



**INNOVATION &
INTELLECTUAL
PROPERTY**

COLLABORATIVE DYNAMICS IN AFRICA

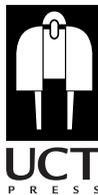
**Editors: Jeremy de Beer, Chris Armstrong,
Chidi Oguamanam & Tobias Schonwetter**

Innovation & Intellectual Property Collaborative Dynamics in Africa

EDITORS:

JEREMY DE BEER, CHRIS ARMSTRONG,
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*

About the Editors

Prof. Jeremy de Beer is an Associate Professor in the Faculty of Law, University of Ottawa, and co-Principal Investigator of the Open African Innovation Research and Training (Open A.I.R.) Project. His edited books include *Access to Knowledge in Africa: The Role of Copyright* (UCT Press, 2010), and *Implementing the World Intellectual Property Organization's Development Agenda* (Wilfred Laurier University Press, 2009). jeremy.debeer@uottawa.ca

Dr Chris Armstrong is a Visiting Researcher at the LINK Centre, University of the Witwatersrand (Wits), Johannesburg, publishing and communications consultant for the Open African Innovation Research and Training (Open A.I.R.) Project, and former Research Manager of the African Copyright and Access to Knowledge (ACA2K) Project. He is an editor of *Access to Knowledge in Africa: The Role of Copyright* (UCT Press, 2010). c.g.armstrong@gmail.com

Dr Chidi Oguamanam is an Associate Professor in the Faculty of Law, University of Ottawa, a lawyer with Blackfriars LLP in Lagos, a co-investigator for the Open African Innovation Research and Training (Open A.I.R.) Project, and former Director of the Law and Technology Institute at Dalhousie University, Halifax, N.S., Canada. He is author of the books *Intellectual Property in Global Governance* (Routledge, 2012) and *International Law and Indigenous Knowledge* (University of Toronto Press, 2010). coguaman@uottawa.ca

Dr Tobias Schonwetter is Director of the IP Unit in the Faculty of Law, University of Cape Town (UCT), African Regional Coordinator for Creative Commons (CC), co-Principal Investigator for the Open African Innovation Research and Training (Open A.I.R.) Project, and former co-Principal Investigator for the African Copyright and Access to Knowledge (ACA2K) Project. He is an editor of *Access to Knowledge in Africa: The Role of Copyright* (UCT Press, 2010). tobiasschonwetter@gmail.com

About the Contributors

Dr Perihan Abou Zeid is a Senior Lecturer in the Faculty of Legal Studies and International Relations, Pharos University in Alexandria (PUA), a Post-doctoral Fellow in the Centre of Economic Law and Governance at Vrije University, Brussels, and a volunteer attorney for Public Interest Intellectual Property Advisors (PIIPA). perihan.abouzeid@pua.edu.eg

Lucienne Abrahams is Director of the LINK Centre, University of the Witwatersrand (Wits), Johannesburg, and a former board member of South Africa's National Advisory Council on Innovation (NACI) and National Research Foundation (NRF). luciennesa@gmail.com

Prof. Adebambo Adewopo is a Professor of Law at the Nigerian Institute of Advanced Legal Studies (NIALS), Abuja, a Principal Partner at L&A Legal Consultants, Lagos, and former Director-General of the Nigerian Copyright Commission (NCC). tonade@yahoo.com

Titi Akinsanmi is Policy and Government Relations Manager at Google, Johannesburg, an African Regional Representative on the At-Large Advisory Committee of the Internet Corporation for Assigned Names and Numbers (ICANN), and a former Research Associate at the LINK Centre, University of the Witwatersrand (Wits), Johannesburg. titi.akinsanmi@gmail.com

Prof. Njoku Ola Ama is an Associate Professor in the Department of Statistics, University of Botswana, Gaborone. amano@mopipi.ub.bw

Dr Bassem Awad is a Judge at the Appeal Court of Egypt, an Adjunct Professor in the Faculty of Law at the University of Western Ontario, London, Ont., Canada, and a Tutor at the Academy of the World Intellectual Property Organisation (WIPO). awad_bassem@hotmail.com

Wondwossen Belete is President of the Society for Technology Studies (STS), Addis Ababa, former Manager of International Creativity and Innovation Development Support Services (ICIDSS), and former Director of IP Protection and Technology Transfer at the Ethiopian Intellectual Property Office (EIPO). wondwossenbel@yahoo.com

Helen Chuma-Okoro is a Research Fellow at the Nigerian Institute of Advanced Legal Studies (NIALS), Lagos, a Research Fellow of the Open African Innovation Research and Training (Open A.I.R.) Project, and Coordinator of Open A.I.R.'s West Africa hub in Lagos. helenchuma@gmail.com

Gino Cocchiaro is a lawyer with Natural Justice: Lawyers for Communities and the Environment, Cape Town, and a former Legal Researcher at the International Development Law Organisation (IDLO), Rome. gino@naturaljustice.org

Dr Tesh Dagne is an Assistant Professor in the Faculty of Law, Thompson Rivers University, Kamloops, B.C., Canada. tdagne@tru.ca

Fernando dos Santos is Director-General of the African Regional Intellectual Property Organisation (ARIPO), Harare, a Tutor at the World Intellectual Property Organisation (WIPO) Worldwide Academy, Geneva, a former Lecturer in Law at Eduardo Mondlane University (UEM) and the Technical University of Mozambique, Maputo, and former Director-General of the Mozambican Industrial Property Institute (IPI). fsantos@aripo.org

Kristen Holman is a JD candidate in the Faculty of Law, University of Ottawa. kristen.holman@gmail.com

Dr Dick Kawooya is an Assistant Professor in the School of Library and Information Science, University of South Carolina, Columbia, SC, and former Lead Researcher of the African Copyright and Access to Knowledge (ACA2K) Project. He is an editor of *Access to Knowledge in Africa: The Role of Copyright*, (UCT Press, 2010). kawooya@sc.edu

Johan Lorenzen is an LLB candidate at the University of Cape Town (UCT) and a former consultant with Natural Justice: Lawyers for Communities and the Environment. yolorenz@gmail.com

Dr Bernard Maister is a Senior Research Fellow in the IP Unit, Faculty of Law, University of Cape Town (UCT), practised as an IP (patent) lawyer in the US, and is one of the authors of *Harnessing Intellectual Property Rights for Development Objectives* (Wolf Legal, 2011). maisterb@gmail.com

Dr Ikechi Mgbeoji is an Associate Professor at Osgoode Hall Law School, York University, Toronto, and a lawyer with Blackfriers LLP, Lagos. His authored books include *Global Biopiracy* (UBC Press, 2006). ikechimgbeoji@osgoode.yorku.ca

Dr Caroline Ncube is an Associate Professor, and Deputy Director of the IP Unit, in the Faculty of Law, University of Cape Town (UCT), and lectures in the Master of IP programme of the World Intellectual Property Organisation (WIPO) and African Regional Intellectual Property Organisation (ARIPO) at Africa University, Mutare, Zimbabwe. caroline.ncube@uct.ac.za

Dr Marisella Ouma is Executive Director of the Kenya Copyright Board (KECOBO), Nairobi, an Advocate of the High Court of Kenya, has taught IP Law at the University of Nairobi, and lectures in the Master of IP programme of the World Intellectual Property Organisation (WIPO) and African Regional

Intellectual Property Organisation (ARIPO) at Africa University, Mutare, Zimbabwe. mwarsie@justice.com

Dr Adejoke Oyewunmi is a Senior Lecturer in the Faculty of Law, University of Lagos (Unilag), Akoka, and a former Adjunct Lecturer in the Master of IP programme of the World Intellectual Property Organisation (WIPO) and African Regional Intellectual Property Organisation (ARIPO) at Africa University, Mutare, Zimbabwe. aoyewunmi@unilag.edu.ng, adejoke21@yahoo.com

Simão Pelembe is a legal advisor at Petróleos de Mozambique (Petromoc), Maputo, a Master's candidate in Business Law at Instituto Superior de Ciências e Tecnologia de Moçambique (ISCTEM), and serves on the boards of Petromoc group companies Petrogás, Somotor, Petroauto, Ecomoz and Somyoung Motors. simao.pelembe@petromoc.co.mz

Dr Nagla Rizk is Professor of Economics at the School of Business, The American University in Cairo (AUC), founding Director of the Access to Knowledge for Development Center (A2K4D) at AUC, a Faculty Associate at Harvard University's Berkman Center for Internet and Society, an affiliated Fellow of Yale University's Information Society Project (ISP), and a founding member of the Access to Knowledge Global Academy. She is co-editor of, and contributor to, *Access to Knowledge in Egypt: New Research on Intellectual Property, Innovation and Development* (Bloomsbury Academic, 2010), and a co-author of *Arab Knowledge Report 2009*. naglarzk@aucegypt.edu

Britta Rutert is a PhD candidate in Anthropology at the Free University of Berlin and a Researcher for Natural Justice: Lawyers for Communities and the Environment in Bushbuckridge, South Africa. britta.rutert@gmail.com

Prof. Ben Sihanya teaches at the University of Nairobi Law School, is CEO of Innovative Lawyering and Sihanya Mentoring, Nairobi, and is former Dean of Law and Chair of the Department of Commercial Law at the University of Nairobi. His edited books include *Intellectual Property Rights in Kenya* (Konrad Adenauer Stiftung, 2009), and he is the author of *Intellectual Property and Innovation in Kenya and Africa* (Innovative Lawyering and Sihanya Mentoring, 2013) and *Presidency and Administrative Bureaucracy in Kenya* (forthcoming, 2013). sihanyamentoring@gmail.com, sihanya@innovativelawyering.com

Izabella Sowa is a JD candidate in the Faculty of Law, University of Ottawa. sowa.izabella@gmail.com

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 1

Innovation, Intellectual Property and Development Narratives in Africa

Jeremy de Beer, Chidi Oguamanam and Tobias Schonwetter

1. Context

Human development, including not just economic growth but also the capability for longer, healthier and more fulfilling lives, depends on innovation and creativity. While various economic, technological, social and other factors influence innovative and creative activity, intellectual property (IP) rights – copyrights, patents, trademarks, trade secrets and other appropriation mechanisms – play an increasingly important role. How IP rights help or hinder innovation and creativity in different contexts in Africa is the subject of this book.

The chapters that follow canvass aspects of the current reality of IP in nine different countries from the four main regions of the African continent. The chapters contain contextual analyses as well as on-the-ground case studies based on empirical, qualitative and quantitative research – and cut across diverse socio-economic contexts and legal systems, and a spectrum of formal, informal and traditional sectors. Examined as a whole, the evidence in this book helps build understanding of the ways in which the dual goals of protecting IP *and* preserving access to knowledge can be balanced. The book also provides indications of the roles that are being, and can be, played by collaborative and openness-oriented dynamics in relation to innovation, creativity and IP. A better understanding of the nuances and dynamics of IP is essential to creating policy frameworks and management practices that balance IP protection and access in such a way that African regions, nations and communities can harness IP as a tool to facilitate collaborative networking within diverse systems of innovation and creativity.

The proliferation and polarisation of opinion

Influential actors – multinational companies, developed-country governments, international organisations, academics, civil society groups – promote opposing

views on how IP protection interacts with innovation and creativity. One view is that IP protection is inevitably and necessarily an incentive for innovation and creativity. The opposing view is that IP protection is not required to facilitate innovation and creativity and, rather, is an impediment to the free and open exchanges of technology, culture and knowledge that form the core of innovative and creative modalities. These polarised views persist because, in fact, little is really known about how IP environments do or could influence innovation and creativity as a means to development. A recent, wide-ranging review (Hassan *et al.*, 2010) of the growing but still “surprisingly scarce” literature on IP and developing countries uncovered little consensus and even less clear evidence on the key questions facing IP policy-makers (2010, p. xiv). It follows that policy-makers who seek to encourage creators and innovators tend to struggle to develop appropriate IP systems. Bottlenecks and systemic inefficiencies occur as law-makers and policy-makers make hazy efforts, based on insufficient information, to calibrate national IP environments in support of innovation and creativity.

Overzealous IP protection regimes may indeed raise the costs of future innovations and may, therefore, discourage potential innovators and creators who cannot afford high up-front investments. Also, over-protection of IP may result in innovators and creators being unable to organise collaborative relationships in strategically optimal ways. On the other hand, under-protection of outputs may indeed be an investment disincentive for a significant proportion of potential innovators and creators, and may therefore be a threat to development.

Despite the lack of consensus about the influence of IP on innovation and creativity for development, some new narratives seem to be emerging. For most of the 20th century, the orthodox assumption was that IP protection is good for development. The wisdom was that if some protection is good, more is even better. The origins and spread of such narratives are explained especially clearly in the literature on the history of the World Trade Organisation’s (WTO’s) Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) and in the leading work on the international political economy of IP more generally (e.g. Drahos and Braithwaite, 2002; May, 2010; May and Sell, 2005; Sell, 2003).

From the 1994 passage of TRIPS onwards, political and economic pressures to increase IP protection succeeded in raising both IP protection standards and awareness of IP in developing countries. But the protectionist pressures led to backlashes against IP systems that were seen as insensitive to local contexts. This was especially true where IP protection impacted other public policy priorities, especially on matters of health, education and cultural participation. The work of scholars such as Barbosa *et al.* (2007), Boyle (1997, 2003, 2004), Chon (2006), Okediji (1996, 2000) and others was influential in that context. Such scholarship contributed indirectly to reform initiatives undertaken by international

organisations including the WTO, the World Health Organisation (WHO) and the World Intellectual Property Organisation (WIPO). A “development agenda”, or indeed a suite of related agendas, emerged as a new paradigm focused on recalibrating international IP law and policy (De Beer, 2009; Deere, 2009; Gervais, 2007; May, 2007; Meléndez-Ortiz and Roffe, 2009; Netanel, 2008; Yu, 2009). Moreover, an *ad hoc* movement of civil society advocates and scholarly researchers came together under the framework of “A2K” (access to knowledge), a civil society coalescence which fundamentally reframed the terms of global IP debates (De Beer and Bannerman, 2013; Kapczynski, 2008; Kapczynski and Krikorian, 2010). An illustration (as this book was being finalised in mid-2013) of the continuing momentum of the A2K movement was the outcome of the WIPO Diplomatic Conference of June 2013 in Marrakesh, at which more than 50 countries signed the Marrakesh Treaty to Facilitate Access to Published Works for Persons Who Are Blind, Visually Impaired, or Otherwise Print Disabled (Marrakesh Treaty, 2013).

A number of important recent works demonstrate the integration of development principles and A2K perspectives into mainstream analyses of IP (e.g. Wong and Dufield, 2011). Several scholars emphasise the complex, dynamic and multi-level nature not just of IP rules, but also of the broader governance of knowledge (e.g. Burlamaqui *et al.*, 2012; Chon, 2011; Oguamanam, 2011). The complexity of the scholarly endeavour has led to contrasting disciplinary perspectives and subtly different framings of IP issues. For example, some works characterise the basic problem as protecting “poor people’s knowledge” (Finger and Schuler, 2004); others promote the recognition of “indigenous people’s innovation” (Drahos and Frankel, 2012). A particularly important theme is the human impact of IP policy, i.e. the impact on individual fulfillment and well-being (Sunder, 2012).

Despite this rapidly growing global body of work, there is still little research examining systemic IP governance or knowledge governance in Africa. More than two decades ago, Juma and Ojwang (1989) urged African countries to examine their IP policies and “introduce laws that reflect the imperatives of national sovereignty” (1989, p. 3). Since then, there have been valuable in-depth examinations of particular issues, such as textiles and traditional knowledge (Boateng, 2011), or access to learning materials (Armstrong *et al.*, 2010; De Beer, 2013). In addition, some researchers have conducted regional analyses of A2K – in North Africa, for example (Shaver and Rizk, 2010) – and sub-Saharan African perspectives on IP and economic development have been put forward (e.g. Blackeney and Megistie, 2011), along with analyses of topics such as neo-colonialism and IP (e.g. Rahmatian, 2009) and African IP organisations (Kongolo, 2000). African-based researchers Pistorius, Harms and Visser have done strong work on the intersections among development and aspects of IP such as copyright (Pistorius, 2007)

and international legal and political IP paradigms (Harms, 2012; Visser, 2007). But many gaps in our understanding of IP and development, especially development in African settings, remain.

Particular blind spots relate to the dynamic and contextual roles of IP in different kinds of African innovation and creation modalities, particularly collaborative and openness-oriented modalities. The researchers who contributed to this book responded to an open public call to investigate matters that would help answer the following question: *How can existing or potential IP systems be harnessed to appropriately value and facilitate innovation and creativity for open development in Africa?* This framing provoked a range of connected questions. Practically, how do African innovators or creators exploit, adapt to, or work around, IP environments? Conceptually, are exclusive IP rights compatible with collaborative, openness-oriented innovation and creativity in Africa, and with inclusive development more generally? What are the on-the-ground interplays between openness and protection in relation to IP in African innovative and creative settings? At a more systemic level, to what extent, and how, have policy-makers in Africa attempted to calibrate IP frameworks in such a way that they can maximise innovative and creative potential? Current research addressing these important questions, as presented in the available literature and translated into practice, remains scarce and often appears to reflect rhetorical polarisation more than objective investigation. This volume seeks to begin to fill that research gap, by presenting findings from studies which explored the role of IP in innovation and creativity within collaboration- and *openness*-based conceptions of development in the African context. In other words, the book is *not* about innovation systems or creative industries in general; it is about the roles that IP rights do, and could, play *within* such systems and industries, specifically *in* Africa, specifically in relation to collaborative, openness-oriented dynamics.

Emphasising Africa

Questions about IP law, policy and practice may appear to be most suitably addressed globally, not least because several multilateral instruments, such as TRIPS, strive to introduce uniform minimum standards of IP protection around the world. This book, however, takes the view that examination of the global setting is insufficient, because regional, national and sub-national characteristics and perspectives must be taken into account and examined. As the research presented in this book reveals, examination of IP environments at African regional, national and local settings has much to offer.

At the outset, it must be emphasised that Africa is an enormous and diverse continent, not a single country. Therefore this book's exploration of the role of

IP in systems of innovation and creativity in African settings seeks to avoid perpetuation of stereotypes of African homogeneity. This book also emerges from an awareness that, in the context of humanity's continual strivings for innovation and creativity, African nations and communities have typically been assigned least-performing status. Africa's contributions have tended to be positioned as confined to the ancient world or the prehistoric era, sometimes via dubiously benevolent attempts to acknowledge the continent's role as the starting place (the "cradle", no less) of humankind. Africa has also tended to be subjected to depictions as a "dark" continent, a disease and affliction hotspot dominated by poverty. Juxtaposing the concept of "modern" innovation with the word "African" has, for much of the past few centuries, been positioned (particularly in the "developed" world) as a contradiction in terms. African knowledge has typically been cast as "traditional", which, as Dutfield (2002, p. 22) points out, implies the opposite of innovative or creative. While there is some very recent evidence of less pejorative media narratives emerging in relation to African innovation (see *The Economist*, 2013), most countries on the continent are still seen as having a long way to go if they wish to become hotbeds of 21st-century innovation.

There are various interrelated, IP-connected reasons that might explain the power of narratives suggesting that creativity and innovation in most parts of Africa appear to fall short of innovative and creative activity in other regions, particularly developed-world regions. This book investigates two possible reasons in particular: first, that African creativity and innovation are not properly valued by prevalent IP systems and assumptions; and second, that African creativity and innovation are being constrained by sub-optimal IP-related policies and practices. Using a range of research methods, the chapters in this book investigate both possibilities: that prevalent IP modalities might be (1) *undervaluing* African innovation and creativity, and/or (2) *undermining* African innovation and creativity. It must be made clear in this introductory chapter, however, that in exploring the possibilities just mentioned, the research outlined in this book was premised on certain assumptions, chiefly that current IP modalities can and do contribute to facilitation of innovation and creativity in some African settings, but that at the same time, the facilitative role of IP modalities in African settings can be improved.

Undervaluing African innovation and creativity?

It would appear that IP-related measurement tools for contributions to innovation do not sufficiently consider how innovation and creativity actually happen on the ground in African settings. It cannot be doubted that, amongst the rank of African and African diaspora intelligentsia, dating back millennia and certainly from pre-colonial times, there is no lack of epochal innovative and creative accomplishments

in virtually all categories of human endeavour. And Africa remains a continent whose diverse natural and human resources are clearly integral to humanity's collective quest for innovative solutions to pressing problems. The issue is, therefore, not whether there is African innovation, but rather whether Africa's real and potential contributions to innovation are properly identified or valued by IP.

It seems likely that certain formal, or informal, or mixed formal–informal, modes of innovation and creativity in Africa cannot be fully or properly accounted for through the Western-oriented prism of patents, copyrights, trademarks and other formal IP outputs. Many measurements used in developed countries, and exported to developing countries, betray apparent misunderstandings of the nuances of IP law, policy and practice, e.g. through blind citation of statistics regarding “patenting by population” or “share of world patents” or “cross-border trade-marks” (e.g. Conference Board of Canada, 2010). Such measurements inevitably influence decision-makers, often through mainstream media coverage. For example, a 2010 media headline proclaimed “Southern Africa: Region Failing to Innovate, Says Study”, and cited a study by the UN Educational, Scientific and Cultural Organisation (UNESCO) that concluded as follows: “Countries in southern Africa are producing so few scientific publications and patents that the region's social and economic progress is threatened” (Campbell, 2010, citing UNESCO, 2010). That Africa needs more patents is currently a key message being conveyed to African national policy-makers, who are, in turn, naturally tempted to seek to bolster their nations' statistical ranking via patent-centric policies, laws and regulations – even if the effects of such policy-making may well be counterproductive in the long term.

Simply citing numbers of patents issued is at best an incomplete attempt to measure innovation, and is at worst inappropriate, especially when in some cases these very patents could be clogging innovation systems with bottlenecks that impede collaboration. Some scholars in the developed world are now writing about such problems (Bessen and Meurer, 2008; Jaffe and Lerner, 2006), and influential bodies such as the Organisation for Economic Co-operation and Development (OECD) are beginning to recognise that sole reliance on such measurements of innovation is inadequate (OECD, 2010). Arguably, conventional IP metrics are especially improper for validation or empowerment of African innovators and creators at the “base of the pyramid”, i.e. the most marginalised (yet often most resilient) segments of society.

But while the developed world seems to be advancing towards more sophisticated measurement and understanding of IP's actual roles in innovation and creativity, there is evidence – e.g. the UNESCO study referred to above – to suggest that African policy-makers continue to be offered relatively stale, globalist, protection- and harmonisation-centric IP narratives containing insufficient counterbalancing

via references to nationally or locally contextualised IP realities and imperatives. This is despite decades-old pleas to look beyond patents for appropriate knowledge-governance frameworks:

Patent protection *per se* is too narrow to account for most of the innovative activity going on in the region. A new regime of intellectual property protection should be introduced to cover traditional technologies, intermediate innovations, inventions and other products of innovative activity. It should take into account the national development needs, regional co-operation, and international competitiveness (Juma and Ojwang, 1989, p. 2).

Undermining African innovation and creativity?

The still-dominant paradigm of IP protection, globally and in Africa, promotes IP as a “power tool” to facilitate economic growth (Idris, 2003), i.e. growth through private sector monopolies that temporarily limit competition and thereby provide financial incentives to invest human and financial resources into innovative and creative endeavours. It seems clear that IP does, to some extent, have a positive role to play in incentivising innovation and creativity. But it also seems clear that too little consideration is given, in the dominant discourses of IP training, education and capacity building finding their way to Africa, to the potential socio-economic externalities of the existing system (De Beer and Oguamanam, 2010). Moreover, the focus of most existing research on IP and innovation is on *formal* sectors of the economy, with little effort made to date to understand IP’s interactions with *informal* modes of innovation and creativity (informal modes which are particularly prevalent in developing-world settings).

If IP-related decisions are made based on narrow understandings of the true nature and value of IP in varying contexts, then human resources, venture capital and other factors influencing creativity and innovation might be misdirected in contexts (e.g. the African contexts that are the focus of this book) that do not conform to the tidy assumptions generated by narrow perspectives. There is a view, shared by the editors of this volume, that better understanding of the nuances of IP law, policy and practice in myriad settings (including, for the purposes of this book, African settings) can help policy-makers and practitioners more effectively harness the potential of what has come to be known as the “knowledge commons” (see Hess and Ostrom, 2006). According to the knowledge commons idea, knowledge is shared by groups of people and governed by dynamic mixes of formal and informal norms of ownership and control – by ownership and control systems that are sometimes closed, sometimes open, and often a combination of both.

Accordingly, the research studies detailed in this book sought to give proper due to dynamic fusions of formality and informality in relation to IP and

innovation. In addition, the studies sought to examine whether greater attention should and could be paid to potential leveraging of existing IP systems, or refinement of existing IP systems, in ways suited to more participatory, collaborative, democratic and just models of innovation and creativity, i.e. leveraging or refinement of IP systems in ways suited to enablement of openness-oriented modalities for development, modalities that some have come to call “open development” – a notion covered in this chapter’s next subsection, on openness.

The concept of openness

At present, it would seem that IP is, for the most part, not conceptualised in an openness-oriented way in Africa. Central to this book is the question of whether conceptualisations giving primacy to openness-based collaboration can help bridge the polarisation in IP discourse. This subsection explains how openness may be situated in respect of IP policy and practice, and the relationships between open IP models and openness more generally (as applied, for example, to notions of open development).

Open development

Open development is a relatively new concept that has only just begun to be investigated, let alone defined. Potential confusion around the concept stems from the elusiveness of agreement about what *openness* is. Whether a system can be considered open or not depends on a variety of factors including, significantly, the degree to which people are free, or even empowered, to universally access a system and to participate, collaborate and share within that system (Smith *et al.*, 2011). Early brainstorming around the idea of open development has centred around principles of collaboration, participation and inclusiveness in the political, legal, economic, social, cultural, technological and other institutions (broadly conceived) that shape people’s lives.¹ Examples of open development applied in practice might include open government, open communications networks, open access to content, open-sourced research, open product development and commons-based peer production (Benkler, 2006; Wunsch-Vincent *et al.*, 2007). Similar principles can be found in discussions using the label “inclusive development”, both generally (IDRC, 2011) and in the specific context of innovation (OECD, 2012).

1 One such brainstorming event was the IDRC Open Development Workshop in Ottawa, Canada (6–7 May 2010); more information about the workshop as well links to 21 paper abstracts are available at: www.idrc.ca/en/ev-140364-201-1-DO_TOPIC.html [accessed 12 April 2013].

Proponents of the value of open or inclusive development paradigms tend to gravitate towards calls for increasing democratic engagement, and they tend to emphasise the distributive implications of the benefits that accrue, from such modes of development, to the most marginalised segments of society. It can even be argued that openness breeds more openness, so that it is a game-changing force for unlocking innovation and creativity. That said, the potential downsides of openness should not be overlooked, including, in the realm of IP protection, the risk of misappropriation and, perhaps, challenges faced in seeking to find financial incentives for innovative and creative activity. The potential advantages and disadvantages make it necessary to consider appropriate degrees of openness that balance benefits with costs. Such balancing tends to be a constantly dynamic process, which further complicates a possible definition of openness in the context of developmental processes. Another challenge in arriving at a clear understanding of open development and related openness-focused concepts is the paradox that one person's freedom often requires another's constraint. Despite these conceptual and definitional challenges – and also to a great extent because of them – this book seeks to help build a better understanding of what the concept of open development might look like in one particular set of contexts: African contexts involving elements of IP, innovation and creativity.

Collaborative innovation and creativity

The term “innovation” has in recent years become a buzz word among government policy-makers, the private sector, civil society and academics. However, its meaning is not self-explanatory. The rich literature on innovation and its connections to entrepreneurship and formal and informal economic systems is canvassed in the De Beer *et al.* Chapter 2 of this book. In this introductory chapter, it will thus suffice to foreshadow the deeper analysis in Chapter 2 by providing an initial definition of innovation, making a rough distinction between the twin notions of innovation and creativity, and drawing some generalised connections among IP, innovation, creativity and openness.

A useful definition of innovation is contained in a handbook known as the *Oslo Manual*, a joint publication of the Organisation for Economic Co-operation and Development (OECD) and Eurostat (OECD and Eurostat, 2005). The *Manual*, now in its 3rd edition, provides guidelines for researchers and statisticians collecting and interpreting data regarding indicators of technological innovation in countries around the world. According to the *Manual*, an innovation can take the form of a new technological product (or service offering), a new production process, a new marketing method or a new organisational practice. Significantly improved products/services, processes, methods and practices also qualify as

new, according to the *Oslo Manual*. But to be an innovation, the new product/service, process, method or practice must be implemented, not merely abstract. Implementation usually refers to market availability, with the market understood broadly so that public sector social innovations may be included.

In this chapter, and in this book as a whole, there is frequent reference made to “innovation and creativity” as twin ideas. This is because this volume seeks to be inclusive of a wide range of innovation and creative practices potentially relevant to IP modalities, and some branches of conventional IP privilege the notion of innovation while others privilege creativity. Reference in this book to innovation and creativity as twin notions should *not*, however, be mistaken as implying that the two are equivalent. As outlined above with reference to the *Oslo Manual*, for something to be called an “innovation” it typically requires implementation via market availability (with the market broadly defined). “Creativity”, on the other hand, does not, in the understanding adopted by the editors of this book, necessarily imply implementation via market provision. In many cases, an instance of creativity may be but one link in the chain leading towards a market-available innovation; in other cases, an instance of creativity may remain as non-market-implemented, and thus not, strictly speaking, an innovation according to the *Oslo Manual* definition adopted by this volume.

In the context of IP law and policy, the term “innovation” is most often used during discussions of patents, while creativity is more typically mentioned alongside copyrights. This discourse results from the mistaken belief that patents are the most (or only) relevant IP right with respect to science and technology, while copyrights are the most (or only) important right in cultural industries. The emerging reality is that patents, trade secrets, copyrights, trademarks and other forms of IP protection are relevant across sectors, and that most industries are impacted by all of these issues (as explained in further detail below). Thus, among the reasons why this chapter typically mentions the concepts of innovation and creativity in conjunction with each other is our desire to move away, to the extent possible, from the tendency to bifurcate between patent-centric innovation analyses and copyright-centric creativity analyses.

Several important concepts emerge from the scholarly literature related to IP environments and collaboration- and openness-oriented innovation and creativity (or what we call, in this chapter, collaborative innovation and creativity). First, collaborative innovation and creativity need to be situated within the more general literature on innovation systems. One of the founders of the concept of innovation systems, Lundvall, has argued that research on formal aspects of innovation is evolving well, even in the developing world, including Africa (Lundvall *et al.*, 2009; see also Oyelaran-Oyeyinka and McCormick, 2007). However, to bridge innovation systems research and development studies, one of Lundvall’s

suggestions is to study the intersections among formal and informal dimensions of innovation (e.g. between patent statistics and social networks) (Lundvall *et al.*, 2009; Oyelaran-Oyeyinka and McCormick, 2007). The emerging conceptualisations of collaborative innovation and creativity seem to present opportunities for examination of formal–informal innovation intersections (Esalimba and New, 2009), and some of the chapters in this book (particularly Chapters 2 and 3) take up the challenge.

Current thinking about collaborative innovation and creativity can be unpacked into two relatively discrete components, which are very often conflated or misunderstood: *macro-level* IP public policies, and *micro-level* IP management practices. For example, when Chesbrough (2003) uses the term “open innovation”, it refers to the strategic exploitation of IP rights by private firms in ways that are, in fact, sometimes open and sometimes closed. Such a conception seems to reflect only one part of the picture of innovation’s role in development. The work of Chesbrough, and others such as Tapscott and Williams (2006) and Shirky (2008), has focused on the self-structuring behaviours of individuals and firms, albeit in the context of collective action. Communities built around initiatives like the Creative Commons, or the free and open source software (FOSS) movement, are likewise concerned mostly about organising actors within the respective communities. The work of researchers such as Lemos on the topic of “open business” also demonstrates how specific industries or parts of an industry can be developed using social rather than strict legal norms to govern expectations around content production, distribution and revenue-sharing (Lemos and Castro, 2008). In this subset of research, the adjective “open” as applied to innovation, creativity or business models is used in a variety of different and sometimes incompatible ways across disciplinary boundaries.

Moreover, even if a uniform understanding of the term *open* existed, it seems clear that while openness principles (however defined) work well in relation to IP in some sectors (such as software, content publishing, music distribution in some genres, health care, agriculture), they are more difficult to apply in other contexts (such as biotechnology research and development [R&D]) (see Adelman, 2005; Boadi and Bokanga, 2007; Boettinger and Burk, 2004; Clark *et al.*, 2000; Connett-Porceddu, 2004; Feldman, 2004; Halewood and Nnadozie, 2008; Hope, 2008; Kuchma, 2010; Nolan-Stevaux, 2007; Octaviani, 2008). Which sectors are most amenable to openness around IP, and why? There are very few studies that investigate multiple sectors simultaneously to determine which strategies might be viable on a larger scale or to draw other broad lessons (see Gastrow [2009] for one example of a multiple-sector study). This knowledge gap is a potential impediment to effective design and implementation of IP management policies and practices seeking to harness openness dynamics.

Another apparent gap in our understanding of the relationships between openness and IP is caused by the fact that, in both the scholarly and practical contexts, the potential public policy consequences of private orderings are usually discussed implicitly rather than explicitly. At the same time, research focused on high-level legal and policy issues – e.g. examination of whether building openness into IP policy will result in greater opportunity for developing countries to transform into equitable and sustainable knowledge societies – tends to fail to appreciate the practical implications of those public policies on private actors. That is, attention tends to be directed at either one or the other of these components of openness (private ordering or public policies) in relation to innovation and creativity, rarely making sufficient connections. It is hoped that this book's research findings and analysis offer some useful connections, or at least the beginnings of useful connections, between the actions of private and public sector actors in relation to IP, openness and collaboration.

2. The research

Analytical framework

The research framework for this book is pragmatic. Chapter authors approached their research on the basis of actual or likely practices of innovators and creators of valuable intangible assets. The researchers were at the same time asked to juxtapose these practices with the overarching legal, economic and policy systems governing people's behaviours, particularly behaviours in relation to IP, in the countries of study. While the point of departure for the research was the existing legal system of IP protection, a meaningful analysis of the ramifications of IP laws necessitated due consideration of disciplines other than law, such as political science, economics, business, engineering, philosophy and sociology. The multi-disciplinary constitution of the network of researchers who contributed chapters to this book duly reflects this approach.

It also needs to be stressed that many of the research studies covered in this book sought to approach IP, innovation and creativity from the perspectives of relatively vulnerable and marginalised collectives of people. The data and analyses presented in this volume are grounded in the need, in the African settings researched, for more equal and just distribution of the benefits of socio-economic development.

Methods

As explained in the Preface, the Open African Innovation Research and Training Project (Open A.I.R.) (www.openair.org.za), of which this book is part, adopted

a two-phase approach to researching the role of IP rights in relation to collaborative innovation and creativity with developmental intent: (1) the case studies, described in Chapters 3 to 15 in this book, seeking to reflect the *status quo* and develop some recommendations for the near future; and (2) scenario-building exercises seeking to understand what the intersection of IP, innovation, creativity and Africa's socio-economic development could look like two decades in the future. The second-phase findings, the scenarios, are documented in separate publications from this book, because the foresight work was geared towards strategic thinking and planning for the future. This book, meanwhile, offers the fruits of the first research phase, the case studies of the present.

The particular case studies in this book sought to lay the groundwork needed for new ways of identifying and valuing innovation and creativity in Africa. The case study method helps to humanise otherwise abstract information and yields understanding into complex systems of interacting variables. Case studies were thus chosen by the Open A.I.R. network as the necessary empirical tool for counteracting the formalistic tendencies of predominant IP measurements and analyses. The case study researchers adopted a range of methods. However, notwithstanding the Open A.I.R. network's interdisciplinary framework, IP is a decidedly legal construct, making legally focused desk research, including statutory analysis, an important part of most of the studies. Most of the researchers analysed a range of materials on the legal and policy contexts for their studies, including international treaties, national policies, statutes and regulations, and scholarly articles. The researchers also consulted a range of non-legal, non-policy sources, in order to generate coherent socio-cultural and economic contexts for their studies. While two of the chapters contain statistical analyses and quantitative data collected through surveys (Chapter 15 on Botswana's publicly funded researchers, and Chapter 8 on production and consumption of Egyptian independent music), most drew primarily on qualitative data from interviews, focus group discussions and qualitative written questionnaires. Such methods are not often used in legally oriented research (especially not regarding IP law), but are common in other areas of the social sciences. As will become clear to the reader, the qualitative data gathered were rich and facilitated author insights into a range of conceptual and practical elements, problems and solutions – insights which almost certainly could not have been generated via desk research alone.

Thematic research areas

The research featured in this book examined a diverse but interconnected range of phenomena in the following thematic areas related to IP: (1) informal appropriation, (2) trademarks and geographical indications, (3) traditional knowledge,

(4) copyrights, (5) patents and (6) publicly funded research. Collectively, these six interconnecting research foci, as brought together in this volume, offer insights into the extent to which IP systems are being, or could be, harnessed in African contexts to enable successful collaborative peer-production and distribution of knowledge-related goods and services.

Many previous and ongoing research projects have done, or are doing, valuable work by looking at particular topics within the framework of IP and development. For instance, there is much value in the work considering copyright's influence on access to learning materials, or strategies to increase access to patented knowledge, or the role of international organisations in local IP systems design. But analysing these issues in silos risks missing the bigger picture. Moreover, segregating topics such as patents, copyrights and trademarks into separate projects ignores the practical reality of how IP is managed on the ground. Any innovator, creator, entrepreneur or supporting policy-maker can attest to the fact that the key, overarching, real-world issue is how valuable intangible resources *of any sort* are protected, managed and mobilised. Whether the legal regime of patents or trademarks or copyrights is the particular tool being utilised in an effort to perform the desired management or mobilisation is of secondary importance to ultimate objectives. Many of the stakeholders affected by IP rights in any particular setting will often be unaware of the technical distinctions among branches of IP. A holistic approach was therefore necessary to achieve the objectives of the Open A.I.R. research programme that generated the content of this book.

Take just one of many possible practical examples: collaborative models of R&D in the biofuel sector. In some respects, this is clearly a patent-related issue. To the extent that patents may pose a problem for the development or deployment of innovative technologies, licensing strategies such as patent pools can be used to overcome such challenges. A wealth of scientific and technical information is contained in electronic patent databases, which are increasingly recognised for their potential value in facilitating North–South technology transfer and collaborative partnerships. Organisations that manage these databases, such as WIPO (via national IP offices), are right now implementing several large-scale online, networked projects to disseminate patent-related information throughout Africa as part of WIPO's development agenda. The information and communication technology (ICT) systems involved, however, are themselves layered with copyright protection. Moreover, the scientific and technical information contained in patent databases is at best incomplete and at worst useless without corresponding information contained in the scientific literature, the latter of which is protected by copyright and often technological protection measures (TPMs) too. To make matters more complex, the scientific research sector is built to a great extent upon public–private partnerships, with huge sums of both private and public funding

supporting R&D, making issues of IP ownership fraught. How are IP rights to be managed to reduce bottlenecks and facilitate collaborative innovation in such circumstances? Despite the convenience of compartmentalisation, investigating IP issues in separate silos, through different programming areas or research projects, may miss important analytical insights and opportunities for influencing behavioural change. By combining the findings from case studies in different but related fields of IP, this book not only reflects research synergies and efficiencies, it also seeks to facilitate overarching insights into certain social, economic, political or other problems related to IP.

However, it must also be said that the book makes no claim to be comprehensive. No project of this nature could cover all relevant fields. Moreover, the case studies presented in the book were generated via responses that the Open A.I.R. network received from an open public call for research proposals. Thus the spread of topics and the countries covered was largely determined by the interests expressed by the researchers who initially came forward to propose studies and who successfully completed their studies. As a result, some topics that some readers may regard as central to understanding IP in relation to African innovation, creativity and development – e.g. access to medicines, plant breeders' rights, farmers' rights, video industries, biodiversity, utility models (UMs), industrial designs – receive only cursory mention, or no mention at all, in the chapters which follow. And while the editors of this volume were pleased to be able to include research from all four main regions of Africa – North, West, East and southern – there will undoubtedly be some readers not satisfied with the fact that only one North African country (Egypt) is featured, and that none of the research was conducted in a Francophone African country. Once again, on this matter of the geographical spread of the chapters of this book, the editors were restricted to consideration of the successful case studies which emerged via the open call.

Also, it is in the nature of the case study method that successful case studies tend to focus selectively on precise, somewhat narrow sub-issues within broader thematic areas, and often seek to chart new paths in a research landscape that already has some frequently examined features. So, within the patents theme, the researchers who contributed to this volume did *not* dwell upon the fairly well-covered issues of patents and access to medicines (see Abbott and Dukes, 2009; Adusei, 2012; 't Hoen, 2002) or patents and control of food (see Tansey and Rajotte, 2008). Instead, researchers concentrated on the emerging issue of patents and renewable energy, specifically biofuels – a source of energy promising to have significant impacts on both rural small-scale farmers and national economies in Africa, not to mention the global environment. Likewise, within the area of traditional knowledge (TK), researchers did *not* attempt to engage with the broad debates about international regimes for access and benefit-sharing (ABS)

or similarly high-level topics. Researchers instead concentrated on one specific question – the viability of “TK commons” models in Africa – as one possible solution to TK-related IP challenges.

The following six subsections go into more detail about the thematic areas covered in the book and the author contributions to each theme.

Informal management of knowledge

One cannot understand African innovation without understanding the vibrant, entrepreneurial informal economy (IE) operating in African nations. But Africa’s IE tends to be conceptually disconnected from the leading scholarly literature on innovation, entrepreneurship and IP. In this volume, a pair of chapters (Chapters 2 and 3) – which should ideally be read as companion pieces – seek to begin to bridge this gap, by (in Chapter 2) establishing an IP and innovation conceptual framework inclusive of the IE, and (in Chapter 3) reflexively engaging with that framework via evidence collected on the ground in the Ugandan capital city Kampala. In Chapter 2, De Beer, Sowa and Holman review concepts developed to understand and measure innovation, and then outline frameworks useful for drawing links, in Africa, between innovation and paradigms of entrepreneurship, the IE and IP. The authors conclude that the time is ripe for African policy-makers to seek holistic approaches to building innovation and, in turn, fostering socio-economic development.

In Chapter 3, Kawooya provides findings from his Ugandan case study of interactions between informal-sector Kampala automotive artisans and formally employed researchers at Makerere University’s College of Engineering, Design, Art and Technology (CEDAT). The site of the interactions studied was CEDAT’s formal–informal hybrid (or “semi-formal”, as Kawooya calls it) entity, the Gatsby Garage automotive workshop. By probing the innovation practices at Gatsby Garage and at linked sites of informal activity, the research found that the informal artisans follow largely non-protectionist approaches to IP, both in their interactions with formal-sector partners and in their collaborations with counterparts in the informal sector.

Collaborative branding through trademarks and geographical indications

Throughout Africa, the agricultural sector remains central to economic and social development. New strategies are being developed to help brand African agricultural products with the unique product and production qualities they possess. Trademarks and related concepts such as certification marks and geographical indications (GIs) are important determinants of the likely success of such strategies. For many innovators, creators and entrepreneurs, especially those working as

or with small- and medium-sized enterprises, their brand may well be their most valuable intangible asset in need of protection. In Africa, there are various examples of collectivities of citizens, firms or other organisations who are interested in collectively protecting brands. The latent commercial and non-commercial value in agricultural products and processes is often interconnected with the TK of indigenous and local communities (ILCs) (Dagne, 2010). But in the absence of a satisfactory protection mechanism for TK, communities must use other tools. In some circumstances, GIs might be used to associate products or processes with desirable qualities attributable to specific geographic locations. In other contexts, ordinary trademarks might be used to protect (or stop others from protecting) words and marks that might confuse consumers in the marketplace. Related to these legal strategies are systems of certification marks, which might shift market power in favour of producers of certified organic or fairly traded goods and services. Effectively, collaborative branding through certification marks or geographical indications presents a possible counter-narrative to the openness instincts that dominate the A2K movement's perspective on copyright and patent issues. Similar to patent pooling, these branding tools create systems that are open on the inside yet closed to outsiders. Studying the nuances of such arrangements holds great potential for contributing to better understanding of the role that IP plays in openness-based innovation and creativity settings.

In Chapter 4, Oguamanam and Dagne examine the Ethiopian coffee and Ghanaian cocoa industries in order to determine their potential to benefit from *sui generis* GIs as a model for practical adoption of IP for open development objectives. Through local field work, the authors investigate whether or not GIs could be successfully and sustainably used as instruments of place-based IP (PBIP). The authors submit that the implementation of GIs involves a range of tasks, including: the establishment of legal and institutional structures; maintaining the quality, reputation or characteristics of the products; enforcing and defending rights; and developing product awareness in international markets. These tasks involve significant costs and efforts that need to be measured and weighed against the expected benefits.

Chapter 5, authored by Adewopo, Chuma-Okoro and Oyewunmi, describes and interprets the findings of a case study into the potential application of communal trademark systems for certain Nigerian leather and textile products. The authors consider the national legal and regulatory environment, the levels of standardisation practised by small-scale leather and textile producers, and the views of producers regarding the viability of communal trademarking. The authors find interest, among the producers they survey, in communal trademarking, but at the same time they identify potential legal and practical challenges.

The potential of traditional knowledge (TK) commons arrangements

The question of how the TK of ILCs in Africa and elsewhere can and should be protected against misappropriation has been controversially discussed for decades. African countries currently protect TK in a wide variety of ways: some by way of *sui generis* systems, others via incorporation of TK into existing sets of IP laws. Interestingly, in the context of TK, many countries in Africa find themselves in the unaccustomed position of being net *exporters* of knowledge rather than, as is the case with most other types of IP, net *importers*. This situation results at times in high-level calls by African and other developing countries (at WIPO, for instance) for stronger protection of TK through IP laws – a position which contrasts with these countries’ frequent demands for generally more flexible standards of IP protection. In other words, on TK matters there tends to be an inversion of typical North–South protectionist dynamics, with African and Southern nations to some extent taking up elements of the protectionist IP logic more usually associated with the stances of Northern governments and firms.

Within African ILCs, TK has typically been managed as a collectively held, shared and preserved resource. But recent decades have seen increased private sector proprietary, closed, commercial exploitation of TK, often in ways that do not benefit the communities that have created and preserved the knowledge. Chapters 6 and 7 look at one particular aspect of the current debate on exploitation of TK: the idea of a “TK commons”. The current prospect that faces many ILCs is unregulated access to their knowledge, leaving it open to abuse or requiring negotiation of a separate ABS agreement for every non-commercial use. TK commons systems seek to provide another possible model, whereby TK can be promoted and circulated without having either to place it in the unrestricted public domain, where it is “free for all”, or to deny all access to it entirely.

In Chapter 6, Ouma looks at the policy context for a possible TK commons in Kenya. Previous projects in Kenya, such as a digital archive documenting Maasai knowledge, have laid the groundwork for positive TK commons policy initiatives in Kenya, and the country has a National TK Policy (and draft law) seemingly capable of supporting commons approaches. But, the author concludes, collaboration between Kenyan government entities and ILCs is, at present, insufficient for full realisation of a TK commons. In Chapter 7, authors Cocchiario, Lorenzen, Maister and Rutert outline their research findings from a legal, social and anthropological examination of the TK commons adopted by a grouping of traditional medicinal practitioners in the Bushbuckridge region of South Africa. Based on findings generated through embedded participatory research and legal analysis, the authors argue that one potential way for these traditional healers to improve management of the TK in their commons could be via establishment of a legal “trust” mechanism.

Copyrights and empowered creativity

The two copyright chapters in this book seek to break down assumptions that creators and users of cultural outputs hold homogeneous perspectives. In particular, both chapters reveal that not all creators need or want more or maximum copyright protection. This suggests a need for outside-the-box solutions, which Chapters 8 and 9 explore. In Chapter 8, Rizk presents findings from an extensive survey of creators and consumers of independent music in Egypt. The author seeks to determine, in the case of the output of the independent musicians, the potential applicability of alternative business models (see reference to the work of Lemos earlier in this chapter) which could enhance copyright compliance and still respect the wishes of both musicians and listeners. The research found a complex web of behaviours and perspectives (among both creators and consumers) in relation to the music and in relation to compliance, or lack thereof, with Egyptian copyright law. Key findings were that neither the musicians nor the consumers of their work are concerned by the lack of copyright compliance inherent in the widespread pirate copying and illegal commercial exploitation of independent music, as both the listeners and the creators regard paid-for live performances as the preferable means of commercial exploitation. While acknowledging the reticence among the musicians surveyed towards forms of commercialisation beyond payment for live performances, Rizk highlights the potential utility of an online Creative Commons-based “digital commons” arrangement for the music. Online combination of access to free and paid-for content and services (a kind of “freemium” model) could, the author argues, serve to simultaneously legalise, accommodate and refine the Egyptian grassroots music sector.

In Chapter 9, Sihanya reflects on the state of Kenyan scholarship in relation to the country’s copyright environment. Sihanya researched attitudes and experiences among Kenyan scholarly publishing stakeholders in relation to emerging notions of “open scholarship” and alternative publishing with relaxed copyright restrictions. The author uncovered support for open scholarship among librarians and users, and a mixture of enthusiasm and reticence among scholarly authors. The primary interest of the scholarly authors Sihanya surveyed was wide dissemination of their ideas (an interest potentially well-served by open access [OA] and other alternative online publishing approaches). But, at the same time, the authors surveyed said they do not want to open themselves up to abuse of their economic rights, i.e. to jeopardise their ability to control commercial exploitation of their works. Sihanya concludes that Kenya’s copyright environment, particularly in relation to enforcement of authors’ economic rights, needs to be clarified and solidified in order for Kenyan authors to more fully embrace open scholarship and alternative publishing.

Patenting dynamics and African innovation policy priorities

Chapters 10, 11 and 12 investigate patenting and related matters relevant to African innovation objectives. Mgbeoji's Chapter 10, based on a survey of patent stakeholders in 44 African countries, focuses on the practical realities of patent examination in Africa. Mgbeoji found that most African patent offices are ill-equipped to discharge their two crucial functions: evaluation of the merits of an invention (to determine whether the criteria of patentability have been met); and collation and dissemination of patent information for the use of researchers, industry and other interested members of society. Mgbeoji argues that these weaknesses at African patent offices have the potential to hamper technology transfer and, in turn, retard domestic industrial development.

Chapters 11 and 12 look at specific issues connected to biofuel patenting, in Mozambique and Egypt, respectively. Both the developed and developing worlds face sustainable development crises for which energy matters are both cause and cure. In addition to wind, solar, geothermal, tidal and other sources, biofuels hold particular promise for the future, while at the same time triggering ethical, environmental and economic challenges. IP plays a little-studied role in this context. IP rights have the potential to induce investment in, and facilitate transfer of, innovative biofuel technologies, but at the same time can conceivably restrict R&D in the sector. Only very recently has attention begun to focus on this topic (see UNEP, n.d.). In Chapter 11, Dos Santos and Pelembe present their findings in Mozambique from a study of national biofuel policy-making and a biofuel patent landscaping exercise. The authors found strong Mozambican government policy commitment to development of small-scale biofuel enterprises and innovation, but, at the same time, a potentially countervailing dominance, by foreign firms, of biofuel technology patenting. Dos Santos and Pelembe argue that strong government support is necessary in support of locally driven biofuel technology research, innovation and development. Among other things, government needs to, according to the authors, facilitate affordable access to technology for small farming and producing enterprises. In Chapter 12, Awad and Abou Zeid outline their findings on Egypt's legal environment for biofuel patenting, and on the country's dearth of domestic biofuel innovation. The authors suggest policy and practical mechanisms that could help spark more Egyptian innovation in this area, with their recommendations including consideration of a clean energy "patent commons".

Ownership of outputs from publicly funded research

The patent chapters just outlined segue into the broader debate on the African continent – which forms the context for Chapters 13, 14 and 15 – about how IP policy can help or hinder the derivation of benefit from publicly funded research.

Scientific research resulting in innovation, and therefore benefiting development, can be complex, requiring large data sets, diverse analytical skills, and sophisticated, expensive equipment. By participating in international consortia, African publicly funded research institutions benefit from collaboration with global leaders in various fields, as such collaborations expose African researchers to best practices and give early access to research data and cutting-edge research equipment. But will African policy and legislative initiatives modelled on foreign instruments such as the US Bayh-Dole Act of 1980 (which permits certain recipients of federal research funds in the US to obtain IP protection for their inventions), be suitable for Africa, i.e. will public research in African nations, at its current levels, benefit from a Bayh-Dole-style commercialisation focus for the IP produced? One Bayh-Dole style law already exists on the continent, in South Africa, and there is a likelihood that other African nations will follow South Africa's example.

In an effort to provide some empirical evidence in support of deliberations by African policy-makers and law-makers giving consideration to introduction or revision of Bayh-Dole-style legislation in their respective countries, Chapters 13, 14 and 15 examine matters of IP protection for the results of publicly funded research in three African countries. In Chapter 13, Ncube, Abrahams and Akinsanmi analyse evidence from two South African universities, the University of Cape Town (UCT) and Johannesburg's University of the Witwatersrand (Wits), in relation to how these universities' innovation and knowledge dissemination activities are potentially influenced by the country's IP regulatory environment for publicly funded research. The authors investigated the ways in which UCT and Wits interact with South Africa's relatively new Intellectual Property Rights from Publicly Funded Research and Development (IPR-PFRD) Act of 2008. The research found problematic aspects with the IPR-PFRD Act's emphasis on knowledge protection and commercialisation, but at the same time evidence was found of initiatives and mechanisms, separate from the Act, by which the need for knowledge "socialisation" (generating non-commercial, societal benefits) and the practices of "open science" (wide sharing of data in order to maximise dissemination and collaboration) in relation to publicly funded research can still be fulfilled in South Africa.

In Chapter 14, Belete analyses findings from research into an apparent disconnect in Ethiopia between the state's innovation policy objectives (which emphasise transfer of protected IP between universities and industry) and the practical on-the-ground realities of scientific research in the country. The author found a dearth of innovative research at Ethiopia's universities, and scant linkage between universities and the private sector. In the author's opinion, the Ethiopian government should, instead of focusing on IP protection, explore alternative ways

of funding and facilitating dissemination and sharing of innovative research, i.e. to support the open science objectives also identified in Ncube *et al.*'s Chapter 13. The open science theme also emerges in Chapter 15, in which Ama outlines and analyses the perceptions of IP in public policy and among publicly funded researchers in Botswana. Based on review of policy and legal instruments and statistical analysis of original survey data, Ama found that (as in the South African and Ethiopian cases covered in chapters 13 and 14), the Botswana government is putting strong emphasis on taking advantage of IP-related opportunities in the service of national science, technology and innovation (STI) goals. However, at the same time, Ama's survey of Botswana's public researchers found that the researchers had low levels of awareness of both national and institutional IP frameworks governing research outputs. In addition, Ama found that the public researchers surveyed had a strong, open science-oriented commitment to wide dissemination of their outputs, a commitment potentially at odds with the patenting orientation of some of the elements of the IP policies of the Botswana government and public research institutions.

3. Comparative analysis: conclusions on the current reality

Chapter 16 is a synthesis and comparative analysis, collaboratively authored by the four editors. The chapter draws out the common and contrasting findings generated by the studies outlined in Chapters 2 to 15. As well as comparing and contrasting specific research findings, the chapter draws some broad conceptual conclusions regarding three key themes that are consistently present in the case studies: (1) *collaborative innovation and creativity*; (2) *openness*; and (3) *IP*. This concluding chapter seeks to give a sense of the *status quo*, i.e. the current functioning, in African settings, of collaborative innovation and creativity in relation to openness and IP modalities. And then, based on that *status quo*, the chapter, and the book, concludes with three broad, evidence-based recommendations for consideration by African policy-makers. These recommendations are to patiently avoid importing and entrenching foreign IP approaches that may not suit local conditions; to broaden conceptions of relevant IP rights beyond merely formal mechanisms in order to create collaborative knowledge governance systems; and to focus on the future rather than the past or present when implementing IP policies.

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