explained as follows by one of the academic respondents interviewed:

Our going to the communities is driven by our passion for effective training in practical agriculture. Yes, the best place to train our students as modern agriculturists is not in the city centre. Some of them have not had the opportunity of going to the rural communities before. So, if you train them in the city centre, they will not be encouraged to accept the reality of agriculture as a rural based vocation. They will consequently run away. We have seen over the years that the university's contribution to agricultural innovations has not been commensurate with the efforts of the university in training the students. We thought it is because students after graduation, when they are faced with rural settings of no electricity, no good road, no ICT, they cannot stay there. So we felt that they should be trained first and foremost under these conditions while they are still students. This will enable them appreciate the environment such that when they graduate, they can also live with these people, stay with them, and farm there as means of job creation (FUNAAB Academic Interview No. 1).

The vision of COBFAS is to produce highly skilled manpower that will transform the rural economy in Nigeria so that rural communities can contribute significantly to food security and sustainable development. COBFAS is directly implemented by FUNAAB Centre for Community Based Farming Scheme. The centre's mission is to train agricultural students how to become modern farmers whose postgraduation activities promote sustainable development and thereby fulfil the mission of the university. To achieve the mission of COBFAS, the University started COBFAS in four locations in Ogun State (see map in Figure 10.1) with the hope of extending it to other states within the university's catchment areas.²⁷ The locations Isaga-Orile in Egba zone, Iwoye-Ketu in Yewa zone, Ode-Lemo in Remo zone, and Odogbolu in Ijebu zone. This is to take advantage of the different ecological zones in the state and make the impact of the University felt throughout the host state. At the time of this study, 2,500 students have participated in COBFAS since its inception.²⁸

²⁷ FUNAAB's catchment areas are Lagos, Oyo, Osun, Ondo and Ekiti States.

²⁸ See COBFAS training data in FUNAAB-COBFAS FPY Students' Handbook, 2013.

Plate 10.1: Student farmers at a COBFAS location



Figure 10.1: Map of Ogun State showing COBFAS locations



What informed the selection of the locations was the rural characteristic of the communities. Most of the communities have not had the opportunity to benefit from the development efforts in the country and have consequently been marginalised. This was well captured by one of the academics interviewed who stated that:

The history of the place is not too important to the project as such, but the rural aspects of the locations are the centre point for us. That is, is it a rural sector? Is it a point where agriculture concentrate in terms of practice? Is it a point where traditional agriculture is what is obtainable? Are there commercial agriculture going on there? So those are the things that informed our choice of location... Some of them have not had that opportunity because they are far away, they are rural settings. And you know that though government wants to develop agriculture, we are developing agriculture in such a manner that the people that should benefit from such development are not really benefiting. What I mean is that agriculture as a project/sector in this country has not moved the way it should move because most of the developmental efforts are targeted towards the cities, and we are talking about 70 per cent of people somewhere that are responsible for what we eat in the city (FUNAAB Academic Interview No.1).

The Lisa of Ode-Lemo²⁹ also commented on the challenges faced in the community:

The challenges faced by our community are numerous. For instance, on our roads are ban, no electricity, no potable water, ... The bad road is still there with little or no difference over the years. This is not the fault of the university but it is a political issue. Electricity is not stable also, but we know that is a general national issue. Though we have no pipe borne water, we have series of boreholes sunk around the community by the university (FUNAAB Community Leader Interview No.6).

At the inception of COBFAS a Memorandum of Understanding (MoU) was signed between FUNAAB and the communities. One of the academics interviewed described the meeting with the community leaders:

They were willing to accept the programme because they know that they will have more advantage. For the fact that students are coming to the place, they knew that the economic activity of the community will be improved. The produce from the students' practical year farms are to be sold within the communities, not to be brought to the campus. Also, the farmers in the communities will learn on improved agricultural technology from our students and at the end of the day the extension components of our programme will be closer to the farmer than when we are on the campus. Before COBFAS, we had the PYTP at the campus here, we take our students to the farm, go to the farmer and ask for problems encountered, go back to the campus, proffer solution to those problem. But now the students are residing with them for the period of nine months. So if they have any problem with agriculture, they can even go to the students' farms or meet the farm officer. They even believe that they will have more advantage when the PYTP is located in their communities. That was why each of the communities was willing to freely give us 50 hectares of land. We also have a memorandum of understanding (MoU) between each community and the university. The agreements in the MoU secured the land for the use of the university and prohibit its sale to third parties (FUNAAB Academic Interview No.2).

Out of the four locations of COBFAS, two were selected for this study based on ease of accessibility and taking cognisance of the limited resources for the project. The selected

²⁹ A High Chief who rules over the affairs of the community in conjunction with other chiefs.

locations are Isaga-Orile and Ode-Lemo. Isaga-Orile is a semi-urban community while Ode-Lemo is a rural community.

10.2. Overview and Structure of the Interaction

The Centre for COBFAS acts as a hub for project management. The centre provides operational support for the Teaching Farm Management Committee (TEFAMAC). TEFAMAC organises academics to train the students in practical agriculture. The Centre for COBFAS also works in collaboration with AMREC which transfers the outcomes of the research conducted in the university to the rural communities. In addition, AMREC carries out On-farm Adaptive Research (OFAR), conduct trainings, and develop skills of local farmers.

Under COBFAS, the interaction between FUNAAB and the selected communities started during the 2010/2011 academic session. This implies that the interaction between the university and the communities has lasted for three years at the time of this study. The partnership has been beneficial to both sides since inception as indicated by one of the interview respondents:

.....Mutual benefit in the sense that these communities provided land for us freely and on the part of our university, we give the farmers training on improved agricultural practices. When some of the community's children are qualified to enter the university, they are given concession for admission. Besides, the produce from PYTP farms are sold first to the community members, before any other buyer. As a result of that, the socio-economic activities in the communities have improved and the level of poverty has also reduced (FUNAAB Academic Interview No.2).

The Onisaga of Isaga-Orile (the king of Isaga-Orile) also viewed the interaction between the university and the community as mutually beneficial to both sides. In his words:

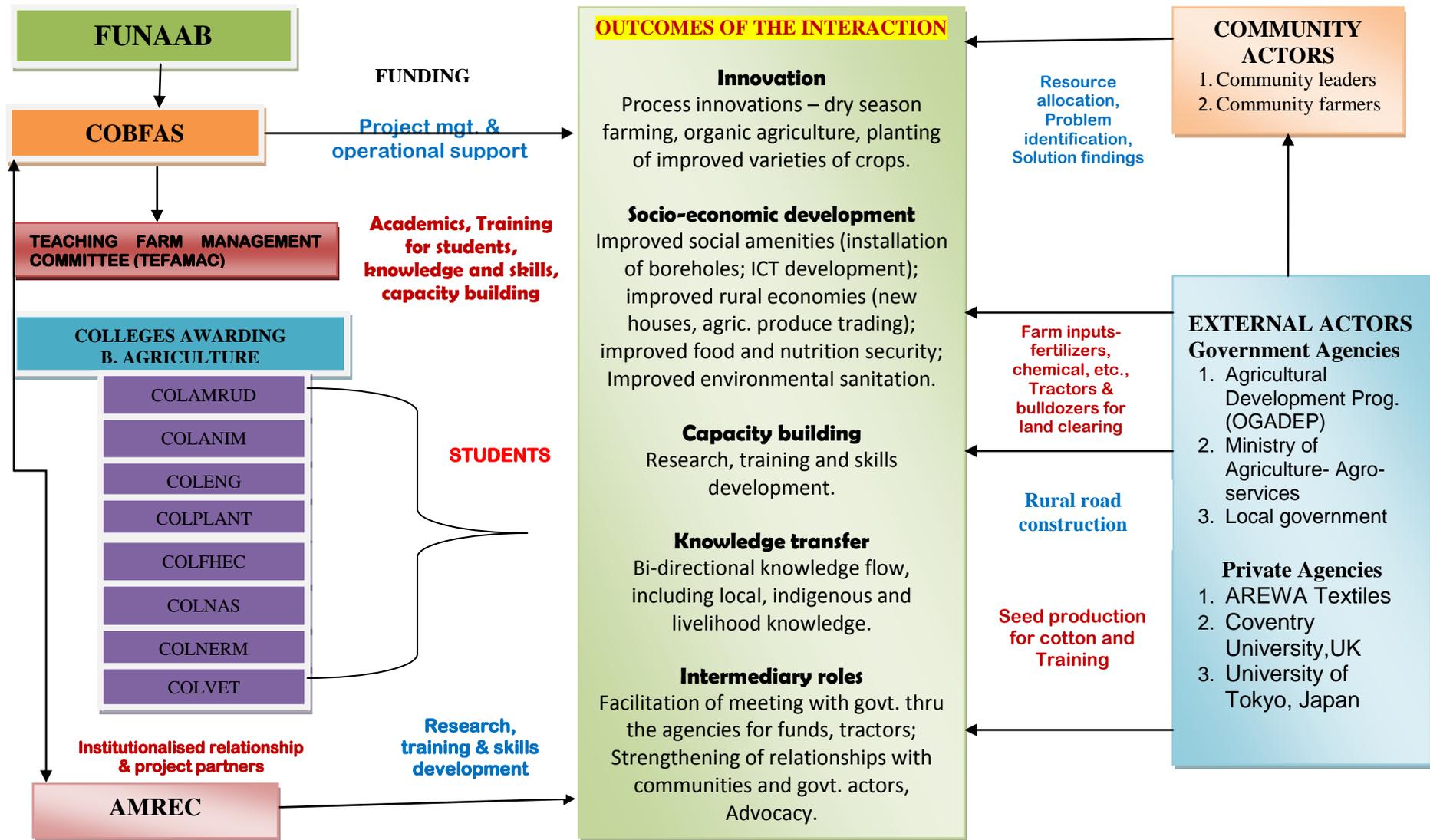
I gave the university 50 hectares of land free of charge, and I told them if they wanted more I will give out more. Also for hostel accommodation, I rented one of my houses to the students, and I made the rent so cheap and affordable. The students who rented houses elsewhere also got accommodation at moderate prices. The people in the town too are enjoying and benefiting from their presence because the students buy things from them. We signed a MoU with the university, because the university is employing our people. In fact two of them are field overseers. Also, they promised to be admitting four of our children if they meet the cut off mark required every year (FUNAAB Community Leader Interview No.3).

COBFAS thus includes a kind of service learning partnership that primarily benefits the university but also of much value to the community. Although in some cases, the university had to pay the real land owners some stipends as compensation for giving out their land or as direct payment for the kola nut trees that were uprooted (as in the case of Ode-Lemo), the land contribution by the communities is perceived as a major commitment that ensures that the interaction is sustained. The interaction is also a kind of 'town and gown' arrangement where the university contributes to the economic development of its catchment areas. This was aptly expressed by some respondents on their satisfaction with the presence of the students in the community and the associated improvement in the social and economic development of the community. One of them stated:

We thank God because there is nothing we want to sell that we do not sell. So their arrival brought increase in our sales. Someone who used to sell little before has seen a lot of increase in his/her sales and sells things on time because of the arrival of the students in our community (FUNNAB Community participant Interview No.5).

It is noteworthy that though the first point of contact between the communities and FUNAAB occurred at the leadership level (i.e., between communities and TEFAMAC), the primary direct contact between the university/COBFAS and communities occurs through the students. The academics in TEFAMAC play a background role. Figure 10.2 provides a map of the actors involved in the interaction, as well as the flows of knowledge and resources.

Figure 10.2: COBFAS map of interaction and knowledge flow



COBFAS has cultivated a range of relationships with other actors that support the interaction. As illustrated in Figure 10.2, these actors are in government and the private sector. They interact and collaborate widely with AMREC to help in facilitating training, workshops and transfer of technology. This agrees with COBFAS objective of improving the capacity of local farmers by introducing them to new agricultural techniques and practices. The Centre for COBFAS collaborates with the Agro-services³⁰ to help in providing agricultural inputs like fertilizers, herbicides, pesticides, tractors and bulldozers for land clearing. The Agricultural Development Programmes (ADPs)³¹ also help in improving technology awareness among local farmers, training, and creating access for marketing farm products.

There are on-going relationships with private sector actors in the manufacturing sector. An example is the case of Arewa Textiles³² in Abuja, which is interested in COBFAS for cotton seed production. The Centre for Agro-ecology and Food Security in Coventry University, United Kingdom,³³ has also interacted with COBFAS in a bid to promote best agricultural practices in the training of students.

Since the students mostly interact with the communities, COBFAS adopted a more open and flexible approach in relating to the local farmers. This enabled the students play a community service role by mentoring some of the young people in the communities through organisation of tutorial classes. The tutorial classes helped the educational improvement of secondary school students particularly in passing WASC/GCE, NECO and UTME examinations that are required to qualify for admission into higher educational institutions. As one academic interviewed reported:

Also, our students have been training the youths that are ready in terms of extra mural classes free of charge. That is why the youths in the communities are improving educationally. It means the presence of our students there is actually improving them academically (FUNAAB Academic Interview No.2).

COBFAS has also acted as a platform for linking ‘producers’ and ‘consumers’ of knowledge. For example, COBFAS has enabled the reporting of the findings of community based scientific research back to the community in conjunction with AMREC. In other cases COBFAS has acted as intermediaries in the context of co-produced knowledge. Community participation in university research projects has often drawn on local and traditional knowledge, and COBFAS has acted as a bridge to bring this knowledge together with the scientific knowledge more commonly produced by the university. As one of the academics interviewed puts it:

The programme is fashioned out in a way that we want to improve the traditional farming system but in form of training to our students. So what we say to our students is that we are trying to combine both traditional farming and conventional (modern) farming. This is what we call *trado-modern farming*. Yes, we are scientists, but the farmers know much more than we know from their own environment. We cannot take

³⁰One of Federal Government agencies/actors in the Ministry of Agriculture

³¹A state government agency/actor

³²A private agency/actor based in Nigeria

³³A private agency/actor based in the United Kingdom

this for granted. We must key into what they know and build upon what they know to improve what we think it should be the case (FUNAAB Academic Interview No.1).

The Principal Farm Manager also attested to the fact that knowledge flow has been bi-directional. There is exchange of mutual learning. In his words:

Yes we have gained a lot from the rural people. When we first got there, we started doing our own activities without taking into consideration the type of weather. The weather normally affects crops there. So far, we have learnt from them local weather prediction. You know that type of information is very vital. They will tell us when to plant and when not to plant. But we also normally convince them that with our scientific knowledge and facility, we can plant at any time in the year. So those are the things we have been discussing with them. We gain from them, they gain from us (FUNAAB Principal Farm Manager-Representative of Agro-services Interview No.8).

These intermediary roles have been central to the innovation outcomes of the interaction, and have acted as a catalyst for other benefits of the interaction.

10.3. Drivers of Interaction

The drivers of interaction in COBFAS are primarily a mixture of social and intellectual factors. COBFAS is a project that is well suited for the pursuit of the university's mandate of community engagement. From university's perspective, the drivers of the interaction were accordingly the desire of the university to help in reducing poverty in the rural communities and the quest for effective training of students in practical agriculture.

From the community's point of view, the main drivers of interaction are poverty alleviation, infrastructural development, access to knowledge, training and economic development. This is illustrated by the response of one of the community leaders interviewed:

Economically we have been able to boast of something in our pockets. For instance, before the students came here many houses were vacant, with nobody to occupy them. The foreigners (like the Igedes, Egun, etc.) who came here to farm could not afford to rent our houses. But with the presence of the students all our houses are occupied. This has resulted in increase in house rent. Most landlords are building more houses. Accommodation is very scarce in some of our communities and very expensive, depending on the amenities provided in the house. This has resulted in more income for us (FUNAAB Community Leader Interview No. 3).

Yet another community leader interviewed stated that:

Boreholes were sunk in our community to aid dry season farming. One was sunk on the students' farm, and another within the community for general use (FUNAAB Community Leader Interview No. 6).

The drivers of interaction from the side of the university and from the side of the community are mutually reinforcing. Both have a mutual interest in community development and poverty reduction while the students and academics serve as channels of knowledge flows, skills development and community engagement.

10.4. Innovation

The innovation resulting from the interaction takes several forms but primarily manifests as process innovation. Examples of innovation emanating from the interaction include the introduction of dry season farming especially for vegetables, organic agriculture such as the use of organic fertilizers and organic pest control, and the introduction of high yielding varieties of common arable crops such as maize, soya bean, cowpea and cassava. These innovations have increased productivity of the subsistence framers, improved variety and quality of their agricultural products. One of the students interviewed provided some insights on this as follows:

I think an important knowledge that we are able to pass across to them was during an incident of pest invasion that affected our dry season vegetable production. The leaves of our vegetables were being eaten by pests. When we contacted our lecturers, they told us to use neem tree (Dongoyaro) extract. It is an organic pest control method. When they saw us preparing neem extract, the village farmers were surprised. Virtually the whole community was suffering from the pest invasion. So when they saw us using it and some days later the pests were eradicated, they were very happy to adopt the organic pest control method (FUNAAB Other Actors Interview No. 9).

In agreement with this, an academic also reported that:

The students mulched their cassava plants. Mulching conserves water in the soil during the dry season and the cassava was growing as if they were putting water on it every day. The cassava plants became very fine. People were coming to admire them and wondered about what might have happened. The difference is just that the students mulched their cassava plant. So we look at such things and advise the farmers in the community that when you do things like conserving water, for instance, during the dry season, it will also improve your agricultural productivity (FUNAAB Academic Interview No.1).

It is clear that the ‘newness’ of the innovation is marginal at best, and is in all cases ‘new to the community’ rather than new in any broader sense. The introduction of organic fertilizer, organic pest control, and mulching of cassava plants, all have elements of process innovations which were new to the farming communities.

The innovation could also be described as social. This is because often times the community participants value their own traditional knowledge, which the students or academics have never questioned directly. Sometimes the solution to most farm problems comes directly from the university, while at other times the solution to some farm problems comes from the community farmers. For example, the community could make weather forecasts based on traditional knowledge. They have also accumulated knowledge on conditions for crop planting and pest challenges. This was aptly illustrated by Ode-Lemo community:

At Ode-Lemo, the villagers told us that if we plant amaranthus (tete) that insect pests would not allow it to grow. We insisted and planted the vegetables but the pest did not allow them to grow. We reported this to the scientists in the university that we were advised that we should break the cycle instead of planting amaranthus in succession. We should stop the planting for at least one season. This is to ensure that we break the cycle of reproduction of the pests, so that the pests/insects would have been dead before the resumption of the planting of amaranthus. The university scientists agreed. So we broke the cycle of reproduction the pests and it worked (FUNAAB Academic Interview No.2).

Also one of the students interviewed reported that:

Yes, we brought dry season vegetable production to the villagers. But in the cultivation of most of these crops, they have more ideas, more practical knowledge that worked better than our theoretical knowledge. While cultivating maize along with cassava, we noticed that we have weed infestation between our plants. The weed overgrows sporadically. We noticed that as we continued weeding after planting, the weeds continued to emerge and they were just so difficult to eradicate. The villagers informed us that we should have eradicated this spare grass before planting maize and cassava. So they told us what to do, that while ploughing, we should have sprayed an herbicide to completely eradicate the spare grass. So that was noted, it was not part of what we knew before, so that was the main knowledge that they passed to us which corrected the theoretical knowledge we had (FUNAAB Other Actors Interviewed No.9).

Even though the innovation described above is largely non-technical, and does not involve technology transfer or diffusion other than the introduction of tractors for land clearing as against manual clearing, it is a case of interaction with the university becoming a catalyst for innovative approaches to farming in marginalised rural communities that have suffered from infrastructural neglect.

10.5. Knowledge and Skills

COBFAS farms serve as demonstration farms that provide learning opportunities for local farmers and the student farmers. If the local farmers encounter any problem on their farms they have free access to ask questions from the students or from the farm officers. The PYTP students also gain valuable field experiences which inform their studies. Moreover, some academics have access to on-site research experience that contributes to knowledge creation, while the students acquire hands-on experience from the community-based farming system. The students exchange their theoretical knowledge with the local farmers in order to create a mutually benefitting relationship for co-construction of practical knowledge in rural farming system. This involves feedbacks from the community about their problems, choices and solutions. The feedbacks fit into the university's research activities and serve as a source of credible knowledge for FUNAAB academics.

The interaction entailed several aspects of skills development and flows of codified and indigenous knowledge. The codified knowledge flows from the university through the students

and academics to the community participants, and indigenous knowledge flows from the communities to the students. The primary area of knowledge generation is academic research that has the farming communities as research site. The skills development activities are among the PYTP students and rural farmers in the community.

Knowledge flow is bi-directional because some elements of local and indigenous knowledge have been incorporated into the university's research process and used to inform scientifically constructed knowledge, while the local farmers have learned from the codified knowledge received through the PYTP students and their lecturers.

10.6. Community Participation

Each of the communities where COBFAS is located has a king (Oba) as the head of the community, and the king is the most prominent actor on the side of the community. He takes the centre stage in positively introducing the project to his people. One of the significant outcomes of the interaction is the signing of a formal agreement that formed the basis for the engagement between the university and the local communities. The MoU signed between the two parties created a formalised arrangement for dialogue and representation of the communities. The university gives employment to qualified community members and concessionary admission to young community members. For example, two members of the communities are employed by the university as field overseers in each of the COBFAS locations. Training programmes are also organised for the community members on garri production, bee rearing for honey production, crop storage, etc. in order to help the community members improve their livelihood conditions. Moreover, the programme has gone beyond just training but has become an interactive forum where academics and the communities discuss pertinent agricultural development issues that affect the local communities. This is termed "town and gown" forum in the university. This is well captured by the following remarks by an academic interviewed:

Our programme has gone beyond just training the students and community members, you know, sometimes, it is interactive. We also try to promote town and gown. That is, the academics come in, the communities are in and we are talking. At such a level, we meet in the palace with the Obas and all the people and then we interact. At such point, we invite the local government chairmen to come in and they come. The last time, they were happy and we say, please, help us do roads to each community. Days after, as we were going to one of the communities, we saw a road grader working on the road to make sure that the road is good (FUNAAB Academic Interview No.1).

10.7. Outcomes, Benefits and Risks

COBFAS was in its third year at the time of this study. Assessing the benefits and risks of the ensuing interaction might therefore be difficult because the engagement is still in its early stages. Most of the benefits and risks might be more visible in the future than now. The impact of the engagement has so far been limited but positive. In this respect, one of the academics interviewed provided some insights as follows:

Yeah, the general outcome is that we have positively impacted on the communities in various ways. You see, the truth is that in those communities, we have improved on their livelihood,.... the university has dug boreholes for the communities so that each of the communities has at least two boreholes donated by the university and one of them has three boreholes donated by the university. In fact, when we put one borehole alone, a particular community say that we have solved 70 per cent of their water problems. We have thus improved on their economic status, for instance they have more money in their pocket to be able to do their business and live well. We also have improved on food availability because we are growing food crops in the communities. As I speak to you, I can say that (I may not be exact) we have cassavas and I think up to 73 hectares of land cultivated by us. We have access to 200 hectares of land in the locations and we are almost using 50 per cent within three years of our presence in the local communities. I expect that we are going to have at least 60 tonnes of maize from the four locations at the time of next harvest (FUNAAB Academic Interview No.1).

The direct output of training and skills development activities include employment generation. For example, in the area of garri and honey bee production, the participants can start up their own micro-enterprise after training if they can gather sufficient funds to purchase their own equipment. The overall benefit of the interaction for the community partners includes skills development, improvement in rural infrastructure, and improved farming system. All these lead to improved livelihoods and socio-economic development of the rural communities. In the words of one of the academics:

....the socio-economic is key to us, not for the benefit of the university, but for the benefit of the community as well as our country. We are talking about poverty alleviation and improved livelihood of the people. So, we felt that in trying to improve the socio-economic status of these people, looking at what will improve their economic status became a major drive for us. Our being there is helping them to improve income and their livelihood conditions (FUNAAB Academic Interview No.1).

The main and direct benefits for the academic partners have been the production of academic outputs such as papers, conference presentations, dissertations, and research partnerships with the rural communities. For the students who are the main channel of knowledge flow, the project has been a popular research site and source of practical learning.

At the national level, the project is viewed as an outstanding example of university community engagement activity with potential for the transformation of rural agricultural economy, job creation, and re-orientation of young farmers to engage in practical farming activities after graduation. COBFAS is regarded as a national “best practice” in the organisation of university practical year training in agricultural study programme.

Though COBFAS has so far been a case of success, it has no guaranteed source of sustainable funding. It is currently dependent on the budgetary allocation from the government and hence subject to the vagaries of fiscal measures of government. Lack of sustained funding is therefore a major risk to the development of COBFAS. One of the interview respondents provided insight on the constraints on COBFAS as follows:

There are many challenges but the major is the funding of this programme. I told you about modern facilities we are looking for; we are not getting the money from the government, one of the reasons why we are on strike, you remember? So the university is just trying to use scarce resources. We still need funding support to be able to drive the project the way we want. We have infrastructural problem which is also linked to funding. We need tractors, good roads, storage facilities, etc. (FUNAAB Academic Interview No.1).

Furthermore, as indicated in the interview excerpt above, most of the equipment (tractors and other machineries) are not in place, bad road network to all the farming locations, poor farmstead, lack of storage facilities and accommodation for the students are important infrastructure constraints which pose significant risks to COBFAS.

10.8. Conclusion

The university interaction with external social partners exemplified by COBFAS involves a network of academics, students, state and local government agents, and members of rural farming communities. This is indicative of a network form of interaction with potency for generating innovation for inclusive development. The innovations produced by the interaction are mainly process innovation which enabled the rural communities to improve agricultural productivity, yield and income. Though there were no data or information on the actual improvement in productivity and yield, the interview responses from participants in the interaction confirm the remarkable improvements in the rural economy consequent upon the activities of COBFAS. Within the first three years of its existence, the direct reach of COBFAS has thus improved the livelihood conditions of subsistence farmers and community dwellers in the COBFAS locations. The interaction has also produced well trained agricultural graduates with knowledge of the practice of agriculture in rural settings.

The interaction has so far contributed to student work integrated learning or service learning programme, and to developing approaches that make FUNAAB more socially accountable and capable of contributing to the national system of innovation and poverty reduction agenda. In a sense therefore, COBFAS can be regarded as a kind of service learning partnership that is based in the community to the benefit of the university primarily but also providing significant benefits to the rural dwellers. To conclude therefore, the scheme/project is worth following over time to assess the realisation of its potentials and the possibilities for implementing the model on a wider scale.

The major driver of the interaction has been the need to fulfil the university's mandate of community outreach and engagement. This urge to fulfil the mandate is driven by a social responsiveness, linked to the belief that the engaged research activity renders an important social and intellectual good for the community, students and the academics. The interaction results in the transfer of knowledge (from university to rural community/farmers), introduction of products and processes new to the rural community, and more importantly, the improvement in livelihoods of the rural dwellers. The university researchers also learn how to improve their research and teaching activities through feedbacks from the community. The interactions between the university and the rural community through COBFAS are thus characterised by bi-directional flow of knowledge, and have evidence of innovation for inclusive development.

Finally, the findings show that this is a case of interaction that improves the livelihoods of marginalised rural farming communities, and can thus promote innovation for inclusive development. The enablers of the interaction that can be identified from the case study analysis include:

1. The university strategic mission and community engagement policy that is broadly supportive of and directly promotes interaction with rural communities, given the inter-dependence of the university and its catchment area communities.
2. The university's commitment to service learning and work-integrated learning that support the provision of social infrastructure to the rural communities and helps rural farming households to align with university priorities.
3. Potential for bi-directional knowledge flows that are characterised by codified knowledge from the university to the community, and indigenous knowledge from the community to the university, however limited in scale.
4. Agricultural students as the main channel of interaction linking the university to individual community actors.
5. The core activities of capacity building, intermediary action, research, and process innovation that complement each other in a reflexive manner, developed over time in response to community demand and as strategic responses to livelihood challenges.
6. The depth of community participation (involvement in problem identification and idea generation) contributes towards the sustainability of the engagement, as well as making a contribution to the knowledge and strategic components.

Constraints and risks primarily relate to the fact that though the livelihoods of the communities have been enhanced thus far, the threat of marginalisation remains substantially unchanged. The main constraints on the interactions include:

- Inadequate funding of COBFAS;
- Lack of rural infrastructure;
- Lack of university policy on interaction; and
- Non-interaction by some academics.

Chapter 11

CONCLUSIONS AND RECOMMENDATIONS

11.1. Conclusions

11.1.1. Higher education system and the national system of innovation

This study examined how the development process in Nigeria has affected the organisation of the higher educational system, and the critical role of universities as agents of innovation for inclusive development. Nigeria has started to appropriately renew efforts aimed at building local technological capability, foster national system of innovation (NSI), and ensure that innovations required for economic competitiveness are delivered. In recent years, there has been improvement in the institutional framework for quality control in university education and deliberate attempts at promoting innovation and entrepreneurship as important aspects of the university course programmes. However, the review of the higher educational system as a major element of the NSI indicates that reform in the organisation of higher education is yet to make significant impact on the NSI. Consequently, the capacity of universities to contribute to innovation for inclusive development has been highly constrained. The recent gain of expansion in access to university education has not been accompanied by prioritisation of investment in science, technology and innovation which is required for increased productivity in both the formal and informal sectors of the economy. Moreover, the constraints of poor funding and inadequate infrastructure for research in Nigerian universities have hindered the contribution of the educational system to the evolution of the NSI. The policy and institutions for university education have no direct focus on how universities can address the social and economic challenges of the marginalised communities. The issue of innovation for inclusive development is therefore absent from the national strategy for the development of the university system.

11.1.2. Patterns of university interaction with external social partners

The results of the comparative analysis of the pattern of interactions of university with external social partners vary by university types. The interactions by the sampled academics in conventional and technology universities are mainly traditional and service forms of interaction, while the academics' interaction at the agricultural university provided substantial cases of network forms of interaction that can engender innovation for inclusive development. However, there is lack of entrepreneurship forms of interaction among the respondents from the three university types. This is more pronounced for the conventional and technology universities, while the agricultural university has made its community engagement activities to produce commercial gains through farmers-students-lecturers relationships that encourage farming as a business enterprise. Although the small sample size and the apparent lack of representativeness make generalisation from the findings difficult, the results are suggestive of what could be scaled up or replicated to enable universities improve their contributions as important nodes in the interactive web of the national system of innovation.

Academics in all three university types interact with individuals, households, schools, and national universities as main external social partners. It is also noteworthy that SMMEs appeared among the three most frequently mentioned external social partners only in FUTA. In the NSI framework, the firm is the centre for innovation, and hence the tendency to interact with SMMEs by FUTA portends a likelihood of strengthening the NSI through innovation activities by SMMEs. This may however not necessarily result in innovation for inclusive development

because the findings of this study have provided no evidence for strong interaction between FUTA and marginalised communities. The partnerships with schools and national universities would provide opportunities for improving the quality of education in high schools and learning among the interacting universities. It is also doubtful if this would translate into improvement in knowledge required for innovation in informal settings without a deliberate university policy or commitment to promote innovation for inclusive development.

At the University of Ibadan, a conventional university, the findings of this study show that there has been a paradigm shift in the university's mission from the production of elite leaders and civil servants to that of a research university. Attempts aimed at linking the aspirations of the university to the national system of innovation have been focused on the NSI and its formal sector relationships. It is indicative that the tendency towards becoming a research university may not involve substantial interactions at the community level except teaching and research are deliberately made to be community based.

For FUNAAB, there is ample evidence of community based interaction through the university extension services and practical year training in the rural farming communities. While interactions by the sample academics in UI and FUTA are mainly traditional and service forms of interaction, the academics interaction at FUNAAB provided substantial cases of network forms of interaction that may promote innovation for inclusive development. If these interactions are sustained and widely replicated, the NSI would most likely respond by shifting attention of innovative activities to favour innovation in informal settings.

11.1.3. Case studies of innovation focused on livelihood in informal settings

The three in-depth case study analyses present only anecdotal evidence of university interaction with external social partners that engender innovation for inclusive development. In each of the three cases, there is at least an innovation that is focused on enhancing the livelihoods of marginalised communities situated in informal settings. The three case studies illustrate university interactions in different contexts and how the mission of the university influences the nature and scope of interaction that involves external social partners. The enablers of and constraints on innovation in the three cases have both common and differentiated features. Table 11.1 and Table 11.2 present the major enablers and constraints on innovation respectively. Each of the three cases generated innovation, which are not new to the world, but new to the environment of the relevant actors. The sources of the innovation are different and the enablers are also remarkably different even for the two cases from the University of Ibadan.

In order to provide deeper insights into the enablers of and constraints to innovation for inclusive development as presented by the case studies, this summary of findings also discusses the sources of innovation identified in the three case studies, the role of the marginalised communities, the critical role of funding for innovation in informal settings, community participation and knowledge flows, and the constraints on interaction and how they limit innovation.

Table 11.1: Major enablers of innovation in informal settings

Auto-mechanic Programme (UI)	CIRDP (UI)	COBFAS (FUNAAB)
<ol style="list-style-type: none"> 1. The necessity to achieve the university's new vision and mission statements. 2. The availability of interface structure within the university. 3. The problem of technological gap created by the emergence of high tech vehicles. 4. Willingness to pay by artisans for the auto-mechanic training programmes. 	<ol style="list-style-type: none"> 1. The necessity to achieve the university's new vision and mission statements. 2. Women groups interested in learning new methods of improving their vocation. 3. Teaching and Research Farm of the university could not provide enough space for the university's practical training programme. 4. Availability of land donated by community members. 	<ol style="list-style-type: none"> 1. The university strategic mission and community engagement policy. 2. Community establishing their own form of internal governance that provides an interface between individual members and university actors. 3. Active and regular communication between academics/students/communities (bi-directional flow of knowledge). 4. Availability of land donated by community members.

Source: Analyses of case studies, 2014

Table 11.2: Major constraints on innovation in informal settings

Auto-mechanic Programme (UI)	CIRDP (UI)	COBFAS (FUNAAB)
<ol style="list-style-type: none"> 1. Absence of direct community participation (auto-mechanics register for the programme as individuals). 2. Funding constraints. 3. Uni-directional flow of knowledge. 4. Lack of policy on interaction. 	<ol style="list-style-type: none"> 1. Limited funding due to inadequate budgetary allocation from the Federal Government. 2. The inability of the university to establish a campus in the community. 3. Lack of policy on interaction. 	<ol style="list-style-type: none"> 1. Inadequate funding. 2. Lack of rural infrastructure. 3. Lack of university policy on interaction.

Source: Analyses of case studies, 2014

Sources of innovation

For informal sector activities in developing countries, innovation may not be defined as an outcome of a formal research and development (R&D) process because of the relatively low knowledge and income levels of the informal sector actors. For the conventional university (i.e., University of Ibadan), the empirical data from the two case studies present innovation as an outcome of interactive processes of agents in the informal sector, the academics from UI, and a third party actor. The third party actor in the case of the auto-mechanic programme is a private sector profit-oriented company, while the third party actor in the case of CIRDP is a not-for-profit non governmental organisation. Another major actor in the CIRDP case is the MacArthur Foundation, which is also a not-for-profit organisation that played a strategic role of providing fund for the activities in the interaction. In the two cases, innovation takes place at the enterprise

level. For the auto-mechanic programme, process innovation occurs at the point of service/maintenance or repairs of automobiles, often carried out in the garage or workshop. For the CIRDP, product and process innovations occur at the micro or small-sized enterprise where moringa processing, agro-processing and snail rearing take place. The two cases have a strong training or capacity building component which facilitated innovation delivery at the enterprise level. In effect, the profit-orientation of external social partners does not appear to affect innovation delivery in informal settings when the conventional university is committed to promoting innovation among marginalised communities. For third party actors, social conscience reasons are noted as important motivations for their participation in the interactions; while for the conventional university, the need to achieve the mission of making societal impacts was identified as the main motivation for the interaction.

The sources of innovation for the COBFAS case include the scientific research at the university of Agriculture and feedbacks from farmers in the rural communities where students carry out their practical farming programme. The student is a major third party in the interaction between the university and the community. In contrast to the conventional university cases, the role of research is notable for the case of COBFAS. This is associated with the fact that the specialised university has a strong extension service agent (i.e., AMREC), which has a primary objective of linking agricultural research outcomes with rural communities. It may thus be inferred that specialisation enabled a more focused attention on innovation delivery in rural communities where livelihood conditions are often characterised by endemic poverty.

Role of marginalised communities

The role of marginalised communities in each of the three cases was initially passive. For the auto-mechanics programme, the community of artisans knew they had the challenge of knowledge gap created by modern/high technology automobiles. However, they were voiceless and incapable of raising the necessary help required for skills upgrading and technological learning. The private sector led intervention by MAC BEN enabled the community of artisans to be drawn out for help. The cost of the interaction to the community of artisans was modest since they lack resources to pay for the full cost of the skills upgrading programme. The social conscience component of the auto-mechanics programme is an important factor especially for the continued participation of MAC BEN.

For the CIRDP, the Ile-Ogbo community was prepared and members of the community were proactive about the interaction after the initiation of the interaction by the University of Ibadan. The community provided the covering needed by the women groups, though it was motivated by the communal expectation or prospects of setting up of a campus of the University of Ibadan in Ile-Igbo. This expectation provided the incentive required for the community to donate vast expanse of land to the university. Thus, the community had a significant resource input into the interaction in addition to knowledge inputs through feedbacks given to students and lecturers on local agricultural practices and how new seedlings, cropping methods, moringa processing, oil palm/kernel oil processing have affected farmers' performance and incomes.

For COBFAS, the rural communities were receptive to the interactions apparently due to the previous neglect of rural communities by public sector agencies. The University of Agriculture entered the rural communities as an agent reaching out to help improve the livelihood conditions of the rural farmers. The communities did not immediately recognise the fact that they were also a source of benefit to the university. However, as mutual trust gained ascendancy, the rural

communities became major stakeholders donating land for the university's practical training in Agriculture and interacting with students and lecturers to provide important feedbacks for the improvements in the research and training activities of the university.

In all the three cases, the communities are made up of marginalised groups located within the informal sector economy. Two cases (CIRDP and COBFAS) demonstrate that the marginalised communities have assets (i.e., land) that can be part of the critical input into innovative projects/programmes aimed at addressing the livelihood challenges of the poor and vulnerable. This shows that given appropriate and adequate incentives, communities would make contributions to enable innovation for inclusive development. Even the auto-mechanic programme included contribution (i.e., payment for skills upgrading programme) from the artisans.

Community participation and knowledge flows

In all the three cases, knowledge flow at the initial stages appears to be uni-directional, from the university to the marginalised communities. The university or a catalyst third-party agent (e.g., MAC BEN) brings the new idea, project and/or programmes, and attempts to create an incentive regime that enables community participation. The community response often introduces bi-directional knowledge flow. The ensuing knowledge flow feeds into the overall interaction which generates innovation and enables the use of innovation for improving the livelihood conditions of the marginalised communities. This was particularly demonstrated by the case of COBFAS in which feedbacks from the communities provide knowledge to students and lecturers, and thus enable improvement in learning by students, and improvement in the quality of research and training activities of the university.

The critical role of funding

The three cases recognised the important role of funding in sustaining interaction and getting the marginalised communities involved in innovation for inclusive development. In all the cases, funding was identified as critical and the universities are unable to provide adequate funding for the project from their regular grant from government and income generated by the university. The auto-mechanic programme is a programme with good prospects of generating self-sustaining income if the programme is able to maintain the tempo of interest expressed in the programme by the community of artisans that patronise the training programme. However, the programme has a delicate balance between raising course fees and increasing artisan participation because the community of artisans is a low-income community that may not be able to cope with fees beyond a certain threshold. If this threshold suffices for MAC BEN and the university to make sufficient income that are considered fair reward for their contributions to the programme, then the auto-mechanic programme has a good and sustainable future. Otherwise, extra funding mechanism would be required to bridge the funding gap, especially to adequately compensate MAC BEN, which may inadvertently exit the programme if its current income from the programme does not improve. Since MAC BEN is a profit oriented private enterprise, its social conscience expression may not sustain its participation in the programme for long.

The CIRDP is currently funded by the MacArthur Foundation and there is no alternative funding mechanism in view. The women groups that have benefited from CIRDP are unable to continue their various projects without continual oversight and guidance by the staff of the University of Ibadan. Carrying on the oversight function and the maintenance of the agro processing equipment used for the micro and small-sized enterprises need a sustained financial support.

Though COBFAS is organised in relation to the agricultural university's extension services programme anchored by AMREC, it is not a programme sponsored or funded under AMREC. It is a separate programme of the university and is operated under the limited funding resources available to the university.

The findings from the three case studies do not provide sufficient insight on how the universities can sustain the funding mechanism for the case studies. It is however possible to assume that as long as the universities derive a sense of fulfilment of their community engagement mission through these case studies, the funding stream would keep flowing. While this may be true for COBFAS, it is doubtful that the auto-mechanic programme and the CIRDP would be able to attract significant funding from the university's regular funding sources. The DLC and the Department of Mechanical Engineering have other remarkable programmes that could overshadow the relevance of the auto-mechanic programme and thus make it inconsequential if decline sets in. The CIRDP funding is for only three years, and if no alternative funding source is available, the project's fate would be determined by the eventual decision of MacArthur Foundation on the renewal of the funding instrument.

Constraints on interaction and innovation

The constraints on interaction and innovation in the three case studies can be classified into three categories. These include constraints of inadequate funding, capacity building gap, and lack of policy on interaction. The funding constraints as discussed above affect the three case studies in different measures. Mostly at risk appears to be CIRDP currently financed by the MacArthur Foundation. COBFAS funding is constrained by resources available to the agricultural university to fund its projects and programmes, while funding for the auto-mechanic programme depends largely on the ingenuity of the DLC to manage the interface between course fees paid by the artisans and the compensation for MAC BEN.

The capacity building gap constraint relates to the universities' dependent on external agents to provide adequate knowledge required for innovation in informal settings. With the exception of the case of COBFAS, key resource persons are outsourced for critical aspects of the projects that generate innovation for improving the livelihood conditions of marginalised communities. For CIRDP, the Life Builders Ltd provided trainers especially for the training of women groups in skills required for moringa processing and packaging. For the auto-mechanic programme, MAC BEN provided trainers on entrepreneurship and the specialised skills required for operating diagnostic automobile scanners and Launch X431 GDS.

Finally, the universities lack policy on interaction and innovation for inclusive development. This becomes a major constraint when opportunity for interaction and innovation arises in informal settings. In such a situation, lack of policy would normally result in either inaction on the part of relevant actors or inappropriate action resulting in wastage of scarce resources. However, the case of COBFAS is somewhat an exception because the programme is well structured and appears to have fairly defined parameters for monitoring and evaluation.

11.2. Recommendations

For the current efforts at economic transformation in Nigeria to achieve desirable outcomes, creating innovation at different levels of agent participation in the economy is an imperative. Typical to the national system of innovation, the interactive and learning activities that engender

innovation are often seen as based in the formal sector economy. The reality that innovation also occurs in informal settings, and the fact that the NSI in the context of developing economies cannot ignore innovation among the marginalised communities, introduce a new challenge to the higher education system. Innovation requires knowledge and the university system is central to the knowledge industry on which modern production and consumption systems depend. Policy reform in the educational system and how it affects social and economic transformation should be a dynamic process that keep pace with the changing patterns of knowledge generation and use in the local context and in the broader scope of the global economy. Based on the findings of this study, the following are the specific policy implications and recommendations for reform action aimed at making universities agents of innovation for inclusive development in Nigeria.

1. *Address the challenge of inadequate funding and poor research infrastructure:* The key policy implication of the findings of the review of the Nigerian higher education system and its role in the NSI is the need to confront the challenge of inadequate funding and poor research infrastructure in the Nigerian universities. Investment in science, technology and innovation (STI) should be a major priority of government expenditure. A major and effective channel of investment in STI is adequate funding of research and research infrastructure projects in the university system.
2. *Make a national policy on university interaction with external social partners:* A national policy on university interaction with external social partners should be part of a strategy to ensure that community engagement function of the universities deliver innovation that benefits people that are often marginalised or excluded from the formal sector economic activities. Contributions of the universities at the community level are practical ways of promoting development that directly empowers the marginalised communities and thus enhance their livelihood conditions. A national policy on interaction would encourage universities to raise the level of awareness and commitment of academics to interaction with external social partners. Such a policy should aim at recognising interactions through research, teaching and community engagement as a form of scholarship that should be part of the assessment framework for academic career progression. The national strategy for higher education course programmes recognises the importance of entrepreneurship development and innovation. Beyond the course programmes, academics should themselves be encouraged to embark on research and teaching activities that involve interaction with external social partners as an effective means of entrepreneurship development among the actors in the interaction.
3. *COBFAS as a model for practical training in agriculture:* The network form of interaction exemplified by COBFAS should be encouraged as a model for practical training in agriculture in Nigerian universities. The basic principle of COBFAS is the engagement of young people at the locations where actual professional practice is carried out with active participation of all the agents critical to agricultural production, storage and marketing.
4. *Make university level policy on interaction with external social partners:* Two of the three case studies demonstrated that innovation in informal settings are associated with learning enabled by capacity building activities often involving third party actors. There is however no evidence of extant policy on university engagement of third parties in its interaction with communities. A policy framework at the university level is required for guiding university interaction with external social partners. This policy should have adequate incentive to attract the participation of third parties in capacity building activities among the marginalised groups. The university level policy may draw from the national policy

earlier recommended, but must adapt the elements of the national policy to suit its specific context.

5. *Encourage non-pecuniary contribution by communities*: Where feasible, communities may be encouraged to make non pecuniary contribution to projects involving university interaction. The three case studies demonstrated in different ways that when the incentives are appropriate, communities would willingly make non-monetary contributions.
6. *Make provision for adequate and sustainable funding of interaction activities*: The most important risk to identified cases of innovation in informal setting is inadequate and unsustainable funding. Organisation of university interaction with external social partners should include a guaranteed source of or framework for adequate and sustainable funding. The uncertainty associated with inadequate funding may otherwise hinder the effectiveness and eventual success of the interaction and its capacity to generate innovation for inclusive development.

Finally, these recommendations are somewhat general but can be tailored for reform actions in each of the university types. Effective action will require ownership of reform by the universities, and hence, the recommendations as adapted for each university should be subject to widespread discussions among the relevant stakeholders.

REFERENCES

- Adeoti, J. O. (1997). Resettlement as an Instrument of Small Enterprise Promotion in Nigeria; University of Leipzig Papers on Africa, Politics and Economics, No.09, Institut für Afrikanistik, University of Leipzig, Germany.
- Adeoti, J. O. (2002). Building Technological Capability in the Less Developed Countries: The Role of a National System of Innovation, *Science and Public Policy*, Vol. 29, No. 2, pp. 95–104.
- Adeoti, J. O. and A.I. Adeoti (2008). Easing the Burden of Fixed Telephone Lines on Small-Scale Entrepreneurs in Nigeria: GSM Lines to the Rescue, *Telematics and Informatics*, Vol.25, No.1, pp. 1-18.
- Adeoti, J. O., S.O. Odekunle and F.M. Adeyinka (2010). *Tackling Innovation Deficit: An Analysis of University-Firm Interaction in Nigeria*, Evergreen Publishers, Ibadan, Nigeria.
- Aderoba, A. (2000). Strategies for Engineering Development in Nigeria. *Integrated Manufacturing Systems*, Vol. 8 No.4, pp. 30-40.
- Adesina, S. (2005). *Growth without development: Nigeria's educational experience: 1914-2004*. Educational Industries Nigeria Limited, Abeokuta.
- Adewoye, Omoniyi. (2000). Higher Education in Nigeria: The Birth of an Idea, In A. Mojuetan, (ed.), *Ibadan University at 50 (1948-1999): Nigeria's Premier University in Perspective*, Ibadan University Press, Ibadan.
- Adubifa, Akin (1990). *Technology Policy in Nigeria*, Nigerian Institute of Social and Economic Research (NISER), Ibadan, Nigeria.
- Bamiro, O. A. (2012). The University of Ibadan Ajibode Project: The Facts of the Case and Lessons for Leadership in the Unstable Environment of University Governance in Nigeria, University of Ibadan, Ibadan.
- Chamberlain, Ohwojero and E.C. Ede (2013). History of Automobile Past and Present Challenges Facing Automobile Production in Nigeria, *IOSR Journal of Research & Method in Education*, Vol.2, No.4, pp. 11-16, www.iosrjournals.org.
- Chambers, Robert and G. Conway (1992). *Sustainable Rural Livelihoods: Practical Concepts for the 21st Century*. IDS Discussion Paper 296, IDS, Brighton, UK.
- Conway, G. and J. Waage. (2010). *Science and Innovation for Development*, Collaborative on Development Sciences (CDS), London.
- Corden, W.M. and J.P. Neary (1982). Booming Sector and De-industrialisation in a Small Open Economy, *The Economic Journal*, Vol. 92, No.368, pp.825-848.
- Cozzens, S. E, and J. Sutz (2012). *Innovation in Informal Settings: A Research Agenda*, An IDRC Commissioned Paper, IDRC Ottawa, Canada.

Etzkowitz, Henry and C. Zhou (2008). Introduction: Building the Entrepreneurial University: A Global Perspective, Science and Public Policy Special Issue on 'the Triple Helix: Building the Entrepreneurial University', *Science and Public Policy*, Vol.35, No.9, pp.627-635.

FMST (2012). National Policy on Science, Technology and Innovation, 2012, Federal Ministry of Science and Technology, Abuja.

FUNAAB (2011). Agricultural Media Resources and Extension Centre (AMREC) Annual Report, Federal University of Agriculture, Abeokuta.

FUNAAB (2012). Federal University of Agriculture, Abeokuta 2012 Annual Report 2011-2012, Federal University of Agriculture, Abeokuta.

FUTA (2011). Handbook, Federal University of Technology, Akure, Nigeria.

FUTA (2012). FUTA's Giant Strides, Vol. IV, Annual Report November 2011 – October 2012, Federal University of Technology, Akure, Nigeria,

Gregersen, B., L.T. Linde, and J.G. Rasmussen (2009). Linkage between Danish Universities and Society. *Science and Public Policy*, Vol. 36, No.2, pp.151-156.

Gupta, A.K., R.Sinha, D.Koradia, R. Patel, M. Parmar, P. Rohit, H. Patel, K. Patel, V.S. Chand, T.J. James, A. Chandan, M. Patel, T.N. Prakash and P. Vivekanandan (2003). Mobilizing Grassroots: Technological Innovations and Traditional Knowledge, Values and Institutions - Articulating Social and Ethical Capital, *Futures*, Vol.35, pp.975–987.

IMF (2010). Year Book, International Financial Statistics, International Monetary Fund, Washington, D.C.

IMF (2012). Regional Economic Outlook - Sub-Saharan Africa, International Monetary Fund, Washington, D.C.

Iizuka, Michiko (2013). Innovation Systems Framework: Still Useful in the New Global Context?, UNU-MERIT Working Paper Series No. 2013-005, UNU-MERIT, Maastricht, The Netherlands.

Juma, Calestous (2006). Redesigning Africa Economies: the Role of Engineering in International Development, Royal Academy of Engineering, London.

Kaplinsky, Raphael (2011). Schumacher Meets Schumpeter: Appropriate Technology Below the Radar, *Research Policy*, Vol.40, No.2, pp.193-203.

Kruss, Glenda (2005). Harnessing Innovation Potential? Institutional Approaches to Industry-Higher Education Research Partnerships in South Africa, *Industry and Higher Education*, Vol.19, No.2, pp.131-142.

Kruss, Glenda (2012). Reconceptualising Engagement: a Conceptual Framework for Analysing University Interaction with External Social Partners, *South African Review of Sociology*, Vol.43, No.2, pp.5-26.

Kruss, Glenda, J.O. Adeoti and D. Nabudere (2012). Universities and Knowledge-based Development in sub-Saharan Africa: Comparing University-Firm Interaction in Nigeria, Uganda and South Africa, *Journal of Development Studies*, Vol.48, No.4, pp.516-530.

Lubell, H. (1991). *The Informal Sector in the 1990s*, OECD, Paris.

Lundvall, B., J. Vang, K.J. Joseph and C. Chaminade, C. (2009). Bridging Innovation System Research and Development Studies: Challenges and Research Opportunities, Paper Presented at the 7th Globelics Conference, Dakar, Senegal. October 6-8, 2009.

Lundvall, B.-Å., (1992) (ed.). *National Systems of Innovation: Towards a Theory of Innovation and Interactive Learning*, Pinter, London.

Malerba, Franco and R.R. Nelson (2012) (eds.). *Economic Development as a Learning Process: Variation Across Sectoral Systems*, Edward Elgar, Cheltenham UK and Northampton, USA.

Meagher, Kate and M.B. Yunusa (1991). Limits of Labour Absorption: Conceptual and Historical Background to Adjustment in Nigeria's Urban Informal Sector, Discussion Paper No.28, UNRISD, Geneva.

Moser, Gary, S. Rogers and R. van Till (1997). Nigeria: Experience with Structural Adjustment, Occasional Paper No.148, International Monetary Fund, Washington D.C.

Mustapha, A.R. (1991). Structural Adjustment and Multiple Modes of Social Livelihood in Nigeria, Discussion Paper No.26, UNRISD, Geneva.

NBS (2010). *Nigerian Economic Outlook*, National Bureau of Statistics, Abuja, Nigeria.

Neitzert, Monica and S. Horton (1992). Research on the Informal Sector in East Africa: A Summary of Findings, The Economic Development Institute of the World Bank, Washington, D.C.

NPC (2011). *Annual Performance Report of the Nigerian Economy*, National Planning Commission, Abuja, Nigeria.

NUC (2012). *Nigerian Universities*, National University Commission, Abuja, Nigeria, <http://www.nuc.edu.ng/>.

Nwaka, G.I. (2004). *The Urban Informal Sector in Nigeria: Towards Economic Development, Environmental Health, and Social Harmony*, Global Urban Development, The Prague Institute, North Carolina State University, Raleigh, USA.

Ogbu, Osita, F. Olokesusi, J.O. Adeoti, G. Akpokodje and O. Okuwa (2011). Nigeria Case Study on Economic Transformation, A Research Report on a Study Commissioned by African Centre for Economic Transformation (ACET), Accra, Ghana.

Okuwa O.B (2010). Household Willingness to Pay for Higher Education in Oyo State Nigeria, *Journal of Sociology and Education*, Vol.9, No 2.

Osalor, Peter (2011). The Informal Economy and Entrepreneurial Development, Vanguard Newspaper, 23 January 2011, Lagos, Nigeria.

Peattie, Lisa (1987). An Idea in Good Currency and How It Grew: The Informal Sector, *World Development*, Vol. 15, No.7, pp.851-860.

Prahalad, C.K. (2005). The Fortune at the Bottom of the Pyramid: Eradicating Poverty through Profits, Upper Saddle River, Prentice-Hall, New Jersey, USA.

Prahalad, C.K. and S.L. Hart (2002). The Fortune at the Bottom of the Pyramid, *Strategy and Business*, Vol.22, pp.2-14.

Sachs, J.D. and A.M. Warner (1995). Natural Resource Abundance and Economic Growth, NBER Working Paper, No.5398, NBER, Massachusetts Avenue, Cambridge, Massachusetts, USA.

Sutz, Judith (2000). The University-Industry-Government Relations in Latin America, *Research Policy*, Vol.29, No.2, pp.279-290.

Swaminathan, Madhura (1991). Understanding the Informal Sector: A Survey, Working Paper No.95, World Institute for Development Economics Research (WIDER), Helsinki, Finland.

Tiwari, R. and C. Herstatt (2012). Frugal Innovation: a Global Network's Perspective, *Die Unternehmung (Swiss Journal of Business Research and Practice)*, Vol.66, No.3, pp. 245-274.

UNECA (2013). *Making the Most of Africa's Commodities: Industrializing for Growth, Jobs and Economic Transformation*, UNECA 2013 Economic Report on Africa, UNECA and Africa Union, Addis Ababa, Ethiopia.

UNESCO (2006). Nigeria/UNESCO Project for the Reform of the Nigerian Science and Innovation System: Science Component of UNSECO Special Plan of Cooperation with Nigeria, UNESCO, Paris.

University of Ibadan (2009). *Promoting Excellence in Teaching, Research and Community Service*, Ibadan University Press, Ibadan.

Zeschky, Marco, B. Widenmayer and O. Gassmann (2011). Frugal Innovation in Emerging Markets, *Research Technology Management*, Vol.54, No.4, pp.38-45.

APPENDICES

Appendix 1: UNIVERSITY INFORMATION SCHEDULE (Template A)

1. Please list all the campuses of your university, and indicate the year in which the campuses or institutes were established and their location.

	Year established	Location
Name of university:		
Campus/institute:		
1.		
2.		
3.		
4.		

2. Please provide total enrolments per faculty for the most recent year available, distinguishing between under-graduate and post-graduate students. Please indicate the year for which you have supplied data.

ENROLMENT		
Faculty name	Under-graduate (BA and Licentiatūra)	Post-graduate (Masters and Doctorates)
Total		

3. Please provide the total number of academic staff and indicate the number of staff with PhDs for the same year, per faculty.

ACADEMIC STAFF		
Faculty name	Number with PhD	Total
Total		

4. Please list all of the research centres and units in your university, indicating their location and size.

Name	Faculty	Campus	Staff size

5. Please list all of the outreach units in your university, indicating their location and size.

Name	Faculty	Campus	Staff size

6. Please indicate the number of research projects funded *over the last three years*.

	Number of projects	Approximate Total Funding
National university funds		
International donor funds		

7. Please indicate the number of academic publications at your university *over the last three years*.

Publications	Number
Internationally accredited journals	
Nationally accredited journals	
Institutional journals	

8. Please indicate the number of patents awarded to your institution *to date*.

Patents	Domestic	Abroad
Number of patent applications		
Number of patents awarded		
Number of licensed patents		

9. How do you expect staff to distribute their working time among the following academic functions?

	% time
Teaching	
Research	

Private activities for individual gain	
Interaction with external actors	
Administration	

10. Does your university have any of the following policies and structures? Please supply copies of each of the formal policy documents that you do have.

	Yes	No
Annual reports		
Research policy		
Intellectual Property Rights (IPR) policy		
Strategic institutional policy		
Teaching and learning policy		
'Community engagement' policy		
Research office		
Contracts office		
Technology transfer office		
Commercialisation office		
Innovation office		
Extension office		
Community engagement office		
Science park		
Small business incubator		
Experimental farm or agricultural centre		
Specialised outreach campus		
Delivery site based in communities		
Cultural sites		
Other – specify		

11. Does your university have any of the following incentive mechanisms that promote interaction?

	Yes	No
Performance management system that rewards interaction or engagement		
Awards for research		
Awards for innovation		
Awards for engaged activity		
Promotion criteria that rewards interaction or engagement		
Open days for external actors		
Community forum		
Newsletter that promotes interaction or engagement		
Specialised funds for promoting research		
Specialised funds for promoting innovation		
Specialised funds for promoting interaction with communities		
Specialised funds for promoting interaction with firms		
Other – specify		

Appendix 2: INTERVIEW SCHEDULE FOR SENIOR MANAGEMENT AND LEADERSHIP (Template C)

1. How does interaction with external social partners fit into the main **missions** of your university?
 - What is the intended balance between teaching and learning, research and innovation, and outreach?
 - How do you expect academics to address these?
2. What are the main **types** of interaction that take place in your university?
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 **coordinated** with your strategic thrust?
4. What are the **institutional structures and processes** you have tried to 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** you have put in place to promote interaction with external social actors, particularly communities and local actors?
 - Internal mechanisms (e.g. performance criteria, special awards)
 - External mechanism (e.g. newsletters, special funds)
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 3: INDIVIDUAL ACADEMIC INTERACTION INSTRUMENT (Template E)

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 centres	<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 organisations	<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 organisations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18	Religious organisations	<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 commercialisation 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	Database variable name
		1	2	3	4	
1	Public awareness and advocacy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	q51
2	Improved teaching and learning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	q52
3	Community-based campaigns	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	q53
4	Policy interventions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	q54
5	Intervention plans and guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	q55
6	Training and skills development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	q56
7	Community employment generation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	q57
8	Firm employment generation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	q58
9	Firm productivity and competitiveness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	q59
10	Novel uses of technology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	q510
11	Improved livelihoods for individuals and communities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Q511
12	Improved quality of life for individuals and communities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	q512
13	Regional development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	q513
14	Community empowerment and agency	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	q514
15	Incorporation of indigenous knowledge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	q515
16	Participatory curriculum development, new academic programmes and materials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	q516
17	Relevant research focus and new research projects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	q517
18	Academic and institutional reputation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	q518
19	Theoretical and methodological development in an academic field	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	q519
20	Cross-disciplinary knowledge production to deal with multi-faceted social problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	q520
21a	Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	q521a
21b	Specify					q521b

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	Database variable name
		1	2	3	4	
1	Limited financial resources for competing university priorities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	q61
2	Lack of clear university policy and structures to promote Interaction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	q62
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"/>	q63
4	Competing priorities on time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	q64
5	Too few academic staff	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	q65

6	Institutional recognition systems do not reward academic Interaction activities sufficiently	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	q66
7	Risks of student involvement in Interaction with external social partners	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	q67
8	Tensions between traditional and new academic paradigms and methodologies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	q68
9	Sustainable external funding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	q69
10	Negotiating access and establishing a dialogue with external social partners	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	q610
11	Unequal power relations and capabilities in relation to external social partners	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	q611
12	Legal problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	q612
13	Lack of mutual knowledge about partners' needs and priorities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	q613
14a	Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	q614a
14b	Specify	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	q614b

8. 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"> • What was the main aim of the project? • What social actors were involved? • What kinds of relationship were involved? • What channels of information were used? • What were the outputs? • What were the outcomes and benefits? • What were the obstacles and challenges?

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

Appendix 4: SCHEDULE FOR ACADEMICS WITH NO INTERACTION (Template F)

There are many **reasons why academics do not interact** with external social actors.

Please indicate how important *each* of the following is in relation to your own experience.
(where 1 = not important, 2 = slightly important, 3 = moderately important and 4 = very important).

	Reason for no Interaction	Not important	Slightly important	Moderately important	Very important
		1	2	3	4
1	Interaction is not appropriate given the nature of my academic field or discipline	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Interaction is not central to my academic role	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Pressures of teaching and research on my time are too great	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	My department or faculty does not promote Interaction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Lack of clarity on the concept of external interaction in my university	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Institutional recognition systems do not reward Interaction activities sufficiently	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	Limited financial resources are available	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	University administration systems do not support Interaction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	Lack of clear university policy on Interaction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	Lack of clear university structures to promote Interaction activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	Lack of recognition of Interaction as a valid type of scholarship in my university	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	Differences between university and social partner priorities and needs are too great	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	Lack of social partners' knowledge about research activities and priorities in universities	<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				

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