



INNOVATION & INTELLECTUAL PROPERTY

COLLABORATIVE DYNAMICS IN AFRICA

**Editors: Jeremy de Beer, Chris Armstrong,
Chidi Oguamanam & Tobias Schonwetter**

Innovation & Intellectual Property

Collaborative Dynamics in Africa

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CHIDI OGUAMANAM AND TOBIAS SCHONWETTER

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Preface

This book is among the key outputs of the Open African Innovation Research and Training (Open A.I.R.) Project. Based on case study research in nine African countries, the book examines the recent history and current on-the-ground realities of innovation and intellectual property (IP) in African settings. In doing so, the book reveals complex collaborative dynamics across a range of different countries, sectors and socio-economic contexts, and generates recommendations for how innovation and IP can be married with social and economic development objectives in African settings. This book's sister report, *Knowledge and Innovation in Africa: Scenarios for the Future*, situates the current realities covered in this book within a much longer historical trajectory and multiple potential futures.

Conceived in 2009, established in 2010 and launched in 2011, Open A.I.R. is a pan-African and globally interconnected research and training network, which was established to:

- raise IP awareness in African settings and facilitate critical policy engagement;
- empower a networked, epistemic IP community in Africa;
- identify IP-related innovation bottlenecks and modes of open collaboration; and
- interrogate IP-related innovation metrics, capital and power structures.

Open A.I.R. is financially supported by Canada's International Development Research Centre (IDRC) and Germany's Federal Ministry for Economic Cooperation and Development (BMZ), and collaborates with numerous other organisations and individuals – all of whom are recognised in the Acknowledgements' pages of this book. In addition to the aforementioned case study and foresight research, the Open A.I.R. network engages in a wide range of training, capacity building, outreach and policy engagement activities – both on the African continent and in settings outside the continent where matters of African innovation and IP are engaged. These engagements target external stakeholders capable of changing policies and practices, including:

- innovators, creators and entrepreneurs – individuals and companies;
- business groups such as chambers of commerce and industry associations;
- national, regional and international law-makers and policy-makers;
- issue leaders, such as politicians, judges, professors and practitioners;
- scientific and cultural research and development funding bodies;

- university researchers, administrators and technology transfer officials;
- rights-holders and collective rights management organisations; and
- representatives of indigenous and local communities.

Open A.I.R. is motivated by a vision in which innovation and creativity in Africa are sustainable, properly valued, collaborative, widely accessible and result in benefits that are distributed throughout society. Based on this vision, the network's mission is to better understand how innovation and IP processes work in African settings, how knowledge and technology currently protected by IP can be mobilised, and how IP systems can be harnessed or adapted in a manner that fosters openness-oriented collaborative innovation resulting in just distribution of new knowledge and technology.

This book and the *Scenarios* volume are two parts of a much broader attempt, by Open A.I.R. and other initiatives, to facilitate, in the medium to long term, the emergence of new, pragmatic means of valuing and facilitating innovation and creativity in Africa. Contextually appropriate metrics sensitive to the monitoring of meaningful changes in behaviour around innovation and creativity could be instrumental for promoting African grassroots entrepreneurship, broad-based business development, and a vibrant private sector built on small and medium-sized enterprises (SMEs) with a sustained ability to innovate. And the opportunities for innovation-driven SMEs could also benefit from policy-maker adoption of appropriate metrics when designing the policy and regulatory frameworks necessary to ensure predictable innovation environments for stakeholders.

Open A.I.R.'s core funders, IDRC and BMZ, have provided a framework for Open A.I.R.'s objectives. Open A.I.R. fits within the IDRC's Science and Innovation programme, which supports research and policy engagement in relation to how science, technology and innovation (STI) can be engines of socio-economic development. Within this programme, the Information and Networks (I&N) initiative, which funds the Open A.I.R. Project, aims to better understand the linkages among innovation, creativity, networked collaborations (often enabled via information and communication technologies [ICTs]), and determinants of openness – including IP rights. The IDRC also supported the precursor network to Open A.I.R., the African Copyright and Access to Knowledge (ACA2K) Project, which ran from 2007 to 2011 and generated the nucleus of the expert network now driving Open A.I.R.

BMZ supports Open A.I.R. via Germany's Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), under the GIZ commons@ip – Harnessing the Knowledge Commons for Open Innovation initiative. The commons@ip initiative focuses on how IP rights interact with open innovation, the knowledge commons, open licences and collaborative innovation. It is part of the BMZ-

mandated Train for Trade programme, which aims at strengthening the private sector and its constituent bodies in the Southern African Development Community (SADC) region through training and capacity building in export promotion, quality control and promotion of open innovation – as well as through promotion of local and regional economic development and trade.

Open A.I.R.'s training and capacity building components include:

- building the network's capacity – through online platforms, network-wide workshops, research methodology support, scenario-building meetings and thematic seminars;
- awarding Open A.I.R. Fellowships to emerging IP scholars and potential leaders – from Tanzania, Kenya, Uganda, Ethiopia, Cameroon, Nigeria and Egypt;
- exchanging knowledge through Africa-wide and South–South knowledge networking at seminars, workshops and conferences;
- growing awareness among African creators, innovators, entrepreneurs and policy-makers of openness-oriented approaches to innovation and IP matters in Africa; and
- teaching at African tertiary educational institutions, including development of a replicable, open course curriculum on IP law and development.

Because of the immense geographic size of the African continent, and unique logistical challenges of African intra-continental travel, ICTs have been instrumental in empowering the research network's "community of practice". Open A.I.R. has an offline presence in 14 African countries and in multiple countries outside the continent. Online, the network includes hundreds of individuals and institutions throughout Africa and from all corners of the globe, linked via a suite of online networking and social-media tools. The Open A.I.R. community of practice advances a culture of multidirectional exchange among African innovative and creative communities and external actors – with a view to sustainably empowering local communities and SMEs. Network members promote cross-fertilisation of ideas via original thinking and partnerships with national and international institutions, scholars, funding agencies, civil society organisations and other willing partners. Those wishing to join the community can visit <http://www.openair.org.za/join>.

Acknowledgements

True to its emphasis on “collaborative dynamics”, this book is the product of the collective energy of dozens of people and institutions in many countries, all of whom work within the Open African Innovation Research and Training (Open A.I.R.) network. Open A.I.R. currently has core network members and institutions in 14 African countries, spanning North Africa (Egypt, Tunisia), West Africa (Senegal, Ghana, Nigeria, Cameroon), East Africa (Ethiopia, Uganda, Kenya, Tanzania) and southern Africa (Malawi, Mozambique, Botswana and South Africa). Other network members and institutions are in Canada, the United States, the United Kingdom, Germany and France. These members are, in turn, linked – via online and offline interactions – to a broader Open A.I.R. network of hundreds of individuals and institutions, including people and entities in Brazil, India, Malaysia, Australia, Switzerland and the Netherlands. The network receives generous financial support from Canada’s International Development Research Centre (IDRC) and Germany’s Federal Ministry for Economic Cooperation and Development (BMZ).

Each of the editors and authors of this volume is part of, and collaboratively exchanges knowledge and expertise with, this large network, and we the editors, and each of the contributors, are profiled in “About the Editors” and “About the Contributors” sections of this book and on the Open A.I.R. website’s Team page, <http://www.openair.org.za/content/open-air-team>. On this Team page, one can also find the names and contact details of Open A.I.R. Fellows and other network members and institutions. The network is also accessible via its social media platforms, featured at <http://www.openair.org.za/join>

Open A.I.R.’s administrative hub is the IP Unit in the University of Cape Town Faculty of Law, where Project Manager Nan Warner and Administrator Phyllis Webb are the key operational drivers. Warner and Webb receive management support from two of the editors of this book (and the co-Principal Investigators of the Open A.I.R. Project), UCT IP Unit Director Tobias Schonwetter and Jeremy de Beer of the University of Ottawa Faculty of Law. Also supporting project management are Julie Nadler-Visser of UCT’s Research Contracts and IP Services (RCIPS) unit, members of the UCT Finance Department and Faculty of Law Finance Department, and another editor of this book: Chris Armstrong of the LINK Centre at the University of the Witwatersrand (Wits) in Johannesburg.

Network strategic guidance is provided by a Steering Committee composed of De Beer, Schonwetter, Warner, Chidi Oguamanam (another of this book’s

editors) of the University of Ottawa Faculty of Law, Nagla Rizk of The American University in Cairo (AUC), Sisule Musungu of IQsensato in Nairobi, Khaled Fourati of the IDRC office in Cairo, and Balthas Seibold of Germany's Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) in Bonn. Further strategic support from the IDRC is, or has been, provided by Naser Faruqui, Simon Carter, Laurent Elder, Fernando Perini, Matthew Smith, Heloise Emdon and Phet Sayo; Karim Badran and Rose-Marie Ndiaye Pereira on financial matters; and Michelle Hibler and Nola Haddadian on publications. GIZ's involvement is focused on the capacity-building components of the network, which are carried out in collaboration with the GIZ's commons@ip – Harnessing the Knowledge Commons for Open Innovation initiative. At GIZ, in addition to support from the aforementioned Steering Committee member Balthas Seibold, who advises on matters of international knowledge cooperation and networking, support has also come from Petra Hagemann, Christine de Barros Said, Ursula van Look, Marina Neuendorff, Margrit Brockhaus and the Working Group of German Development Organisations on Promoting Innovation Systems. At UCT, as well as those already mentioned, key supporters and collaborators have been the Dean of Law, PJ Schwikkard, Lee-Ann Tong in the Faculty of Law, and, in the IP Unit, the Unit's founder Julian Kinderlerer, its Deputy Director Caroline Ncube and its Senior Research Fellow Bernard Maister. At the University of Ottawa, in addition to those already mentioned, support has been provided by the Dean of the Faculty of Law, Common Law Section, Nathalie Des Rosiers, and Former Dean Bruce Feldthusen.

For this book, key network participants were the team of JD candidates in the University of Ottawa Faculty of Law – Lukas Frey, Will Sapp, Phil Holdsworth, Maya Boorah, Kristen Holman and Saara Punjani – who provided long hours of diligent editorial assistance. In addition, because the research case studies presented in this book all required collection of data from human subjects – via interviews and/or focus group discussions and/or written surveys – this book would not have been possible without the cooperation of dozens of respondents across the countries of study. For reasons of confidentiality, most survey and interview respondents are not named in this book, but we are sincerely grateful for their contributions. Also contributing to the research outlined in this book was Donna Podems of OtherWISE in Cape Town, who advised on research methodologies and supported a methodology workshop for several of the authors featured in this volume, in addition to her support of Open A.I.R.'s monitoring and evaluation (M&E) framework. At this book's publisher, UCT Press, the key drivers have been Publisher Sandy Shepherd and Project Manager Glenda Younge. The cover design for this volume is by Elsabe Gelderblom of Farm Design in Cape Town, who does all of Open A.I.R.'s design work for its website, social media tools, PR materials,

Briefing Notes and the network's other substantial publication output, the Open A.I.R. *Scenarios* compendium – which is available in hard-copy, and on the Open A.I.R. website, as a separate published output and companion to this book.

Network headquarters at the UCT IP Unit serves as Open A.I.R.'s Southern Africa Hub, coordinated by Project Manager Warner. There are also four other Hubs: the North Africa Hub at the Access to Knowledge for Development Center (A2K4D) of the School of Business at The American University in Cairo (AUC), coordinated by Nagham El Houssamy under the direction of Nagla Rizk; the West Africa Hub at the Nigerian Institute of Advanced Legal Studies (NIALS) in Lagos, coordinated by Helen Chuma-Okoro under the direction of Adebambo Adewopo; the East Africa Hub at the Centre for IP and IT Law (CIPIT) of Strathmore University, Nairobi, coordinated by CIPIT Director Isaac Rutenberg; and the Canada Hub at the University of Ottawa Faculty of Law, coordinated by De Beer and Oguamanam. Contact can be made with these Hubs and Hub Coordinators via the aforementioned Open A.I.R. website Team page.

Also integral to the success of the network are its nine Fellows, each of whom has spent time at the UCT IP Unit in Cape Town. The Fellows have contributed to Open A.I.R.'s case study and foresight research, to outreach and training work, and to building the network. The nine Fellows are: Esther Ngom of the Ngo Nyemeck law firm in Yaoundé; Seble Baraki of the Justice and Legal System Research Institute (JLSRI) in Addis Ababa; Moses Mulumba of the Centre for Health, Human Rights and Development (CEHURD) in Kampala; Douglas Gichuki of CIPIT in Nairobi; Milton Lore of Bridgeworks Africa in Nairobi; Eliamani Laltaika of the Tanzania Intellectual Property Rights Network (TIP-Net) in Dar es Salaam; Alexandra Mogyoros, a student in the Faculty of Law at the University of Ottawa; West Africa Hub Coordinator Helen Chuma-Okoro of NIALS in Lagos; and North Africa Hub Coordinator Nagham El Houssamy of A2K4D in Cairo.

Other collaborating institutions are the Program on Information Justice and Intellectual Property (PIJIP) at the Washington College of Law at American University in Washington, DC; the Centre for Technology and Society (CTS) in Brazil; the Centre for Internet and Society (CIS) in India; and the Open Society Foundations, where Open A.I.R.'s key partner is Vera Franz. The Open A.I.R. network has also benefited from interaction with staff at the World Intellectual Property Organisation (WIPO) headquarters in Geneva. In London, Shirin Elahi of Scenarios Architecture is the driver of Open A.I.R. foresight research work, as featured in the aforementioned *Scenarios* compendium that provides an important forward-looking complement to the current picture offered by this volume. Jo Higgs of Go Trolley Films in Cape Town did post-production on the videos available on the Open A.I.R. YouTube channel – videos which show how the network came into being and how the research was conceptualised.

All the people and institutions mentioned here have in one way or another played a role, by collaborating within the Open A.I.R. network, in the conceptualisation, planning, data collection, data analysis, writing, editing, design and production processes that resulted in successful research and the completion of this book. It is hoped that this volume's free availability online, under a Creative Commons (CC) licence, will ensure that the book's collaborative dynamics do not end here at the moment of publication, and continue long into the future in the work of the still-growing Open A.I.R. community.

Jeremy de Beer, Chris Armstrong, Chidi Oguamanam, Tobias Schonwetter
September 2013

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Acronyms and Abbreviations

A2K	access to knowledge
A2K4D	Access to Knowledge for Development Center (The American University in Cairo, Egypt)
AAU	Addis Ababa University
ABS	access and benefit-sharing
ACA2K	African Copyright and Access to Knowledge Project
ACP	African, Caribbean and Pacific Group of States
ACTS	African Centre for Technology Studies (Kenya)
ADPP	Ajuda de Desenvolvimento de Povo para Povo (Mozambique)
AERC	African Economic Research Consortium
AFTE	Association for the Freedom of Thought and Expression (Egypt)
AGOA	African Growth and Opportunity Act
AIM	Agência de Informação de Moçambique
AmCham	American Chamber of Commerce (Egypt)
ARC	Aquaculture Research Centre (Egypt)
ARIPO	African Regional Intellectual Property Organisation
ASSAf	Academy of Sciences of South Africa
ASTII	African Science, Technology and Innovation Indicators
ATO	alternative trading organisation
ATPC	African Trade Policy Centre
ATPS	African Technology Policy Studies Network
AU	African Union
AUC	The American University in Cairo
B-BBEE Act	Broad-Based Black Economic Empowerment Act 53 of 2003 (South Africa)
BCP	bio-cultural community protocol
BIH	Botswana Innovation Hub
BMZ	Federal Ministry for Economic Cooperation and Development (Germany)
BoI	Bank of Industry (Nigeria)
BOTEC	Botswana Technology Centre
BPR	business process re-engineering
CAA	Cocoa Abrabopa Association (Ghana)
CARICOM	Caribbean Community
CBD	Convention on Biological Diversity
CBN	Central Bank of Nigeria

CC	Creative Commons
CCIA	Computer and Communications Industry Association
CEDAT	College of Engineering, Design, Art and Technology (Makerere University, Uganda)
CEHURD	Centre for Health, Human Rights and Development (Uganda)
CEPIL	Centre for Public Interest Law (Ghana)
CIGI	Centre for International Governance Innovation
CIPC	Companies and Intellectual Property Commission (South Africa)
CIPIT	Centre for IP and IT Law (Strathmore University, Kenya)
CIPO	Canadian Intellectual Property Office
CIPR	Commission on Intellectual Property Rights (UK)
CMO	collective management organisation
COCOBOD	Ghana Cocoa Board
CPD	Centre for Policy Dialogue (Nigeria)
CRTT	Centre for Research in Transportation Technologies (Makerere University, Uganda)
CSIR	Council of Scientific and Industrial Research (India)
CTEA	Copyright Term Extension Act (US)
CVCP	Committee of Vice-Chancellors and Principals (UK)
DACST	Department of Arts, Culture, Science and Technology (South Africa)
DEST	Department of Education, Science and Training (Australia)
DFID	Department for International Development (UK)
DHET	Department of Higher Education and Training (South Africa)
DNS	domain name system
DRC	Democratic Republic of Congo
DRM	digital rights management
DRST	Department of Research, Science and Technology (Botswana)
DST	Department of Science and Technology (South Africa)
DTI	Department of Trade and Industry (South Africa)
EAEP	East African Educational Publishers (Kenya)
EC	European Commission
ECBP	Engineering Capacity Building Program (Ethiopia)
ECOWAS	Economic Community of West African States
ECX	Ethiopia Commodity Exchange
EEAA	Egyptian Environmental Affairs Agency
EIPO	Ethiopian Intellectual Property Office
EIPRL	Egyptian Intellectual Property Rights Law
EPA	Environmental Protection Authority (Ethiopia)
EPO	European Patent Office
EST	environmentally sound technology

EU	European Union
EUEI	EU Energy Initiative
Eurostat	Statistical Office of the European Communities
FAO	UN Food and Agriculture Organisation
FCN	Friendship, Commerce and Navigation (Kenya)
FDI	foreign direct investment
FDRE	Federal Democratic Republic of Ethiopia
FDSE	Free Day Secondary Education (Kenya)
FES	Friedrich Ebert Stiftung (Germany)
FLO	Fairtrade Labelling Organisations International
FOSS	free and open source software
FPE	Free Primary Education (Kenya)
FTA	free trade agreement
GDP	gross domestic product
GEM	Global Entrepreneurship Monitor
GERD	gross expenditure on research and development
GI	geographical indication
GIPC	Global Intellectual Property Center
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (Germany)
GM	genetically modified
GOAN	Ghana Organic Agriculture Network
GOK	Government of Kenya
GR	genetic resources
GTZ	German Technical Cooperation
HSRC	Human Sciences Research Council (South Africa)
ICANN	Internet Corporation for Assigned Names and Numbers
ICIDSS	International Creativity and Innovation Development Support Services (Ethiopia)
ICJ	International Commission of Jurists
ICLS	International Conference of Labour Statisticians
ICPSK	Institute of Chartered Public Secretaries of Kenya
ICT	information and communication technology
ICT4D	ICT for development
ICTSD	International Centre for Trade and Sustainable Development
IDC	Industrial Development Corporation (South Africa)
IDLO	International Development Law Organisation
IDRC	International Development Research Centre (Canada)
IDS	Institute of Development Studies (Kenya)
IE	informal economy

IFC	International Finance Corporation
IICA	Inter-American Institute for Cooperation on Agriculture
IIDMM	Institute of Infectious Disease and Molecular Medicine (South Africa)
IIED	International Institute for Environment and Development
IIPA	International Intellectual Property Alliance
IISD	International Institute for Sustainable Development
ILC	indigenous and local community
ILO	International Labour Organisation
INAO	Institut national des appellations d'origine (France)
IP	intellectual property
IPA	Industrial Property Act (Botswana)
IPC	International Patent Classification
IPi	Industrial Property Institute (Mozambique)
IPR-PFRD Act	Intellectual Property Rights from Publicly Financed Research and Development Act (South Africa)
IRB	Institutional Review Board (Botswana)
IRENA	International Renewable Energy Agency
ISAS	integrated seawater agriculture system
ISCTEM	Instituto Superior de Ciências e Tecnologia de Moçambique
ISI	Institute for Scientific Information
ISO	International Organisation for Standardisation
ISP	Information Society Project (Yale University, US)
ITC	International Trade Centre
JBEDC	Japan Bio-Energy Development Corporation
JITAP	Joint Integrated Technical Assistance Programme
JLSRI	Justice and Legal System Research Institute (Ethiopia)
K2C Biosphere	Kruger to Canyons Biosphere (South Africa)
KE	knowledge economy
KECOBO	Kenya Copyright Board
KENFAA	Kenya Nonfiction and Academic Authors' Association
KES	Kenyan Shilling
KHA	Kenya Historical Association
KICD	Kenya Institute of Curriculum Development
KIPI	Kenya Industrial Property Institute
KIPRA	Kenya Institute for Public Policy Research and Analysis
KNAS	Kenya National Academy of Sciences
KOLA	Kenya Oral Literature Association
KTO	knowledge transfer office
LBC	Licensed Buying Company (Ghana)
LDC	least developed country

LE	Egyptian Pound
LINK Centre	Learning Information Networking Knowledge Centre (Wits University, South Africa)
LSK	Law Society of Kenya
MAN	Manufacturers Association of Nigeria
MANCAP	Mandatory Conformity Assessment Programme (Nigeria)
MCH	Maasai Cultural Heritage Organisation (Kenya)
MCST	Ministry of Communications, Science and Technology (Botswana)
MCT	Ministério da Ciência e Tecnologia (Mozambique)
MDCA	Malindi District Cultural Association (Kenya)
MDG	Millennium Development Goal
MEA	Multilateral Environmental Agreement
MIST	Ministry of Infrastructure, Science and Technology (Botswana)
MIT	Massachusetts Institute of Technology
MOA	Ministry of Agriculture (Ethiopia)
MOE	Ministry of Education (Ethiopia)
MOFA	Ministry of Food and Agriculture (Ghana)
MoFED	Ministry of Finance and Economic Development (Ethiopia)
MOST	Ministry of Science and Technology (Ethiopia)
MoU	memorandum of understanding
MRC	Medical Research Council (South Africa)
Natoil	Natural Oil Company (Egypt)
NACI	National Advisory Council on Innovation (South Africa)
NCC	Nigerian Copyright Commission
NDA	non-disclosure agreement
NEP	National Enquiry Point (Botswana)
NEPAD	New Partnership for Africa's Development
NESC	National Economic and Social Council (Kenya)
NESTI	National Experts on Science and Technology Indicators
NIALS	Nigerian Institute of Advanced Legal Studies
NRF	National Research Foundation (South Africa)
NGO	non-governmental organisation
NIALS	Nigerian Institute of Advanced Legal Studies
NIPMO	National Intellectual Property Management Office (South Africa)
NIS	national innovation system
NMIMS	Narsee Monjee Institute of Management Studies (India)
NPR	National Public Radio (US)
NPSB	National Policy and Strategy on Biofuels (Mozambique)
NRC	National Research Centre (Egypt)

NREA	New and Renewable Energy Authority (Egypt)
NWLR	Nigerian Weekly Law Report
OA	open access
OAPI	Organisation africaine de la propriété intellectuelle
OCEES	Oxford Centre for the Environment, Ethics and Society
OCFCU	Oromia Coffee Farmers Cooperative Union (Ethiopia)
ODEL	open, distance and electronic learning
ODI	Overseas Development Institute (UK)
OECD	Organisation for Economic Co-operation and Development
OER	open educational resource
Open A.I.R.	Open African Innovation Research and Training Project
ORD	Office of Research and Development (Botswana)
PBIP	place-based intellectual property
PCT	Patent Cooperation Treaty
Petromoc	Petróleos de Mozambique
PIIPA	Public Interest Intellectual Property Advisors (US)
PIJIP	Program on Information Justice and Intellectual Property (American University, US)
PPS	probability proportional to size
PRO	public research organisation
ProBEC	Programme for Basic Energy and Conservation in Southern Africa
R&D	research and development
RCIPS	Research Contracts and IP Services unit (UCT, South Africa)
RIPCO (B)	Rural Industrial Promotion Company (Botswana)
RMI	rights management information
SADC	Southern African Development Community
SARUA	Southern African Regional Universities Association
SCE	Society for Critical Exchange (Kenya)
SID	Society for International Development (Kenya)
SINER-GI	Strengthening International Research on Geographical Indications
SME	small and medium enterprise
SMIEIS	Small and Medium Industries Equity Investments Scheme (Nigeria)
SMME	small, micro and medium enterprise
SNA	social network analysis
SON	Standards Organisation of Nigeria
SPS	sanitary and phytosanitary measures
STCI	Science and Technology Capacity Index
STEP	Science Technology and Economic Policy (US)
STI	science, technology and innovation
STS	Society for Technology Studies (Ethiopia)

SVKM	Shri Vile Parle Kalamani Mandal (India)
TBT	technical barriers to trade
TCE	traditional cultural expression
TGE	Transitional Government of Ethiopia
THE	Times Higher Education (UK)
THRIP	Technology and Human Resources Programme (South Africa)
TIA	Technology Innovation Agency (South Africa)
TIP-Net	Tanzania Intellectual Property Rights Network
TISC	Technology and Innovation Support Center
TK	traditional knowledge
TKDL	Traditional Knowledge Digital Library (India)
TPMs	technological protection measures
TRIPS	Agreement on Trade-Related Aspects of Intellectual Property Rights
TTO	technology transfer office
TVET	Technical and Vocational Education and Training (Ethiopia)
UB	University of Botswana
UCC	Universal Copyright Convention
UCITA	Uniform Computer Information Transactions Act (US)
UCT	University of Cape Town (South Africa)
UEM	Eduardo Mondlane University (Mozambique)
UGT	Uganda Gatsby Trust
UK	United Kingdom
UM	utility model
UNCST	Uganda National Council for Science and Technology
UNCTAD	UN Commission on Trade and Development
UNDESA	UN Department of Economic and Social Affairs
UNDP	UN Development Programme
UNECA	UN Economic Commission for Africa
UNEP	UN Environment Programme
UNESCAP	UN Economic and Social Commission for Asia and the Pacific
UNESCO	UN Educational, Scientific and Cultural Organisation
UNFCCC	UN Framework Convention on Climate Change
UNICAMP	University of Campinas (Brazil)
UNIDO	UN Industrial Development Organisation
Unilag	University of Lagos
US	United States
USAID	US Agency for International Development
USPTO	US Patent and Trademark Office
WAK	Writers Association of Kenya
WATH	West Africa Trade Hub

WBCSD	World Business Council for Sustainable Development
WCT	WIPO Copyright Treaty
WEF	World Economic Forum
WEP	World Employment Programme
WHO	World Health Organisation
WIPO	World Intellectual Property Organisation
Wits	University of the Witwatersrand (South Africa)
WPIS	WIPO Patent Information Service
WPPT	WIPO Performances and Phonograms Treaty
WTO	World Trade Organisation
ZAR	South African Rand

Chapter 3

Informal–Formal Sector Interactions in Automotive Engineering, Kampala

Dick Kawooya

Abstract

This chapter provides findings from a Ugandan case study that examined innovation transfers between informal-sector automotive artisans and formally employed researchers at Makerere University's College of Engineering, Design, Art and Technology (CEDAT). The primary site studied was CEDAT's Gatsby Garage, an automotive workshop where it was found that the informal-sector artisans were central to innovative processes but were at the same time driven more by sharing impulses than by concern for the intellectual property (IP) implications of their work. Based on these findings, it is argued that Ugandan policy-makers need to seek policy tools to support innovation transfers between informal and informal sectors, and that the tools need to cater for a wide range of innovation incentives.

1. Introduction

Very little research has focused on the dynamics of intellectual property (IP) rights in Africa's informal sector. No research has, to my knowledge, analysed the role or impact of IP rights in the exchange or transfer of innovation between the formal and informal sectors in Africa. Seeking to fill this research gap, the study outlined in this chapter examined the nature and scope of transfers and diffusion of innovative ideas in the Ugandan capital city, Kampala, between a Makerere University research centre and informal-sector artisans involved in automotive mechanics and engineering. The findings of the study are potentially important because there is reason to believe that indigenous technology research and innovations generated locally in Uganda (and more generally in Africa) are increasingly competing with research and innovations sourced from outside the continent, which are often inappropriate or ill-suited to local circumstances. At the same time, it

would seem that the formal and informal sectors in Africa often do not collaborate or “talk” to each other, as evidenced by the large body of African research and innovations that remain underutilised and not communicated beyond the confines of African universities (Hassan, 2001; Lor and Britz, 2005; Ondari-Okemwa, 2007; Ondari-Okemwa, 2004).

Disparaging portrayals of the informal sector in Africa (see Hart, 1973; ILO, 1972) do not encourage researchers in formal institutions to pay much attention to what their informal counterparts do. Communication by formal researchers with informal sector actors tends to be limited to occasional interactions in instances of research data collection or sourcing of specific skills. I am of the understanding that national government policies facilitating collaboration between Africa’s formal and informal sectors are rare and, in some places, totally absent. I therefore anticipate that the findings of this study can potentially provide lessons relevant to the crafting of policy initiatives aimed at fostering research and collaboration between the formal and informal sectors in African nations, specifically in relation to innovations grounded in (and appropriate to) Africa’s realities.

2. Conceptual framework

Dualistic conceptions of formal and informal

In defining formal and informal sectors in the context of this study, I focused on the elements that characterise each sector. Informal-sector activities are sometimes defined as those outside or beyond government regulatory reach. They are broadly defined to include, but are not limited to, activities not liable to taxation. Formal institutions and sectors, meanwhile, are broadly defined as those within the reach of government regulation or even government agencies themselves.

Another potential means of distinguishing between the informal and formal sectors is to highlight how they differ from each other, e.g.:

- automated production (formal) v. intensive labour (informal);
- high barriers to entry (formal) v. low barriers to entry (informal);
- new materials (formal) v. scrap materials (informal);
- large-sized business (formal) v. small-sized business (informal);
- skills acquisition via institutions (formal) v. via a mentor (informal); and
- foreign “Western” approach (formal) v. adaptable to market and indigenous culture (informal) (Daniels, 2010; ILO, 1972; Palmer, 2004; Tabak, 2000).¹

1 I thank David Gildiner for helping expand this list of elements typically used to define the informal sector.

These dualistic characterisations and framings of the formal versus informal sector may be helpful at the broad conceptual level, but the reality in many African contexts is that the line between the formal and informal sectors is blurred. A rigid binary cannot capture the highly complex nature of the interrelationships between the formal and informal sectors, and between these sectors and the broader economy, in many African contexts. Moreover, despite numerous informal sector studies conducted in Latin America, Africa and some advanced economies (Palmer, 2004; Portes, 1983; Portes and Sassen-Koob, 1987), there is actually little agreement on the nature and scope of the informal sector. Conceptualising the informal sector continues to be difficult due to the sector's fluidity and constant interaction with the formal sector. Indeed, the dualistic framing of formal versus informal has been discredited and discarded, to some extent, by many informal sector scholars (ILO, 2002, 2003; Palmer, 2004; Portes, 1983; Portes and Sassen-Koob, 1987). (See Chapter 2 of this volume for discussion, by De Beer *et al.*, of the concept of the informal economy [IE].)

In practical terms, the formal and informal sectors interact symbiotically. For example, a government department's use of an informal car repair shop for its fleet illustrates a form of interaction between the formal sector (government) and an informal-sector entity (repair shop). Another example is the practical training that informal-sector enterprises provide to students of formal research and training institutions. Both examples illustrate the potential for knowledge transfer between the two sectors. And formal sector entities – e.g. music recording studios – may periodically operate underground to avoid or limit their tax burden.

A formal–informal continuum

Based on the above analysis, it can be argued that it is more appropriate to conceptualise a *continuum* from formal to informal, where activities with varying degrees of informality are situated at different points along the continuum. This view is consistent with the conclusions of International Labour Organisation (ILO) studies on labour issues in the informal sector (ILO, 2002, 2003; Palmer, 2004). At the most formal end of the continuum are fully documented, regulated and taxed enterprises; at the most informal end of the continuum are entirely hidden, underground enterprises far removed from government oversight and often associated with illegal activities. But along the continuum between formal and informal, between the extreme ends, there is a mix of actors and enterprises whose characteristics are complex and often difficult to measure in terms of their degrees of formality or informality. For this study, I was interested in informal-sector enterprises somewhat near the middle of the continuum – i.e. likely to be well-organised internally and in the conduct of their business operations but still operating outside formal

government oversight – but at the same time, enterprises which, while informal, have some contact with the formal (or at least more formal) sector.

Choosing a point on the continuum

I determined that, in the Ugandan context, studying interactions between a formal university research institution (positioned to serve as an engine of research and innovation) and informal sector actors would offer insights, particularly given my intention to investigate matters of IP. I anticipated that, in the Ugandan context, university researchers and innovators, including both faculty and students, would be interacting with informal-sectors through a wide range of mechanisms. My choice of research focus was informed by awareness of anecdotal evidence suggesting that in African contexts, a number of quite formalised institutions partially rely on the informal sector, e.g. to, *inter alia*, absorb their graduates (a process of informal-sector engagement often starting via internships for graduates). I was interested in the effect that fresh graduates coming to the informal sector (with somewhat formalised knowledge and know-how) might be having on the informal sector and, in turn, the effect the informal sector might be having on the formal institutions from which the graduates were emerging.

From the formal sector side, I was interested in understanding whether university IP-related research and innovation were being diffused into the informal sector – and whether (and if so, how) that IP-related innovation translated into commercially viable goods and/or services in the informal sector (a sector which, unlike a publicly funded university, operates on the basis of profit maximisation for survival). However, while the goal was to focus on IP-related innovations, I did not expect or assume ahead of the study that the innovations in question would be protected by IP laws or, for that matter, that the actors in the formal or informal contexts to be studied would even be aware of, or preoccupied with, IP as part of their innovation processes. Nonetheless, I did assume that there were a number of innovations that originated in Ugandan universities and that some of the resultant goods and/or services were finding their way into the informal sector (such as, to take but one possible example, software applications developed in university research laboratories). Thus, the overarching goal was to gain a nuanced understanding of the innovation dynamics moving in two directions: from formal to (the relatively) informal, and *vice versa*.

3. The research

The overarching question for this case study was: *To what extent do the formal and informal sectors in Uganda exchange ideas and innovations, and what is the*

role of IP, if any, in that exchange? The study's primary objectives were therefore to understand:

- the kinds of innovations that formal and informal sector actors are involved in;
- the processes of transfer of innovation (and IP) between the two sectors;
- the role of IP rights and IP protection in either facilitating or hindering innovation in either sector; and
- the role of IP rights and IP protection in either facilitating or hindering the exchange of ideas and innovations between the two sectors.

The main setting I identified for the study was Gatsby Garage, run by Makerere University's College of Engineering, Design, Art and Technology (CEDAT) in the Ugandan capital city, Kampala. Gatsby Garage is a formal-sector entity that procures some of its inputs from informal-sector artisans. The study employed a qualitative methodology using elements of the social network analysis (SNA) method. The SNA method, which has been applied in a variety of disciplines, aims to construct a picture of the complex networks that form based on individual and organisational relationships, collaborations and sharing mechanisms. The SNA in this study focused on the personal network of a formal-sector innovator as the starting point, followed by identifying informal-sector nodes and relations, as well as the channels and mechanisms for the diffusion of innovation from formal to informal sector, or *vice versa* (Hanneman and Riddle, 2005; Hanneman *et al.*, 2005). Given that this study began in the formal sector (at Makerere University), innovators in that sector formed the core of the network. I then identified and approached the informal-sector component via the Gatsby Garage manager. (It was found during the research that the title "Garage manager" did not fully capture the wide range of activities, skill-sets, experience – and passion for his work – of this individual.)

In determining which actors or nodes to include in the network, I used the "egocentric networks" approach, where a central "node" is selected followed by identifying nodes around it (Hanneman and Riddle, 2005). This approach does not require determination and complete analysis of the network around the central node. Therefore, in both the formal and informal contexts studied by this research, the depth of the network was largely determined by the extent of the ties and the strength of the nodes that emerged. For the most part, I did not go beyond two layers of analysis, meaning that from the central actor (the formal-sector contact, the Garage manager) or "ego", I elected to go to two layers of nodes (Hanneman and Riddle, 2005; Hanneman *et al.*, 2005). I initially selected informal-sector contacts directly linked to the Garage manager, followed by contacts of those informal-sector actors, many of whom were not in direct contact with the Garage manager (see diagram in the Appendix). At each node or alter,

I conducted in-depth qualitative interviews that probed not only the connections or relationships that a given individual had, but also the kinds of innovative activities in which the individual engaged. I also inquired about the factors that influenced the individual's innovations, including the adoption and exchange of innovations by others.

The study focused on product engineering, reengineering and metal fabrication by informal artisans, with specific reference to automotive engineering and repair. The interconnectedness of informal-sector artisans in Uganda means that those whose primary work area is automotive engineering and repair will often shift to other related work as opportunities present themselves. It is also not unusual for them to outsource work to colleagues outside of automotive repair. Therefore, the unstructured nature of the relationships among informal-sector artisans required that a non-linear methodology like SNA be used to study the linkages and exchanges amongst them.

Gatsby Garage

Gatsby Garage is a project of Makerere University's CEDAT, with funds from the Uganda Gatsby Trust (UGT), a UK-funded non-governmental organisation (NGO). The Garage, a semi-formal entity, was seen as a suitable research site for this study because both faculty and students at CEDAT use it, especially those involved in automotive engineering research and design; students use the Garage as an internship facility and a place to translate their models into products; and the Garage actively employs graduates from CEDAT as well as informal-sector artisans. The aforementioned Garage manager, who has over 10 years of experience in the field, is a graduate of CEDAT (formerly Makerere's Faculty of Technology). The UGT is a member of the Gatsby Charitable Foundation in the UK, and its focus is on small enterprise development and innovation (see UGT, n.d.). UGT's organisational structure and leadership mix private technology-industry leaders with senior faculty at CEDAT, seeking to ensure responsiveness to industry needs as well as CEDAT's research priorities (see CEDAT, n.d.).

One of the network connections discovered in pursuing the Gatsby Garage manager's associations in the informal sector was a connection to an electronic vehicle project at CEDAT called the Kiira EV Project. The Kiira EV, developed by CEDAT's Centre for Research in Transportation Technologies (CRTT), is a prototype electric car designed and developed in Uganda by engineering students and faculty at CEDAT – probably the first of its kind in East and Central Africa (see CRTT, n.d.). Of interest in the context of this study was the fact that some of the informal artisans working for Gatsby Garage were involved in the actual fabrication and production of some parts for this prototype car, with the parts based

on designs from the engineering team at CEDAT. Further, some informal-sector artisans not directly connected to CEDAT were also involved in the production of some parts of the car, via their connections to informal-sector artisans working directly with CEDAT. I thus decided to interview the Technical Head and Manager of the Kiira EV Project, in order to better understand the innovations associated with the project and its connections with the informal sector.

Data collection

A qualitative interview instrument was developed for the interviews at each node, as well as a consent form to secure informed respondent participation. I received permission to conduct the study from the Ugandan Government through the Uganda National Council for Science and Technology (UNCST). Data were collected using a mix of written memos and notes, as well as audio and video recordings. The field work began with informal discussions with researchers at CEDAT,² followed by 11 in-depth interviews with informal-sector artisans, CEDAT researchers and a government official (the official responsible for science, technology and innovation [STI] at the UNCST). All of the interviewees were male, largely due to the fact that both the formal and informal automotive research and fabrication settings investigated were virtually all-male environments.

Interviews with artisans were always secured and coordinated by the Gatsby Garage manager. His insistence on introducing me to the artisans to establish rapport was immensely important. Interactions with artisans generally took the form of an interview, followed by a site visit to witness the artisan's activities. The initial interviews were generally done inside the manager's car, away from the artisans' garages or fabrication facilities. The site visits that followed the initial interviews were carried out without the presence of the Garage manager.

4. Findings

The research data provided clear indications that the formal and informal actors studied were exchanging ideas and/or innovations, often via Gatsby Garage. At the same time, the role of IP protection issues was found to be minimal in the actions and thinking of the informal artisans. IP only became an issue on occasions when formal-sector entities raised IP matters in the course of sharing their innovations

2 I was introduced to CEDAT researchers by Prof. Robert Ikoja-Odongo, who availed me of his extensive contacts (deriving from his work on the informal sector), which proved invaluable in finding the appropriate contacts (including the Gatsby Garage manager) to start the SNA work.

with informal-sector entities, as was the case when CEDAT outsourced some of the work on the Kiira project to artisans (as is described later).

Innovative work in the formal and informal sectors

Much of the innovation in the sector studied stemmed from the undersupply of affordable spare automobile parts imported from Japan. Parts available through formal-sector outlets, such as from local representatives of Japanese automakers, are generally too expensive for owners of used cars. This shortage of affordable parts presents opportunities for artisans to find solutions to fixing broken parts or fabricating new ones. Most cars imported into Uganda operate on rough roads, making the breakdown of cars and car parts fairly common. This environment creates a significant demand for the services of informal-sector artisans skilled in automotive engineering and repair.

The research found a great deal of innovation among both the formal-sector and informal-sector actors studied. Formal-sector Makerere staff and researchers affiliated with the semi-formal Gatsby Garage were found to have developed products such as carriers to enable inspection under the vehicle, a movable stand for proper handling of car engines, and a computer-aided system for managing vehicle maintenance projects at Gatsby Garage. In terms of the informal sector, there was evidence that the artisans affiliated with Gatsby Garage were finding solutions to a wide range of problems. The artisans were involved in activities that ranged from maintenance of parts – e.g. fixing car radiators, aluminium welding and working with metal forgers – to interior design. It was found that the artisans' vast experience and expertise in these areas were allowing some of them to fabricate parts (via a mix of repairing old parts and creating new ones) not readily available on the Ugandan market.

Apprenticeship as a means of learning

Learning to innovate in the informal sector studied was found to be linked to apprenticeship, wherein senior artisans train new ones. There is a dynamic of generosity, a willingness to help a relative or friend. In the words of one artisan:

If I don't help relatives by training them and giving them hands-on skills to produce stuff or repair work, they will likely become a burden in future, or social misfits, or probably engage in criminal activities due to poverty and lack of skills to find jobs. Besides, I was helped by a relative, so it's imperative that I do the same for young relatives and friends. (Participant 2, 2012)

Almost all participants interviewed for this study said they had acquired skills from friends or relatives through an apprenticeship. Some acquired their skills at

semi-formal entities such as Gatsby Garage, where there is a degree of informality even in the way untrained men come to be identified as trainees. According to the manager:

It's very informal the way we get them. I mean, you know somebody and they say: "I have a son, I have somebody, please help them out", and so they come. (Garage manager, 2012)

The study found that it is common that once a young trainee or apprentice has acquired basic skills, they either establish their own garages or work in a specialised area. In either case, the nature of problems presented to them on a regular basis demands that they are constantly thinking of innovative solutions. However, according to the manager, not all artisans are open to innovation, especially innovation seen as originating from academia:

[T]here is a challenge of acceptance and adaptability. Sometimes people prefer doing things the way they are always done. They prefer to continue with the *status quo*, so introducing the new technology or machine, there is always resistance. There is that feeling that this thing [new idea or way of doing something] belongs to the "book people". They [artisans] tell us, "this isn't our thing, for us we want to work with our hands", so there is always criticism. (Garage manager, 2012)

Another reason why senior artisans train new artisans is that the latter are eager to learn and are a source of cheap labour. Once a new artisan masters a particular skill-set, the senior artisan assigns him to routine or more mundane activities. As such, young or inexperienced artisans will deal with problems that do not necessarily require new solutions, but at the same time have a degree of complexity. The senior artisan's involvement with the newer artisan is then limited to supervising and dealing with complicated tasks (particularly tasks that require new methods for dealing with new problems that have emerged, or tasks related to designing a new part).

Networks, linkages between formal and informal sectors

The social networks between the two sectors are nurtured by Gatsby Garage's commitment to informal enterprises, as well as what the Garage manager referred to as the "vast and deep talent and skills available in Uganda's informal sector" (Garage manager, 2012). The manager specifically noted that Gatsby Garage staff generally approach artisans after they have "identified a particular skill-set in someone" (Garage manager, 2012). Ideally, these are skills that they do not have in the formal sector. The same sentiments were expressed by the head of the Kiira EV Project, whose production depended largely on the experience of the artisans. While the research team at CEDAT produced the Kiira EV computer designs and

models, the project depended on informal artisans for small steps in the process, such as costing of the car materials and fabricating some car parts. As one artisan indicated:

[The Kiira EV staff] approached me to provide cost estimates for the car based on the models and I did, but they didn't come back to me, probably preferring another artisan. (Participant 6, 2012)

While the above process might appear to be a simple exercise of costing the car and sourcing the most affordable artisans for the Kiira EV Project, the fact is that the informal artisans know the market for new and used automobile parts better than the formal-sector researchers. According to Participant 6, the Kiira EV researchers were inclined to select the artisans who know the best and cheapest sources for parts for the EV model they have designed. The relationships between formal and informal actors are also based on a degree of mutual trust and respect. The formal-sector actors recognise limitations in certain areas that can only be met by the practical skill-sets found in the informal sector.

The creation of the formal–informal networks was found to be a rather informal process. For example, a Gatsby Garage client recommends a young, unemployed relative with no formal training, but with skills in vehicle maintenance. In turn, the young relative, once taken on by the Garage, refers some of his work at the Garage to places where he had formerly worked. Alternatively, the manager is informally introduced to a respected mechanic who is well known for certain areas of speciality. In other cases, artisans who had previously worked with Gatsby Garage recommend or introduce the manager to other highly skilled artisans. Put simply, the processes of formal–informal sector linkages and network creation are informal and organic. (However, I learned from Gatsby Garage and the Kiira EV Project that there are now efforts being made by researchers at Makerere to proactively and systematically identify informal-sector artisans and to co-opt them into formal research and innovation centres.)

The relationships with formal institutions are of particular importance to informal-sector artisans; a matter of personal pride as formal-sector actors come to them, rather than *vice versa*. As one participant put it, “I am proud of helping those with PhDs and more advanced training than I have [...] me without significant formal education” (Participant 5, 2012). However, this participant also acknowledged that he had learned some new skills from his formal-sector contacts, particularly soft skills such as customer care (particularly important when an informal sector artisan is dealing with formal-sector clients).

Gatsby Garage primarily outsources work to informal-sector mechanics when its employees do not have the requisite expertise or cannot do the work efficiently in-house. However, the Garage only works with the best informal-sector actors –

individuals with many years of experience in a particular field. Therefore, despite their lack of formal education or training, Gatsby's informal-sector partners feel valued by the researchers in the formal sector.

Another relationship vividly described by one participant is the relationship between artisans and technology students, especially graduating students. The majority of technology students turn to informal artisans when translating product models or designs developed in their programme into finished products. As such, informal-sector garages serve as production facilities for products whose models were developed at the university. While the students proudly present the finished products to supervisors back at the university, they cannot overlook the fact that the process involved shared efforts between themselves and informal-sector artisans. In fact, there is evidence to suggest that without the ingenuity of the artisans, many of the models would remain theoretical ideas on paper.

The dynamics of the interactions among CEDAT, Gatsby Garage and the informal-sector artisans would appear to be consistent with the theoretical proposition, outlined above, of the formal-informal continuum. Gatsby Garage has had an ongoing relationship with artisans and conducts "informal" non-contractual paid work with them. Gatsby Garage represents a case of a semi-formal sector entity because it is situated at the centre – or near the centre – of the continuum. On the other hand, CEDAT is a more formal entity, fairly removed from the informal sector. Thus, certain formal-informal hybrid entities (of which Gatsby Garage is an example) can actually move along the continuum towards informality and serve as conduits or bridges for highly formalised actors existing far from the centre of the continuum but needing to reach the informal sector.

The data demonstrate that, in the case studied, formal-sector researchers and innovators both require and seek out informal-sector actors more than *vice versa*. However, this does not necessarily mean that there is wide diffusion of informal-sector innovations into the formal sector. Instead, in the case studied, it may be that formal-sector researchers are primarily using informal-sector solutions on an *ad hoc* basis as problems arise, with limited learning among formal-sector innovators when they take work or problems to informal-sector artisans.

Networks, linkages within the informal sector

While the primary focus of this study was formal-informal exchanges and linkages, the study also revealed that there are strong connections among informal-sector actors. For example, one of the interview participants from the informal sector who is affiliated with Gatsby Garage has a relationship with the Central Engineering Workshop (an informal-sector entity) located in Kalerwe, a suburb

of Kampala. While this entity focuses primarily on agro-processing machinery (e.g. grinding mortars), most of the raw materials for the machinery produced come from automotive garages. Moreover, other parts – such as metal sheets for agro-processing machinery – can be easily sourced from automotive garages with old car body parts. Central Engineering Workshop has slightly more advanced production machinery than some of the artisans interviewed for this study. For this reason, when necessary, artisans go to Central Engineering to use machines such as rollers (which roll flat metal sheets to desired angles). Conversely, staff from Central Engineering source specific expertise from car artisans to help with the fabrication and production of their agro-processing machines. Indeed, the artisan who connected me with Central Engineering often sources work from the Workshop when he has no clients. The Workshop therefore provides a secondary source of income and opportunity for this artisan.

The data thus suggest that informal–informal connections are even more organic than the formal–informal connections. This is likely because informal-sector actors are more likely to speak the same language and operate by the same rules. Moreover, many informal actors might specialise in a particular area but do not limit themselves to that area if opportunities present themselves elsewhere. Switching from one area of speciality to another can happen even during the course of a single working day.

Sharing of innovations

The research found, in the interactions between the formal- and informal-sector actors studied, that there was a great deal of freedom to share – innovations, solutions to problems, and even product designs and models – between the two sectors. While I had anticipated this situation, the extent and freedom with which both sides were sharing ideas was rather surprising, because it happened much more easily and frequently than I had anticipated. Given the complicated and competitive economic climate, I expected less sharing than was revealed in this study. It is therefore important to try to understand the rationales and motives for the sharing identified.

On the part of informal-sector artisans, it would seem that the ability to translate theoretical concepts into finished products, mostly through processes and activities that require a great deal of improvisation, is something the artisans are extremely proud of. They legitimately can (and do) portray themselves as solvers of problems that have eluded formally trained researchers in the academic setting. I even detected among the informal-sector artisans a sense of inevitability underlying the freedom with which they share their knowledge and new ideas, i.e. the artisans feel that individuals in academic settings are simply incapable of taking

ideas beyond theory and applying them to existing or new problems. According to the artisans interviewed, new problems call for thinking about new solutions, which many “ivory tower” individuals are incapable of.

Also relevant to understanding the sharing impulse is consideration of the dynamics of the artisans’ relationships with their clients, be they formal-sector partners or informal-sector colleagues. Artisans stated that once a client has paid for a service or product, the artisan feels obliged to explain what he did and how he did it, even if this involves disclosing new ideas, products or innovative ways of solving new problems. Almost all of the artisans interviewed expressed this view, even after repeated probing about the possibility of the formal-sector clients doing the job themselves in the future or taking artisans’ innovations and commercialising them.

One artisan did say that he would be reluctant to freely and openly share his ideas, saying that if some of his innovative approaches became publicly known, client retention would be jeopardised. Another interviewee approached the matter of sharing innovation from a very practical perspective. He said that even if artisans did sometimes feel the urge to keep innovations to themselves, working in open spaces prevented artisans from being able to keep their ideas out of the public eye:

It would be good to have ownership of a new idea, but we work in open places and spaces making it difficult and impractical to protect new ideas. Everybody can see what you’re doing or working on every day. (Participant 7, 2012)

Also sometimes making it unrealistic for artisans to try to keep clients from seeing their innovations is a lack of trust. This is particularly true for clients from formal settings who may not have the same level of trust artisans have among themselves. One participant indicated that:

[M]ost of our clients tend to stay around as we work on their cars. As such, they will get to know exactly what we do and whatever ideas and solutions we apply to whatever problems their cars present. Clients stay around and observe because they are not sure about [the] security of their cars. If we were a company, they wouldn’t necessarily stay around. (Participant 7, 2012)

IP dynamics

Among the informal-sector artisans, the role of IP rights and IP protection was found to be of little or no concern in relation to their collaborations with the formal sector. With the exception of one artisan, the participants found the notion of owning ideas, innovations or inventions antithetical to the workings of the informal sector, where collaboration and sharing is the norm rather than the exception. This view was consistent regardless of whether sharing involved a vertical

collaboration between formal and informal or a horizontal collaboration among informal-sector actors. Indeed, the notion of owning ideas was closely associated with preventing access and application of such ideas. This notion was understood to mean working in secrecy. One artisan asked:

If my mentor had withheld his knowledge and new ideas from me, how on earth would I have acquired the knowledge I got from him? If I withhold the knowledge I have, how am I supposed to teach the next generation of artisans?

While young apprentices are often charged small “training fees”, it is never the case that expectations go beyond that requirement. Usually, a small fee or even a family or friendship tie is sufficient for the senior artisan to freely pass on his knowledge without any expectation that it is protected “property”. This mentality also enables experienced or senior artisans to share new ideas and ways of doing things when new problems or tasks arise. None of the informal-sector participants was aware of IP laws that could protect their innovations. Furthermore, they remained unconcerned about IP even after I provided a brief explanation. And apparently Gatsby Garage was not particularly concerned about IP protection in its relationship with informal-sector actors.

However, unlike Gatsby Garage and the Garage’s informal-sector partners, the formal-sector actors studied were found to be increasingly aware of IP and wary of the possibility that their ideas could be “misappropriated”. For instance, the Kiira EV Project within CEDAT signed formal memoranda of understanding (MoUs) with Gatsby Garage and the informal-sector artisans, and each MoU contained non-disclosure clauses. Also, at the time of the field work for this study, Kiira EV Project researchers were in the process of pursuing IP protections related to a number of innovations or inventions from the project. Notably, the Kiira EV manager did not feel that informal-sector artisans made a large enough contribution to warrant being part of the resultant IP, and thus whatever IP protection came out of the filings would go to the CEDAT researchers and Makerere University.

Notwithstanding the MoUs, the Kiira EV project manager was aware that informal-sector artisans came into contact with the project’s IP in the form of designs that they could easily exploit. However, he was not concerned about informal-sector partners “stealing” or “commercialising” any of these ideas, because he felt that doing so would require heavy capital investment, which informal-sector artisans would be incapable of mobilising.

Policy-making

According to the official interviewed at the UNCST, the government of Uganda has neither studied, nor has experience with, the relationship between the formal

and informal sectors. Instead, emphasis is placed on formal-to-formal sector linkages, such as university–industry linkages or collaborations and exchanges of innovation through formal “clusters” (UNCST official, 2012). The rationale is that these relations are easier to foster than formal-to-informal sector linkages and *vice versa*. The official stated: “Actually, we are working with Makerere University’s Innovation System and Clusters Programme. They have clusters, and we are trying to study the relationships within those clusters” (UNCST official, 2012). The UNCST official said he hoped that, through such clusters, the university might bring informal actors on board. However, Makerere’s Clusters Programme currently focuses on formal industry actors.³ Arguably, these clusters present an easier means of dealing with IP issues than if the university were to collaborate extensively with informal-sector artisans.

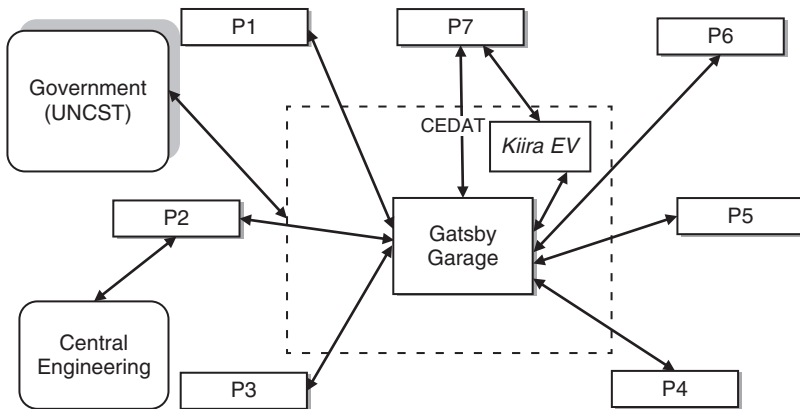
5. Conclusions

This research found a striking absence of concern among the informal-sector actors studied about IP protection or IP rights in relation to their innovative collaborations with other informal actors or with formal-sector players. Meanwhile, the formal sector was found to be showing increasing interest in IP protection, but it was notable that the formal sector’s formal–informal proxy entity, Gatsby Garage, appeared not to bring IP considerations into play during collaborations with the informal-sector artisans. These findings suggest there is a great deal of dynamism inherent in non-IP-based incentive modalities. Examination of how policy-makers might be able to optimise the incentive mechanisms at play in the settings studied in the course of this research was beyond the scope of the study, but there is clearly a need for substantial African-focused research in this area.

Government policies are needed in Uganda, and perhaps similarly in other African nations, to support formal–informal and informal–informal sector knowledge exchanges, so that innovations extend beyond project-specific or institution-specific initiatives. The incentive mechanisms included in such policy tools will need to be grounded in nuanced understanding of the complex mixes of motivations at play at different points along the formal–informal continuum.

3 Details about Makerere’s Clusters Programme are available at: <http://cedat.mak.ac.ug/cluster-programs.html>.

Appendix 3.1: Visual representation of networks among study participants and entities



P =Participant

CEDAT = College of Engineering, Design, Art and Technology (Makerere University)

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